UNIVERSITI TEKNOLOGI MARA

THE IMPACT OF TEAM SHARED VISION, TEAM COMMITMENT AND TEAM COLLABORATION ON TEAM EFFECTIVENESS AMONG NURSES IN MALAYSIA: THE MEDIATING ROLE OF COLLECTIVE LEADERSHIP AND THE MODERATING EFFECT OF TEAM VIRTUALITY

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PhD

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Thesis submitted in fulfilment
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CONFIRMATION BY PANEL OF EXAMINERS

I certify that a Panel of Examiners has met on 20th May 2025 to conduct the final examination of Wan Nurulasiah binti Wan Mustapa on her Doctor of Philosophy thesis entitled "The Impact of Team Shared Vision, Team Commitment and Team Collaboration on Team Effectiveness Among Nurses in Malaysia: The Mediating Role of Collective Leadership and The Moderating Effect of Team Virtuality" in accordance with Universiti Teknologi MARA Act 1976 (Akta 173). The Panel of Examiners recommends that the student be awarded the relevant degree. The Panel of Examiners was as follows:

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ABSTRACT

This study examine the effect of team shared vision, team commitment and team collaboration on the team effectiveness. The collective leadership serve as mediator on the relationship between team shared vision, team commitment, team collaboration and team effectiveness, while team virtuality serve as moderator on the relationship between collective leadership and team effectiveness among the Nurses in Malaysia. Relational Coordination Theory (RCT) and Social Information Processing Theory (SIP). were utilized in developing research framework of this study. The data was collected from 417 registered nurses across twelve general hospital in Malaysia. Descriptive statistics conducted using IBM SPSS, while model assessment was performed using PLS-SEM covering measurement model assessment, structural model assessment and Importance of Performance Matrix Analyses (IPMA). The measurement model was use to assess the reliability and validity of the study constructs, while the structural model examined the relationship among variables. IPMA was employed to identify the most significant factor between team shared vision, team commitment and team collaboration that contributed to collective leadership and team effectiveness. Finding of this study revealed that team shared vision, team commitment and team collaboration have a positive and significant effect on collective leadership. Furthermore, collective leadership significantly mediates the relationship between team collaboration and team effectiveness among nurses in Malaysia. These findings also offered practical implication for healthcare management to monitor the performance, by implementing effective team building, training and reward that can strengthen the collective leadership and overall team effectiveness.

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CHAPTER 1
INTRODUCTION

1.1 Background of the Study

Healthcare systems globally continue to operate under increasing strain, driven by increasing patient loads, clinical complexity, demographic shifts, and workforce shortages (Pursio et al., 2023; Abdulqader, 2025) and Malaysia is no exception to these structural and operational problem (Planning Division, Ministry of Health Malaysia, 2023). Public hospitals, which serve the majority of the population, face overwhelming service demands that intensify operational pressures on nursing teams (Planning Division, Ministry of Health Malaysia, 2023). Nurses constitute the largest group of the healthcare workforce and are central to ensuring continuity of care, monitoring patient conditions, coordinating treatment, and providing emotional support (Oerther & Rosa, 2020; Department of Statistics Malaysia, 2023). However, high nurse to patient ratios, understaffing problem, resource limitations, administrative burdens, and rapidly evolving clinical demands place significant strain on their capacity to work collaboratively and effectively (Planning Division, Ministry of Health Malaysia, 2023). These system wide constraints undermine the relational indicators that supports teamwork and disrupt the communication structures essential for coordinated patient care, particularly in general hospitals that manage a wide range of complex and multidisciplinary cases (Planning Division, Ministry of Health Malaysia, 2023).

Within these conditions, the relational foundations of effective teamwork are especially vulnerable as the pressure of clinical workload, organizational hierarchy and resources constraints disrupt the pattern that required fir team effectiveness (Cho et al., 2022; Nemati-Vakilabad et al., 2024; Husarek et al., 2024). Relational Coordination Theory emphasised that high quality team performance depends on strong relational relationship characterised by shared goals, shared knowledge and mutual respect, supported by timely, accurate, frequent and problem solving communication (Gittell, 2002). However, in Malaysian hospitals, these relational conditions are often compromised by fragmented workflows, shift rotations and the relentless pace of

patient care, which reduce opportunities for team members to build a stable shared understanding of patients, roles and processes (Cho et al., 2022). Nurses have limited opportunities to engage in reflective communication, clarify team expectations or build shared mental models, making coordinated action difficult to sustain (Eldor, 2020). At the same time, Social Information Processing Theory highlighted that individuals interpret situational cues, behavioural expectations and social norms based on the information available within the work environment (Salancik & Pfeffer, 1978). In fast paced and unpredictable clinical settings, these cues are often inconsistent, ambiguous or overshadowed by urgent clinical demands, decreasing the development of shared behavioural norms and reducing the clarity with which nurses understand team expectations (Schmidt & Umans, 2024). Together, these indicators create an environment where relational alignment, meaning making and coordinated teamwork are increasingly difficult to maintain.

Team effectiveness in Malaysian nursing units is further compromised by persistent structural and behavioural challenges (Planning Division, Ministry of Health Malaysia, 2023). Nursing tasks are highly interdependent, requiring seamless coordination, rapid communication and shared clinical judgement across multiple shifts, wards and specialties (Jepkosgei et al., 2022). However, empirical evidence from hospital based studies shows that team functioning is frequently disrupted by communication breakdowns, ambiguous role boundaries, hierarchical decision making practices and insufficient leadership support, particularly in high acuity settings (Dener & Elcin, 2024; Mai et al., 2022). When communication becomes transactional rather than relational, teams lose the shared knowledge and shared goals that Relational Coordination Theory identifies as essential for coordinated performance (Cullati et al., 2019; Han et al., 2021). Similarly, when roles are unclear or inconsistently communicated, Social Information Processing Theory suggests that nurses may struggle to interpret situational cues about task ownership, leadership responsibility or appropriate collaborative behaviours (Fragoso et al., 2025; Feijoo et al., 2021). These inconsistencies diminish team cohesion and hinder the development of stable norms necessary for effective teamwork (Baek et al., 2023). Furthermore, hierarchical structures common in Malaysian hospitals create leadership gaps by discouraging nurses from voicing concerns, taking initiative or participating in shared decision

making, thereby weakening the relational and cognitive processes that underpin team effectiveness (Schmidt & Umans, 2024; Cho et al., 2024).

Collective leadership has been proposed as a potential response to these challenges, particularly in complex and interdependent work environments such as healthcare (Shirley et al., 2024). Collective leadership involves distributing influence across team members, fostering shared responsibility and encouraging collaborative decision making in day to day clinical practice (Martin et al., 2018; Wang et al., 2017). Theoretically, the relational emphasis in Relational Coordination Theory aligns closely with the behaviours that collective leadership is expected to promote, such as mutual support, open communication and shared problem solving (Han et al., 2021; Wu et al., 2018). When team members share goals, knowledge and respect, they are more likely to step forward, support each other's leadership efforts and coordinate their actions without relying solely on formal authority (Jaaffar & Samy 2023). At the same time, Social Information Processing Theory suggests that collective leadership can shape the social cues that team members rely on to understand expected behaviours, enabling more consistent interpretation of norms around voice, initiative and shared responsibility (Hu & Caseey, 2021; Brun & McAuliffe, 2022). While some teams exhibit elements of distributed leadership, structural barriers such as rigid hierarchy, low autonomy and inconsistent communication patterns often limit its capacity to influence team effectiveness (Salehi et al., 2024), particularly in public hospitals where decision making is centralised and nurses' influence is constrained by formal role structures (Chen & Zhang, 2022).

The increasing use of digital technologies introduces another layer of complexity into teamwork dynamics as virtual communication channel can alter the flow of information, reduced access to relational cues and challenge the ability of team members to maintain shared understanding and coordinated action (Naim et al., 2025). Electronic medical records, digital shift handover tools and online reporting systems are becoming more prevalent in Malaysian hospitals as part of broader digitalisation efforts (Ong et al., 2024). These tools are designed to support coordination by enabling rapid information access and documentation across time and space, and they can, in principle, strengthen shared knowledge within teams (Kohanova et al., 2024). However, Social Information Processing Theory emphasises that virtual communication often

reduces access to rich social cues such as tone, facial expressions and non-verbal signals, which are critical for building trust, understanding relational intentions and interpreting leadership behaviours (Nashwan et al., 2025). Similarly, Relational Coordination Theory highlights that high quality communication is not only frequent and timely but also problem solving in nature, a quality that can be difficult to maintain when interactions are mediated by technology rather than by face to face contact (Kohanova et al., 2024). Thus, while digital tools can streamline information flow, they may unintentionally weaken relational depth and hinder the social interpretation processes that support collective leadership and team effectiveness (Fujii & Iwasa, 2025). The implications of team virtuality and technology mediated communication for clinical teamwork remain under examined in Malaysia, particularly among nurses who continue to provide predominantly hands on, in person care (Lee et al., 2025; Zurina et al., 2022).

Taken together, these realities reveal several important gaps in the existing literature, Firstly, little is known about how relational antecedents such as team shared vision, team commitment and team collaboration shape collective leadership within nursing teams, despite evidence from other contexts that shared vision and collaboration can strengthen leadership processes and team effectiveness (Kohanova et al., 2024). Second, prior studies rarely examine whether collective leadership functions as a mediator linking these relational factors to team effectiveness in hierarchical, resource constrained clinical environments, even though Relational Coordination Theory and Social Information Processing Theory both imply that relational and informational processes should connect team climate with performance (Zhao et al., 2025; Fragoso et al., 2025). Third, the moderating role of team virtuality remains largely untested in hospitals setting, leaving unanswered questions about whether technology mediated communication patterns strengthen or weaken the link between leadership and team effectiveness in settings where face to face care remains dominant (Zhao et al., 2025; Purvanova & Kenda, 2021). Addressing these gaps is essential for advancing theoretical understanding and for informing practical strategies to strengthen teamwork in Malaysia's public healthcare system (Walker et al., 2021). By grounding the present research in Relational Coordination Theory and Social Information Processing Theory, this study is positioned to explore not only structural and behavioural predictors of team

effectiveness but also the relational and cognitive processes that enable or decrease the effective teamwork among nurses in Malaysian general hospitals.

1.2 Problem Statement

The Malaysian public healthcare system has undergone rapid expansion in service demand, clinical complexity and technological integration, while continuing to operate under constraints in staffing, resources and infrastructure (Baalharith and Aboshaiqah, 2024; Durney et al., 2024). Nurses form the largest professional group and are central to the continuity, safety and quality of care delivered in public hospitals (Oerther and Rosa, 2020; DOSM, 2023). Their work is highly interdependent and requires ongoing coordination of tasks, information and responsibilities across wards, disciplines and shifts (Nanji et al. 2025). Relational Coordination Theory emphasises that such high stakes, interdependent work demands strong relational conditions, namely shared goals, shared knowledge and mutual respect, supported by timely, frequent and problem solving communication Falatah & Conway, 2019; Gittell, 2016). However, increasing patient loads, staff shortages and organisational pressures in Malaysian hospitals strain these relational ties, limit opportunities for structured communication and reduce the time available for joint reflection or shared problem solving (Baalharith and Aboshaiqah, 2024; Jarva et al., 2022). At the same time, Social Information Processing Theory highlights that employees interpret and respond to work demands based on the social cues available in their environment (Gittellet al., 2008). In fast paced clinical settings, these cues can be inconsistent or ambiguous, making it difficult for nurses to form shared expectations about teamwork and leadership (Nanji et al., 2025). Together, these dynamics create a complex environment in which the relational and interpretive foundations of effective nursing teamwork are under continuous pressure.

Within this context, team effectiveness in nursing units is particularly vulnerable as high task interdependence and workload pressure increase the consequences of even small breakdowns in coordination, communication or role of leadership (Kohanove et al., 2024). Team effectiveness is critical because patient outcomes depend not only on individual clinical competence, but also on the team's

ability to coordinate tasks, manage uncertainty and sustain collaboration over time (Han et al., 2021; Wu et al., 2018). However evidence from Malaysian and international studies indicates that nursing teams commonly experience unclear role boundaries, fragmented communication and hierarchical decision making, all of which undermine shared understanding and coordinated action (Nuratri et al., 2022; Mangla, 2021; Swart et al., 2022). These conditions weaken team shared vision, dilute team commitment and constrain team collaboration, which are central relational elements in Relational Coordination Theory and shape how social cues are interpreted according to Social Information Processing Theory (Zada et al., 2022; Kashive et al., 2022; Mayer et al., 2022; Wahab et al., 2023). When team members do not share a clear vision of their goals, are unevenly committed to team priorities or struggle to collaborate consistently, the quality of relational coordination declines and team effectiveness is likely to suffer, particularly in resource constrained public hospitals (Reilly et al., 2024).

Leadership processes sit at the core of these relational dynamics, shaping how team members interpret their role, coordinate their actions and respond to the social cues embedded within fast-paced clinical setting (Duprez et al., 2023). In many Malaysian hospitals, leadership remains largely hierarchical, with authority and decision making concentrated at higher organisational levels, while nurses are expected to implement directives within tightly structured routines (Planning Division, Ministry of Health Malaysia, 2023; Brun and McAuliffe, 2022). This model can limit opportunities for nurses to exercise influence, share leadership responsibilities or engage in joint decision making at the team level (Nemati-Vakilabad et al., 2024). Relational Coordination Theory suggests that teams function more effectively when leadership supports shared goals, shared knowledge and mutual respect across professional boundaries (Najafi et al., 2022). Social Information Processing Theory further indicates that when team members receive consistent cues that initiative and voice are valued, they are more likely to engage in leadership behaviours, whereas cues that reinforce passivity or obedience discourage such engagement (Yang et al., 2024). Collective leadership, which involves distributing leadership influence among team members, is conceptually well aligned with these theoretical perspectives and has been proposed as an important mechanism for strengthening relational coordination in complex care settings (Moon & Lee, 2024). However, there is limited empirical

evidence on how collective leadership actually emerges in Malaysian nursing teams and how it relates to team effectiveness under conditions of high workload, strong hierarchy and constrained autonomy (Kee & Jong 2022).

The growing use of digital tools in Malaysian hospitals introduces additional complexity as technology-mediated communication can alters how information is exchanged (Brun & McAuliffe, 2022). Electronic medical records, online reporting systems, messaging platforms and teleconsultation technologies have become more visible features of daily work for nurses, creating new patterns of virtual interaction alongside traditional face to face communication (Baalharith and Aboshaiqah, 2024; Razavi et al., 2022; Jarva et al., 2022). Team virtuality, reflected in the extent to which team members rely on digital tools and work across physical or temporal boundaries, has been shown in other contexts to reshape communication patterns, trust and coordination in both positive and negative ways (Mayer et al., 2022; Kirkman and Stoverink, 2021). Relational Coordination Theory warns that if digital communication reduces opportunities for interaction, it weaken shared goals and mutual respect, while Social Information Processing Theory suggests that reduced or filtered social cues in virtual environments can complicate sense making about roles, expectations and leadership (Zada et al., 2022). However little is known about whether, and how, team virtuality alters the relationship between collective leadership and team effectiveness among nurses in Malaysian public hospitals, where most clinical work still requires physical presence at the workplace but communication increasingly involves digital platforms (Shehata, 2024).

In conclusion, several important knowledge gaps become apparent, particularly regarding how relational conditions, leadership processes and technology-mediated communication interact to shape effective teamwork in healthcare settings (Hayat et al., 2024; Carron et al., 2021). First, existing research has not adequately clarified how key relational conditions such as team shared vision, team commitment and team collaboration shape the emergence of collective leadership within Malaysian nursing teams (Royani et al., 2024). Although international studies indicate that these relational conditions may increase collective leadership behaviours, the evidence remains context specific and has not been rigorously tested within Malaysian public hospitals (Han et al., 2021; Khan, 2020; Groulx et al., 2023). Second, limited research has examined

whether collective leadership mediates the relationship between these relational conditions and team effectiveness, despite theoretical emphasis in Relational Coordination Theory and Social Information Processing Theory on relational mechanisms and interpretive processes that link team inputs to team effectiveness (Hayat et al., 2024; Joniakova et al., 2021; Nakrem and Kvanneid, 2022). Third, although team virtuality has received growing attention in recent leadership and teamwork studies, its role as a moderator of the relationship between collective leadership and team effectiveness remains untested within Malaysian public hospitals (Handke et al., 2019; Purvanova and Kenda, 2021; Shi et al., 2023). This creates uncertainty about whether virtual communication conditions strengthen, weakened or have no effect on the influence of collective leadership on team effectiveness in nursing teams (Nuratri et al., 2021; Majumdar et al., 2023). Addressing these gaps is essential to support the application of Relational Coordination Theory and Social Information Processing Theory in healthcare and to develop contextually grounded evidence that can inform interventions aimed at strengthening teamwork, leadership and patient care outcomes in Malaysia's public hospital system (Hayat et al., 2024).

1.3 Research Questions

This study sought the answer to certain significant questions based on the problem statement involving the team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness in the context of nurses in Malaysia. The specific research questions to be addresses by this study could be worded as follows:

1. Does team shared vision, team commitment and team collaboration effect the collective leadership among nurses in Malaysia?
2. Does team shared vision, team commitment, team collaboration and collective leadership effect team effectiveness among nurses in Malaysia?
3. Does collective leadership significantly mediates the relationship of key elements of teamwork (team shared vision, team commitment, team collaboration) with team effectiveness among nurses in Malaysia?

4. Does team virtuality significantly moderates the relationship of collective leadership with team effectiveness among nurses in Malaysia?

1.4 Research Objectives

In order to address the issues highlighted in the problem statements and to answer the research questions above. Specifically, the objectives of this study could be worded as follows:

1. To examine the effect of team shared vision, team commitment and team collaboration on the collective leadership among nurses in Malaysia.
2. To examine the effect of team shared vision, team commitment, team collaboration and collective leadership on team effectiveness among nurses in Malaysia.
3. To investigate the mediating role of collective leadership on the relationship between key elements of teamwork (team shared vision, team commitment, team collaboration) and team effectiveness among nurses in Malaysia.
4. To investigate the moderating effect of team virtuality on the relationship between collective leadership and team effectiveness among nurses in Malaysia.

1.5 Scope of the Study

This study examined how team shared vision, team commitment, and team collaboration influence collective leadership, team virtuality, and team effectiveness within Malaysian public hospitals. The scope was guided by Relational Coordination Theory, which emphasises shared goals, shared knowledge, and mutual respect as foundations of high-quality teamwork (Gittell, 2016), and Social Information Processing Theory, which explains how individuals interpret social cues and communication patterns in shaping their behaviour (World Health Organization, 2021; Massimine, 2023). Data for the study were collected through survey questionnaires administered to nurses working in twelve public hospitals in Peninsular Malaysia. These hospitals Hospital Tuanku Fauziah, Hospital Sultanah Bahiyah, Hospital Pulau

Pinang, Hospital Raja Permaisuri Bainun, Hospital Sungai Buloh, Hospital Putrajaya, Hospital Tuanku Ja'afar, Hospital Melaka, Hospital Sultanah Aminah, Hospital Tengku Ampuan Afzan, Hospital Sultanah Nur Zahirah, and Hospital Raja Perempuan Zainab II represent diverse working environments and patient populations. They also reflect the operational realities of Malaysian public healthcare, which must manage large patient volumes, staffing shortages, and structural constraints (Salleh & Khalid, 2021).

A quantitative cross sectional research design was employed, using a self-administered questionnaire adapted from established scales to measure team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness. Data screening, descriptive statistics and preliminary reliability analysis were conducted using SPSS to identify missing values, assess normality, and examine demographic characteristics. Partial Least Squares Structural Equation Modelling was then applied using PLS software to evaluate the measurement model and structural model, including tests of reliability, convergent validity, discriminant validity, and the relationship of direct, mediating and moderating effects. Bootstrapping procedures were used to estimate the significance of path coefficients, indirect effects through collective leadership, and interaction effects involving team virtuality.

Within this scope, the study investigated the mediating role of collective leadership and the moderating role of team virtuality. Collective leadership was included because hierarchical leadership remains dominant in Malaysian hospitals, and understanding whether collective leadership can enhance team effectiveness is both theoretically and practically relevant. Team virtuality was included as a moderator because virtual modes of communication have expanded in Malaysian hospitals, through the use of electronic medical records, interdepartmental messaging systems, and telehealth services (Bell & Kozlowski, 2020). Although virtual tools can enhance coordination, they may also weaken access to social cues and reduce informal interactions that support effective teamwork, an issue highlighted in earlier studies of virtual teams (Kirkman et al., 2004). By narrowing the scope to nurses in twelve public hospitals in Peninsular Malaysia, this study ensured that the findings remained contextually specific and analytically coherent with the realities of Malaysia's hierarchical, multicultural, and resource-constrained healthcare environment.

1.6 Significance of the Study

This study makes an important contribution to the existing body of knowledge by addressing the limited empirical work on team effectiveness, collective leadership, and team virtuality within the Malaysian public healthcare system (Salleh & Khalid, 2021). Most previous studies have examined these constructs separately and largely in Western healthcare or organisational settings, often overlooking the structural and cultural realities of public hospitals in Malaysia (Somboonpakorn & Kantabutra, 2014). In contrast, this study integrates team shared vision, team commitment, and team collaboration as independent variables, collective leadership as a mediating variable, team virtuality as a moderating variable, and team effectiveness as the outcome in a single, empirically tested framework. This integration clarifies how relational conditions, leadership processes, and communication contexts jointly influence team functioning among nurses in public hospitals. The study also offers conceptual clarification by distinguishing team commitment from team effectiveness. Team effectiveness is treated as the team's capacity to function, retain members, and achieve its goals (Balkundi & Harrison, 2006), while team commitment is conceptualised as the intention of members to invest effort and maintain their relationship with the team (Hwang & Joo, 2017; Meyer & Allen, 1997; Mowday et al., 1982). This distinction strengthens theoretical precision and avoids conceptual overlap that has limited the explanatory power of earlier research.

A central theoretical contribution lies in the application and extension of Relational Coordination Theory within Malaysian public hospitals. Relational Coordination Theory emphasises shared goals, shared knowledge, and mutual respect as critical relational conditions for high quality coordination of work (Gittell, 2002; Gittell, 2011). By examining team shared vision, team commitment, and team collaboration together with collective leadership and team effectiveness, this study shows how these relational conditions operate in a highly interdependent, resource constrained, and hierarchical clinical environment (Planning Division, Ministry of Health Malaysia, 2023). The findings demonstrate that while these relational factors are important, their direct effects on team effectiveness are not always significant, and their influence is channelled more strongly through collective leadership. This extends

Relational Coordination Theory by showing that relational processes not function in isolation; instead, their impact on outcomes depends on whether they are translated into leadership behaviours that can shape communication, problem solving, and mutual support within the team (Martin et al., 2018; Wang et al., 2017).

The study also advances Social Information Processing Theory by examining how nurses interpret and respond to social and informational cues in both face to face and partially virtual contexts. Social Information Processing Theory proposes that individuals rely on available social cues to construct meanings, guide behaviour, and enact roles in organisational settings (Salancik & Pfeffer, 1978). By incorporating team virtuality as a moderating variable, this research tests whether digital communication and reduced access to rich social cues alter the relationship between leadership and effectiveness. The results show that team virtuality does not significantly strengthen the relationship between collective leadership and team effectiveness, suggesting that in the nursing context, where work is still largely hands on and co located, face to face cues, physical proximity, and direct interaction remain more influential than virtual modes of communication (Kirkman et al., 2004; Bell & Kozlowski, 2020). This provides an important refinement of Social Information Processing Theory by highlighting that the value of virtual communication for team processes is context dependent and may be limited in highly relational, safety critical work such as nursing.

In addition to these theoretical contributions, the study provides new empirical evidence by testing the relationships between team shared vision, team commitment, team collaboration, collective leadership, team virtuality, and team effectiveness among nurses in Malaysian public hospitals. Existing literature on collective leadership, virtual teamwork, and team effectiveness is dominated by Western perspectives and often does not reflect local structural and cultural realities (Drescher et al., 2014; Fausing et al., 2015). By focusing on nurses who represent the largest workforce in public hospitals and who are central to patient care, this study offers contextually grounded insights into how these constructs interact in a setting characterised by high workload, strict hierarchy, and growing digitalisation (DOSM, 2023; Oerther & Rosa, 2020). This helps to refine international theories by showing where they hold, where they are weakened, and how they may need adaptation in Malaysia environment.

As practical contributions, the findings offer hospital managers, nursing leaders, and policymakers evidence based guidance on how to strengthen teamwork and leadership among nurses in public hospitals. The results indicate that efforts to improve team effectiveness should not only promote shared vision, commitment, and collaboration but also create conditions that enable these relational factors to be expressed through collective leadership practices (Carson et al., 2007; Pearce & Conger, 2003). At the same time, the study cautions that introducing virtual communication tools without attention to social cues, trust, and coordination mechanisms may not enhance team performance and can create new barriers to effective relational coordination (Handke et al., 2019; Purvanova & Kenda, 2021). For healthcare organisations facing increasing patient demand and workforce pressures, these insights support the design of interventions, training, and policy changes that address both the relational and informational dimensions of teamwork (World Health Organization, 2021; Massimine, 2023).

Finally, by grounding its framework in Relational Coordination Theory and Social Information Processing Theory and testing it in a Malaysian nursing context, this study provides a theoretically coherent and empirically supported model that can guide future research on team effectiveness in healthcare. It demonstrates that team processes must be understood not only in terms of structure and roles, but also in terms of the quality of relationships, the patterns of communication, and the interpretation of social information that underpin collective leadership and performance.

1.7 Definition of Terms

The following definitions would spell out the key terms used in this study to clarify the problem statement and research questions that conforms to the objectives and scope of the work. The definitions would explain and describe the variables used in the context of this study. The following definition, which should also serve as operational definitions are therefore worded at this point to delineate the current's study perimeter and thereby avoid any ambiguity that might arise while interpreting the variables of the study.

1.7.1 Team Effectiveness

Team effectiveness is the output production of the team which should meet or exceed the performance standard, and the work that should maintain or enhance the capability of team members to work together (Hackman, 1990). Followed Hackman (1990), this study operationalized team effectiveness in three ways; 1) team performance (productive output, i.e. product, service, and decision that meets the standards of expectations) 2) team satisfaction (as a necessary component for the well-being of individuals) 3) team viability (intention to stay or remain within organization).

1.7.2 Team Shared Vision

This study operationalized the team shared vision whether the team members of the organization have goals and an image of the future in common and share ambitions by Oswald et al., (1994) and Tsai and Ghoshal (1998) as cited in Gutierrez et al., (2008) and Garcia-Morales et al., (2019).

1.7.3 Team Commitment

This study operationalized the team commitment as the relative strength of an individual identification with and involvement in a particular organization (or team), which can be characterized by (a) a strong belief in and acceptance of the team goals and value, (b) a willingness to exert considerable effort on behalf of the team and (c) strong desire to maintain memebership in team (Bishop & Scott, 2000).

1.7.4 Team Collaboration

This study operationalized the team collaboration as a sharing the responsibilities of problem solving and decision-making in formulating and carrying out plan to achieve the organizational goal (Sudeshika et al., 2021; Aaberg et al., 2018; Lin et al., 2013; O'Daniel & Rosenstein, 2008).

1.7.5 Collective Leadership

This study operationalized collective leadership as a dynamic process that emerge at the crossroads of a distribution of the leadership role, diverse skill and expertise within the network, and the effective exchange of information among team members in order to capitalize on and coordinate their role and behavior and expertise to the achievement of group or organizational goals and both (Brussow, 2013). In this studies, researchers used similar definition for shared leadership and collective leadership.

1.7.6 Team Virtuality

This study operationalized the team virtuality is defined as a group of people or stakeholders working together from different location and possibly different department and time zones, who are collaborating on a common task and use information and communication technologies (ICTs) intensively to co-create. It can be seen that one of the main characteristics is virtuality, which implies physical and temporal distance between members and a shared purpose (Ebrahim et al., 2009). In other words, virtual team members are all working towards the same goal and connected together through computer and other technology. This study will include a range of virtual teams, those where individual members are located in different states, as well as those virtual teams where members are located in the same building but are located in different departments and use electronic mediums to connect and communicate.

1.8 Organization of the Thesis

This study organized into five chapter including this one. This first chapter introduced the background of the study highlighting the significance of the study area followed by the problem statement that demonstrated the gaps related to the area under investigation and the issues that are addressed in this study by means of the prescribed research questions and objectives. This chapter further hosted the scope of the study, significance of the study and the definition of the key terms. Based on the problem statement and

research objectives outlined in this chapter, as extensive review of literature is undertaking, as could be found in the second chapter of this proposal. The second chapter firstly rationalized the selection of Malaysia as a laboratory to study the key elements of teamwork, collective leadership, team virtuality and team effectiveness among nurses in Malaysia and outlined the different concepts related to the study. It further highlighted the theories and relevant existing literature in conceptualizing the relationships between independent, mediating, moderating and dependent variables of the study. The second chapter also illustrated the underpinning theories, the conceptual framework of the study along with the development of hypothesis that were examined.

Accordingly, chapter three describes the research methodology of the study. This chapter describes the operationalization of the variables and measurement of instruments, research design, research population, sample size, sampling method, as well as the strategies and instrument for the data collection. The chapter discusses the method of data analysis and the statistical package used in the study. Finally, reliability resting of pilot study or preliminary study is reported. Followed by chapter four, this chapter describes the statistical analysis of the data collected through, which include data examination, screening and preparation. Then, the measurement model as well as the structural model, which were assessed with PLS-SEM using SmartPLS 4.0 software package, were analysed and reported. Consequently, result of the hypotheses based on the assessment of the structural model are reported.

Finally, this study end with chapter five. Chapter five discuss the research findings based on the research objectives and hypothesis as proposed in chapter one. Furthermore, this last chapter provided the theoretical and practical contributions and implication of the findings of this study. The chapter describes the research limitations and suggest future research directions. Finally, the chapter presents the conclusion of the study.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This chapter presented a brief background of the study context, Malaysia, in terms of key elements of teamwork which are team shared vision, team commitment, team collaboration, followed by a discussion on collective leadership, team virtuality and team effectiveness illustrating the concept, reflecting on different theories that used to explain the phenomena of team effectiveness and the role of key element of teamwork as an indicators of team performance.

The chapter then provided a detailed narration of the key elements of teamwork in general, highlighting the antecedents, consequences and existing models with specific focus on collective leadership, team virtuality and team effectiveness. The chapter also examined how the key elements of teamwork effect on team effectiveness by explained the relationship between team shared vision, team commitment, team collaboration on collective leadership. In addition, The chapter discussed the relationship between key elements of teamwork and team effectiveness, the mediating role of collective leadership and the moderating effect of team virtuality among nurses in Malaysia.

Based on the literature review, this chapter described the development of the research framework and hypotheses for the study. Finally, the chapter end with a discussion of the underpinning theories, which are Relational Coordination Theory and Social Information Processing Theory, and synthesis how these theories justify the proposed relationship within the research framework.

2.2 Concept of Team Effectiveness

Team effectiveness was recognised as a main factor in organisational success, particularly in healthcare, where it directly affected the quality and safety of patient outcomes (McHugh et al., 2020). Previous studies offered several definitions of team

effectiveness, each emphasising different aspects of how teams functioned successfully within organisations. Stojadinovic-Jovanovic et al. (2021) and Aube and Rousseau (2011) described team effectiveness as a team's ability to complete assigned tasks and achieve objectives that aligned with organisational goals. Cohen and Bailey (1997) defined team effectiveness as a multidimensional construct that included performance, member attitudes and the behavioural viability of team members, and explained that emotional support and commitment contributed to sustained collaboration. Burke et al. (2021) further explored the social dimensions of team effectiveness by highlighting interpersonal trust as a crucial factor in achieving optimal performance in evolving environments. This view was consistent with Campion et al. (1993), who argued that effective teams demonstrated participative safety and shared goals, thereby facilitating collective learning and productivity.

In this study, team effectiveness was defined in a way that reflected the realities of healthcare practice in Malaysian public hospitals. It was conceptualised in three conditions, namely team performance (productive output such as services and decisions that met required standards), team satisfaction (as a necessary component for the well-being of team members) and team viability (the intention of team members to stay and remain within the organisation) (Hackman, 1990; Abelsen & Fosse, 2024). By integrating these three conditions, the study adopted a comprehensive view of team effectiveness that aligned with the emphasis of Relational Coordination Theory on both performance and relational quality (Wang et al., 2023). This approach recognised that a team could achieve short-term performance targets while still being considered ineffective if its members were dissatisfied, disengaged or inclined to leave the team or organisation (Zawawi & Nasurdin, 2020).

Compared with earlier models that prioritised measurable outputs such as productivity or efficiency, this definition of team effectiveness emphasised a balance between performance and human sustainability (Ayalew et al., 2019). Previous research often treated effectiveness as synonymous with output, overlooking the interpersonal and emotional aspects that sustained long-term collaboration (Ma'arof et al., 2024; Rad & Yarmohammadian, 2006). The inclusion of satisfaction and viability acknowledged that morale, trust and commitment were crucial to maintaining effectiveness, especially in hospital settings where teamwork occurred under constant pressure and fatigue

(Elsayed & El-Sayed, 2025; Cho et al., 2023). For nurses in Malaysia, who worked with high patient loads, limited staffing and emotional strain, these factors directly influenced their capacity to function collectively and deliver safe care (Ma'arof et al., 2024; Zawawi & Nasurdin, 2020). Defining effectiveness through performance, satisfaction and viability therefore aligned the study with the realities of nursing professionals in public hospitals (Azizan et al., 2021).

Debates in the literature remained regarding what constituted an "effective" team, some scholars emphasised tangible performance outcomes such as productivity and innovation and treated these as the ultimate indicators of success (Mathieu et al., 2017; 2019; Salas et al., 2017). Others argued that in healthcare, effectiveness could not be measured solely by output because teamwork involved communication, coordination and emotional engagement that directly influenced patient outcomes (Burke et al., 2018; Hughes et al., 2016). This study supported the later perspective and proposed that healthcare team effectiveness was both task-driven and relationship-driven. A team that performed efficiently but failed to maintain trust, commitment and satisfaction was unlikely to sustain excellence or patient safety over time (Kang et al., 2021; Liao et al., 2023).

The selection of team effectiveness as the dependent variable in this study was grounded in theoretical reasoning, as it represented the most appropriate outcome for examining how relational conditions, leadership processes and information interpretation combined to influence the functioning of nursing teams (Spritzer et al., 2023). Relational Coordination Theory provided the main foundation by viewing effectiveness as the outcome of strong relational conditions and high-quality communication among team members (Han et al., 2018). Within this perspective, team shared vision, team commitment and team collaboration were treated as key relational inputs that shaped coordination processes, while collective leadership was positioned as a mediating mechanism that translated these inputs into team effectiveness (Brun et al., 2020). The inclusion of team virtuality as a moderating factor was supported by Social Information Processing Theory, which explained how team members interpreted and responded to information and signals when interaction occurred through technology-mediated channels (Morian et al., 2024). Together, these theoretical

perspectives justified the focus on team effectiveness as the central outcome of the relationships among the constructs examined in this study (Strode et al., 2022).

2.3 Key Element of Teamwork

Teamwork was defined as a process in which individuals with different skills, experiences and responsibilities worked together to achieve shared objectives that were difficult to accomplish independently (Kohanova et al., 2024; Ross et al., 2021). Teamwork involved coordinated effort, mutual support and the integration of multiple perspectives, and depended not only on technical competence but also on interpersonal relationships, communication and shared understanding (Meneses-La-Riva et al., 2025; Ahn & Lee, 2021). In complex settings such as healthcare, scholars emphasised that teamwork among multidisciplinary professionals was essential because it created synergy in which collective output exceeded individual contributions through mutual trust, respect and coordinated action (Bakht et al., 2024; Husarek et al., 2024; Greilich et al., 2023; Paganin et al., 2023; Shirley et al., 2024).

Within this study, the main elements of teamwork were acknowledged as team shared vision, team commitment and team collaboration, as these factors collectively determined how well individuals aligned their goals, sustained motivation and coordinated their efforts to achieve team effectiveness (Uraon et al., 2023; Greilich et al., 2023; Zasa & Buganza, 2022; Vanlommel et al., 2022). Team shared vision represented the cognitive aspect of teamwork by providing clarity of purpose and direction, team commitment reflected the emotional dimension through attachment, loyalty and willingness to contribute, and finally team collaboration captured the behavioural dimension by translating shared intentions into coordinated action through communication, mutual respect and problem-solving (Zasa & Buganza, 2022; Vanlommel et al., 2022; Greilich et al., 2023; Mustapa et al., 2024). Together, these elements formed the relational foundation emphasised in Relational Coordination Theory and were treated as core inputs to team effectiveness in this study. A more detailed discussion of the definitions and concepts of team shared vision, team commitment and team collaboration was presented in the following section.

2.4 Concept of Team Shared Vision

Team shared vision referred as one of the elements that guided individuals within teams and organisations toward a common understanding of purpose and direction (Amiruddin et al., 2021). A clear shared vision helped team members to understand not only the goals of the team but also the significance of their own contributions, which increased their sense of responsibility and commitment to the team purpose (Mustapa et al., 2024). Xu et al. (2022) and Matsuo (2022) indicated that, when team members understood their team vision, collaboration and commitment were enhanced, and greater clarity and focus were achieved in working toward effectiveness while inconsistency in the environment was reduced.

From a motivational perspective, a shared vision generated a sense of purpose and emotional ownership among team members, translating organisational objectives into personally meaningful commitments (McCarthy et al., 2021). Zasa and Buganza (2022) argued that this emotional dimension of shared vision strengthened organisational identity and collaboration, reinforcing shared values that sustained members' motivation in times of rapid change. Building on this, shared vision was interpreted as the team's shared understanding, motivation and behaviour aligned with the organisation's strategic objectives and long-term aspirations (Eldor, 2020). Shared vision was therefore not a static mission statement but a living and shared understanding among team members about their organisation's mission, values and expected behaviours (Somboonpakorn & Kantabutra, 2014; Colakoglu, 2012; Nahapiet & Ghoshal, 1998).

By positioning team shared vision as an independent variable, this study recognised it as a key cognitive and motivational driver that initiated cooperation, supported the sharing of leadership and contributed to team performance. Within the perspective of Relational Coordination Theory, team shared vision reflected the shared goals that aligned nurses' actions with team objectives, facilitated clearer communication and supported cohesive responses to patient needs (Gong, 2025). In the demanding environment of Malaysian public hospitals, this shared vision functioned as an integrating force that aligned diverse roles and helped to sustain coordinated and effective teamwork (Azizan et al., 2021).

2.5 Concept of Team Commitment

Team commitment represents one of the most influential psychological and behavioral factors of how individual engage with their teams and organization (Wirotama, 2022). Team commitment has been defined as the relative strength of an individual's identification and involvement with a particular organization, willingness to exert effort on its behalf, and intention to remain within it (Nunes et al., 2014). This definition highlights both an emotional connection and an active behavioral investment in achieving organization gaols, where commitment manifests as loyalty, sustained effort, and cooperation in achieving the organization's mission (Nunes et al., 2014; Han et al., 2015; Wang et al., 2017). Within healthcare settings, where interdependence and continuity of care are essential, commitment ensures that practitioners remain motivated to uphold patient safety, maintain service quality, and support their colleagues even under heavy workloads and stressful conditions (Samad et al., 2024).

Comparatively, the definitions of team commitment converge on its dual nature encompassing both attitudinal and behavioral components (Husarek et al., 2024). The attitudinal aspect reflects an individual's emotional attachment, identification, and sense of loyalty toward the team or organization, whereas the behavioral aspect represents the willingness to invest effort, remain with the organization, and act in ways that support its objectives (Husarek et al., 2024). However, interpretations vary across contexts because the ways in which individuals demonstrate and experience commitment are depends on cultural values, leadership styles and the organizational environment within teams (Dasgupta, 2024). In Western literature, commitment is usually linked to a sense of empowerment and personal satisfaction, whereas within hierarchical setting such as Malaysia Public hospitals, commitment serves more as a stabilizing element that helps teams remain united and continue their work even when staff have limited decision-making power and facing heavy workloads (Alona et al., 2021). Thus, in this study, team commitment is conceptualized as an intention by team member to make a maximum effort to maintain the relationship (Hwang & Joo, 2017). This conceptualization positions commitment as a psychological anchor that maintains cohesion and effectiveness, particularly within Malaysia's public hospitals, where the demands of patient care and resource limitations require teams to operate with a high

degree of interdependence and mutual support (Ahn & Lee, 2021;Bragadottir et al., 2023).

2.6 Concept of Team Collaboration

Team collaboration was a central component of effective healthcare delivery, representing the joint efforts of professionals from multiple disciplines working with patients, families and communities to achieve optimal health outcomes (Albarqi, 2024; Alshammri et al., 2022; Schot et al., 2020). In modern healthcare organisations, collaboration extended beyond general teamwork and involved structured processes through which professionals shared responsibilities, exchanged expertise and engaged in joint decision-making to ensure comprehensive and continuous care (Banez et al., 2023; Liu et al., 2010). International and professional bodies such as the International Pharmaceutical Federation and the World Health Organization emphasised that multidisciplinary collaboration among health professionals was central to improving patient safety and outcomes (International Pharmaceutical Federation, 2011; Alshammri et al., 2022; Nene, 2024). At its core, collaboration involved shared responsibility for problem-solving and decision-making in patient care and reflected the interconnected nature of hospital work, where physicians, nurses and allied health personnel integrated their knowledge and skills to deliver safe and efficient care (O'Daniel & Rosenstein, 2008; McLaney et al., 2022). Team collaboration required more than information exchange, demanding active engagement in co-creating solutions through mutual respect, negotiation and openness (Banez et al., 2023). Empirical evidence showed that effective collaboration was associated with higher patient satisfaction, fewer clinical errors and improved staff job satisfaction, whereas poor collaboration produced inefficiencies, miscommunication, treatment delays, compromised patient safety and increased burnout (Nene, 2024; McLaney et al., 2022; Aaberg et al., 2018; Levenson, 2010).

Within the Malaysian healthcare system, team collaboration faced distinct challenges arising from high patient loads, limited staffing and resource constraints (Tan et al., 2021). In public hospitals, nurses frequently acted as the main link between doctors and patients and carried much of the responsibility for ensuring effective

communication and coordinated care (Mustapa et al., 2024). In such environments, the quality of collaboration directly influenced the standard of care and the speed of clinical decision-making (Karuthan & Kaur, 2025). However, heavy workloads and time pressures reduced opportunities for meaningful interaction, while hierarchical structures and professional boundaries restricted open exchange of ideas (Mustapa et al., 2024). Although formal mechanisms for collaborative practice existed, their implementation varied and often depended on leadership style and local work culture. Units characterised by inclusive or collective leadership tended to exhibit stronger collaboration, whereas units with centralised control were more exposed to communication breakdowns and slower clinical responses (Amar-Singh, 2025).

The selection of team collaboration as an independent variable in this study was therefore grounded in theoretical reasoning and closely related to the issues identified in the literature. Collaboration functioned as a key antecedent to leadership and team effectiveness because it enabled information sharing, coordinated responsibilities and supported the pursuit of collective goals in healthcare teams (Kida et al., 2023; 2024). From the perspective of Relational Coordination Theory, collaboration represented the communication processes that connected shared goals to coordinated action, while Social Information Processing Theory explained how collaboration facilitated the exchange and interpretation of information required to manage complex tasks (Salancik & Pfeffer, 1978; Miao et al., 2024). Through collaborative interaction, cognitive and emotional alignment among team members was translated into concrete team effectiveness (Liu et al., 2023). Empirical studies further showed that collaboration strengthened communication, mutual respect and shared accountability and thereby supported the emergence of collective leadership in healthcare teams (Muslim et al., 2022; Lei et al., 2022). For these reasons, collaboration was treated in this study as both a behavioural and relational construct that enabled teams to engage in collective leadership and enhance overall effectiveness.

2.7 Concept of Collective Leadership

Collective leadership referred as a team process in which multiple members shared and exercised leadership responsibilities, in decision-making, problem-solving and coordination were distributed according to members' expertise and situational needs rather than concentrated in a single individual (Hofman et al., 2023; Hadi & Chaudhary, 2021; Gu et al., 2020; Kim & Han, 2019; Morgeson et al., 2010). In contrast to traditional, leader-centred models, collective leadership emphasised shared influence, mutual accountability and the integration of diverse expertise across team members (Zapata & Rojas, 2023). Leadership was viewed not as a fixed position but as a dynamic process that emerged from interaction and collaboration within the team (Klasmeier et al., 2022; Knippenberg et al., 2024). This conception aligned with the complex realities of modern teamwork, where tasks were interdependent, problems were multifaceted and solutions required coordinated input from different professionals (Kurdi et al., 2023).

The decision to choose collective leadership as a mediating variable in this study was grounded in Relational Coordination Theory and Social Information Processing Theory. Relational Coordination Theory indicated that strong relationships based on shared goals, shared knowledge and mutual respect formed the conditions through which team processes translated inputs such as team shared vision, team commitment and team collaboration into effective outcomes (Brun & McAuliffe, 2020). Social Information Processing Theory explained how team members interpreted and responded to the information and signals present in their work environment, shaping their behaviour and patterns of influence (Uitdewilligen & Waller, 2018). Within this framework, collective leadership was treated as the indicator that linked these relational and informational processes to team effectiveness by enabling influence, decision making and responsibility to be shared among team members rather than concentrated in a single formal leader.

In Malaysia's public hospital system, where nurses experienced high workloads and limited autonomy, collective leadership played an important role in sustaining collaboration and protecting morale (Brun & McAuliffe, 2022). It created conditions in which nurses could participate meaningfully in problem solving and decision making,

which improved adaptability and responsiveness in rapidly changing clinical situations (Brun & McAuliffe, 2022). Collective leadership also supported the professional development of nurses by recognising their expertise and fostering a sense of ownership over patient outcomes (Hayat et al., 2024). This was particularly important in multidisciplinary teams, where timely and shared decisions were essential to maintain coordination and safeguard patient safety.

2.8 Concept of Team Virtuality

Team virtuality referred to the extent to which team members communicated and collaborated through digital technologies across different locations and time periods, enabling them to coordinate tasks, share information and make decisions without being physically co-located (Foster et al., 2015; Batirlik et al., 2022). The concept was originally applied to global organisations with geographically dispersed teams; however, following the COVID-19 pandemic, virtual collaboration expanded rapidly across many sectors, including healthcare (Suneson, 2020; Craven et al., 2020). While industries such as education, finance and information technology transitioned almost completely to remote operations, healthcare organisations, which needed to remain functional, increasingly adopted hybrid approaches that combined in-person and virtual collaboration (Ashcroft et al., 2023; Tuzovic & Kabadayi, 2021; Carnevale & Hatak, 2020). Digital tools such as Google Meet, WhatsApp, Telegram and telemedicine platforms became essential for maintaining coordination and patient care (Vincent et al., 2022; Hernandez-Jimenez et al., 2021). Even after the acute phase of the pandemic, the use of virtual communication in hospitals had persisted because it offered greater flexibility, continuity of care and access to expertise across different units (Shati et al., 2024; Vincent et al., 2022; Klonek et al., 2021). Virtual collaboration offered important advantages, including reduced operational costs, time savings and greater flexibility, while enabling teams to bring together members from various functional and regional backgrounds (Khoshrounejad et al., 2021).

The degree of virtuality varied depending on the extent to which a team relied on digital tools and how geographically distributed its members were (Mayer et al., 2022; Kirkman & Stoverink, 2021; Gilson et al., 2021). Teams ranged from those that

were mostly co-located and only occasionally used technology to those that were entirely virtual and relied solely on digital interaction (Gibson & Gibbs, 2006). In Malaysia, many hospitals functioned as hybrid systems, combining physical patient care with virtual communication among healthcare professionals (Baalharith & Aboshaiqah, 2024). Nurses, who coordinated patient records, communicated with doctors and managed follow-ups through online systems, frequently experienced this dual form of collaboration (Razavi et al., 2022). In this context, team virtuality had become a defining characteristic of nursing work (Jarva et al., 2022). The Malaysian government's introduction of telemedicine and digital health programmes further accelerated the integration of technology into daily nursing practice. Nurses were required to manage electronic medical records, participate in virtual consultations and maintain teamwork through digital platforms (Baalharith & Aboshaiqah, 2024; Nuratri et al., 2022). These developments reshaped traditional team structures and introduced new communication norms (Durney et al., 2024). As a result, leadership and teamwork practices that functioned well in purely physical environments did not necessarily produce similar outcomes in virtual or hybrid settings (Jarva et al., 2022).

The selection of team virtuality as a moderating variable in this study was grounded in Relational Coordination Theory, Social Information Processing Theory and existing empirical findings. Prior studies showed that key leadership behaviours such as communication, coordination and collaboration were influenced by the degree of virtuality within the team (Bartsch et al., 2020; Kahai et al., 2012). High-virtuality teams depended more heavily on shared responsibility, mutual trust and strong relational ties to maintain commitment, whereas low-virtuality teams, where members interacted face-to-face, often operated through more direct and hierarchical forms of leadership (Zhang et al., 2021; Sanmas et al., 2024). From the perspective of Relational Coordination Theory, virtuality reshaped the relational conditions that sustained effective coordination, particularly shared goals, shared knowledge and mutual respect (Zada et al., 2022). When communication occurred through digital channels, these relational conditions were more difficult to maintain, making the effect of leadership behaviours less predictable (Zada et al., 2022; Wahab et al., 2023). Social Information Processing Theory further explained that virtuality changed how team members

interpreted, exchanged and responded to information, altering the cues that guided collective behaviour (Mayer et al., 2022; Kashive et al., 2022).

In dispersed teams or teams working across different departments and time zones, collective leadership, in which influence and decision-making were shared among members, became increasingly important for maintaining alignment with team goals and sustaining effective performance (Mills et al., 2021; Karimi et al., 2024). In Malaysian public hospitals, where resource constraints, high workloads and hierarchical structures were common, virtual communication introduced additional challenges to coordination. This made it essential to examine whether team virtuality strengthened or weakened the effect of collective leadership on team effectiveness in this unique environment.

2.9 Hypotheses Development

2.9.1 Relationship between Team Shared Vision and Team Effectiveness

According to Kahn (1990), teams that perceived their work environment as meaningful tended to feel valued and appreciated within their organisation. This sense of meaning was often developed through a shared vision that aligned individual roles with the broader organisational purpose (Liorens et al., 2025). A well communicated shared vision offered employees a sense of direction and helped them understand how their contributions supported a common goal (James, 2021). Rich et al. (2010), Yunyi et al. (2024) and Sharma and Mehta (2023) explained that such clarity increased psychological safety, enabling employees to engage confidently in their work without fear of negative consequences. By reducing uncertainty and clarifying expectations, shared vision supported the development of a cohesive and motivated team (Li & Wareewanich, 2024).

Within this study, the relationship between team shared vision and team effectiveness was interpreted through Relational Coordination Theory and Social Information Processing Theory. From the perspective of Relational Coordination Theory, shared vision reflected the shared goals necessary for coordinated communication and collective action (Spitzer et al., 2023). It strengthened the relational

conditions that supported teamwork by providing a unifying purpose that guided coordination (Deneckere et al., 2010). From the perspective of Social Information Processing Theory, shared vision influenced how team members interpreted information and made sense of their roles, expectations and responsibilities (Chen et al., 2013). When team members aligned their understanding of the team's purpose, they processed information more consistently and engaged more effectively with one another, which contributed to improved team effectiveness (He et al., 2020).

When teams shared a clear understanding of their purpose, they coordinated their efforts more effectively, remained motivated and sustained team performance (Shanjabin & Oyshi, 2021). Carton et al. (2014) and Zasa and Buganza (2022) showed that relationship between individual and organisational objectives encouraged greater effort investment. Inkpen and Tsang (2005) and Hassan et al. (2024) emphasised that shared vision served as a bonding mechanism that created common expectations and identity. Eldor (2020) and Han et al. (2021) described shared vision as a strategic resource that enhanced coordinated effort. Likewise, Han et al. (2021), Wu et al. (2018) and White et al. (2015) demonstrated that shared vision supported collaboration and strengthened individual and team level outcomes. Fragoso et al. (2025) and Feijoo et al. (2021) provided further evidence that shared vision acted as both a motivational and structural force that supported coordination and goal alignment.

Despite these positive relationship, some studies reported inconsistent results, which are Mai et al. (2022) and Tredget et al. (2023) found that shared vision did not significantly influence organisational resilience, indicating that contextual factors such as culture, leadership and resources played a role. Doorn et al. (2013) also showed that the impact of shared vision varied across settings, while Schmidt and Umans (2024) argued that organisational hierarchy and communication culture could weaken the influence of shared vision. These findings suggested that shared vision was not universally effective and its impact depended on contextual features.

To address these gaps, this study examined the effect of team shared vision on team effectiveness in Malaysian public hospitals. Prior research had focused largely on Western, less hierarchical contexts, leaving uncertainty about its relevance in settings where authority was centralised and work demands were high (Navajas-Romero et al., 2020; Granel-Gimenez et al., 2022). This study assessed shared vision at the individual

level among nurses working within interdependent yet hierarchical structures. Guided by Relational Coordination Theory and Social Information Processing Theory, the study explained how shared understanding of goals supported coordinated action and consistent interpretation of information in resource constrained and high pressure environments (Tingvold & Munkerjord, 2020). In view of previous mixed findings, this study proposed that team shared vision had a positive effect on team effectiveness at the individual level of analysis. Based on this reasoning, the following hypothesis was tested:

H1: Team shared vision has a significant positive effect on team effectiveness among Nurses in Malaysia

2.9.2 Relationship between Team Commitment and Team Effectiveness

Team commitment was widely recognised as a central determinant of team functioning and effectiveness, reflecting the extent to which members remained dedicated to team objectives and sustained their involvement in achieving shared outcomes (Zheng & Wang, 2025). It represented an individual's psychological attachment and willingness to contribute through continued engagement and effort (Rusdi & Wibowo, 2022; Widianto et al., 2024). Within the framework of this study, the relationship between team commitment and team effectiveness was interpreted through Relational Coordination Theory and Social Information Processing Theory. From the viewpoint of Relational Coordination Theory, committed members were more likely to uphold shared goals and engage in respectful, timely communication, thereby strengthening the relational conditions needed for coordinated action (Aube & Rousseau, 2005)). From the perspective of Social Information Processing Theory, commitment influenced how team members interpreted their responsibilities, processed work-related information and aligned their behaviour with collective expectations (Rusdi & Wibowo, 2022). Through these lenses, commitment supported consistent coordination, emotional stability and sustained effort, which contributed to team effectiveness (Zettna et al., 2024).

Empirical studies consistently demonstrated that team commitment contributed to various positive outcomes, including higher motivation and satisfaction, lower turnover intention and greater overall team effectiveness (Uraon et al., 2023). Parker (2007) and Paolucci (2019) found that committed members engaged in proactive and creative behaviour, while Isen and Reeve (2005) and Lopez-Gajardo et al. (2022) showed that they set more ambitious goals. Strauss et al. (2009), Ng et al. (2010) and Yusof et al. (2021) reported that commitment enhanced team proficiency and supported improvements in work processes and outcomes. Marchand and Vandenberghe (2013) noted that commitment correlated strongly with positive emotional states, forming the foundation for team viability and satisfaction. Likewise, Bentein et al. (2005) and Memon et al. (2021) found that higher commitment reduced turnover intention, supporting long-term team stability. Studies by Van Beek (2011), Paolucci (2019), Senel and Ulas (2022) and Adam et al. (2025) showed that emotionally committed members engaged in constructive dialogue and collaboration, while Weer et al. (2015) and Drach-Zahavy and Freund (2006) demonstrated that committed teams performed better and maintained strong communication, coordination and accountability. Omar and Ahmad (2014) further showed that team commitment mediated the relationship between satisfaction, research productivity and overall performance, highlighting its central role in sustaining effective teamwork.

Despite these positive findings, the literature also presented contradictory results which are, Paolucci et al. (2018) and Kocoglu et al. (2019) found that the influence of commitment depended on contextual and structural factors such as hierarchy, leadership style and autonomy. Paolucci et al. (2018) observed that affective commitment was most influential during early team development but weakened as teams matured. Kocoglu et al. (2019) showed that while commitment strengthened cooperation, it could also reinforce conformity. Uraon et al. (2023) found that in large teams, high commitment could suppress open communication and weaken the link between trust and active listening. Porter (2005) reported that in low-performing teams, strong commitment could reduce efficacy rather than improve it. These findings suggested that although commitment generally supported effectiveness, excessive or misdirected commitment might impede adaptability or critical judgment.

Building on this body of work, the present study examined team commitment within Malaysian public hospitals, where nurses worked under interdependent yet hierarchical conditions. The study revealed that commitment functioned as a stabilising and motivational force that supported cohesion and effectiveness under high workload and resource constraints (Mansor et al., 2022). By applying Relational Coordination Theory and Social Information Processing Theory, the study explained how commitment enhanced coordinated action and supported consistent interpretation of work expectations (McCullough et al., 2015). While some studies found negative or context-dependent effects, the broader literature supported a positive influence of commitment on team effectiveness. Therefore, this study proposed the following hypothesis:

H2: Team commitment has a significant positive effect on team effectiveness among Nurses in Malaysia

2.9.3 Relationship between Team Collaboration and Team Effectiveness

Team collaboration had long been recognised as a critical component of effective healthcare delivery and team effectiveness because it involved the active exchange of knowledge, skills and responsibilities among professionals working toward a common purpose (McGuier et al., 2023). In this study, the relationship between collaboration and team effectiveness was interpreted through Relational Coordination Theory and Social Information Processing Theory. From the perspective of Relational Coordination Theory, collaboration reflected the communication and relational processes through which shared goals were enacted, ensuring that team members coordinated their efforts, engaged in problem-solving and maintained clarity in roles and responsibilities (Akrour et al., 2025; Ullah et al., 2023; Greilich et al., 2023). From the viewpoint of Social Information Processing Theory, collaboration supported the exchange and interpretation of information that enabled team members to respond effectively to changing clinical conditions (Salancik & Pfeffer, 1978; McGuier et al., 2023). Within healthcare settings, this theoretical linkage positioned collaboration not merely as a procedural task but as a mechanism that facilitated

learning, adaptability and shared decision-making, all of which underpinned team effectiveness (Abelsen & Fosse, 2024; Ding et al., 2024).

Empirical evidence strongly supported the positive influence of collaboration on team effectiveness across multiple dimensions (Hedqvist et al., 2024; Udensi et al., 2025). Studies showed that collaborative practices enhanced patient care quality, reduced medical errors and improved service efficiency (Sudeshika et al., 2021; Reeves et al., 2017; Tan et al., 2014; Mickan et al., 2010). Udensi et al. (2025) found that open communication and coordinated decision-making contributed to safer and more comprehensive care. Collaboration also improved staff job satisfaction by creating a supportive environment in which members felt valued and respected for their contributions (Hedqvist et al., 2024).

However, several studies highlighted that collaboration's impact on effectiveness depended on contextual factors. Sudeshika et al. (2021) and Reeves et al. (2017) showed that professional hierarchies and unclear boundaries reduced the free flow of communication between physicians, nurses and allied health workers. Team members often held incomplete knowledge of each other's roles, leading to duplication of tasks or overlooked responsibilities (Gupta et al., 2024; Tidman, 2022). These role frictions discouraged open communication and undermined shared responsibility (Bose et al., 2025). Power imbalances also limited the willingness of lower-ranking members, particularly nurses, to voice concerns or participate actively in decision-making (Noyes, 2025). Such constraints weakened collaboration and diminished team effectiveness, especially in settings where authority structures were rigid. Poor collaboration and communication were associated with fragmented care, higher readmission rates and medication-related problems (Steward, 2018; O'Connor et al., 2016). McKinlay et al. (2019) and O'Daniel and Rosenstein (2008) further demonstrated that the absence of effective collaboration contributed to team dysfunction, poor management and inefficiency, ultimately compromising both patient safety and organisational performance.

In response to these findings, the present study examined the relationship between team collaboration and team effectiveness in Malaysian public hospitals, where collaboration was essential but often constrained by hierarchical structures and resource limitations (Primanto & Puspitasari, 2023). Earlier research largely focused

on Western healthcare systems, which differed in autonomy, structure and professional culture (Arallah et al., 2021). By situating the analysis within Malaysian public hospitals, this study addressed an important gap and provided insight into how collaboration operated in environments characterised by centralised authority and interdependent work practices. Based on this reasoning, the following hypothesis was proposed:

H3: Team collaboration has a significant positive effect on team effectiveness among Nurses in Malaysia

2.9.4 Relationship between Team Shared Vision and Collective Leadership

Team shared vision had been consistently recognised as a central antecedent of collective leadership because it provided the cognitive and motivational alignment required for members to lead collaboratively (Xu et al., 2022). In this study, the relationship between shared vision and collective leadership was interpreted through Relational Coordination Theory and Social Information Processing Theory. From the perspective of Relational Coordination Theory, shared vision represented one of the key relational conditions that supported coordinated action by ensuring that members held a common understanding of goals, expectations and work priorities (Brun & McAuliffe, 2022). This shared understanding strengthened the quality of interaction, increased predictability in team exchanges and created a foundation for mutual influence conditions that supported collective leadership (Cheng et al., 2025). From the viewpoint of Social Information Processing Theory, shared vision helped members interpret work-related cues consistently and reduced ambiguity in decision-making (Azeem & Maturana-Dos-Santos, 2019), thereby enabling leadership responsibilities to be shared across individuals rather than concentrated on a single role (Best et al., 2012). Through these theoretical lenses, shared vision was understood as a guiding mechanism that aligned cognitive, relational and behavioural processes necessary for collective leadership (Gram-Hanssen, 2021).

Empirical research supported this theoretical relationship by demonstrating that shared vision enhanced communication, increased mutual trust and strengthened coordination, all of which contributed to improved healthcare outcomes (Brun &

McAuliffe, 2022). Dionne et al. (2004) showed that teams with a clear shared vision showed higher motivation and stronger coordination features that are central to collective leadership. Han et al. (2021) further found that relationship-oriented collective leadership was positively related with team effectiveness, reinforcing the importance of a shared sense of purpose. Ensley et al. (2006) revealed that shared vision within top management teams contributed to stronger distributed leadership processes. Groulx et al. (2023) demonstrated that shared vision offered a motivational framework that supported the enactment of collective leadership in complex organisational settings.

Shared vision also strengthened the psychological and relational conditions required for collective leadership by fostering mutual trust, reducing uncertainty and encouraging shared responsibility (Gabriel & Medina, 2022; Hayat et al., 2024). Wu et al. (2018) found that collective leadership increased trust and social cohesion, and shared vision contributed to this process by clarifying priorities and stabilising expectations. Xu et al. (2022) revealed that shared vision mediated the effect of leadership behaviours on team creativity and performance, highlighting its role in shaping how leadership was enacted collectively. Joniakova et al. (2021) further emphasised that shared vision served as the foundation for trust, collaboration and mutual influence the core features of collective leadership. Although studies such as Dionne et al. (2004), Wu et al. (2018), Brun & McAuliffe (2022) and Teame et al. (2022) confirmed the positive relationship between shared vision and collective leadership, only few examined this relationship in healthcare environments where the implications for coordination and patient outcomes were especially critical.

Despite many empirical support, gaps remained in the literature, particularly regarding how shared vision operated in different cultural and organisational settings (Zohra et al., 2023). Many of the existing research had been conducted in Western organisational and entrepreneurial contexts, where teams typically functioned with more autonomy and flatter structures. Less was known about how shared vision influenced collective leadership in more hierarchical environments such as Malaysian public hospitals, where decision-making authority was centralised and leadership roles were traditionally formalised (Royani et al., 2024). In these settings, the emergence of collective leadership may have depended heavily on the strength of a shared vision to

overcome structural barriers and align professionals from diverse disciplines (Royani et al., 2024).

To address these limitations, the present study examined how team shared vision influenced collective leadership among nursing teams in Malaysian public hospitals. By focusing on this context, the study extended existing evidence to a setting where teamwork was essential but shaped by hierarchical and resource-constrained environments. This analysis contributed to understanding how shared vision functioned as a relational and cognitive condition that enabled distributed leadership in fast-paced clinical settings. Based on this reasoning, the following hypothesis was proposed:

H4: Team shared vision has a significant positive effect on collective leadership among Nurses in Malaysia

2.9.5 Relationship between Team Commitment and Collective Leadership

Team commitment had been identified as a critical psychological condition that supported the emergence and sustainability of collective leadership by fostering loyalty, mutual trust and willingness among team members to take shared responsibility for achieving team goals (Kim & Shin, 2021). In this study, the relationship between commitment and collective leadership was understood through Relational Coordination Theory and Social Information Processing Theory. Relational Coordination Theory emphasised that strong relational ties built on shared goals, shared knowledge and mutual respect created the foundation for coordinated action, and team commitment strengthened these relational ties by increasing members' willingness to support one another and maintain cooperative behaviour even under pressure (Brun & McAuliffe, 2022; Binatari et al., 2022). From the perspective of Social Information Processing Theory, committed members interpreted work cues and expectations more consistently, which encouraged the distribution of leadership responsibilities rather than reliance on a single authority figure (Chiu et al., 2016). Through these theoretical perspectives, commitment functioned as the psychological and relational condition that enabled members to participate in shared decision-making and to accept influence from peers (Bakar & Connaughton, 2025).

Empirical evidence supported this relationship by showing that commitment enhanced trust, cohesion and shared responsibility, which encouraged participation in leadership processes (Damamik et al., 2021). Khan (2020) found that members who embraced team values and beliefs showed greater openness to participatory leadership forms, allowing influence to flow more freely among team members (Malloy et al., 2022). Seibert et al. (2003) and Saira et al. (2020) further demonstrated that collective leadership depended on strong psychological attachment to team objectives because members were more inclined to contribute actively when they felt emotionally connected to the group. Without such attachment, individuals tended to rely more heavily on formal authority, limiting their willingness to engage in collective leadership (Damamik et al., 2021). These findings suggested that commitment functioned as the motivational base that translated individual attachment into collaborative leadership behaviours (Ribeiro et al., 2020).

Despite this evidence, the literature revealed important contextual challenges that questioned whether the positive relationship between commitment and collective leadership applied uniformly across settings (Brun & McAuliffe, 2022). Studies in Western and corporate environments consistently showed that commitment encouraged collective behaviour, yet these findings may not translate to hierarchical systems where authority is centralised, such as Malaysian public hospitals (Malloy & Kavussanu, 2021). In such environments, strict supervision and concentrated decision-making among senior staff (Men & Jia, 2021) restricted informal leadership behaviours. Under these conditions, commitment may have reinforced compliance and adherence to authority rather than enabling collective leadership (Brun & McAuliffe, 2022). This raised an important question: did commitment in hierarchical and resource-constrained healthcare settings strengthen collective leadership or simply stabilise existing structures?

Collective leadership also relied on psychological safety and trust, allowing members to share responsibilities and express ideas without fear of negative consequences (Ziegert et al., 2021). High levels of commitment could contribute to this psychological safety by giving individuals confidence that team members were aligned in purpose (Mustaqim, 2021). Seibert et al. (2003) found that the relationship between team influence strategies and group effectiveness was mediated by collective

leadership, suggesting that commitment strengthened the internal processes through which teams coordinated actions. In this respect, commitment operated as both a motivational and structural condition that linked leadership and teamwork (Malloy & Kavussanu, 2021). However, gaps persisted because most existing studies were carried out in Western contexts where flat organisational structures and individual empowerment were more common. Malaysian nursing teams operated within hierarchical systems where commitment might reflect duty-based obligations rather than collaborative empowerment.

To address these limitations, the present study examined how team commitment shaped collective leadership among nurses in Malaysian public hospitals. By analysing this relationship in a hierarchical and resource-constrained environment, the study extended existing evidence to a context where the expression of collective leadership may differ from Western organisational norms. This contribution advanced understanding of how psychological and cultural factors shaped collective leadership processes in healthcare teams. Building on this reasoning, the following hypothesis was proposed:

H5: Team commitment has a significant positive effect on collective leadership among Nurses in Malaysia

2.9.6 Relationship between Team Collaboration and Collective Leadership

Team collaboration represented one of the essential elements of collective functioning in healthcare, as professionals from different disciplines were required to coordinate their expertise to deliver safe and effective care (Hayat et al., 2024). In this study, the relationship between collaboration and collective leadership was understood through Relational Coordination Theory and Social Information Processing Theory. Relational Coordination Theory emphasised that collaboration strengthened shared goals, shared knowledge, and mutual respect, all of which formed the relational foundation necessary for distributed leadership in interdependent work settings (Hayat et al., 2024). When healthcare professionals collaborated, they reinforced the relational conditions that supported coordinated decision-making and reduced ambiguity in clinical tasks. From the perspective of Social Information Processing Theory,

collaboration shaped how information was exchanged, interpreted, and translated into action within teams (Morian et al., 2024). In complex clinical environments, collaboration ensured that information originating from multiple professional sources was integrated effectively, enabling team members to respond more accurately to changing patient conditions (Joniakova et al., 2021). As a result, collaboration operated as both a relational and cognitive foundation for collective leadership, enabling leadership roles to be distributed according to expertise rather than formal authority (Asumadu et al., 2024).

Empirical findings supported this theoretical relationship by showing that open communication, mutual support, and joint problem-solving created conditions that allowed collective leadership to emerge (Wang, 2024; Morian et al., 2024; Nakrem & Kvanneid, 2022; Carron et al., 2021). Studies consistently demonstrated that interdependence and synergy among healthcare professionals enhanced patient outcomes, job satisfaction, and overall team effectiveness (Lin et al., 2013; Hall & Weaver, 2001; Clark et al., 1986). Collaboration enabled team members to align their efforts and recognise the interconnected nature of their roles, strengthening their ability to respond collectively to patient needs (Lai et al., 2021). With increasing complexity in healthcare delivery, collaboration gained global recognition as a core professional competency (Bakht et al., 2024; Carron et al., 2021). Research by Lin et al. (2013) and Mendez et al. (2008) further showed that collaboration should be embedded in education to prepare practitioners for coordinated practice. Findings from Hays (2007) and Yan et al. (2007) similarly revealed that collaboration promoted shared understanding, joint responsibility, and adaptability. These patterns demonstrated that collaboration not only supported team effectiveness but also created the relational conditions required for collective leadership by fostering respect, open communication, and shared responsibility (Fredericks, 2023; Tai & Chang, 2023; Bakht et al., 2024).

The World Health Organization (Baker, 2010) reinforced this perspective by advocating for a workforce prepared for collaborative practice. In practice, collaboration allowed doctors, nurses, pharmacists and allied health workers to make shared decisions grounded in collective expertise (Meneses-La-Riva et al., 2025). Studies by Sudeshika et al. (2021) and Aaberg et al. (2018) revealed that collaboration improved interprofessional attitudes and communication, which strengthened

teamwork in clinical settings. Such collaborative conditions facilitated the emergence of collective leadership, as authority and responsibility were shared across professional boundaries based on situational needs (Cochran et al., 2023; D'Costa et al., 2024). Kerissey and Singer (2023) confirmed that when leadership influence was distributed according to expertise, members were more likely to demonstrate initiative and contribute to collective decision-making. Therefore, collaboration provided both the structural and relational basis for sustaining collective leadership in healthcare organisations (Fortin & Robinson, 2024).

Despite these strengths, the literature revealed many challenges that complicated the relationship between collaboration and collective leadership. Professional hierarchies and communication barriers often restricted the sharing of authority among healthcare workers (Kida et al., 2024; Brun & McAuliffe, 2022). Interprofessional collaboration was frequently hindered by unclear authority boundaries, conflicting values, and communication breakdowns (Sudeshika et al., 2021; Aaberg et al., 2018; Lin et al., 2013; Thistlethwaite & Nisbet, 2007). These challenges were particularly evident in hierarchical systems where decision-making was concentrated among physicians or senior administrators (Osti et al., 2023). In such contexts, team members might hesitate to share leadership responsibilities or express their perspectives openly (Osti et al., 2023). Jonsen et al. (2006) and Nagpal et al. (2010) further showed that ineffective collaboration increased ethical and clinical conflicts, reducing patient safety. These patterns indicated that collaboration required supportive cultural conditions such as mutual respect and open communication to produce the intended leadership and performance outcomes (Farchi et al., 2022).

Given these mixed findings, this study examined the relationship between team collaboration and collective leadership in Malaysian public hospitals. By investigating how collaboration supported collective leadership among nurses and allied personnel in these environments, this study addressed a significant gap. The findings extended teamwork and leadership theories by showing how collaboration operated in settings where interprofessional coordination was essential yet constrained by structural and cultural hierarchies. Building on these insights, this study proposed the following hypothesis:

H6: Team collaboration has a significant positive effect on collective leadership among Nurses in Malaysia

2.9.7 Relationship between Collective Leadership and Team Effectiveness

Collective leadership had increasingly been recognized as a key determinant of team effectiveness, particularly in dynamic and interdependent healthcare environments where coordinated action and shared decision-making were essential (Hudon et al., 2024). In this study, the relationship between collective leadership and team effectiveness was explained through Relational Coordination Theory and Social Information Processing Theory. Relational Coordination Theory emphasized that collective leadership strengthened shared goals, shared knowledge and mutual respect, which improved the quality of communication and coordination among team members (Mustapa et al., 2024). When influence and responsibility were distributed across members, teams were better able to integrate diverse expertise, respond quickly to patient needs and maintain consistent workflow across professional boundaries. From the perspective of Social Information Processing Theory, collective leadership shaped how information was interpreted, communicated and enacted within clinical environments (Anjara et al., 2021). By enabling team members to contribute information openly rather than relying solely on formal authority, collective leadership enhanced information flow, reduced bottlenecks and fostered more accurate team responses (Song et al., 2019). Together, these theoretical perspectives provided the foundation for understanding how collective leadership aligned team members cognitively, relationally and behaviorally toward shared goals, thereby supporting higher levels of team effectiveness (Zhao et al., 2024).

Empirical evidence consistently supported this theoretical relationship, demonstrating that when leadership influence was shared among team members, teams communicated more effectively, coordinated tasks more efficiently and achieved stronger levels of effectiveness (Illahi et al., 2024; Hayat et al., 2024; Paracha et al., 2022; Mindeguai et al., 2021). Numerous studies showed that collective leadership enhanced team performance, satisfaction and adaptability, particularly in interdependent work environments such as hospitals (Hadi & Chaudhary, 2021; Gu et

al., 2020; Kim & Han, 2019). Research by Hayat et al. (2024) and D'Innocenzo et al. (2016) revealed that collective leadership strengthened trust, goal alignment and conflict management, while Paracha et al. (2022), Mindeguai et al. (2021), Barnett and Weindenfeller (2016) and Morgeson et al. (2010) identified motivation, coordination and shared goal-setting as key mechanisms through which collective leadership improved effectiveness. Illahi et al. (2024) and Day et al. (2004) further described collective leadership as a strategic intangible resource that promoted learning and cohesion. These findings indicated that in high-pressure systems such as hospitals, distributing leadership enabled teams to remain flexible, resilient and responsive to changing patient needs.

Despite this strong support, several studies revealed that the effects of collective leadership were not always uniformly positive. Han et al. (2021) and Chiu (2016) showed that poorly managed collective leadership could create role confusion, reduce accountability and weaken coordination. Chen and Zhang (2022) argued that collective leadership might undermine the authority or motivation of formal leaders, while Wood and Fields (2007) found that shared influence sometimes increased ambiguity and job stress. These studies (Han et al., 2021; Sweeney, 2022; Chiu, 2016; Chen & Zheng, 2022) suggested that the effectiveness of collective leadership depended heavily on communication quality, clarity of roles and cultural norms that supported open dialogue and mutual respect. Without these conditions, collective leadership could produce overlapping responsibilities, unclear goals and reduced team coherence.

Even with these mixed findings, meta-analytic evidence showed a generally positive influence of collective leadership on effectiveness. D'Innocenzo et al. (2016) and Brun et al. (2020) confirmed significant overall effects, especially in teams requiring high interdependence and trust. Mayer et al. (2023) similarly found that collective leadership enhanced productivity and effectiveness by strengthening psychological empowerment and distributed accountability. In healthcare settings, where decisions must be made rapidly and are often interdependent, collective leadership enabled practitioners to share responsibility, respond quickly to patient needs and maintain continuity of care (Brun et al., 2020). These patterns reinforced the importance of studying collective leadership in clinical environments.

Building on this foundation, the present study examined the role of collective leadership in influencing team effectiveness in Malaysian public hospitals. This context was important because decision-making structures were traditionally hierarchical, and authority was concentrated among senior practitioners (Brun & McAuliffe, 2020). In such systems, understanding whether collective leadership could serve as a balancing mechanism was essential (Kjellstrom et al., 2020). By investigating this relationship, the study addressed inconsistencies in prior findings and extended theoretical understanding of how collective leadership operated within hierarchical and resource-constrained healthcare settings. In line with these arguments, the study proposed the following hypothesis:

H7: Collective leadership has a significant positive effect on team effectiveness among Nurses in Malaysia

2.9.8 The Mediating Role of Collective Leadership

Collective leadership had increasingly been conceptualized as a dynamic process in which leadership functions were shared, rotated and enacted collaboratively among team members to achieve a common mission (Brun et al., 2020; Carson et al., 2007). In this study, the relationship between collective leadership and other teamwork elements was explained using Relational Coordination Theory and Social Information Processing Theory. Relational Coordination Theory emphasized that collective leadership strengthened the relational conditions necessary for effective coordination, particularly shared goals, shared knowledge and mutual respect (Brun & McAuliffe, 2022). These relational conditions allowed team members to integrate their expertise, maintain consistent communication and sustain cooperation core requirements for effective functioning in interdependent environments such as healthcare (Lal & Khan, 2023). From the perspective of Social Information Processing Theory, collective leadership shaped how information was interpreted, evaluated and acted upon within teams (Wu et al., 2018). When leadership influence was shared rather than centralized, members processed work-related cues through consultation and mutual feedback, which reduced ambiguity and supported accurate, collective decision-making (Ntakumba & Jongh, 2023). Through these mechanisms, collective leadership

transformed individual contributions into coordinated team action, a condition essential for sustainable effectiveness in complex clinical settings (Brun et al., 2020; Lyu et al., 2023).

Empirical research supported these theoretical insights by showing that collective leadership enhanced the relational and communication structures through which teams functioned (Brun et al., 2020). Studies found that when team members collective leadership roles and participated in joint decision-making, they strengthened mutual trust, increased information sharing and improved cooperation (Gonzalez-Mule et al., 2016; Ishikawa, 2012; Wang et al., 2017; Marks et al., 2001). These behaviours created an internal network of influence that operated as an intangible resource supporting team effectiveness (Nahapiet & Ghoshal, 1998). Gupta et al. (2010) and Day et al. (2006) revealed that collective leadership increased immediate performance while also supporting longer-term team development. Similarly, Williams et al. (2010) and Parker et al. (2006) found that teams practicing collective leadership demonstrated higher autonomy, proactive behaviour and problem-solving capacity. Zhang et al. (2012) further reported that multiple informal leaders enabled teams to manage complex tasks more efficiently through distributed coordination, planning and feedback processes. These results indicated that collective leadership functioned as an adaptive role that integrated leadership, communication and decision-making, thereby enhancing team effectiveness.

Despite these findings, the mediating role of collective leadership between teamwork elements and effectiveness remained insufficiently explored, particularly in healthcare settings where hierarchical structures and interdependence shape how leadership is practiced (Song & Gu, 2024; Yoo et al., 2022). While earlier studies (Carson et al., 2007; Bligh et al., 2006; Pearce et al., 2002) suggested that collective leadership mediated relationships between team characteristics and outcomes, empirical support across different contexts remained inconsistent. Bligh et al. (2006) reported that collective leadership mediated the influence of shared vision, commitment and collaboration on team effectiveness, but later studies showed different findings, indicating that this mediating effect may depend on contextual factors such as organizational culture, task complexity or team composition (Jung et al., 2022). Berson et al. (2014) revealed that charismatic leadership affected team learning primarily

through shared vision and trust rather than through leadership mediation, raising questions about whether leadership consistently serves as an intermediary mechanism. Omar and Ahmad (2014) similarly found only partial mediation when linking team climate to effectiveness and satisfaction, suggesting that other contextual factors such as communication quality, leadership style and organizational support may weaken or strengthen the effect of collective leadership.

These inconsistencies indicated that the mediating influence of collective leadership was depend on contextual factors such as autonomy, hierarchy and the degree of interdependence among team members (Knippenberg et al., 2024). In highly structured and hierarchical settings such as public healthcare, collective leadership may function differently compared to flatter organizational contexts. Restricted autonomy, centralized authority and formalized roles may limit the extent to which leadership can be genuinely shared (Brun & McAuliffe, 2022). As a result, it remained unclear whether collective leadership would effectively mediate the influence of shared vision, commitment and collaboration in environments where decision-making authority is often concentrated. By examining this mediating role, the present study contributed to addressing gaps in the literature and extended theoretical understanding of how teamwork elements shared vision, commitment and collaboration were translated into team effectiveness through collective leadership in hierarchical healthcare systems. While some findings supported the significance of this mediating mechanism, other studies suggested that its effect might be less substantial than expected. Building on this previous work, the following hypothesis was proposed:

H8: Collective leadership significantly mediates the relationship between key elements of teamwork and team effectiveness among Nurses in Malaysia.

H8a: Collective leadership significantly mediates the relationship between team shared vision and team effectiveness among Nurses in Malaysia.

H8b: Collective leadership significantly mediates the relationship between team commitments and team effectiveness among Nurses in Malaysia.

H8c: Collective leadership significantly mediates the relationship between team collaboration and team effectiveness among Nurses in Malaysia

2.9.9 The Moderating Effect of Team Virtuality

The growing use of virtual communication in healthcare teams had reshaped how leadership and teamwork were enacted, particularly in environments that depended on technology-mediated collaboration (Christodoulou et al., 2024; Shi et al., 2023). In this study, the moderating role of team virtuality was understood through Social Information Processing Theory, which emphasized that the interpretation of information, the quality of communication and the coordination of tasks depended heavily on the cues available within the communication environment (Salancik & Pfeffer, 1978). Virtuality altered these cues by reducing physical presence, increasing reliance on asynchronous communication and shifting teamwork toward digital platforms (Yang et al., 2022; Lei et al., 2022). Through this lens, team virtuality was expected to influence how effectively collective leadership processes were translated into team effectiveness. When teams operated in virtual or partially virtual settings, communication patterns, trust formation and coordination processes changed substantially, affecting the way members collective leadership responsibilities and interpreted each other's contributions (Simonson et al., 2021; Schmutz et al., 2023; Majumdar et al., 2023). The extent to which collective leadership enhanced team effectiveness was therefore depend on the level of virtuality present in the team.

Empirical evidence regarding the influence of virtuality on leadership processes and team effectiveness was mixed. Several studies suggested that virtuality could support positive outcomes when leadership practices were adapted appropriately. Research showed that well-structured virtual teams could achieve high levels of efficiency, coordination and innovation when supported by leadership that fostered autonomy, mutual accountability and clear communication (Mayer et al., 2022; Robert & You, 2018; Drescher & Garbers, 2016; Hoegl & Muethel, 2016; Hoch & Kozlowski, 2014; Muethel et al., 2012). Collective leadership, in particular, appeared beneficial in dispersed teams because shared influence compensated for the absence of face-to-face oversight and enhanced members' engagement and decision-making (Mayer et al., 2022; Kahai et al., 2012; Rybnikova & Lang, 2021). These findings indicated that distributed leadership could improve coordination and relational cohesion even in high-virtuality environments.

However, other scholars reported that virtuality weakened leadership influence by reducing interpersonal connection, slowing information exchange and limiting opportunities for informal communication. Studies revealed that virtual communication could hinder trust development and create misunderstandings, leading to slower decisions and reduced coordination (Nuratri et al., 2021; Petreska, 2022). Additional evidence showed that teams often required more time to reach decisions (Pridmore & Philips-Wren, 2011) and were more prone to errors, misinterpretation and coordination breakdowns when virtuality was high (Swart et al., 2022; Mangla, 2021; Marrison-Smith & Ruiz, 2020; Cramton & Webber, 2005; Schweitzer & Duxbury, 2010). Purvanova and Kenda (2021) found that the moderating effect of virtuality on leadership and team effectiveness was insignificant, suggesting that high virtuality could dilute leadership influence. Ganesh and Gupta (2010) similarly reported a generally negative relationship between virtuality and team effectiveness, highlighting reduced cohesion and decreased consistency in performance. These findings suggested that virtuality introduced structural and relational constraints that could limit the positive effects of collective leadership.

Conversely, some studies indicated that contextual conditions offered the negative effects of virtuality. When teams employed structured communication processes, used appropriate digital tools and maintained strong relational ties, the adverse effects of virtuality on coordination and trust were reduced (Mutha & Srivastava, 2021; Nuratri et al., 2022). Hoch and Kozlowski (2014) found that while virtuality weakened the impact of hierarchical leadership, it enhanced the effect of collective leadership, suggesting that distributed leadership could be more effective in virtual contexts than traditional forms. Handke et al. (2020) further revealed that clear task structures, reliable communication systems and clearly defined roles helped mitigate the challenges associated with virtuality. These studies highlighted that virtuality's moderating role depended on the team's ability to establish shared norms, maintain strong relational coordination and develop communication patterns that supported distributed influence (Zaharie, 2021).

Building on these insights, the present study examined the moderating role of team virtuality in the relationship between collective leadership and team effectiveness within Malaysian public hospitals. By analysing this relationship, the study contributed

to ongoing debates regarding whether virtuality strengthened, weakened or did not alter the effect of collective leadership on effectiveness. Based on the previous findings, the following hypothesis was proposed:

H9: Team virtuality significantly moderates the relationship between collective leadership and team effectiveness among Nurses in Malaysia.

2.10 Underpinning Theory

This study grounded primarily in Relational Coordination Theory (RCT) and supported by Social Information Processing Theory (SIP). Together these theory explained how shared vision, commitment, and collaboration increase collective leadership in virtual teams setting and improve team effectiveness among nurses. Relational Coordination Theory proposed that outcomes improved when interdependent roles operated with shared goals, shared knowledge, mutual respect, and communication that was frequent, timely, accurate, and oriented to problem solving (Williams et al., 2023; Aivalli et al., 2025). In this study, team shared vision represented shared goals, while team commitment and team collaboration reflected mutual respect and the regular exchange of accurate and timely information. Collective leadership was treated as a team process in which influence was distributed according to expertise and task needs. Strong relational coordination reduced coordination failures and supported higher team effectiveness by promoting timely communication, mutual understanding, and seamless integration of tasks among team members, which ultimately enhanced the quality, efficiency, and reliability of healthcare delivery (Persson et al., 2022; Asbas et al., 2025).

In conjunction with RCT, Social Information Processing Theory (SIP) explained how team members learned what behaviors were expected by attending to social and informational indicators in the work setting (Rouleau et al., 2024). Clear communication about the team vision, visible cross-role helping, and leaders who shared authority acted as indicators that guided norms and behaviour (Wang et al., 2025). In virtual or hybrid teams with limited face-to-face contact, these indicators were especially important because members relied on messages, routines, and digital records to understand expectations and coordinate action (Wathne et al., 2025). Integrating

these two theories provided a structured basis for the model tested in this study by linking the relational conditions that enhanced teamwork with the informational processes that shaped member's behaviour (George et al., 2020).

2.10.1 Relational Coordination Theory (RCT)

Relational Coordination Theory was adopted as the main underpinning theory for this study because it empirically grounded explanation of how coordination occurred in interdependent work settings such as nursing. The theory defined effective coordination as a function of three relational conditions which are shared goals, shared knowledge, and mutual respect that supported by communication that was timely, accurate, frequent, and problem-solving in focus (Fasawe et al., 2025; Naruse et al., 2016). These conditions were consistently reflected in the operational environment of nursing teams, where daily work required the integration of information, rapid decision processes, and cooperation across roles (Baek et al., 2023; Simony et al., 2022). The theory therefore offered a reliable conceptual structure for examining how relational interactions shaped collective leadership and team effectiveness in healthcare settings (Bakht et al., 2024).

The decision to use Relational Coordination Theory was based on its demonstrated relevance in healthcare research (Azzellino et al., 2025; Bakht et al., 2024), where it had been applied to explain variations in quality of care, patient outcomes, safety indicators and staff well-being across different healthcare setting. Empirical studies in hospitals have shown that relational coordination is directly related with decreasing medical errors, reduced delays in treatment, improved patient outcomes, higher staff satisfaction, and stronger continuity of care (Elmdni, 2025; Bakht et al., 2024). These findings reflected actual patterns in nursing practice, where coordination failures often resulted in medication errors, duplicated assessments, inconsistent documentation, and delayed interventions.

The theory aligned closely with the interactional processes related with team shared vision, as shared goals and agree-upon goals influenced the flow of communication, coordinated task priorities and supported consistent decision making during daily routine and high pressure healthcare activities (Fasawe et al., 2025). In

nursing, shared vision was not an written concept but a functional requirement that guided clinical priorities, risk assessment, and care delivery (Hustoft et al., 2018). When nurses aligned around a common direction such as safety, continuity of care, or patient-centred practice, coordination improved because each action contributed to the same strategic objective (Veldhuizen et al., 2024). Shared vision clarified expectations at the point of care, reduced ambiguity during critical events, and ensured consistency across shifts (Hustoft et al., 2018). These functions directly reflected the shared goals component of Relational Coordination Theory, demonstrating the theoretical compatibility between shared vision and coordinated performance that lead to effectiveness among team (Taggart et al., 2024).

Beyond shared vision, team commitment also corresponded with the relational features described in the theory, as higher levels of commitment were reflected in nurses' willingness to support team objectives, invest sustained effort and remain engaged with team task even when facing high workloads or complex clinical situations (Falatah & Conway, 2019). In hospital units, commitment influenced coordination through practical behaviours which are taking initiative during peak workload periods, supporting colleagues during emergencies, and maintaining professional accountability even in psychologically demanding conditions. (Kuipers et al., 2021) These behaviours enhanced mutual respect and strengthened relational ties among nurses, which, according to the theory, were essential for achieving coordinated action (Haverhals et al., 2022). Commitment in nursing was therefore not a passive attitude but an active relational resource that sustained teamwork under pressure, and consistent with the theory's assumptions about relational conditions (Miller et al., 2021).

Building on this relational foundation, team collaboration, which centred on joint problem solving and shared decision-making, represented the behavioural indicator of the communication qualities highlighted in Relational Coordination Theory (Jorgensen et al., 2025). Collaboration in clinical settings required nurses to exchange relevant information during handovers, update team members on changes in patient status, and coordinate interventions during urgent situations (Gangathimmaiah et al., 2025). Breakdowns in collaboration led to fragmented care, inconsistent monitoring, and avoidable clinical risks (Doekhie et al., 2019). The theory directly addressed these issues by specifying the communication characteristics necessary for coordination

(Wong et al., 2020), demonstrating strong conceptual integration with the collaborative practices measured in this study.

Apart from that, the theory also provided a strong basis for understanding collective leadership within nursing teams by explaining how shared goals, mutual respect and coordinated communication enabled leadership responsibilities to rotate naturally among team members (Williams et al., 2023). Collective leadership in clinical practice did not emerge from organisational directives but from the combination of shared expertise, relational trust, and coordinated communication (Aivalli et al., 2025). In hospital wards, a nurse with specialised wound-care knowledge led wound management, while another with strong medication expertise guided complex medication administration (Gangathimmaiah et al., 2025). These patterns reflected collective leadership emerging from shared understanding and respect that described in Relational Coordination Theory (Bolton et al., 2021). The theory therefore provided an analytically rational explanation for how collective leadership developed from relational factors rather than individual authority.

Extending beyond leadership processes, team effectiveness, conceptualised in terms of performance, satisfaction, and viability, also aligned with outcomes documented in relational coordination research (Al-Sabei et al., 2022). Nursing teams with strong relational coordination demonstrated higher quality documentation, more consistent compliance to clinical standards, better continuity of care across shifts, and more stable staffing due to reduced turnover intentions (Kim & Ko, 2023). These outcomes were observable in healthcare settings and supported by empirical evidence (Gittell et al., 2008; Kim & Ko, 2023), establishing a direct theoretical link between relational coordination and the dimensions of team effectiveness relevant to this study. Furthermore, the theory offered a critical perspective on coordination in virtual or technology-mediated nursing environments by explaining how reduced face-to-face interaction, reliance on digital communication, and separated information flows required stronger relational foundations to sustain accurate, timely and integrated teamwork (Kim & Ko, 2023). The expansion of digital tools such as electronic health records, virtual consultations, and electronic communication systems changed how nurses exchanged information (Huber et al., 2019). These systems structured communication but also introduced vulnerabilities such as information overload,

delayed responses, and reduced relational contact. Relational Coordination Theory provided a lens to analyse how teams sustained coordination when communication was mediated by technology and when relational cues were limited (Kim & Ko, 2023). This allowed for critical investigation of how relational strengths or weaknesses influenced coordination under virtual conditions.

In summary, these analytical considerations demonstrated that Relational Coordination Theory was the most suitable theoretical foundation for this study as it aligned directly with the relational, behavioural, and performance-based characteristics of nursing teamwork and provided a disciplined framework for interpreting how shared vision, commitment, and collaboration shaped collective leadership and team effectiveness. Its grounding in empirical healthcare research, its applicability to real-world nursing processes, and its ability to support critical analysis of both face-to-face and virtual coordination justified its selection as the underpinning theory for this study.

2.10.2 Social Information Processing Theory (SIPT)

Social Information Processing Theory (SIPT) was adopted as the supporting theory for this study because it provided a well-grounded explanation of how individuals interpreted their work environment and adjusted their attitudes and behaviours based on the social and informational inputs available to them (Miller & Monge, 1985). The theory argued that employees did not rely solely on personal attitude when generating perceptions or making decisions, instead, they processed information from their social surroundings to understand expectations, norms, and appropriate behaviours (Yang et al., 2018). This perspective was particularly relevant in healthcare environments where information was exchanged continuously, and where the quality of interpretation had direct consequences for patient care and team coordination (Pennington et al., 2023).

The decision to use SIPT as a supporting theory was grounded in the realities of nursing practice, particularly the increasing reliance on digital communication in hospital settings (Gee et al., 2015). Nurses routinely operated in environments where immediate physical interaction was not always possible, especially across shifts, wards, and multidisciplinary teams. Communication frequently occurred through electronic

health records, digital handover notes, virtual consultations, and team messaging systems (Burgess et al., 2020). Under such conditions, nurses depended on the clarity and consistency of information transmitted through technological channels to understand what actions were expected (Lazzari, 2024). SIPT provided a theoretical basis for analysing how nurses processed these digital and social signals and how this influenced their behaviour within the team (Homewood et al., 2024).

The suitability of SIPT to the study became more observable when analysing team virtuality particularly in explaining how nurses interpreted and responded to social and informational signals transmitted through technology-mediated communication within their teams (Garnett et al., 2022). Virtuality introduced constraints on the richness of communication, reducing non-verbal indicators, limiting spontaneous interaction, and increasing dependency on structured, technology-based messages (Hoonakker et al., 2017). In highly virtual environments, team members could not rely on informal conversations or real-time clarification, making the interpretation of available information essential (Lim, 2022). SIPT explained how nurses used whatever indicators were available such as written updates, documented instructions, response patterns in communication systems, and observable behaviours of colleagues to determine norms, expectations, and appropriate responses (Valentine et al., 2019). The theory therefore offered a critical framework for understanding how virtuality shaped relational and behavioural processes within teams (Cho et al., 2021).

SIPT also supported the relationship of how shared vision, commitment, and collaboration translated into collective leadership under conditions of reduced face-to-face contact. When teams operated with virtual elements, nurses monitored not only explicit messages but also patterns in team behaviour, such as who initiated discussions, how information was shared, and how responsibilities were distributed (Kalisch et al., 2010). These indicators informed their understanding of their role within the team and signalled whether collective leadership behaviours such as contributing expertise, offering guidance, or making decisions were appropriate or expected (Cortellazzo et al., 2019). SIPT therefore helped explain why collective leadership could either strengthen or weaken depending on how effectively team members interpreted and responded to social information in virtual settings (Ahmed et al., 2023).

The theory further offered a critical perspective on the development of team effectiveness in technology-mediated environments such as in nursing units, errors in interpreting electronically communicated information could lead to incomplete assessments, delayed interventions, and inconsistent patient monitoring (Manser, 2009; Weller et al., 2014). SIPT provided a structured way to analyse how these errors arose from limitations in quality of information within virtual communication channels (Ghosh & Scott, 2009). Conversely, when nurses effectively processed available information, virtual communication supported coordination across shifts, improved documentation accuracy, and enhanced access to shared patient data, and translated to better team effectiveness (Wong et al., 2025). SIPT therefore allowed the study to examine how virtuality acted not only as a constraint but also as a factor that shaped team processes depending on how information was perceived and utilised. (Kotb et al., 2023)

Importantly, SIPT complemented Relational Coordination Theory by explaining the cognitive process through which relational conditions translated into action when team members interacted virtually (Pauleen & Yoong, 2001). While Relational Coordination Theory focused on shared goals, shared knowledge, and mutual respect as drivers of coordination, SIPT clarified how team members recognised, interpreted, and internalised these relational conditions through the information they received (Cho et al., 2021). In nursing contexts, this involved interpreting the tone, consistency, and completeness of messages which are observing how team members responded to emerging issues and identifying behavioural patterns that signalled expectations for teamwork (Lalic et al., 2022). The integration of SIPT allowed for deeper understanding of how virtual communication shaped these interpretations and, consequently, how relational coordination was maintained or disrupted (Chang et al., 2016).

Taken together, these conceptual considerations demonstrated that Social Information Processing Theory provided a comprehensive and appropriate supporting foundation for examining team virtuality in this study (Zhang et al., 2021). It aligned with real-world patterns of digital and mediated communication in nursing teams, offered a clear explanation of how team members interpreted expectations and norms under virtual conditions (Cho et al., 2021), and strengthened the understanding of how

relational and leadership processes developed in environments where direct interaction was limited (Cortellazzo et al., 2019). The theory therefore played an essential role in supporting the relationship of team virtuality and its influence on shared vision, commitment, collaboration, collective leadership, and team effectiveness in healthcare settings (Endalamaw et al., 2024).

2.11 Research Framework

The proposed framework in Figure 2.1 illustrated the relationship among the variables examined in this study. The independent variables were team shared vision, team commitment and team collaboration, while team effectiveness was act as the dependent variable. In line with the underpinning theory of Relational Coordination Theory, these three teamwork elements were acted as relational inputs that shaped how nurses coordinated their work and achieved effective outcomes. To capture the underlying processes more fully, the framework also incorporated collective leadership as a mediating variable and team virtuality as a moderating variable. Collective leadership was included to test the indirect effect between the key teamwork elements and team effectiveness, reflecting the idea that shared vision, commitment and collaboration operated through a collective leadership process to influence team effectiveness. Team virtuality was examined as a moderator of the relationship between collective leadership and team effectiveness, consistent with Social Information Processing Theory, which highlighted how technology mediated communication affected the way team members interpreted information and leadership signals. Overall, this framework represented a novelty from earlier models that focused mainly on direct relationships between collective leadership, virtual conditions and team effectiveness among nurses in Malaysia, by offering a more relational and information based explanation of how these variables were connected.

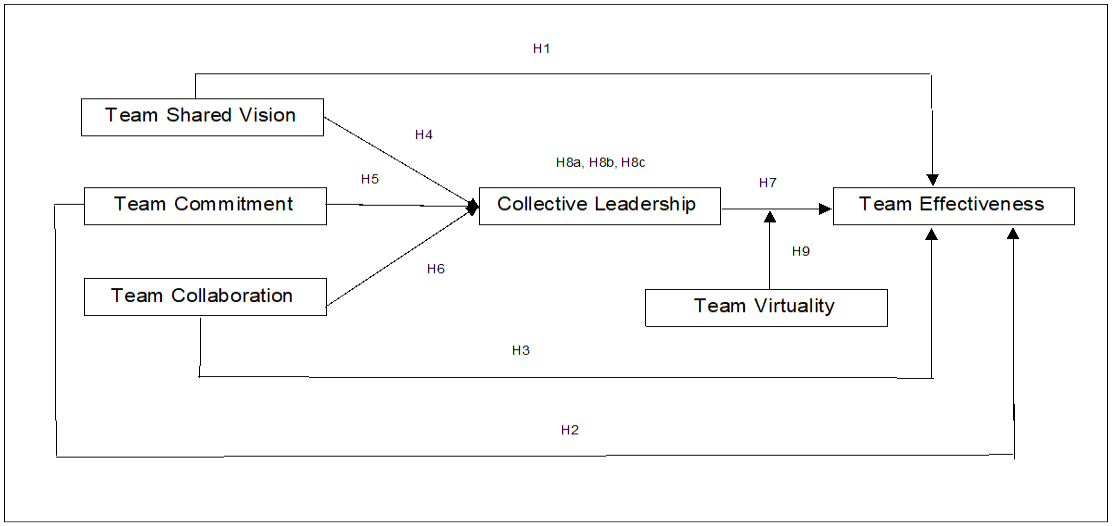

Figure 2.1 Research Framework

2.12 Summary of Hypotheses

Derived from the previous literature, this study formulated nine main hypotheses and three sub-hypotheses. The dependent variable was team effectiveness, while the independent variables were team shared vision, team commitment and team collaboration. Collective leadership was specified as the mediating variable, and team virtuality was identified as the moderating variable. The summary of the hypotheses was presented in Table 2.1.

Table 2.1
Hypotheses Summary

	Hypotheses
H1	Team shared vision has a significant positive effect on team effectiveness among Nurses in Malaysia
H2	Team commitment has a significant positive effect on team effectiveness among Nurses in Malaysia
H3	Team collaboration has a significant positive effect on team effectiveness among Nurses in Malaysia
H4	Team shared vision has a significant positive effect on collective leadership among Nurses in Malaysia
H5	Team commitment has a significant positive effect on collective leadership among Nurses in Malaysia

H6	Team collaboration has a significant positive effect on collective leadership among Nurses in Malaysia
H7	Collective leadership has a significant positive effect on team effectiveness among Nurses in Malaysia
H8	Collective leadership significantly mediates the relationship between key elements of teamwork and team effectiveness among Nurses in Malaysia
	H8a: Collective leadership significantly mediates the relationship between team shared vision and team effectiveness among Nurses in Malaysia
	H8b: Collective leadership significantly mediates the relationship between team commitment and team effectiveness among Nurses in Malaysia.
	H8c: Collective leadership significantly mediates the relationship between team collaboration and team effectiveness among Nurses in Malaysia
H9	Team virtuality significantly moderates the relationship between collective leadership and team effectiveness among Nurses in Malaysia

2.13 Chapter Summary

Apart from establishing Malaysia as a suitable setting to study the key elements of teamwork, collective leadership, team virtuality and team effectiveness among nurses, this chapter discussed the related theories and existing literature relevant to these concepts. It further articulated the relationships between the different constructs and their dimensions of interest, namely the independent, mediating, moderating and dependent variables. Based on the extensive review of the literature, this chapter also illustrated the conceptual framework and the development of the hypotheses for this study. In addition, it presented the underlying theories employed in this study, particularly Relational Coordination Theory and Social Information Processing Theory, to develop the research framework and hypotheses aimed at empirically examining the effects of the key elements of teamwork (team shared vision, team commitment and team collaboration) on collective leadership, team virtuality and team effectiveness among nurses in Malaysia. The next chapter therefore described the research methodology that was implemented to collect the data and to test the model and hypotheses proposed in this chapter

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

Guided by the research objectives of the study, this chapter outlined the research methodology employed by the present study. The chapter began with the research design followed by discussion on population, unit of analysis, sampling methods, respondents and sample size. The chapter further elaborated on aspects of the research questionnaire, variables and their measurement and the pilot test for the current study. Finally, the chapter ends by illustrating the reliability and validity of the measurement, data collection and analysis procedures and a chapter summary.

3.2 Research Design

The research design, as the first block of the methodology building, forwarded the master plans on the methods and procedures to collect and analyze data, as required by the study in order to answer the determined research questions and thereby accomplish the objectives of the study (Saunders et al., 2023; Sekaran & Bougie, 2025; Ngah et al., 2014; Easterby-Smith et al., 2012; DeVaus 2001). According to Saunders et al. (2023), the research design illustrated the purpose of the study, whether exploratory, descriptive or hypothesis testing. According to Sekaran and Bougie (2025), the research design described the preparation of the study in regards to the data collection and analyses, as required to answer the proposed research questions by determining the appropriate research method, employing research resources effectively, selecting appropriate data collection methods and determining the most suitable data analysis technique. The following subsections therefore discussed and justified the different components of the research design paradigm as used by this study.

In this study, a hypothesis testing quantitative design was adopted (Sekaran & Bougie, 2025). This approach was appropriate because the main objectives of the study were to examine the causal relationships between the independent variables, namely

team shared vision, team commitment and team collaboration, and the dependent variable, team effectiveness, with collective leadership acting as a mediating variable and team virtuality as a moderating variable (Sekaran & Bougie, 2025; Saunders et al., 2023). The explanatory design enabled systematic testing of the hypothesised relationships that were derived from Relational Coordination Theory and Social Information Processing Theory, which together guided the specification of the input variables, the mediating process and the moderating context in the research framework.

Sekaran and Bougie (2025) defined research design as the structured preparation of a study in terms of how data were collected and analysed to answer specific research questions. In alignment with this view, this study employed a cross sectional survey design, in which data were collected at a single point in time from a large sample of respondents (Sekaran and Bougie, 2025). This design was chosen for several reasons (Sekaran and Bougie, 2025), firstly, it allowed the researcher to capture the perceptions, attitudes and experiences of nurses across various general hospitals simultaneously, making it suitable for analysing patterns and associations among variables. Second, cross sectional surveys were efficient for hypothesis testing in large populations, providing the ability to generalise findings within defined organisational contexts (Saunders et al., 2023).

The study further utilised a quantitative approach because the variables under investigation, namely team shared vision, team commitment, team collaboration, collective leadership and team effectiveness, were conceptualised as measurable constructs. Quantitative methods allowed these constructs to be operationalised using standardised instruments, which supported objectivity and comparability of the results (Sekaran & Bougie, 2025). This approach also enabled the use of advanced statistical analysis, specifically Partial Least Squares Structural Equation Modelling (PLS SEM), to test the hypothesised relationships and to assess the mediating and moderating effects within the proposed model (Sekaran & Bougie, 2025; Heir et al., 2024).

This design was considered appropriate given the practical and ethical constraints of conducting research in hospital settings (Saunders et al., 2023). Experimental or longitudinal designs were less feasible due to time limitations, patient care responsibilities and restricted access to staff (Sekaran & Bougie, 2025). The cross sectional quantitative survey provided an efficient and ethical means of gathering large

scale data without disrupting daily healthcare operations (Sekaran & Bougie, 2025). In summary, the research design for this study was quantitative, cross sectional and explanatory in nature (Sekaran & Bougie, 2025), and was aimed at empirically testing the conceptual model developed in Chapter Two, which was grounded in Relational Coordination Theory and Social Information Processing Theory. This design allowed for a systematic and statistically supported investigation of the relationships among teamwork elements, collective leadership, team virtuality and team effectiveness within Malaysian public healthcare settings. The following subsections describe the philosophical approach, quantitative method, cross sectional design, unit of analysis, population and sampling methods, data collection procedures, measurement instruments and data analysis techniques employed in this study.

3.2.1 Philosophical Approach

The first dimension of an effective research design was an appropriate philosophical approach (Saunders et al., 2023). This study was grounded in a hypothetic deductive philosophical method whereby hypotheses were developed and tested to explain the nature of the relationships between the variables in the research framework. Following Sekaran and Bougie (2025), this philosophical standpoint was selected because the nature and objectives of the study required the main variables associated with the research problem to be clearly demonstrated and delineated. The philosophical approach underlying the study was positivism, and a quantitative analytical method was adopted to address the issues examined (Sekaran & Bougie, 2025). The positivist quantitative analytical method was suitable for this study because it allowed emphasis on quantitative data that were gathered and analysed using surveys and statistical techniques (Saunders et al., 2023; Sekaran & Bougie, 2025). This approach was further selected because it was relatively fast and economical, and provided wide coverage of different situations, whereby data collected and analysed from a large sample could be considered relevant for policy related decision making (Saunders et al., 2023; Sekaran & Bougie, 2025)

3.2.2 Quantitative Method

Two dominant research methods in the social sciences were qualitative and quantitative approaches, and the choice between them depended on the philosophical assumptions underlying a study (Saunders et a., 2023; Sekaran & Bougie, 2025). The qualitative approach was particularly useful for understanding certain aspects of social life and generally generated words rather than numbers as data for analysis (Saunders et a., 2023; Sekaran & Bougie, 2025). In contrast, a quantitative design was more suitable for determining relationships between independent and dependent variables within a population, with emphasis on measurement and numerical analysis of data collected through polls, questionnaires or surveys (Saunders et a., 2023; Sekaran & Bougie, 2025). Therefore, the quantitative approach, which focused on numeric data and its generalisation across populations, was most suited for this study (Saunders et a., 2023; Sekaran & Bougie, 2025).

Punch (2013) argued that the methods used to conduct research should match the research objectives. Based on the research model and hypotheses developed in Chapter Three, and in order to address the research objectives and answer the research questions identified in Chapter One, it was appropriate for the present study to adopt a quantitative research approach to test the proposed hypotheses and achieve the stated objectives (Saunders et a., 2023; Sekaran & Bougie, 2025). Hypothesis testing not only reflected the nature of the relationships between two or more interdependent constructs of interest but also explained variance in the dependent variable, providing a higher degree of validity and reliability when standardised measurements, suitable sampling techniques and systematic statistical analyses were applied (Saunders et a., 2023; Sekaran & Bougie, 2025). It was acknowledged that a quantitative approach enabled findings to be generalised to a larger population (Sekaran & Bougie, 2025). Therefore, considering these factors, this study adopted the quantitative method as the most suitable approach for the investigation (Sekaran & Bougie, 2025).

3.2.3 Cross Sectional Design

Regarding the research design, this study adopted a cross sectional design in which the fieldwork was carried out in a natural work environment (Saunders et al., 2023). Data were gathered once to answer the research questions (Sekaran & Bougie, 2025), and the cross sectional design was chosen because of cost and time constraints and to minimise interference or manipulation during data collection, as all information was collected at a single point in time (Saunders et al., 2023; Sekaran & Bougie, 2025).

Accordingly, the study comprised a pilot test, an actual survey in which data were gathered through questionnaires, and a data analysis stage in which the responses from the questionnaires were analysed using appropriate statistical tools (Sekaran & Bougie, 2025). Although it could be argued that a longitudinal approach using time series data might provide marginally richer insights, the practical difficulties associated with collecting data repeatedly in hospital settings made such a design less feasible (Sekaran & Bougie, 2025). In view of these constraints, the cross sectional design was deemed suitable for the present study, as it provided sufficiently accurate and timely results for the issues under investigation using a snapshot approach (Sekaran & Bougie, 2025).

3.3 Unit of Analysis

According to Sekaran & Bougie, (2025), the unit of analysis refers to the level at which a study focuses its investigation. For the purpose of this study, the unit of analysis was measured at the individual level (Sekaran & Bougie, 2025), namely healthcare practitioners and particularly registered nurses in the twelve general hospitals in Peninsular Malaysia. The study therefore measured team shared vision, team collaboration, team commitment, collective leadership, team virtuality and team effectiveness at the individual level. The individual level referred to each nurse's perception of the team, regardless of the focal individual's formal role or position (Saunders et al., 2023). Similar approaches were adopted in the work of Avolio et al. (2009), Davis (1995) and Mayer et al. (2023), who examined team related variables using individual level data.

This study selected the individual level to measure team shared vision, team collaboration, team commitment, collective leadership, team virtuality and team effectiveness in order to capture how each nurse's perceptions and behaviours contributed to team functioning and outcomes. Assessing these constructs at the individual level supported accountability within teams, as awareness that personal contributions were examined encouraged greater responsibility, effort and commitment toward achieving team effectiveness (DeShon et al., 2004; Dietz et al., 2015). In addition, measuring team shared vision, team collaboration, team commitment, collective leadership, team virtuality and team effectiveness from the individual perspective made it possible to examine how individual roles, perceptions and strengths influenced team processes and, in turn, contributed to performance (Duch et al., 2010; Ahmadpoor & Jones, 2019).

3.4 Population of the Study

Population was defined as the members of a well-defined class of people, events or objects (Sekaran & Bougie, 2025). It consisted of a collection of information whose properties were to be assessed in a specific research situation (Sekaran & Bougie, 2025). Population also referred to the total group of individuals, events or things that a researcher intended to study (Sekaran & Bougie, 2025). In other words, population was the universe of entities from which a sample was selected, comprising all units such as individuals, households or organisations to which survey results were to be generalised (Sekaran & Bougie, 2025). Saunders et al., (2025) described population as a group of individuals who shared common features and other characteristics that researchers could identify and study.

The population frame of this study consisted of healthcare practitioners, particularly nurses, in twelve general hospitals in Peninsular Malaysia. The work structure of nurses in Malaysian hospitals typically involved teams led by matrons with several staff nurses as members. Nurses performed different types of tasks and were often engaged in multiple team processes at the same time. This group was chosen because nurses formed the backbone of Malaysian hospitals and represented the largest professional group in the healthcare sector (Oerther & Rosa, 2020). Since most

hospitals in Malaysia were relatively homogeneous in terms of nursing workforce characteristics, only general hospitals located in all states were selected (Planning Division, Ministry of Health Malaysia, 2023). General hospitals were chosen because they offered all major specialist services such as surgery, orthopaedics, paediatrics and cardiology, whereas district hospitals mainly provided general services and did not have specialists stationed permanently (Planning Division, Ministry of Health Malaysia, 2023). Selecting general hospitals therefore ensured broader coverage of nurses working across various disciplines.

In this study, responses were required from a specific group of healthcare practitioners, namely staff nurses and their matrons. Based on information from the Department of Statistics Malaysia (DOSM, 2023), which served as the most reliable and official source of information on registered nurses in Malaysia, there were 51,126 registered nurses across all states as of the end of 2020 (Table 3.1). Accordingly, 51,126 registered nurses formed the final population for this study based on the general hospitals listed and selected.

Table 3.1
Number of Nurses in the General Hospital in Peninsular Malaysia

No	Name of General Hospital	Number of Nurses
1.	Hospital Tuanku Fauziah	981
2.	Hospital Sultanah Bahiyah	4830
3.	Hospital Pulau Pinang	3660
4.	Hospital Raja Permaisuri Bainun	6081
5.	Hospital Sungai Buloh	9465
6.	Hospital Putrajaya	1414
7.	Hospital Tuanku Ja'afar	2966
8.	Hospital Melaka	2403
9.	Hospital Sultanah Aminah	6959
10.	Hospital Tengku Ampuan Afzan	4123
11.	Hospital Sultanah Nur Zahirah	3093
12.	Hospital Raja Perempuan Zainab II	5151
	Total Population	51 126

Source: Planning Division, Ministry of Health Malaysia, (2023)

3.5 Sample Size

The size of the sample needed to be sufficient for the study by being adequate to estimate the characteristics of the population and to provide reliable outcomes (Sekaran & Bougie, 2025). The sample size therefore had to be broad enough to represent the population accurately and to yield realistic findings. As suggested by Sekaran and Bougie (2025), the guiding principle developed by Krejcie and Morgan (1970) for determining sample size was adopted. Accordingly, the sample size for this study was determined based on Krejcie and Morgan's (1970) guidelines and formula:

$$s = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)} \tag{3.1}$$

s	=	Required sample size
X^2	=	The table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)
N	=	The population size (51 126)
P	=	The population proportion (assumed to be 0.50 since this would be provide the maximum sample size)
d	=	The degree of accuracy expressed as a proportion (0.05)

Based on Krejcie and Morgan's (1970) formula for determining sample size, for a population of 51,126 a minimum sample size of 381 was required. Nevertheless, the sample size was increased by three respondents for each general hospital to minimise sampling error and to address potential non response issues (Hair et al., 2024). Accordingly, to avoid complications in data analysis arising from a small sample, this study collected data from 417 registered nurses in Malaysia. Consistent with Hair et al. (2024), the lower the sample size, the greater the tendency for error, whereas a higher sample size increases the accuracy of the results

However, a sample size of 150 or more was considered appropriate to obtain parameter estimates with standard errors sufficiently small to be of practical use (Sekaran & Bougie, 2025). Hair et al. (2024) recommended that sample size should range from 150 to 450 to avoid problems of model misspecification. Similarly, a sample size ranging from 100 to 150 was suggested in order to avoid lack of convergence or

improper solutions in confirmatory factor analysis (Saunders et al., 2023)(Appendix F1 and Appendix F2). Furthermore, in multivariate studies the sample size was suggested to be several times, preferably ten times or more, larger than the number of variables under examination, and when the sample comprised sub samples, at least 30 cases in each group or a minimum of five cases for each indicator were recommended (Sekaran & Bougie, 2025).

In addition, Cohen (1988) argued that in determining the prerequisite sample size for a study, researchers should first decide the significance criterion and the preferred level of statistical power to be attained. The expected effect size, which referred to the anticipated population effect, also needed to be specified. Cohen (1988) further stated that if the sample size was large, the error would be smaller and the accuracy of the results would improve. This increased the likelihood of detecting the phenomena under investigation. It was also suggested that selecting a sample that was representative of the population was more important than merely obtaining a large but biased sample, which could lead to erroneous conclusions about the population (Sekaran & Bougie, 2025). Thus, the researcher has selected the population samples of this study carefully, bearing in mind the numerous precautions and suggestions of previous researchers.

3.6 Sampling Technique

There were two basic types of sampling design, namely probability and non-probability sampling. Under probability sampling, every unit of the population had a known, non-zero chance of being selected as part of the sample (Sekaran & Bougie, 2025). This approach was used when the representativeness of the sample was important for generalisation (Sekaran & Bougie, 2025). In contrast, under non probability sampling, the elements of the population did not have a known or predetermined chance of selection. This approach was used when time or other practical considerations were more important than strict generalisability (Sekaran & Bougie, 2025).

The sampling technique used in this study was purposive sampling, a non-probability method that allowed the researcher to select participants based on specific

characteristics and the purposes of the study (Saunders et al., 2023; Sekaran & Bougie, 2025). This approach was appropriate because the study targeted a clearly defined population (Sekaran & Bougie, 2025), namely registered nurses working in Malaysian general hospitals, who possessed direct experience with teamwork, leadership and hospital based healthcare delivery. Purposive sampling enabled the researcher to deliberately select hospitals and participants who could provide relevant, rich and reliable data aligned with the study objectives (Saunders et al., 2023).

The decision to conduct this study in general hospitals was both strategic and methodological. General hospitals were selected because they represented the highest level of public healthcare facilities in Malaysia and were typically equipped with diverse departments, specialised units and multidisciplinary teams. These hospitals provided comprehensive services, including surgery, orthopaedics, paediatrics, cardiology, obstetrics and gynaecology, psychiatry and intensive care. They therefore offered a suitable environment for examining elements of teamwork, collective leadership, team virtuality and team effectiveness among healthcare professionals, particularly nurses.

General hospitals also had a larger and more heterogeneous nursing workforce than district hospitals or health clinics. This diversity allowed broader representation of nurses from different specialties, levels of seniority and work arrangements, such as shift or divided duty systems. The inclusion of nurses from multiple wards and clinical units ensured that the sample reflected variations in teamwork processes, leadership interaction and work culture across different hospital settings. This, in turn, enhanced the external validity of the findings and supported the generalisation of results to other large scale healthcare environments within Malaysia's public health system.

The sampling frame for this study comprised twelve general hospitals across Peninsular Malaysia, which were selected based on their size, service capacity and accessibility. These hospitals were distributed across different regions to reflect Malaysia's healthcare structure and to minimise geographical bias. The hospitals included in this study were Hospital Tuanku Fauziah, Hospital Sultanah Bahiyah, Hospital Pulau Pinang, Hospital Raja Permaisuri Bainun, Hospital Sungai Buloh, Hospital Putrajaya, Hospital Tuanku Ja'afar, Hospital Melaka, Hospital Sultanah Aminah, Hospital Tengku Ampuan Afzan, Hospital Sultanah Nur Zahirah and Hospital

Raja Perempuan Zainab II. The summary of the population, sample size and number of questionnaires distributed for each hospital is presented in Table 3.2 below:

Table 3.2
Number of questionnaires distribute

No	Name of General Hospital	Number of Nurses	Calculation	Questionnaires distribute
1.	Hospital Tuanku Fauziah	981	(981/ 51,126) * 381	10
2.	Hispital Sultanah Bahiyah	4830	(4830/ 51,126) * 381	39
3.	Hospital Pulau Pinang	3660	(3660/ 51,126) * 381	30
4.	Hospital Raja Permaisuri Bainun	6081	(6081/ 51,126) * 381	48
5.	Hospital Sungai Buloh	9465	(9465/ 51,126) * 381	74
6.	Hospital Putrajaya	1414	(1414/ 51,126) * 381	14
7.	Hospital Tuanku Ja'afar	2966	(2966/ 51,126) * 381	25
8.	Hospital Melaka	2403	(2403/ 51,126) * 381	21
9.	Hospital Sultanah Aminah	6959	(6959/ 51,126) * 381	55
10.	Hospital Tengku Ampuan Afzan	4123	(4123/ 51,126) * 381	34
11.	Hospital Sultanah Nur Zahirah	3093	(3093/ 51,126) * 381	26
12.	Hospital Raja Perempuan Zainab II	5151	(5151/ 51,126) * 381	41
Total		**51,126**		**417**

3.7 Data Collection Procedure

Self-administered questionnaires were used to gather data from registered nurses with the assistance of matrons, who served as their immediate leaders, in the twelve selected general hospitals in Peninsular Malaysia. The data collection procedure

followed a systematic and ethical process to ensure validity, confidentiality and compliance with institutional and national regulations governing research involving human participants. Before data collection commenced, the study was registered with the National Medical Research Registry (NMRR), as required for all research conducted in Malaysian hospitals. The study was submitted online to obtain approval from the National Institute of Health (NIH) and the Medical Research and Ethics Committee (MREC). Several documents were enclosed with the application, including the research proposal, the questionnaire and completed agreement forms from the investigators, heads of departments and institutional authorities. After registration and submission of the supporting documents, the study received a registration number issued by NMRR.

At the same time, this study applied for ethical approval through the Research Ethics Depository (RED) system. Registration with the UiTM Research Ethics Depository system (RED UiTM) was required for all research involving human participants. The study was submitted online to obtain approval from the Ethical Research Committee of UiTM Perlis before proceeding to data collection. Several documents were enclosed with the application, including a copy of the research proposal, the research questionnaire, the proposal defence report, the research flow chart and completed agreement forms from the investigators, heads of departments and institutional authorities. After registration and submission of the supporting documents, the study received approval from the UiTM Research Ethics Committee. At the same time, letters seeking permission were submitted to the twelve selected general hospitals for administrative approval. Once these approvals were obtained, the researcher proceeded to deliver the questionnaires by hand to the participating hospitals in Peninsular Malaysia

Following the approvals obtained from NMRR, NIH, MREC (Appendix D4) and the UiTM Research Ethics Committee (Appendix B and Appendix C), the researcher initiated contact with all participating hospitals through formal channels, specifically their research centres. Official letters (Appendix D1 and Appendix D2) were sent to the hospital research centres and chiefs of matron in the twelve general hospitals, explaining the study objectives, ethical approvals and data collection procedures. After written consent was received from the hospitals (Appendix D3), the

chief matrons were contacted directly via telephone and email to arrange meetings and briefing sessions. During these sessions, the researcher explained in detail the purpose of the study, the criteria for selecting participants and the procedures for questionnaire distribution and collection. Matrons were selected as key liaison officers because of their managerial roles and close familiarity with nursing staff across departments. They were also responsible for ensuring that the study complied with hospital protocols and did not disrupt daily clinical operations.

The researcher provided each matron with a briefing document outlining the study objectives, inclusion and exclusion criteria and guidelines on the ethical handling of the questionnaires. Matrons were instructed to identify registered nurses who met the inclusion criteria using a purposive approach, so that the sample represented nurses from various clinical departments, including medical, surgical, orthopaedic, paediatric, obstetrics and gynaecology, psychiatric, critical care, high dependency, multidisciplinary wards and specialist clinics. To be eligible, nurses had to be registered with the Malaysian Nursing Board, have served in their current hospital for at least six months and be actively involved in direct patient care. Both male and female nurses were included to ensure gender representation, although female nurses formed the majority of the nursing workforce in these hospitals.

Once eligible participants had been identified, the matrons compiled lists of selected nurses according to their respective wards and departments. However, due to confidentiality and ethical restrictions, the researcher did not receive or access these lists directly. Instead, the matrons acted as intermediaries in the distribution process. Each matron received a bundle of questionnaires proportionate to the number of nurses in her hospital, following the allocation determined earlier (refer to Table 3.2). Each questionnaire was accompanied by a cover letter that introduced the researcher, described the purpose and importance of the study, outlined the voluntary nature of participation and assured respondents of complete anonymity. The cover letter also explained that no names or identifying information were required and that all responses would be used strictly for academic purposes. The matrons then distributed the questionnaires personally to the identified nurses, typically during shift changes, departmental meetings or designated administrative sessions, in order to minimise disruption to clinical duties.

To respect participants' time and work responsibilities, nurses were given flexibility to complete the questionnaires during non-working hours, rest periods or at home. Each hospital provided a sealed collection box, placed either in the matron's office or another secure location known to the participants. After the data collection period, which typically lasted two to three weeks in each hospital, the matrons gathered the completed questionnaires and contacted the researcher to arrange collection. The researcher then personally retrieved the sealed envelopes from each hospital to maintain confidentiality and data integrity. This systematic and collaborative procedure ensured ethical compliance, minimised disruption to hospital operations and encouraged higher response rates through institutional support and trust. By involving matrons as intermediaries, the study utilised existing organisational structures to facilitate smooth communication and coordination. Furthermore, the indirect distribution method enhanced respondent anonymity, reduced potential bias associated with direct contact with the researcher and increased the likelihood of obtaining honest and reflective responses from participants..

Out of the 417 questionnaires distributed, all 417 completed questionnaires were returned, representing a 100 per cent response rate, which was considered highly satisfactory for survey based research in healthcare settings. This final sample exceeded the minimum sample size requirement of 381 as determined by Krejcie and Morgan's (1970) table, thereby ensuring adequate statistical power and representativeness. The high response rate was attributed to close coordination with matrons, the structured distribution procedure and the flexibility given to nurses in completing the survey. Overall, this data collection strategy ensured ethical conduct and methodological reliability and yielded high quality data suitable for quantitative analysis.

3.8 Inclusion Criteria

This study employed specific criteria for the selection of target samples. For staff nurses to be included, they were required to have a nursing tenure of at least six months in their current hospital. The participants comprised nurses working in medical, surgical, orthopaedic, paediatric, obstetrics and gynaecology, psychiatric, critical care and high dependency units, multidisciplinary wards and specialist clinics. The sample

included nurses who were working on divided duty as well as shift duty. Male nurses were also included, although they formed a small proportion of the nursing population in the hospitals.

3.9 Exclusion Criteria

Nurses who were on long leave, such as study leave, maternity leave or any other leave approved by the organisation at the time of the study, were excluded. Nurse aides and attendants were also excluded because they were not frequently involved in direct patient care. Newly graduated nurses who had served in the current hospital for less than six months were not included, and nurses working in community clinics or health offices were likewise excluded from the study. Specific advanced practice roles within nursing teams were also not considered, because these roles were limited to advanced practice nurses such as nurse practitioners, or to other medical disciplines such as physicians or physician assistants.

3.10 Research Instrument

The main instrument for this study was a self-administered questionnaire designed to collect quantitative data from registered nurses in twelve Malaysian public hospitals. The questionnaire was developed as a bilingual instrument in English and Bahasa Malaysia, based on previously tested and validated scales that were borrowed and adapted from existing literature to ensure clarity for respondents. English and Bahasa Malaysia were used as the languages of the instrument because the healthcare practitioners, namely registered nurses, were expected to be proficient in both.

The questionnaire was adapted and adopted from previously validated and widely used instruments in the relevant literature to ensure both content validity and construct validity. Each construct representing the independent, mediating, moderating and dependent variables was operationalised through multi item scales. The wording of the items was kept simple, neutral and free from technical terminology in order to reduce ambiguity and respondent fatigue. Certain items were reverse coded to minimise response bias, particularly acquiescence or extreme response tendencies that are

common in self report surveys. These reverse coded items were re coded during the data cleaning process to ensure consistent interpretation before statistical analysis.

To further enhance content validity, the instrument underwent expert review by three qualified specialists which are two academic experts in management (Appendix H2) and organisational behaviour (Appendix H1), and one senior medical doctor acting as a visiting professor with extensive experience in hospital administration and nursing supervision (Appendix I). The academic experts examined the questionnaire for conceptual clarity, theoretical relevance and appropriateness of construct operationalisation, while the medical doctor assessed its applicability, contextual suitability and comprehensibility for healthcare practitioners, particularly nurses. Feedback obtained from these experts was used to refine the wording, sequence and structure of the items so that the instrument measured the intended constructs accurately and consistently.

In terms of language and translation accuracy, the bilingual questionnaire followed the back-to-back translation procedure as recommended by Harkness (2003). The translation process was conducted by a certified language lecturer who was fluent in both English and Bahasa Malaysia and had experience in academic translation (Appendex G)). Both language versions were then compared for conceptual equivalence to ensure that the meaning, tone and contextual nuances of each item remained consistent across versions. Any discrepancies identified during this comparison were discussed and reconciled jointly by the translators and the researcher. This process ensured semantic and conceptual accuracy and prevented distortion or alteration of item meaning, which could have compromised the validity of the instrument.

A Likert scale is a summated rating scale constructed from statements that reflect either a positive or negative attitude toward the object of interest, and increasing the number of scale points tends to increase the reliability of the measure (Blumberg et al., 2014). In this study, a five point Likert scale was adopted. First, the five point scale supported a wider distribution of scores around the mean and provided greater discriminating power. Second, it was easier to establish covariance between variables when responses showed greater dispersion around their mean. Third, the five point scale had been well established in academic and industry research, and from a model

development perspective, a wider response scale was preferred. This was consistent with Neuman and Robson (2008), who asserted that the five point Likert scale is appropriate and provides better results. Therefore, five point Likert scales were used in this study.

The researcher structured all constructs in the measuring instrument using a five point Likert scale, including the independent, mediating, moderating and dependent variables. This decision was taken despite some debate in the literature regarding the advantages of different Likert scale formats. To achieve optimal results in terms of information processing and scale reliability, the five point Likert scale was considered efficient (Neuman & Robson, 2008). The Likert format was also found to be suitable for this study given the nature of the respondents and the type of information they were required to provide.

Furthermore, Krosnick and Fabrigar (1997) argued that scales with five or seven points are more reliable than higher or lower scales and that the absence of a midpoint may increase measurement error. Similarly, Dawes (2008) pointed out that five or seven point scales are likely to produce better results (Sauro, 2010). In line with these arguments, the five point Likert scale was applied consistently across all constructs in this study. For clarity and to support understanding of the research instrument, a description of all variables, their dimensions and the measurements used to construct the instrument was provided in the next following section.

3.11 Questionnaire Design

Questionnaire design was an important stage of this research because it provided the means to capture responses from the targeted participants and to minimise potential measurement error through a logical arrangement of questions that could be easily understood by respondents (Saunders et al., 2023; Sekaran & Bougie, 2025). This study used a self-report questionnaire method for all adopted items to measure the independent variables (team shared vision, team commitment and team collaboration), the mediating variable (collective leadership), the moderating variable (team virtuality) and the dependent variable (team effectiveness).Self report methods remained the most

commonly used form of assessment in social science research (Sekaran & Bougie, 2025). They were frequently employed because of their efficiency and practicality in obtaining large amounts of data from many respondents within a relatively short period of time (Sekaran & Bougie, 2025).

A questionnaire has been defined as a set of questions designed to provide information on certain variables based on the responses of individuals identified as respondents (Sekaran & Bougie, 2025). These questions can be open ended, dichotomous or close ended (Saunders et al., 2023). For the purpose of this research, the questions were close ended because they restricted respondents to a set of predefined alternative answers when reporting their objective and subjective views on collective leadership, team virtuality and team effectiveness in their work context. To achieve this efficiently, the researcher standardised the questions through a well-structured, undisguised, self-administered questionnaire. This effort was necessary because the expected responses were critical for obtaining reliable data suitable for robust statistical analysis in the results (Hair et al., 2024).

The questionnaire used in this study comprised seven parts. Part A consisted of eleven questions regarding the respondents' demographic background and social characteristics. Part B contained six questions related to the key study variables, namely the independent variables (team shared vision, team commitment and team collaboration), the mediating variable (collective leadership), the moderating variable (team virtuality) and the dependent variable (team effectiveness).

3.12 Variables and Measurement

To ensure the validity of the scales used, the variables in this study, namely team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness, were measured using items adapted from previously validated instruments in the existing literature. In order to achieve adequate reliability and validity, the study employed multiple items with at least three items per construct, following Lamb et al. (2004), who stressed that the minimum number of items to measure a construct should be three to improve the reliability and validity of the measurement.

This section elaborated on the variables and measurements of this study. The measurements of the study were mostly adapted from previous research with acceptable reliabilities (Cronbach's alpha). The summary of the measurements adapted in this study was shown in Table 3.3. To ensure contextual appropriateness within the Malaysian public healthcare setting, the wording of several items was adapted to use the term "my team". This adjustment allowed respondents, who were nurses working in hospital wards, to relate the questions more specifically to their immediate working group. The adaptation maintained the collective meaning of the construct while improving clarity, comprehension and contextual relevance. The next sub section explained the instruments for each variable.

Table 3.3
Reliability of Adapted Items

Variables	Items	Reliability	Sources
Team Shared Vision	12	0.910	Gutierrez et al., (2008)
Team Commitment	8	0.980	Bishop and Scott (2000)
Team Collaboration	18	0.940	Lin et al., (2013)
Collective Leadership	20	0.910	Brussow (2013)
Team Virtuality	9	0.850	Lu (2006)
Team Effectiveness	15	0.940	Hackman (1990) and Balkundi & Harisson (2006)

3.12.1 Independent Variable: Team shared Vision

The items used for measuring team shared vision were composed of 12 items taken from work by Oswald et al., (1994) and Tsai and Ghoshal (1998) as cited in Gutierrez et al., (2008) and Garcia-Morales et al., (2019). These items included whether the team members of the organization had goals and an image of the future in common and shared ambitions (as illustrated in

Table 3.4). Both the scale's unidimensional, through the explanatory factor analysis, and its internal consistency ($\alpha = 0.910$) were confirmed. The measure for all items was on a Five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree.

Table 3.4
Measuring the Team Shared Vision

Number	Original Items	Adopted Items
TSV1	In the organization, there is a clear vision guiding the strategic goals and missions	In our hospital, there is a clear vision guiding the strategic goal and missions
TSV2	The leadership of the company shares a common vision of the organization's future	Our matron shares a common vision of the future
TSV3	The shared vision guiding change, in the organization, is appropriate	The shared vision guiding change in the hospital, is appropriate
TSV4	We agree on what is important for our organisation	My team agree on what is important for our hospital
TSV5	Our unit shares the same ambitions and vision with other units at work	My team shares the same ambitions and vision with others unit at work
TSV6	People on our unit are enthusiastic about pursuing the collective goals and missions of the whole organization	People on my unit are enthusiastic about pursuing the collective goals and mission of the whole hospital
TSV7	We fully understand the meaning of the organization vision and mission and can fully explain it in detail	My team fully understand the meaning of the hospital vision and mission and can fully explain it in detail
TSV8	We understand the meaning of the phrase make culture embedded in the vision	My team understand the meaning of the phrase make culture embedded in the vision
TSV9	We fully engaged and in accordance with our organization vision and mission	My team fully engaged and in accordance with our hospital vision and mission
TSV10	We can explain our organizational vision and mission and explain the organization direction in detail	My team can explain our hospital vision and mission organization direction in detail
TSV11	We believe our organization vision and direction are adequately set	My team believe our hospital vision and direction are adequately set
TSV12	We know what to do in order to achieve our organization vision	My team know what to do in order to achieve our hospital vision

Sources: Gutierrez et al., (2008)

3.12.2 Independent Variable: Team Commitment

This study operationalized the team commitment as the relative strength of an individual identification with and involvement in a particular organization (or team), which could be characterized by (a) a strong belief in and acceptance of the team goals and value, (b) a willingness to exert considerable effort on behalf of the team and (c) strong desire to maintain memebership in team (Bishop & Scott, 2000). However, this study adopted 8 items (α = 0.980) from Bishop and Scott (2000) to measure the team commitment as illustrated in Table 3.5. The measure for all items was on a Five-point Likert scale, ranging from 1 = strongly disagree to 5 =. Strongly agree.

Table 3.5
Measuring the Team Commitment

Number	Original Items	Adopted Items
TC1	I talk up (brought up) this team to my friend as a great team to work on	I talk up (brought up) my team to my friend as a great team to work on
TC2	I would accept almost any job in order to keep working with this team	I would accept almost any job in order to keep working with my team
TC3	I find that my values and the team's values are very similar	I find that my values and my team's values are very similar
TC4	I am proud to tell others that I am part of this team	I am proud to tell others that I am part of my team
TC5	This team really inspires the very best in me in the way of job performance	My team really inspires the very best in me in the way of job performance
TC6	I am extremely glad that I chose this team to work with over other team	I am extremely glad that I chose my team to work with over other team
TC7	I really care about the fate of this team	I really care about the fate of my team
TC8	For me this is the best of all possible teams with which to work	For me this is the best of all possible teams with which to work

Source: Bishop and Scott (2000)

3.12.3 Independent Variable: Team Collaboration

This study operationalized the team collaboration as a sharing the responsibilities of problem solving and decision-making in formulating and carrying out plan to achieve the organizational goal (Sudeshika et al., 2021; Aaberg et al., 2018; Lin et al., 2013; O'Daniel & Rosenstein, 2008). The construct of team collaboration was adapted from validated instrument that assessed community pharmacist-general practitioner relationship (Zillich et al., 2005; Liu et al., 2010; Van et al., 2012) as cited in Sudeshika et al., (2021) and Lin et al., (2013). The 18-items adapted from Lin et al., (2013) was unidimensional indicators that describe collaborative behaviour between nurses and general practitioners teams in primary care as illustrated in Table 3.6. The measure for all items was on a Five-point Likert scale, ranging from 1 = strongly disagree to 5 =. Strongly agree.

Table 3.6
Measuring the Team Collaboration

Number	Original Items	Adapted Items
TCOL1	Understand the role of other professions in clinical situations	My team understand the role of other professions in clinical situations
TCOL2	Recognize and respect roles and contribution of another professions	My team recognize and respect roles and contribution of another ward/units
TCOL3	Recognize and respect competence of other	My team recognize and respect competence of other
TCOL4	Capable of working as a team with people from another professions	My team capable of working as a team with people from another wards/units
TCOL5	Capable of communication, coordination and conflict resolution	My team capable of communication, coordination and conflict resolution
TCOL6	Recognize and respect leadership in collaboration practice	My team recognize and respect leadership in collaboration practice
TCOL7	Capable of facilitating collaborative practice	My team capable of facilitating collaborative practice
TCOL8	Confident in own ability as well as other's	My team confident in own ability as well as other's

TCOL9	Capable of patient-centered collaborative practice	My team capable of patient-centered collaborative practice
TCOL10	Willing to work as a team and share the same goal with people from another professions	My team willing to work as a team and share the same goal with people from another wards/units
TCOL11	Plan together in decision making	My team member plan together in decision making
TCOL12	Open communication in decision-making	My team open communication among team members in decision-making
TCOL13	Shared responsibilities for decision-making	My team shared responsibilities for decision-making
TCOL14	Team member cooperated in decision making	My team member cooperated in decision making
TCOL15	All team members concern in decision-making	My team members concern was considered in decision-making
TCOL16	Coordination in decision-making	My team will coordinate the decision making among the team members
TCOL17	Level of collaboration in decision-making	My team have a high level of collaboration among team members in decision-making
TCOL18	How satisfied with the decision making process	I satisfy with the decision making process among my team members

Sources: Sudeshika et al., (2021) and Lin et al., (2013)

3.12.4 Mediating Variable: Collective Leadership

This study operationalized collective leadership as a dynamic process that emerged at the crossroads of a distribution of the leadership role, diverse skill and expertise within the network, and the effective exchange of information among team members in order to capitalize on and coordinate their role and behavior and expertise to the achievement of group or organizational goals and both (Brussow, 2013). This study measured collective leadership adopted from Brussow (2013). Team members rated each of their individual peers regarding the extent to which they relied on these individuals for specific leadership support using seven-point Likert scale, ranging from 1 = strongly disagree to 5 =. Strongly agree. The total of 20 items represented different

team leadership functions including facilitating planning in organization, aiding in problem solving, providing personal support and consideration and fostering development and mentoring (from Brussow (2013) using a single measure as illustrated in Table 3.7.

Table 3.7
Measuring the Collective Leadership

Number	Original Items	Adopted Items
CL1	I collaborate regularly with my team members to achieve goals.	I collaborate regularly with my team members to achieve goals.
CL2	My team has collective vision with agreed upon goals.	My team has collective vision with agreed upon goals.
CL3	The formal leader in my team are willing to delegate some control to informal leaders	The formal matron in my team are willing to delegate some control to informal leaders
CL4	Our team members rust each other to work effectively and get the job done.	My team members rely on each other to work effectively and get the job done.
CL5	I understand my team's purpose and goals.	I understand my team's purpose and goals.
CL6	When major decisions must be made, team members are involved in the decision process in a meaningful way.	When major decisions must be made, team members are involved in the decision process in a meaningful way.
CL7	Each team members' unique expertise is valued and utilized.	Each team members' unique expertise is valued and utilized.
CL8	When I think of leadership, I think of collective mission to learn and construct knowledge collaboratively.	When I think of leadership, I think of collective mission to learn and construct knowledge collaboratively.
CL9	I have an excellent rapport with at least two other team members.	I have an excellent rapport with at least two other team members.
CL10	When a new task arises, leadership responsibilities are determined by members' strength, not by formal titles.	When a new task arises, leadership responsibilities are determined by members' strength, not by formal titles.
CL11	I feel confident taking on leadership responsibilities in this team	I feel confident taking on leadership responsibilities in this team

CL12	If the team's chairperson left, the team would continue to make progress towards its goals.	If the team's matron left, the team would continue to make progress towards its goals.
CL13	When team members work together as leaders, they share beliefs, values, and goals	When team members work together as leaders, they share beliefs, values, and goals
CL14	As a leader in the team, I have responsibilities in multiple roles/positions.	As a leader in the team, I have responsibilities in multiple roles/positions.
CL15	All members of my team value collective efficacy.	All members of my team value collective efficacy.
CL16	I know what strengths and skills each of the other team members possesses	I know what strengths and skills each of the other team members possesses
CL17	In addition to the team's formally designated leaders, I can identify at least two other team members who act as informal leaders.	In addition to the team's formally designated leaders, I can identify at least two other team members who act as informal leaders.
CL18	The leadership roles available in my group result from the needs arising from our goals.	The leadership roles available in my team result from the needs arising from our goals.
CL19	I feel that every other team member has a capacity for leadership.	I feel that every other team member has a capacity for leadership.
CL20	Multiple people are trusted with information and decision-making for every activity our group undertakes.	Multiple people are trusted with information and decision-making for every activity my group undertakes.

Sources: Brussow (2013)

3.12.5 Moderating Variable: Team Virtuality

This study operationalized the team virtuality as a group of people or stakeholders working together from different location and possibly different department and time zones, who were collaborating on a common task and used information and communication technologies (ICTs) intensively to co-create. It could be seen that one of the main characteristics was virtuality, which implied physical and temporal distance between members and a shared purpose (Ebrahim et al., 2009). In other words, virtual team members were all working towards the same goal and connected together through computer and other technology. This study included a range of virtual teams, those where individual members were located in different states, as well as those virtual teams where members were located in the same building but were located in different departments and used electronic mediums to connect and communicate.

The construct of team virtuality was adopted from the work of Chudoba et al., (2005) as cited in Lu (2006), which was based on a framework proposed by Kirkman and Mathieu (2005). Specifically, it was based on the dimensions of reliance on distribution subscale, workplace mobility subscale, variety of practices subscale, virtual tools, information value and synchronicity. Following Lu (2006), this study adopted 9 items from Chudoba et al., (2005) as cited in Lu (2006) to measure the team virtuality, thus capturing the distribution subscale, workplace mobility subscale, variety of practices subscale, virtual tools, information value and synchronicity dimension of the construct within a single measure as illustrated in Table 3.8. The measure for all items was on a Five-point Likert scale, ranging from 1 = strongly disagree to 5 =. Strongly agree.

Table 3.8
Measuring the Team Virtuality

Number	Original Items	Adopted Items
TV1	Work with people via internet-based video conferencing	My team work through internet-based video conferencing
TV2	Work with people via internet-based audio conferencing (Phone/Conference calls)	My team work through internet-based audio conferencing (Phone/Conference calls)
TV3	Work with people via email	My team work through email

TV4	Work with people through texting/ Instant messaging/WhatsApp	My team communicates through WhatsApp/Telegram
TV5	Work with people in real time (there are no delay due to differences in work hours)	My team work and collaborates in real time (there are no delay due to differences in work hours)
TV6	Collaborate with people who speak different native through internet-based video conferencing	Collaborate with people who speak different dialects from my own through internet-based video conferencing
TV7	Work at different Intel sites	My teams work at different sites
TV8	Work with team that have different ways to track their work using different technologies	Work with team that have different ways to track their work using different technologies
TV9	Work with people that use different collaboration technologies	Work with people that use different collaboration technologies

Sources: Chudoba et al., (2005) as cited in Lu (2006)

3.12.6 Dependent Variable: Team Effectiveness

This study operationalized team effectiveness in three ways; 1) team performance (productive output, i.e. product, service, and decision that met the standards of expectations) 2) team satisfaction (as a necessary component for the well-being of individuals) 3) team viability (intention to stay or remain within organization) (Hackman, 1990). This items for team effectiveness as illustrated in Table 3.8 consisted 15 items (Hackman, 1990, Balkundi & Harisson, 2006). A number of items in this construct were reverse-coded, indicated by the symbol (R) in Table 3.8. Reverse-coded items, such as "Sometimes, one of us refuses to help another team member (R)" and "There is a lot of unpleasantness among members in the team (R)", were deliberately included to minimize response bias, the tendency of respondents to agree with statements regardless of their content. Including reverse-coded statements also helped ensure that respondents read each item carefully and critically rather than responding mechanically.

During data entry and analysis, these reverse coded items were systematically recoded before statistical processing. Specifically, the scoring direction of these items was reversed to maintain consistency with the positive items. For example, responses

coded as 1 (Strongly Disagree) were recoded as 5 (Strongly Agree), 2 as 4, and so forth. This procedure ensured that higher scores consistently represented higher levels of perceived team effectiveness across all items (Sekaran & Bougie, 2025). The recoding process was verified twice, first during data cleaning and again before reliability and validity testing to prevent any inconsistency in interpretation or analysis.

By carefully integrating both positively worded and reverse-coded items, the measurement design of this study enhanced the instrument's content validity and response reliability (Sekaran & Bougie, 2025). This approach aligned with methodological recommendations in survey research to balance the directionality of scale items and reduce systematic response errors, ultimately strengthening the internal consistency and construct validity of the instrument (Sekaran & Bougie, 2025; Saunders et al., 2023). The measure for all items was on a Five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. The measurement of the team effectiveness was presented in Table 3.9:

Table 3.9
Measuring the Team Effectiveness

Number	Original Items	Adopted Items
TE1	Working with team members is an energizing and uplifting experience.	Working with team members is an energizing and uplifting experience.
TE2	Sometimes, one of us refuses to help another team member (R).	Sometimes, one of us refuses to help another team member out (R).
TE3	There is a lot of unpleasantness among members in this ward (R).	There is a lot of unpleasantness among members in the team (R).
TE4	Working as a team will improve patient satisfaction	Working as a team will improve patient satisfaction.
TE5	Some members in the team do not carry their fair share of the overall workload (R)	Some members in the team do not carry their fair share of the overall workload (R)
TE6	Working as team in this ward show signs of falling apart (R).	Working as team show signs of falling apart (R).
TE7	Every time we attempt to straighten out a member of this ward, whose behavior is not acceptable, things seem to get worse rather than better (R).	Every time we attempt to straighten out a member of the team, whose behavior is not acceptable, things seem to get worse rather than better (R).

TE8	I am satisfied with my present colleagues.	I am satisfied with my present team member.
TE9	I am satisfied with working in this ward	I am satisfied with working in this team.
TE10	As soon as I can find a better place, I will leave this hospital	As soon as I can find a better place, I will leave this hospital
TE11	I am actively looking for a job from other hospital.	I am actively looking for a job from other hospital.
TE12	I am seriously thinking about quitting my job.	I am seriously thinking about quitting my job.
TE13	Staff nurse in this ward is very competent	This team is very competent.
TE14	I think I will be working at this hospital five years from now	I think I will be working at this hospital five years from now
TE15	Staff nurse in this ward get work done very effectively.	This team gets its work done very effectively.

Sources: Hackman (1990) and Balkundi & Harisson (2006)

3.13 Pilot Study

As explained by Gay et al. (2006), pilot study use was regarded as a trial in which a small scale of the study was carried out before the actual full scale study. The sample of population was usually small, ranging from fifteen to thirty respondents (Malhotra, 2008). The most test of inter term consistency reliability was the Cronbach alpha coefficient (Sekaran & Bougie, 2025). Once the research design, sampling frame, instrument and measure of variable were finalized, a pilot study was conducted to pre-test the questionnaire and detect and thereby rectify any weakness in regards to the design of the survey instrument before distributing it to the entire sample frame (Saunders et al., 2023). The pre-test of the questionnaire was crucial to ensure that respondents would understand all questions easily, all wordings were unbiased and unambiguous and the measurement used were appropriate (Sekaran & Bougie, 2025). Moreover, pilot test was significant in order to assess the ability of the instruments to capture the constructs it was supposed to measure and to test the internal consistency and comprehension of the questionnaire's items (Appiah-Adu et al., 2000). A pilot study could serve as a guide for a larger or examine specific aspects of the research to

determine if the selected procedures would work as intended (Zikmund et al., 2013). It acted as a tool to identify the weakness in the questionnaire design and the ability to odder proxy data for the selection of a probability sample (Blumberg et al., 2014).

Based on the population of the sample frame, 100 registered nurses in Malaysia were randomly invited to participate in the pilot test, to which 30 registered nurses responded positively. The questionnaire for the pilot test was administered personally to all 30 respondents, and data were collected through a survey using the instruments described above and designed for the study. Data for the pilot study were collected over a period of two weeks in December 2023, and the pilot test samples were not included in the main analysis. The collected data from the pilot survey were used to carry out the reliability tests for each construct of the study. One of the criteria for the selection of past instruments was the internal consistency of scales, using Cronbach's alpha reliability coefficient. Cronbach's alpha estimate values of 0.70 and above were generally considered acceptable (Hair et al., 2024).

According to Sekaran and Bougie (2025), if the value of Cronbach's alpha reliability was less than 0.5, it was considered poor, whereas values around 0.6 were acceptable and reliability values above 0.7 were considered good. Thus, the closer Cronbach's alpha was to 1.0, the better the reliability. The results of the pilot study showed adequate reliability, with Cronbach's alpha values ranging between 0.854 and 0.917, which were good. Therefore, the measures of all constructs used in this study could be considered reliable.

Table 3.10
Reliability Coefficient for the Variables in Pilot Study (n=30)

Construct	Cronbach' Alpha Value
Team Shared Vision	0.917
Team Commitment	0.899
Team Collaboration	0.883
Collective Leadership	0.886
Team Virtuality	0.843
Team Effectiveness	0.886

The feedback from the pilot test was used to improve the overall survey instruments, assess the internal validity of the items and determine an expected response

rate (Zikmund et al., 2013). However, as all items from the pre-test were found to be reliable (see Table 3.10), no changes (add or drop) were made to the indicators in the instrument. Based on the above, it could be concluded that the (final) instrument for this study was adequately reliable and valid.

3.14 Data Analysis Procedures

Once the data collection was complete, the data were keyed into appropriate statistical software (Sekaran & Bougie, 2025). The data were checked and re checked for errors, followed by cleaning and coding, thus preparing them for the final analysis. As for the data analysis technique, this study decided in using PLS SEM as the main data analysis tool. This study adopted both an exploratory and predictive approach following Carrion et al. (2018). To assess models using IPMA with PLS SEM, an additional procedure implemented by SmartPLS (Version 3.2.9) had been established (Ringle et al., 2015).

Additionally, this study tested the path model using the classical two step assessment proposed by Hair et al. (2024), which were the assessment of the measurement model and the assessment of the structural model (Hair et al., 2024). In order to determine the significance of the parameters, this study used a bootstrap procedure (Chin, 1998). Bootstrapping was a resampling procedure that determined the significance of the path coefficients and the weights and loadings of the indicators for each composite (Hair et al., 2024). To detect potential issues of common bias due to the instrument used, a full collinearity test based on variance inflation factors (VIF) was carried out (Kock & Lynn, 2012). In addition, SEM provided an overall test of the model fit and individual parameter estimate tests simultaneously (Hair et al., 2024).

In order to answer the research questions and research objectives, a selection of analyses was conducted in this study, such as coding, missing data examination, assessment of normality, descriptive statistics, measurement model evaluation and structural model evaluation. Before discussing each of these analysis steps, the selection of SEM in general and PLS as a data analysis mechanism was justified in the following subsections.

3.14.1 Structural Equation Modelling (SEM)

The data collected from the actual surveys of this study were analysed using the Structural Equation Modelling (SEM) technique, also known as path analysis with latent variables (Hair et al., 2025). According to Cho et al. (2017), SEM was an appropriate tool to analyse path models with latent variables in order to uncover causal relationships, and thus SEM suited the present context to test the measurement and structural model of this study. SEM was often referred to as a second generation multivariate technique (Alzubi, 2018; Fornell & Larcker, 1981) that explained the relationship between variables using multivariate regression and factor analysis (Cho et al., 2017; Hair et al., 2024). SEM was considered to be one of the most important elements of applied multivariate statistical analysis used by many researchers in social and behavioral studies (Hair et al., 2024).

In SEM technique, two phased analysis comprises of the measurement model and the structural model (Hair et al., 2024). In the first phase of analysis, the measurement model measured the relationship between the latent variables (unobserved variables) and indicators (observed variables) (Hair et al., 2024). Following the measurement model analysis, the structured model examines the relationship between the latent variables (unobserved variables). The measurement model gives an assessment of how appropriate the newly established latent variables are together and whether they are connected adequately to their indicator (Hair et al., 2024). Before initiating the structural model (the significance) proceeding, the measurement model is used to measure the validity and reliability of the constructs (Alzubi, 2018).

SEM as a multivariate tool considered complete and simultaneous equations of all relationships in a model, which in turn allowed the articulation of relationships between all variables easily (Cho et al., 2017, Hair et al., 2024). SEM portrayed several advantages compared to its first generation counterparts which were regression, path analysis and factor analysis, due to its ability to explore the relationship between the dependent variables (hair et al., 2024), allow unequal weight for indicators that were unequal and correlated, and measure recursive and non-recursive relationships between constructs (Yusuff & Yaacob, 2010).

Unlike the first generation techniques, SEM did not assume that all variables were measured without error (random and systematic error) and therefore was able to assess or correct existing measurement error, which was vital to reach actual research conclusions (Haenlein & Kaplan, 2004). Secondly, unlike the first generation techniques, SEM did not consider all variables to be observable (Haenlein & Kaplan, 2004), which was applicable for this study. Given that the hypothesized relationships in the research model of the present study had multiple inter correlations between a set of variables, which had multiple indicators and were unobservable, developed based on literature review and hypothetical assumptions, SEM was assumed to be the most suited technique to analyse the data of this study (Cho et al., 2017).

Thirdly, the first generation techniques were most suited for a simple model, with one dependent and several independent variables (Hair et al., 2024), which was not the case in the present study, further supporting the choice of SEM technique as appropriate for this study. The SEM technique could be either covariance based (e.g. AMOS, LISREL, EQS) or variance based as in the case of PLS (Partial Least Squares) analysis (Hair et al., 2024). Neither of the approaches was claimed to be superior to the other. The selection of one over the other was based merely on the research objectives and limitations of the different approaches that needed to be considered.

3.14.2 Partial Least-Square (PLS)

Specifically, this study employed PLS, a variance based SEM technique, as required for analysis of the collected data (Hair et al., 2024). Chin (2010) forwarded covariance based SEM to be one of the best known SEM methods. The analysis of this technique could be implemented using software programs such as LISREL, AMOS, CALIS, EQS and SEPATH. However, in certain types of research a number of limitations existed which made using covariance based SEM analysis inappropriate (Hair et al., 2024). For instance, to apply covariance based SEM analysis, a large sample size and normality were required. In addition, this type of analysis technique required reflective constructs where a latent variable was designated as a reflective construct and if the items were influenced by the construct, then they were assumed to be correlated (Gefen et al., 2011).

On the other hand, Partial Least Square (PLS) was a variance based SEM technique used widely in social science studies (c.f. Alzubi, 2018; Cho et al., 2017; Sallehudin et al., 2015). The PLS method was developed by Wold (1975) for studies where data did not meet the limiting rules of covariance based SEM techniques. It was used to estimate the parameters of a measurement and structural model. The analysis technique could be implemented using software programs such as LVPLS 1.6 and 1.8, PLS Graph 3.0, WarpPLS 3.0 and SmartPLS 2.0 and 3.0. In this study SmartPLS version 4.0 (Ringle et al., 2012) was used to analyse the data. The PLS technique was most suited for studies that were exploratory and prediction oriented in nature, as was the case in this study (Hair et al., 2024).

The PLS technique had several advantages over covariance based SEM (Hair et al., 2024). For instance, in PLS, a construct was perceived as a formative construct in cases where the concerned items caused the latent variable, and the items were not expected to be correlated (Chin, 2010). PLS was also able to estimate a complex model that comprised a large number of items or constructs (Hair et al., 2024). Moreover, if the data of a study did not meet the normality criteria, PLS could still be used effectively for a larger number of indicators (Chin, 2010). Furthermore, this type of analysis technique did not require a large sample size to generate significant p values and stable path coefficients (Hair et al., 2024). With a sample size fewer than 100, PLS was able to evaluate both reflective and formative latent variables (Hair et al., 2024).

Furthermore, the PLS method did not have identification constraints and this meant that latent variables did not need to have at least three items as required by covariance based SEM techniques (Hair et al., 2024). In the present study, Partial Least Square (PLS), a powerful components based SEM technique, was primarily adopted to examine the paths in the structural model (Hair et al., 2024). Specifically, PLS Smart Version 4.0, also known as SmartPLS, was used to analyse the data. Rationally, due to its relevance to the current study and its popularity in recent research, the adoption of PLS was justified, as PLS in recent years had gained more interest because of its capacity for modelling latent variables under non normal and small sample conditions, for examining the measurement path and for explaining the regression estimation of structural paths (Henseler et al., 2009).

In the present study, a main key argument for employing PLS SEM related to the use of formative measurement models, since PLS SEM readily handled both reflective and formative measures (Hair et al., 2024). Technically and implicitly, the researcher accepted the underlying assumptions of the PLS SEM methods, which were predictor specification that allowed for the possibility of formative measurement models (Hair et al., 2024). Secondly, the large number of items and constructs in the model of this study also supported the use of PLS, which was able to estimate a complex model comprising a large number of items or constructs (Hair et al., 2024). Thirdly, the ability of PLS to handle analysis even when the data did not meet the normality criteria further complemented the requirements of the present study (Ringle et al., 2012), thereby establishing PLS as a suitable statistical tool for this study.

Apart from that, PLS path modelling was selected in this study because it estimated the interactions between constructs in the structural model and the associations between indicators and their corresponding latent constructs in the measurement model concurrently, even though it was similar to conventional regression techniques (Duarte & Raposo, 2010). Furthermore, as stated at the beginning of the study, despite the extensive research regarding the role of collective leadership, team virtuality and team effectiveness among nurses, the literature showed that the mediating and moderating effects of collective leadership and team virtuality on the relationship of team shared vision, team commitment and team collaboration with team effectiveness had remained limited. Additionally, the objective of the study was to predict the role of collective leadership and team virtuality in increasing team performance. The present study was explorative in nature by applying Relational Coordination Theory and Social Information Processing Theory (SIPT). Therefore, the path modelling approach was required to be used since it had been recommended that if a study did not test or compare theories, or was prediction oriented or an extension of an existing theory, PLS path modelling ought to be employed (Hair et al., 2024; Henseler et al., 2009).

Lastly, the model structure of the study was regarded as somewhat complex because the study examined both direct and indirect, as well as mediating and moderating, effects of the variables under study (Hair et al., 2024). In addition, the study had reflective constructs. Thus, compared to other path modelling software such as

AMOS, SmartPLS software was carefully chosen as the tool of data analysis because of its user friendly graphical interface that helped users to create mediating and moderating effects for path models with interaction effects (Temme et al., 2010; Hair et al., 2024).

3.14.3 Data Screening, Cleaning and Coding

After the analysis tool was confirmed, the data screening, cleaning and coding processes were initiated as the first steps of the data analysis procedure (Hair et al., 2024). For executing these steps, the data were entered into the relevant statistical software for analysis. During this process, it was important to ensure that no errors or mistakes were committed. The data were carefully entered, checked and re checked to avoid distortions in the analysis results. Following the entry, the data were coded accordingly and arranged consistently in the required numerical pattern suitable for statistical analysis. The other purpose of data coding was to define the labels for each variable and assign numbers to each possible response.

During this coding process, particular attention was given to the method of reverse-coded items included in the questionnaire. Reverse-coded items were incorporated to minimize response bias, especially the tendency for respondents to agree with all statements regardless of content (Podsakoff et al., 2003). These items, marked with (R) in the instrument, were identified and systematically recoded after data entry. For this purpose, the transformation scoring direction was opposite to that of the positively worded items. For example, in a five-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree, a higher score on a negatively worded item would normally indicate a lower level of the construct being measured. This ensured that higher values consistently represented higher levels of the construct being measured. After transformation, data were verified to confirm accuracy through frequency checks and descriptive statistics. This process safeguarded the consistency and reliability of the dataset before proceeding to statistical analysis (Hair et al., 2024).

Apart from the reasons for using PLS derived from Hair et al. (2024), an additional justification for using PLS was that it offered the possibility for different variable measurements ranging from categorical to ratio (Hair et al., 2024). Based on

the previously mentioned justification, PLS SEM was considered more appropriate for the study. Several stages and procedures were followed in the data analysis of this study in using PLS for evaluating the measurement and structural model.

3.14.4 Missing Data Issue

The next steps in the data analysis process were to identify the missing data involved and evaluate its possible treatment (Sekaran & Bougie, 2025). Missing data could exist as a result of error or lack of knowledge by respondents who perhaps unknowingly omitted or refused to answer certain questions in the questionnaire (Sekaran & Bougie, 2025). In the context of social science research, missing data often caused problems, as most social science studies obtained data using survey methods (Sekaran & Bougie, 2025). Missing data occurred when a respondent either purposely or inadvertently failed to complete or answer one or more questions (Saunders et al., 2023). This could therefore also mean that non response bias existed in the dataset. According to Hair et al. (2024), there were several techniques to handle missing data, such as deletion, distribution or replacement (mean or median). Thus, to address these issues, this study followed Hair et al. (2024), who suggested that if the questionnaires answered exceeded 50% of missing data, such questionnaires should be removed from the data set before running a PLS SEM analysis. However, in this study, no missing data were detected. This was primarily due to the careful design of the data collection process, which included clear instructions, concise question wording, and close coordination with the matrons who supervised the questionnaire administration.

Each matron briefed respondents on the importance of completing every item before submission and provided onsite support to clarify any uncertainties. Moreover, the use of self-administered questionnaires distributed in physical form within hospital settings allowed immediate completion and return, reducing the likelihood of partial responses. The researcher also conducted a manual review of all returned questionnaires to ensure completeness before data entry. As a result, all 417 distributed questionnaires were fully completed and returned, producing a dataset free from missing values. This outcome strengthened the reliability and validity of the data by eliminating the need for estimation or imputation methods (Sekaran & Bougie, 2025). It also enhanced the

robustness of subsequent statistical analyses, ensuring that the findings accurately reflected respondents' true perceptions rather than being influenced by data replacement procedures (Saunders et al., 2023).

3.14.5 Non-Response Bias

Non-response bias occurred when a respondent purposely failed to complete or answer one or more questions (Hair et al., 2024). To address this issue, this study followed Hair et al. (2024), who suggested that if any questionnaire exceeded 50% of missing data, such a questionnaire should be removed from the data set before running a PLS SEM analysis. However, in this study, no evidence of non-response bias was detected. This was achieved through a carefully managed data collection process that ensured full participation and completion. The distribution of questionnaires was conducted personally by the researcher with the cooperation of matrons in each participating hospital. The matrons were responsible for briefing nurses on the importance of completing all items and for ensuring that every returned questionnaire was fully answered before collection. Because all respondents were registered nurses within the same institutional setting, and the purpose of the study was clearly explained in the cover letter, the level of commitment and compliance was high.

Furthermore, the entire data collection was conducted in a controlled hospital environment, which minimized the risk of incomplete or unreturned questionnaires. As a result, all 417 distributed questionnaires were completed and returned, achieving a 100% response rate. The absence of non-response bias and missing data strengthened the internal validity of the study, enhanced the credibility of the findings, and eliminated the need for statistical adjustments or data imputation procedures (Saunders et al., 2023; Sekaran & Bougie, 2025).

3.14.6 Data Normality

Normality assessment was usually conducted as a step in the data analysis process to ensure that the data distribution of scores at the item level or combination of two or more items was linear and normally distributed (Sekaran & Bougie, 2025). The multivariate analysis, as a test of normality, was used as a reference for statistical methods in the form of data distribution for a specific variable metric and was associated with normal distribution (Hair et al., 2024). Data normality was particularly important because it provided the fundamental analysis for many of the inferences made by social science, business and marketing researchers who collected data through a survey (Hair et al., 2024).

In this study, normality assessment was carried out during the data screening stage to identify potential deviations that could affect the validity of the statistical analysis. The results indicated that the dataset exhibited an acceptable level of normality, with no significant skewness or kurtosis observed for any of the measured variables. This outcome could be attributed to several factors. First, the data were collected from a large and homogenous group of respondents (Sekaran & Bougie, 2025), which were registered nurses working in Malaysian public hospitals and who shared similar job environments, professional responsibilities and training backgrounds. Such uniformity often led to consistent response patterns and reduced the likelihood of extreme or outlier values.

Second, the questionnaire items were derived from well-validated scales and were structured using a balanced five-point Likert format, which tended to produce data that approximated a normal distribution, particularly when the sample size exceeded 200 respondents (Hair et al., 2024). Third, with 417 fully completed responses and no missing data, the dataset was sufficiently large for the central limit theorem to apply, ensuring that the sampling distribution of the mean approached normality even if minor deviations existed at the item level.

Therefore, it could be concluded that the study encountered no significant normality issues. This finding supported the robustness of subsequent analyses using Partial Least Squares Structural Equation Modeling (PLS-SEM), which was also known to be less sensitive to non-normal data distributions (Sekaran & Bougie, 2025). The

combination of a complete dataset, large sample size and reliable measurement scales ensured that the data met the assumptions necessary for valid multivariate analysis (Saunders et al., 2023).

3.14.7 Common Method Variance

This study adopted a self-report, single-informant approach in gathering data, therefore it was necessary to check for the possibility of common method bias (MacKenzie & Podsakoff, 2012). Common method bias referred to the systematic measurement error that originated from the features that were intended to represent the construct of interest and the characteristics of the specific method being employed, which might be common to measures of another construct (MacKenzie & Podsakoff, 2012). To minimize the effect of common method bias, besides carefully constructing the items, this study also informed the respondents that the responses would be evaluated anonymously and that there were no right or wrong answers while the data were being collected (Podsakoff et al., 2003). Apart from that, this study also used negatively worded (reverse-coded) items in certain constructs to reduce response patterns (Saunders et al., 2023).

As a statistical test for CMV, this study adopted Harman's (1976) one-factor test as recommended by Podsakoff et al. (2003), in which one fixed factor was extracted from all principal constructs that was expected to explain less than 50 percent of the variance. According to MacKenzie and Podsakoff (2012), common method bias was only serious if a single latent factor accounted for the majority of the explained variance. The results revealed that the first factor explained only 34.7% of the total variance, which was well below the threshold of 50% suggested by Podsakoff et al. (2003). This indicated that common method variance was not a significant concern in this study. Furthermore, a full collinearity test was conducted as an additional diagnostic procedure, as recommended by Saunders et al. (2023), to detect both vertical and lateral collinearity that might suggest CMB. The results showed that all variance inflation factor (VIF) values were below the threshold of 3.3, confirming the absence of multicollinearity and common method bias problems (Hair et al., 2024). In summary, both procedural and statistical evidence demonstrated that common method bias was

not an issue in this study. The combination of well-structured items, reverse coding, respondent anonymity, and diagnostic tests provided strong assurance that the observed relationships among constructs reflected the relationships between variables rather than methodological assumptions (Saunders et al., 2023; Sekaran & Bougie, 2025).

3.14.8 Descriptive Statistics

Moreover, descriptive statistics were carried out as a part of the data analysis to provide an overall summary and abstract description of the overall data statistics (Saunders et al., 2023). This analysis was used to examine the characteristics of the study's Malaysian nurses. Descriptive statistics referred to the transformation of raw data into a form that made it easy to understand and interpret (Sekaran & Bougie, 2025). This analysis provided a clear meaning of the data and demographic details of the respondents through background information, frequency distribution, means, and standard deviation (Saunders et al., 2023). Through this analysis, the demographic section of the respondents was summarized in terms of key background information such as gender, age, educational qualification, ward or department, and employment information. Frequency distributions were computed to display how respondents were distributed across different categories, while measures of central tendency such as mean and standard deviation were calculated to summarize continuous variables (Saunders et al., 2023). This approach allowed for a clear and comprehensive overview of the participants' characteristics, ensuring that the sample accurately represented the target population of Malaysian nurses. The results of the descriptive analysis not only provided valuable insights into the respondents' demographic background but also served as an important validation step, confirming that the collected data were consistent, complete, and appropriate for further inferential analysis (Saunders et al., 2023). Overall, this descriptive assessment formed the foundation for subsequent statistical analyses, including measurement model evaluation and hypothesis testing (Sekaran & Bougie, 2025).

3.14.9 The Measurement Model

The PLS technique of data analysis comprised two phases, the measurement model and the structural model (Hair et al., 2024). In the first phase, the measurement model measured the relationship between the latent variables (unobserved variables) and indicators (observed variables). According to Hair et al. (2024), the measurement model assessed how appropriate the newly established latent variables were linked together and whether or not they were connected adequately to their indicators. Chin (2010) argued that there existed no reason to perform a structural model assessment when the results of the measurement model, which were reliability and validity, were doubtful. Therefore, before proceeding with the structural model, the measurement model was employed to measure the validity and reliability of the constructs as discussed in the following sub-sections:

3.14.9.1 Reliability

Reliability referred to the degree to which measures were free from error and yielded consistent results (Sekaran & Bougie, 2025). A reliability test could be defined as the extent to which specific measure tests could be repeated to produce similar results in order to examine the consistency of the instruments used to measure respective constructs. According to Sekaran and Bougie (2025), reliability of a measure indicated the extent to which the measure was without bias and consistent while being used across time and across various items in the research instruments.

Consistent results from recurrent measurements reflected high reliability of the measurement procedures used. According to Hair et al. (2024), reliability measured to what extent the measurement items were consistent with the latent construct that they were required to measure and how the construct was measured by respective items. Item reliability could be assessed by calculating the loading of each indicator on the construct to be measured (Hair et al., 2024). The PLS algorithm was calculated to obtain the loading and cross-loading of the item measurement (Hair et al., 2024).

Following Hair et al. (2024), the criteria used to evaluate the reliability of the items employed by this study included Cronbach's alpha and composite reliability. The

threshold was that internal consistency should be greater than 0.7 using either Cronbach's alpha and/or composite reliability for all indicators, which would translate that all the items used were reliable (Hair et al., 2024). However, when research was exploratory, 0.6 to 0.7 was acceptable and an indicator's loading higher than 0.70 was required (Hair et al., 2024). Moreover, the Dillon-Goldstein's rho values for all indicators needed to be more than 0.7 in order to confirm that all the items used were reliable (Hair et al., 2024).

3.14.9.2 Multicollinearity

To address the multicollinearity issue, the variance inflation factors (VIF) needed to be tested, where the VIF values for all variables needed to be below 3.3, indicating that multicollinearity was not severe (Diamantopoulos & Siguaw, 2006). In this study, all VIF values were found to be below the threshold of 3.3, confirming that there was no multicollinearity issue among the variables.

3.14.9.3 Internal Consistency

The critical issues of reliability depended much on the internal consistency of the scales used (Hair et al., 2024). The internal consistency of scales indicated the homogeneity of the items in the measure that tapped the construct, where items in the scale had to hang together as a set (Sekaran & Bougie, 2025). According to Fornell and Larcker (1981), internal consistency could be measured by calculating the composite reliability index (CR). The CR value indicated the degree to which a construct's indicators indicated the latent variables. Hair et al. (2024) recommended that the threshold could be considered to be significantly reflecting the consistency of the measurement.

3.14.9.4 Validity

Validity referred to the degree to which an empirical measure adequately reflected the real meaning of the concept under consideration (Sekaran & Bougie, 2025). Validity reflected the degree to which a scale or set of scales correctly represented the study concept, which was the extent to which the measure was free from any systematic or non-systematic non-random error. However, accuracy did not ensure validity (Zikmunds et al., 2013). There were possibilities that the scales could have defined what was to be measured but still had an invalid measure of the concept when the supposed appropriate questions in the scales were not being asked (Zikmund et al., 2013). Among the commonly used methods in determining the validity of scales were content validity, criterion-related validity and construct validity (Hair et al., 2024; Sekaran & Bougie, 2025).

The scales of this study could be deemed valid as they had been adopted from established scales in existing literature, developed by well-known researchers in the field of the present study (Sekaran & Bougie, 2025). To ensure the validity of the scales used, the variables in this study were measured by single-item scales adopted from well-established studies (Sekaran & Bougie, 2025) on team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness. As recommended by experts (Hair et al., 2024), to establish convergent validity, average variance extracted values for all constructs should have been higher than 0.50 (AVE > 0.50), while to confirm discriminant validity, cross loadings needed to be examined (Hair et al., 2024).

To establish efficiency in the data collection, the researcher consulted the Matron and an academician. The objective was to help the researcher in identifying the strengths and weaknesses of the questionnaire in relation to the questions' wording, format and order (Sekaran & Bougie, 2025). Nunally (1978) recommended conducting the pre-test and argued that subjective estimates be made of a survey instrument to make sure that the questions stood comprehensible and understandable and that item scales signified the basic idea of interest. During the pre-test, the respondents were asked to evaluate the questions on how well they measured the subject of interest. They were also asked to mark the questions they found confusing or unclear. After the pre-test was

completed, the researcher carefully analysed the feedback and found that all items were clear and well understood, with no wording issues identified. This process enhanced the content validity of the instrument by ensuring that each item accurately reflected the constructs being measured and that the questionnaire was suitable for the target respondents (Sekaran & Bougie, 2025), particularly nurses in Malaysia who participated in this study.

3.14.9.5 Discriminant validity

Discriminant validity referred to the extent to which items differentiated among constructs that measured distinct concepts (Hair et al., 2024). Discriminant validity was assessed by examining the correlations between the measures of potentially overlapping constructs (Hair et al., 2024). It was required that items loaded more strongly on their own construct in the model than the average variance shared between constructs (Hair et al., 2024). Factor analysis was used as a technique and it was seen as a set of techniques for studying the interrelationships among the variables and was also used to verify factors/item loadings on the correct factors as identified by prior researchers (Hair et al., 2024). It also decreased large sets of variables into manageable, meaningful and interpretable sets of factors (Cavana et al., 2001).

Hair et al. (2024) and Tabachnick and Fidell (2014) recommended factor loadings above 0.3 to be considered as a minimal level, while 0.4 loadings were regarded as more important and 0.5 and above were considered practically significant. Nevertheless, Tabachnick and Fidell (2014) stated that the selected loading cut-off was the preference of the researcher. Thus, a loading of 0.5 and above was considered as a significant factor loading of this study.

3.14.10 The Structural Model

Following the measurement model, the second and final phase of PLS analysis was the structural model that examined the relationship between latent variables (unobserved variables) (Hair et al., 2024). The second stage was employed in PLS to generate a structural model and thereby test the proposed hypotheses (Hair et al., 2024). The structural model presented the relationship among the hypothetical constructs (Hair et al., 2024). The terms used for latent variables in PLS were exogenous and endogenous variables (Hair et al., 2024). Exogenous variables referred to the latent variables that only predicted other latent variables, whereas endogenous variables reflected the latent variables that depended on at least one causal relationship (Hair et al., 2024). Under the structural model, the standard bootstrapping technique with 5000 bootstrap samples and 417 cases was employed to assess the structural model (Hair et al., 2024; Hanseler, 2009). To establish a structural model, three tests, which were path coefficient, R-squared level values, effect size and predictive relevance of the model, were required (Hair et al., 2024) as discussed below:

3.14.10.1 Path Coefficients

Path coefficients represented the beta coefficients resulting from the least squares estimation and portrayed the significance between constructs, which was hypothesis testing (Hair et al., 2024). The goodness of the path was shown by the beta (β) and t-statistic values (Hair et al., 2024). A significant path indicated that the proposed causal relationship and hypothesis were empirically supported by the data of the study (Hair et al., 2024). To determine the significance of the path coefficients, bootstrapping with a minimum number of 5000 bootstrap samples and the number of cases in the original sample was used (Hair et al., 2024). Furthermore, path coefficient critical values for a one-tailed test were 1.40, 1.645 and 1.965 at the 10%, 5% and 1% significance levels, respectively (Hair et al., 2024).

3.14.10.2 Explained Variance (R^2)

The R^2 value indicated the goodness of the path coefficient against the empirically obtained manifest item (Hair et al., 2024). The strength and prediction of the theoretical model were related to the strength of its structural path, which was the combination of predictiveness (R^2) and the exogenous constructs, and this was in line with the purpose of PLS, which was prediction (Chin, 2010). The R^2value level was another important element in evaluating the predictive ability of the structural model (Hair et al., 2024). The value of R^2described the total variation in the latent dependent variable explained by independent variables (Saad et al., 2011). It could be evaluated in two ways: by the effects of a particular IV on the DV, or for the endogenous latent variables in the structural model. In the case of the effect of a specific IV on the DV, the values of 0.02, 0.15 and 0.35 were regarded as small, medium and large effects, respectively (Hair et al., 2024). However, for the overall effect on the endogenous latent variable, the values of 0.25, 0.50 and 0.75 were considered weak, moderate and substantial, respectively (Hair et al., 2024).

3.14.10.3 Effect Size (f^2)

Effect size assessed the extent to which each individual independent variable contributed independently to the explanation of the DV (Hair et al., 2024). It was assessed using Cohen's (1988) recommendation of 0.02, 0.15 and 0.35, which were classified as small, medium and large.

3.14.10.4 Predictive Relevance (Q^2)

Predictive relevance was another technique of assessing a structural model by measuring the model's capability to predict (Hair et al., 2024). In most cases, it was done by using Geisser's Q^2, which proposed that the model had to be able to predict each of the indicators of the endogenous latent construct (Hair et al., 2024).

Accordingly, a Q2 value beyond zero pointed out that the exogenous variables had predictive relevance for the endogenous variable (Hair et al., 2024).

3.14.11 Moderator and Mediation analysis

After the analyses of the main PLS path model were run, a supplementary PLS-SEM analysis, which were moderator and mediation analysis, was conducted using Henseler and Chin (2010) in addition to Henseler and Fassort (2010) method for the analysis of the moderating effect of team virtuality in the PLS path model. Lastly, the strength of the moderating effect was ascertained using Cohen's (1998) formula of effect size.

Mediation estimated the total, direct and indirect effects of causal variable X on outcome variable Y through a proposed mediator variable or set of mediator variables M, controlling for (optional) one or more variables in cov. Mediation was similar to indirect (Preacher and Hayes, 2008) but allowed multiple X variables and also offered features for handling and coding a single multicategorical X variable. Mediation also provided omnibus tests for direct, indirect and total effects for X as a set, or the group variable coded with X when multicategorical. Inferences for indirect effects could be based on either percentile bootstrap confidence intervals or Monte Carlo confidence intervals (Preacher and Hayes, 2008). The principle behind the estimation of direct, indirect and total effects when X was multicategorical could be found in Hayes and Preacher (2014).

3.14.12 Importance Performance Matrix Analysis

Finally, to extend the results, this study looked for an approach from a more global perspective, and the importance matrix-analysis (IPMA) emerged (Hair et al., 2024). This analysis could allow the Matron to improve team effectiveness among nurses, since the IPMA pointed out the main factors among the ones identified in this study (Hair et al., 2024). The IPMA allowed for prioritizing constructs to improve a certain target construct, identifying the most important factors for specific actions (Hair et al., 2024). The findings of this study provided by the IPMA were important in

practical studies that identified the different impacts that certain dimensions of the construct had on the phenomena (Ringle & Sarstedt, 2016). In addition, IPMA application was based on three motivations, which were: IPMA facilitated more rigorous management decision making, IPMA was a powerful tool that could help the Matron to set better priorities and better allocate scarce resources, and IPMA had guidelines for performance evaluation that served both an organization and the people (Streukens et al., 2017). In other words, IPMA provided a better understanding (Hair et al., 2024) of where the leader and management should have focused their team effectiveness and performance, as it still limited in the healthcare sector.

3.15 Chapter Summary

This chapter articulated the research methodology that was used in this study, as presented in Table 3.11. It highlighted the research design, population, sampling frame, sampling technique and sample size, research instruments and variable measurements, along with the data collection and analysis approaches. All procedures related to the methodology of this study were thoroughly discussed in this chapter, reflecting the steps undertaken by the researchers, particularly with regard to collecting and analyzing data for both the pilot and actual survey.

Table 3.11
Summary of Research Design

Research approach	Quantitative
Types of study	Cross-sectional
Unit of Analysis	Individual
Final Sample Size	417 Registered Nurses in Malaysia
Required Sample Size	381 (Krejcie & Morgan,)
Sampling Type	Purposive Sampling Technique
Instruments	Questionnaire (Five-point Likert Scale) based on the subjective/perceptual measure of the variables
Types of Data	Primary
Data Analysis Tools	SPSS and SmartPLS 4.0
Data Analysis	Exploratory Data Analysis

Normality Test	Multivariate Normality
Bias	Common Method Variance
Descriptive Statistics	Mean, Standard of Deviation, Skewness, Kurtosis
Reliability	Cronbach's alpha, composite reliability, Dillon-Goldstein rho
Validity	Convergent validity (AVE), Discriminant validity (Fornell-Larcker Criterion, Heterotrait-Monotrait Ratio)
Multicollinearity	Variance Inflation Factors (VIF)
Structural Model	Path Co-efficient, R^2, f^2, Q^2, followed by mediation test, moderator test and Importance Performance Matrix Analysis
Total Hypotheses Tested	12

CHAPTER 4
RESULTS AND FINDINGS

4.1 Introduction

This chapter presented the analyses undertaken for the study and the results obtained. The analysis was conducted using both descriptive and inferential statistics. Descriptive analysis was employed to summarise the demographic characteristics of the respondents, while inferential statistics were used to examine the relationships among the independent variables (team shared vision, team commitment, team collaboration) and the dependent variable (team effectiveness), as well as the moderator (team virtuality) and mediator (collective leadership).

This chapter also discussed the results of the data analysed using PLS path modelling. It began by reporting the response rate, data screening procedures and preliminary analyses, followed by the descriptive statistics for all variables. The main results of the measurement and structural models were then presented. The measurement model was used to assess cross-loadings, convergent validity, internal consistency reliability and discriminant validity, whereas the structural model was applied to evaluate the path coefficients, R-squared values, individual effect sizes of the variables and the model's predictive relevance. In addition, the results of the complementary PLS-SEM analyses, which demonstrated the moderating and mediating effects of team virtuality and collective leadership, were reported as part of the structural model. The chapter concluded with a summary of the key findings.

4.2 Data Screening and Preliminary Analysis

As mentioned in the previous chapter, a total of 417 questionnaires distributed to tap out required responses for the study. At the end of data collection, a total of 417 questionnaires were received that were considered for further screening, and analyses. The following subsections described the different steps undertaken for screening the collected data before furthering analyses.

4.2.1 Data Preparation: Coding and Entry

After the data collection, the next process was data analysis, which began with data preparation involving data screening, data coding and data entry into the software for data analysis (Sekaran & Bougie, 2025). Data coding involved assigning serial reference numbers to the questionnaires received, assigning numeric codes to responses in the demographic section, and assigning item codes for scale items to construct the study codebook (Babbie, 2013). Data were then keyed into SPSS in the CSV (comma delimited) format to prepare for transfer into the SmartPLS 4.0 analysis software (Hair et al., 2024). In addition, 7 items were reverse coded and the data were fully transformed before data analysis (Hair et al., 2024). These items were recoded manually in SPSS by reversing the response values; for example, responses originally coded as "1 = strongly disagree" were recoded as "5 = strongly agree," and vice versa. This transformation ensured that all items reflected the same positive direction of agreement, thereby improving the reliability and validity of the measurement scales (Hair et al., 2024). After reverse coding was completed, the transformed dataset was checked again for accuracy before proceeding with the subsequent analysis.

4.2.2 Missing Data and Non-Response Bias

The first step required for the data screening process was the analysis of missing data (Hair et al., 2024). In the context of social science research, missing data often caused problems as most social science researches obtained data using survey methods (Hair et al., 2024). Missing data occurred when respondents either purposely or inadvertently failed to complete or answer one or more questions (Sekaran & Bougie, 2025). This could therefore also mean that non-response bias existed in the dataset (Sekaran & Bougie, 2025). To address these issues, this study followed Hair et al. (2024), who proposed four ways to evaluate the degree to which there were missing data.

The first could be classified as ignored when a respondent failed to answer equal to or less than ten percent of all questions in the survey conducted (Hair et al., 2024). Second, missing data status was classified as candidates for deletion if it achieved

fifteen percent (Hair et al., 2024). Third, the researcher could replace missing values with the mean or median by SPSS if the respondents were unable to answer 20–30% (Hair et al., 2024). Lastly, Hair et al. (2024) suggested that if the questionnaires (that were answered) exceeded 50% of missing data, such questionnaires should be removed from the data set before running a PLS-SEM analysis. Therefore, out of the received 417 questionnaires that were answered and carefully sorted, none questionnaires were identified as having data exceeding the 50% threshold and no data were removed from the data set. Thus, the 417 questionnaires were retained for the next screening process.

4.2.3 Straight Lining

After missing data analysis and non-response bias, the 417 remaining questionnaires were examined for suspicious response patterns (Hair et al., 2024). During this process, the answered questionnaires were carefully checked for suspicious patterns that could be described as straight lining. Straight lining pattern referred to cases when respondents marked the same response for a high proportion of the questionnaire items (Hair et al., 2024). According to Hair et al. (2024), questionnaires that were answered with suspicious response patterns such as straight lining should be removed from the data set before running PLS-SEM analysis. Out of the 417 retained questionnaires, none were identified as having a suspicious pattern containing straight lining. Thus, finally, 417 questionnaires were deemed usable and were subsequently coded and analyzed.

4.3 Data Normality

Once data screening, input and coding were done, the dataset was checked for normality. Normality meant that the distribution of the data was normally distributed with a mean of 0, a standard deviation of 1 and a symmetric bell-shaped curve. According to Hair et al. (2024), normality of the dataset was an issue because it was a fundamental requirement in order to proceed with SEM analysis such as AMOS. However, this problem was much less severe when using the PLS-SEM analysis

because it was based on non-parametric calculation in determining the significant relationship within a model for a non-normal dataset (Hair et al., 2024).

Even though the partial least squares (PLS) method did not require a multivariate normal data distribution, this study undertook the multivariate normality test using the online tool named "Web Power" (Hair et al., 2024). Web Power calculated Mardia's multivariate skewness and kurtosis coefficients and p-values (Appendix E). Findings of the test reported Mardia's multivariate skewness p-value of less than 0.05, which confirmed the non-normality. Moreover, the multivariate kurtosis p-value of less than 0.05 further confirmed the non-normality of the data used in this study (Hair et al., 2024).

4.4 Common Method Variance

Succeeding the normality test, the data set for the study was checked for common method bias (Hair et al., 2024). Common method variance (CMV) referred to the systematic measurement errors that originated from the features that were intended to represent the construct of interest and the characteristics of the specific method being employed, which might be common to measures of other constructs (Mackenzie & Podsakoff, 2012). However, there was general agreement that common method variance was a major concern for researchers using self-report surveys (Mackenzie & Podsakoff, 2012). For instance, Conway and Lance (2010) identified that common method bias inflated relationships between variables measured by self-reports. This study used self-reported data from registered nurses, which created potential for CMV; this showed that the predictors (team shared vision, team commitment, team collaboration, collective leadership and team virtuality) and the dependent variable (team effectiveness) were obtained from single raters (nurses).

The study embraced numerous procedural remedies to minimize the CMV effects (Hair et al., 2024). This study informed the respondents that the responses were evaluated anonymously and the respondents were told that there were no right or wrong answers to the items in the questionnaire and that their answers were confidential throughout the research process. Also, an improved scale of items was used to reduce

method bias. This was done by avoiding vague concepts in the questionnaire; when such concepts were used, simple definitions were provided (Hair et al., 2024).

To analyse the effect of CMV statistically, this study adopted Harman's (1976) one-factor test as recommended by Podsakoff et al. (2003), in which one fixed factor extracted from all principal constructs was expected to explain less than 50 percent of the variance. Findings of this study showed that component one explained 38.26 percent variance, which was less than the maximum threshold of 50 percent. Furthermore, the correlation of the constructs of more than 0.9 was considered as an indicator of common method bias. The highest correlation between the constructs was 0.733, which indicated a lack of common method bias in the collected data for this study.

4.5 Profile of Respondents

This section described the profile of respondents who participated in the study survey.

Table 4.1
Summary of Respondents Profile

Demographic Variable	Category	N	%
Gender	Male	72	17.3
	Female	345	82.7
Ethnicity	Malay	298	71.5
	Chinese	21	5.0
	Indian	17	4.1
	Bumiputera (Sabah & Sarawak)	81	19.4
Age	26 to 33 Years old	191	45.8
	34 to 41 years old	197	47.2
	42 to 49 years old	29	7.0
Level of Education	Diploma	359	86.1
	Bachelor Degree	58	13.9
Department	Anesthesiology	26	6.2
	Cardiology	34	8.2
	Day Care	17	4.1
	Dermatology	21	5.0
	Emergency & Trauma	32	7.7

	Ear, Nose & Throat	17	4.1
	General Medical	14	3.4
	Nephrology	12	2.9
	Neurology	14	3.4
	Obstetrics & Gynecology	45	10.8
	Ophthalmology	35	8.4
	Orthopedic	51	12.2
	Pediatric	12	2.9
	Psychiatric	12	2.9
	Respiratory	32	7.7
	Surgery	43	10.3
	Total	417	100
Length of Service in current Hospital	Less than 1 Years	23	5.5
	1 to 5 years	58	13.9
	6 to 10 years	233	55.9
	11 to 15 years	103	24.7
Length of service in Nursing Profession	1 to 5 years	52	12.5
	6 to 10 years	227	54.4
	11 to 15 years	138	33.1
Length of service in current ward	Less than 1 Years	52	12.5
	1 to 5 years	197	47.2
	6 to 10 years	139	33.3
	11 to 15 years	29	7.0
Grade of position	U29	263	63.1
	U32	110	26.4
	U41	44	10.6
Location of Profession	Hospital Tuanku Fauziah	10	2.4
	Hospital Sultanah Bahiyah	39	9.4
	Hospital Pulau Pinang	30	7.2
	Hospital Raja Permaisuri Bainun	48	11.5
	Hospital Sungai Buloh	74	17.7
	Hospital Putrajaya	14	3.4
	Hospital Tuanku Ja'afar	25	6.0
	Hospital Melaka	21	5.0
	Hospital Sultanah Aminah	55	13.2
	Hospital Tengku Ampuan Afzan	34	8.2
	Hospital Sultanah Nur Zahirah	26	6.2
	Hospital Raja Perempuan Zainab II	41	9.8

In this study, data were collected from 417 registered nurses in 12 general hospitals in Malaysia, which were Hospital Tuanku Fauziah (10 or 2.4%), Hospital Sultanah Bahiyah (39 or 9.4%), Hospital Pulau Pinang (30 or 7.2%), Hospital Raja

Permaisuri Bainun (48 or 11.5%), Hospital Sungai Buloh (74 or 17.7%), Hospital Putrajaya (14 or 3.4%), Hospital Tuanku Ja'afar (25 or 6.0%), Hospital Melaka (21 or 5.0%), Hospital Sultanah Aminah (55 or 13.2%), Hospital Tengku Ampuan Afzan (34 or 8.2%), Hospital Sultanah Nur Zahirah (26 or 6.2%) and Hospital Raja Perempuan Zainab II (41 or 9.8%). From the total, 345 respondents (82.7%) were females and 72 respondents (17.3%) were females. In the ethnicity category, 298 or 71.5% of the registered nurses that participated in the study survey were Malay, followed by 81 or 19.4% of the respondents who were Bumiputera (Sabah & Sarawak) and 21 or 5.0% of the respondents who were Chinese. Only 17 or 4.1% of the respondents were Indian who participated in this study.

As stated in Table 4.1, most of the respondents were 34 years old to 41 years old (197 respondents or 47.2%), followed by 191 (45.8%) of the respondents who were 26 years old to 33 years old. Only 29 (7.0%) of the respondents were 42 years old to 49 years old. As per their educational background, a total of 359 (86.1%) of the respondents completed their diploma level and only 58 (13.9%) of the respondents with bachelor's degree participated in this study.

As for the respondents' working department, this study collected responses from 16 different departments, which showed that most of the respondents were working in the Orthopedic department (51 or 12.2%), followed by Obstetrics & Gynecology (45 or 10.8%), Surgery (43 or 10.3%), Ophthalmology (35 or 8.4%), Cardiology (34 or 8.2%), Emergency & Trauma (32 or 7.7%), Respiratory (32 or 7.7%), Anesthesiology (26 or 6.2%) and Dermatology (21 or 5.0%). As for the Day Care and Ear, Nose & Throat departments, there were 17 or 4.1% of the respondents from each department who participated in this study. There were only 14 (3.4%) respondents who participated in this study from the General Medical and Neurology departments respectively, and only 12 (2.9%) were from Nephrology, Pediatric and Psychiatric respectively.

Based on Table 4.1, there were 233 or 55.9% of the respondents who reported having been working in the current hospital for 6 to 10 years, 103 or 24.7% for 11 to 15 years, 58 or 13.9% for 1 to 5 years and only 23 or 5.5% of the respondents for less than 1 year respectively. The results revealed that the mean number of years in the current hospital of the respondents was found to be 3.00 years with a standard deviation of 0.780 years. This study also revealed the total number of years of respondents

working in their nursing profession: only 52 (12.5%) of respondents had been working as nurses for 1 to 5 years, while the majority of the respondents had been working as nurses for 6 to 10 years (227 or 54.4%) and 11 to 15 years (138 or 33.1%).

As for the length of respondents' service in the current ward, this study revealed that only 29 (7.0%) respondents had been working in the same ward for 11 to 15 years, followed by 52 (12.5%) respondents working for less than 1 year in the same ward, 139 (33.3%) respondents working for 6 to 10 years in the same ward and 197 (47.2%) respondents working for 1 to 5 years in the same ward. Thus, the mean value of years working in the same ward of the respondents was found to be 2.35 years with a standard deviation of 0.785 years. As noted in the Table 4.1, most of the respondents were in grade U29 (263 or 63.1%), followed by U32 (110 or 26.4%) and U41 (44 or 10.6%).

4.6 The Measurement Model

In PLS analysis, the initial step was to evaluate the outer model or measurement model (Hair et al., 2024). The outer model involved determining individual item reliability, internal consistency reliability, content validity, convergent validity and discriminant validity (Hair et al., 2024). The measurement model was concerned with estimates of the goodness of measure (Hair et al., 2024).

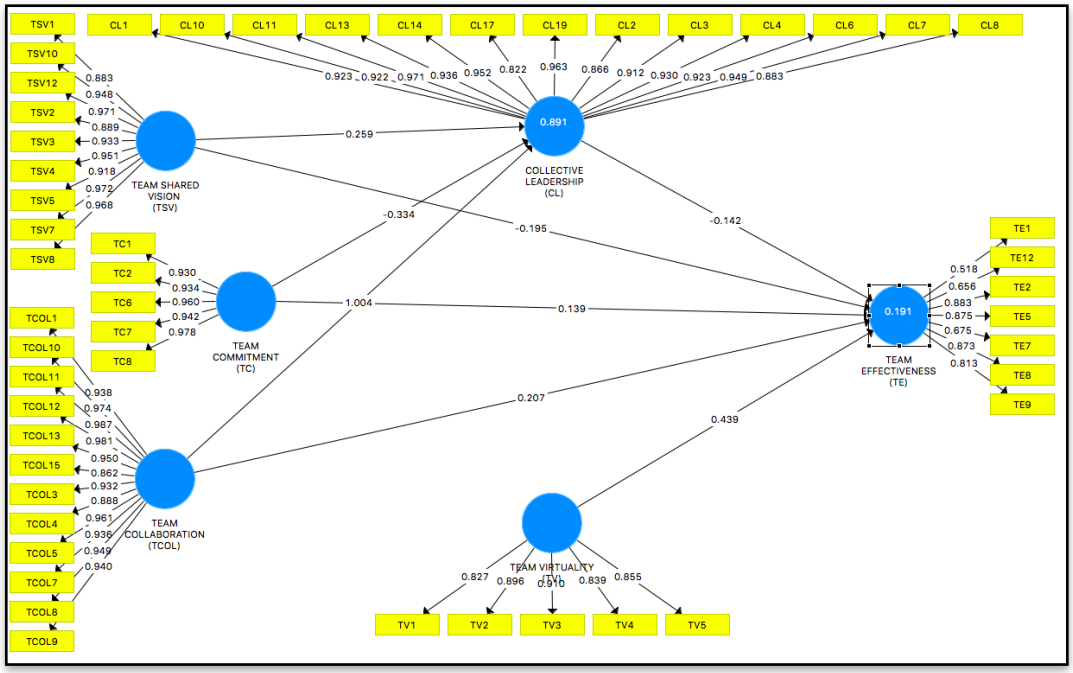

Figure 4.1 PLS Algorithm Measurement Model

For this study, two key criteria were used to assess the outer model's validity and reliability (Hair et al., 2024). Reliability tests tried to assess how consistently measuring tools measured what they were meant to measure, while validity tests tried to assess how well an instrument measured the exact concept it was designed to measure (Hair et al., 2024; Sekaran & Bougie, 2025).

4.6.1 Reliability Analysis

Reliability was evaluated by looking at the outer loadings of individual item measures (Hair et al., 2024). Hair et al. (2024) suggested the rule of thumb for retaining items with loadings between 0.40 and 0.70. Thus, this study revealed that, out of 82 items, 31 were deleted because of lower loadings below the threshold of 0.40. Thus, in the whole model, only 51 items were retained as they had loadings between 0.519 and 0.987 (Table 4.2).

Meanwhile, internal consistency reliability referred to the extent to which all indicators on a particular (sub) scale were evaluating the same concepts (Hair et al., 2024). The most frequently used estimators of the internal consistency reliability of an instrument in social science research were Cronbach's alpha coefficient value and

composite reliability coefficient (Peterson & Kim, 2013). Even though there was a lot of debate concerning the best technique to calculate reliability, Cronbach's alpha coefficient was the universal method used, although it might underestimate reliability (Sekaran & Bougie, 2025; Hair et al., 2024). But composite reliability was typically used in conjunction with SEM-PLS models; this technique was more vigorous than Cronbach's alpha (Fornell & Larcker, 1981). Apart from that, composite reliability offered a much less biased estimate of reliability compared to Cronbach's alpha because Cronbach's alpha assumed all items equally contributed to their construct without considering the actual role of individual loading (Gotz et al., 2010). However, both coefficient values (Cronbach's alpha and composite reliability) were selected to ascertain the internal consistency reliability of the measure (Hair et al., 2024).

The Cronbach's alpha values for team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness were found to be more than 0.7 (Table 4.2). As Cronbach's alpha for all items was more than 0.7, this study considered all items reliable (Hair et al., 2024). For the composite reliability, the indicators had different loadings for all items, and all the values were found to be more than 0.7 (Table 4.2). According to Hair et al. (2024), if the indicators were higher than 0.7, they could be considered reliable.

4.6.2 Multicollinearity

Multicollinearity was a situation in which one or more exogenous latent constructs turned out to be highly correlated (Hair et al., 2024). Variance inflation factors (VIF) were examined to detect multicollinearity issues (Hair et al., 2024). Hair et al. (2024) recommended that multicollinearity was a concern if the VIF value was greater than 5, the tolerance value was less than 0.20 and not greater than 3. As observed from Table 4.2, the VIF values for all variables were much below 3.3, indicating a lack of multicollinearity issues across the dataset of this study (Hair et al., 2024).

4.6.3 Convergent Validity

Convergent validity defined as the extent to which items accurately epitomized the intended construct and correlated with other measures of the same construct (Hair et al., 2024). The validity of a measurement scale was regarded as convergent as soon as indicator/item loadings were high (more than 0.5) on their related construct (Hair et al., 2024). Chin (2011) proposed three assessment principles, which were that the factor loading of all indicators achieved a significant level, the indicators' composite reliability was higher than 0.7 and the average variance extracted was higher than 0.5.

Table 4.2
Reliability Analysis

Variables	Items	Mean	SD	CA	DG rho	CR	AVE	VIF
TSV	9	0.879	0.014	0.983	0.989	0.985	0.879	1.834
TC	5	0.901	0.011	0.972	0.976	0.978	0.901	1.637
TCOL	12	0.888	0.010	0.988	0.989	0.990	0.888	1.856
CL	13	0.847	0.012	0.985	0.986	0.986	0.847	1.926
TV	5	0.751	0.018	0.917	0.924	0.937	0.750	1.873
TE	7	0.589	0.023	0.880	0.924	0.937	0.750	-

Notes: Team Shared Vision (TSV), Team Commitment (TC), Team Collaboration (TCOL), Collective Leadership (CL), Team Virtuality (TV), Team Effectiveness (TE), Standard Deviation (SD), Cronbach Alpha (CA), Dillon-Goldstein's rho (DG rho), Composite Reliability (CR), Variance Extracted (AVE), Variance Inflation Factors (VIF)

Also, as suggested by Fornell and Larcker (1981), convergent validity was evaluated using the average variance extracted (AVE) of each construct under study. To realize adequate convergent validity, Chin (1998) endorsed that the AVE for each underlying construct must be 0.50 or more. Following Hair et al. (2024), the average variance extracted (AVE) revealed high loadings on their individual constructs and, as presented in Table 4.2, the values for all items were more than 0.5, indicating acceptable convergent validity in this study.

4.6.4 Discriminant Validity

Discriminant validity was another criterion which assessed the degree to which a variable was truly not the same as other variables (Hair et al., 2024). It could also be seen as the extent to which a particular construct differed from another construct (Duarte & Raposo, 2010). Therefore, a greater level of discriminant validity suggested that a variable was distinct and captured some phenomena that other variables did not (Hair et al., 2024). In this study, discriminant validity was ascertained using the Fornell-Larcker criterion, and it should be greater than the correlation among latent constructs (Fornell & Larcker, 1981), and by comparing the items' loadings with other items in the cross loadings (Hair et al., 2024). The following section illustrated the discriminant validity tests and their results, carried out by this study.

4.6.4.1 Outer Model Loading and Cross Loading

Discriminant validity in this study was ascertained using Hair et al. (2024) standard by comparing the items' loadings with other items in the cross loadings. Hair et al. (2024) further stressed that indicators could be assumed reliable if the absolute standardized outer loadings were higher than 0.70 and could be assumed acceptable if the absolute standardized outer loadings were higher than 0.50.

Table 4.3
Cross Loading and Outer Loading

Code	TSV	TC	TCOL	CL	TV	TE
TSV1	**0.883**	0.838	0.835	0.856	0.066	0.054
TSV2	**0.889**	0.878	0.928	0.940	0.064	0.061
TSV3	**0.933**	0.927	0.712	0.622	0.025	0.019
TSV4	**0.951**	0.944	0.975	0.898	0.041	0.046
TSV5	**0.918**	0.914	0.741	0.630	0.021	0.013
TSV7	**0.972**	0.948	0.861	0.767	0.027	0.033
TSV8	**0.968**	0.981	0.847	0.752	0.028	0.037
TSV10	**0.948**	0.940	0.768	0.705	0.032	0.023
TSV12	**0.971**	0.934	0.852	0.756	0.030	0.024
TC1	0.954	**0.930**	0.860	0.833	0.045	0.036
TC2	0.916	**0.934**	0.876	0.845	0.052	0.060
TC6	0.909	**0.960**	0.791	0.705	0.025	0.033

TC7	0.933	**0.942**	0.858	0.729	0.015	0.026
TC8	0.949	**0.978**	0.820	0.723	0.023	0.033
TCOL1	0.872	0.831	**0.938**	0.897	0.058	0.050
TCOL3	0.903	0.920	**0.932**	0.844	0.030	0.039
TCOL4	0.829	0.837	**0.888**	0.875	0.051	0.045
TCOL5	0.839	0.817	**0.961**	0.922	0.050	0.042
TCOL7	0.798	0.781	**0.936**	0.867	0.018	0.036
TCOL8	0.789	0.796	**0.949**	0.884	0.026	0.050
TCOL9	0.791	0.787	**0.940**	0.854	0.014	0.047
TCOL10	0.854	0.832	**0.974**	0.898	0.036	0.051
TCOL11	0.878	0.856	**0.987**	0.929	0.038	0.050
TCOL12	0.857	0.848	**0.981**	0.942	0.047	0.052
TCOL13	0.883	0.835	**0.950**	0.929	0.045	0.052
TCOL15	0.937	0.934	**0.862**	0.788	0.034	0.033
CL1	0.905	0.880	0.913	**0.923**	0.053	0.059
CL2	0.804	0.773	0.828	**0.866**	0.055	0.042
CL3	0.700	0.660	0.826	**0.912**	0.068	0.032
CL4	0.804	0.764	0.917	**0.930**	0.053	0.033
CL6	0.799	0.819	0.867	**0.923**	0.061	0.052
CL7	0.824	0.798	0.939	**0.949**	0.050	0.045
CL8	0.686	0.679	0.735	**0.883**	0.076	0.035
CL10	0.675	0.638	0.810	**0.922**	0.068	0.027
CL11	0.793	0.779	0.903	**0.971**	0.069	0.050
CL13	0.740	0.695	0.853	**0.936**	0.058	0.041
CL14	0.796	0.768	0.887	**0.952**	0.062	0.047
CL17	0.651	0.655	0.802	**0.822**	0.065	0.076
CL19	0.813	0.801	0.943	**0.963**	0.058	0.048
TV1	0.033	0.026	0.036	0.065	**0.890**	0.194
TV2	0.054	0.052	0.061	0.081	**0.918**	0.257
TV3	0.036	0.033	0.021	0.042	**0.929**	0.248
TV4	0.025	0.015	0.020	0.042	**0.889**	0.251
TV5	0.039	0.031	0.043	0.070	**0.904**	0.240
TE1	0.034	0.038	0.034	0.024	0.109	**0.519**
TE2	-0.011	-0.012	0.013	0.019	0.245	**0.882**
TE5	0.012	0.006	0.029	0.044	0.270	**0.874**
TE7	0.003	0.001	0.021	0.030	0.142	**0.677**
TE8	0.036	0.039	0.032	0.023	0.245	**0.872**
TE9	0.100	0.104	0.083	0.067	0.210	**0.813**
TE12	0.052	0.062	0.067	0.072	0.126	**0.660**

Notes: Team Shared Vision (TSV), Team Commitment (TC), Team Collaboration (TCOL), Collective Leadership (CL), Team Virtuality (TV), Team Effectiveness (TE)

As presented in Table 4.3, all items used to measure team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness were found to be more than 0.7, except for items TE2, TE7 and TE12 for team effectiveness. However, the items TE2, TE7 and TE12 were found to be more than 0.5, which was acceptable (Hair et al., 2024). The cross-loading values were below the outer loadings, which suggested good discriminant validity (Hair et al., 2024).

4.6.4.2 Fornell-Larcker Criterion

The Fornell-Lacrker assessed the discriminant validity at the construct level as presented in Table 4.4.

Table 4.4
Fornell-Larcker Criterion

Code	TSV	TC	TCOL	CL	TV	TE
TSV	0.938					
TC	0.904	0.949				
TCOL	0.904	0.889	0.942			
CL	0.838	0.909	0.941	0.920		
TV	0.041	0.035	0.040	0.066	0.906	
TE	0.039	0.040	0.049	0.049	0.265	0.768

Notes: Team Shared Vision (TSV), Team Commitment (TC), Team Collaboration (TCOL), Collective Leadership (CL), Team Virtuality (TV), Team Effectiveness (TE)

As shown in Table 4.2, the values of AVE were between 0.750 and 0.901, suggesting acceptable values (Hair et al., 2024). In Table 4.4, the correlations between the latent constructs were compared with the square root of AVE (Hair et al., 2024). Table 4.4 indicated that the Fornell-Larcker values were greater than the correlations between the latent constructs, indicating that discriminant validity was adequate (Fornell & Larcker, 1981).

4.6.4.3 Heterotrait-Monotrait Ratio (HTMT)

Furthermore, the Heterotrait-Monotrait Ratio (HTMT) was an estimate of the correlation between constructs, which paralleled the disattenuated construct score

creation (Hair et al., 2024). Using a value of 0.9 as the threshold, this study concluded that there was no evidence of a lack of discriminant validity and all the constructs met the criteria (Table 4.5).

Table 4.5
Heterotrait-Monotrait Ration (HTMT)

Code	TSV	TC	TCOL	CL	TV	TE
TSV	-					
TC	0.776	-				
TCOL	0.558	0.767	-			
CL	0.457	0.553	0.786	-		
TV	0.456	0.533	0.586	0.712	-	
TE	0.428	0.488	0.506	0.543	0.790	-

Notes: Team Shared Vision (TSV), Team Commitment (TC), Team Collaboration (TCOL), Collective Leadership (CL), Team Virtuality (TV), Team Effectiveness (TE)

4.7 Structural Model

Having established the measurement model, this section examined the structural modelling with the aim of establishing the relationship of the modelling as a whole. It was crucial to mention that a study conducted by Henseler and Sarstedt (2013) proposed that the goodness of fit (GoF) index was not suitable for model validation (see also Hair et al., 2024). For example, using a PLS path model with simulated data, the authors showed that the goodness of fit index was not suitable for model validation because it could not separate valid models from invalid ones (Hair et al., 2024).

In light of this recent development, this study adopted a two-step process to evaluate and report the results of the PLS-SEM path, as suggested by Henseler et al. (2009). This study assessed the structural model. The structural model evaluated the path model for the study, established by a series of structural equations representing the research model of the study (Hair et al., 2024), which allowed the estimation of the path relationships among exogenous (independent) and endogenous (dependent) latent variables, as detailed in the following subsections.

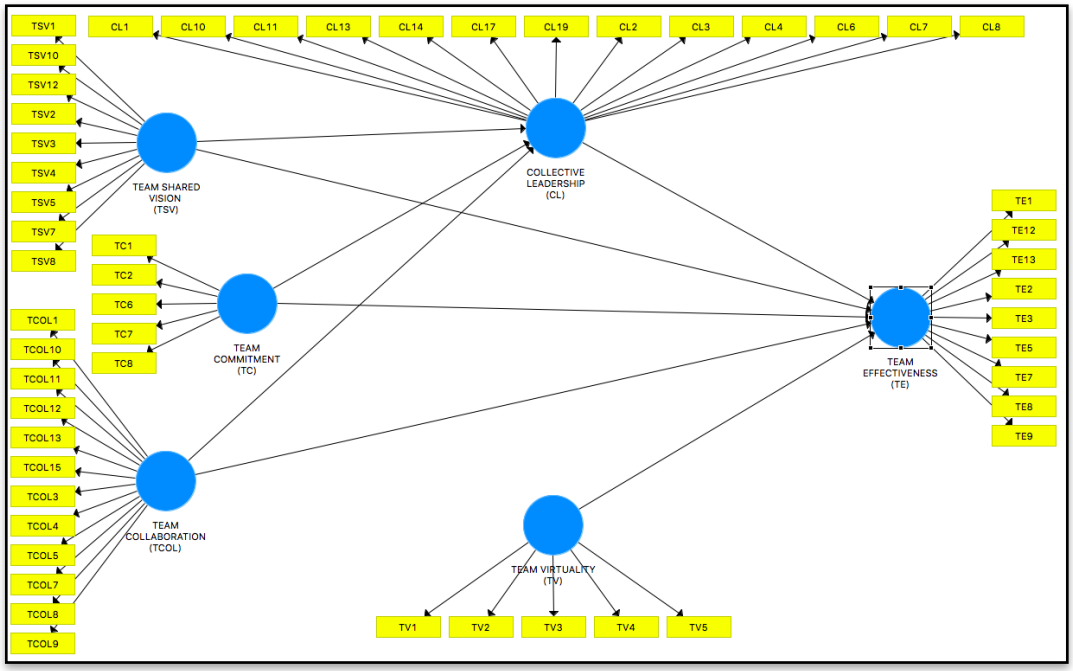

Figure 4.2 Structural Model with Moderator and Mediator

4.7.1 Path Coefficients

Path coefficients were estimated as path relationships in the structural model between the constructs in the model (Hair et al., 2024). Each path relationship was examined through the regression coefficient (β) (Hair et al., 2024). The significance of the regression coefficient β was based on the t-value, which was obtained using the SmartPLS bootstrap process (Hair et al., 2024). This study applied the bootstrapping method with 5000 bootstrap samples to assess the significance of the path coefficients (Hair et al., 2024; Henseler et al., 2009). Figure 4.3 and Table 4.6 therefore showed the estimates for the full structural model.

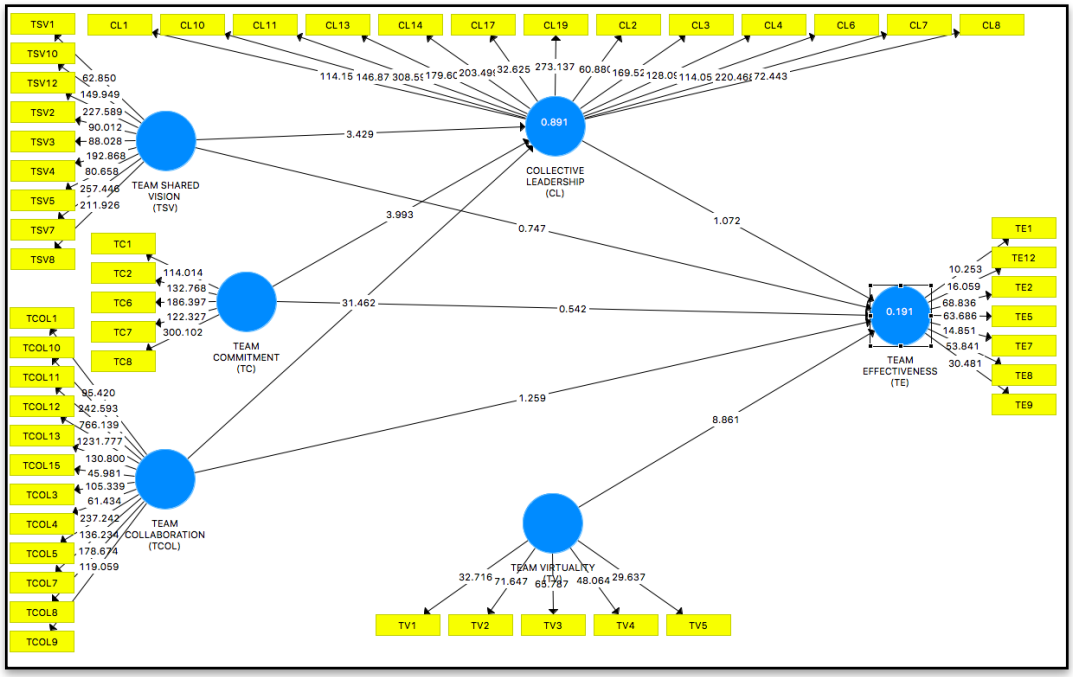

Figure 4.3 Bootstrapping Model

The results in Table 4.2 determined the strength and statistical significance of each hypothesized relationship of this study. The findings showed that while team shared vision, commitment, and collaboration significantly influenced collective leadership, their direct and mediated effects on team effectiveness were not significant. The detailed statistical outcomes for each hypothesis were presented in Table 4.6 below**.**

As presented in Table 4.6, the path coefficients of team shared vision (TSV) were found to be positive but statistically not significant (β = 0.261, t = 8.861, p = 0.455), not supporting H1 (Mai et al., 2022; Tredget et al., 2023; Doorn et al., 2013; Schmidt & Umans, 2024). The finding of this study did not support Hypothesis 1, indicating that the complex and specialized nature of healthcare work often required a high degree of individual autonomy and decision-making, and that contextual conditions such as culture, leadership and organisational structure could weaken the influence of shared vision (Doorn et al., 2013; Schmidt & Umans, 2024). Additionally, the results of this study proved that the pressing demands of patient care, limited resources and the dynamic nature of healthcare environments sometimes overshadowed the influence of shared vision among the team (Mai et al., 2022; Tredget et al., 2023).

Table 4.6
Path Coefficient

Hypo	Path	Beta (β)	t-value	CI-Min	CI-Max	*p*-value	Decision
H1	TSV➔TE	0.261	8.861	-0.590	0.344	0.455	Not Supported
H2	TC➔TE	0.257	0.542	-0.360	0.523	0.588	Not Supported
H3	TCOL➔TE	0.164	1.259	-0.166	0.362	0.208	Not Supported
H4	TSV➔CL	0.076	3.429	0.135	0.383	0.001	Supported
H5	TC➔CL	0.084	3.993	-0.478	-0.201	0.000	Supported
H6	TCOL➔CL	0.032	31.462	0.953	1.056	0.000	Supported
H7	CL➔TE	0.133	1.072	-0.255	0.212	0.284	Not Supported

Notes: Team Shared Vision (TSV), Team Commitment (TC), Team Collaboration (TCOL), Collective Leadership (CL), Team Virtuality (TV), Team Effectiveness (TE)

Table 4.6 further displayed that team commitment had a positive but statistically not significant effect on team effectiveness (β = 0.257, t = 0.542, p = 0.588). Thus, this finding did not support H2. The finding did not support Hypothesis 2, thereby indicating that healthcare teams often comprised individuals with varying levels of commitment, stemming from factors such as personal priorities, workload and individual motivations (Paolucci et al., 2018; Kocoglu et al., 2019). This heterogeneity could dilute the overall impact of team commitment on effectiveness. Apart from that, this finding proved that healthcare work demanded quick decision-making and adaptability to dynamic situations, which could sometimes take precedence over commitment to a shared team goal (Uraon et al., 2023). Additionally, the intricate nature of healthcare tasks and the critical need for specialized skills might have meant that factors such as competence and expertise played a more prominent role in determining team effectiveness (Porter, 2005).

Team collaboration was also found to have a positive and statistically not significant (β = 0.164, t = 1.259, p = 0.208) effect on team effectiveness. Thus, the finding of this study did not support Hypothesis 3 (H3). These findings did not support H3, indicating that healthcare teams often comprised diverse individuals with varying levels of experience, expertise and communication skills (Sudeshika et al., 2021;

Reeves et al., 2017; Gupta et al., 2024; Tidman, 2022). While collaboration could foster better information sharing and mutual support, the intricate nature of healthcare tasks sometimes necessitated individual decision-making and specialized knowledge, which might have overshadowed the impact of collaboration (Abelsen & Fosse, 2024; Ding et al., 2024; Noyes, 2025). Moreover, measuring the precise influence of collaboration on team effectiveness could be challenging, as it might have been intertwined with other variables such as leadership, resource allocation and patient acuity (Bose et al., 2025; McKinlay et al., 2019; O'Daniel & Rosenstein, 2008). Thus, while collaboration undoubtedly contributed positively to the healthcare team dynamic, its effect on team effectiveness might not consistently have reached statistical significance due to the complex and multifaceted nature of healthcare work and the presence of various confounding factors (Steward, 2018; O'Connor et al., 2016).

As for team shared vision and collective leadership, Figure 4.3 and Table 4.6 displayed a positive and statistically significant effect of team shared vision on collective leadership (at the chosen 5% level of significance) ($\beta = 0.076$, $t = 3.429$, $p = 0.001$). The finding of this study supported hypothesis H4, thereby indicating that when healthcare teams shared a common vision, it served as a unifying force that aligned individuals towards a common goal and purpose (Brun & McAuliffe, 2022; Gram-Hanssen, 2021). This shared vision not only increased a sense of unity but also enhanced communication, as team members were more likely to collaborate and make collective decisions when they were all working towards a shared objective (Brun & McAuliffe, 2022; Groulx et al., 2023). Furthermore, a shared vision empowered individuals within the team to assume leadership roles based on their expertise and contributions towards achieving that vision (Best et al., 2012; Ensley et al., 2006). As a result, collective leadership emerged, where team members actively engaged in decision-making and took ownership of their roles and responsibilities (Wu et al., 2018; Han et al., 2021; Gabriel & Medina, 2022; Joniakova et al., 2021). The finding proved that a shared vision in healthcare could increase collective leadership, promoting a cohesive and high-performing team that positively impacted patient care and the healthcare environment (Brun & McAuliffe, 2022; Teame et al., 2022).

Furthermore, as posited, team commitment was also found to have a positive and statistically significant effect on collective leadership ($\beta=0.084$, $t=3.993$, $p=0.000$).

This finding supported hypothesis H5, proving that when healthcare teams exhibited high levels of commitment to their shared goals and objectives, it cultivated a sense of responsibility and accountability among team members (Kim & Shin, 2021). This commitment encouraged individuals to proactively engage in collective decision-making, share their expertise, and take on leadership roles as needed to ensure the team's success (Damamik et al., 2021; Khan, 2020). Thus, the result of this study proved that a committed team was more likely to foster collective leadership, where team members collaborated, communicated effectively, and collectively steered the team towards achieving their goals (Seibert et al., 2003; Saira et al., 2020), ultimately resulting in a positive and quantifiable impact on patient care and healthcare outcomes (Ribeiro et al., 2020).

Team collaboration was also found to have a positive and statistically significant effect on collective leadership. This finding supported hypothesis H6 and revealed that effective collaboration inherently promoted a culture of shared responsibility and mutual support within healthcare teams, consistent with the view that collaboration formed an essential element of collective functioning in healthcare (Hayat et al., 2024). When individuals collaborated seamlessly, they were more likely to engage in open communication, actively share knowledge and expertise, and collectively make decisions, reflecting empirical evidence that open communication and joint problem-solving fostered collective leadership (Wang, 2024; Morian et al., 2024). This collaborative environment naturally nurtured collective leadership, where team members actively participated in problem-solving, contributed their unique skills, and took on leadership roles as needed to address patient needs and achieve shared objectives, in line with findings that collaboration strengthened shared understanding and distributed leadership roles according to expertise (Asumadu et al., 2024; Carron et al., 2021). Thus, it could be concluded that team collaboration reinforced collective leadership, fostering a quantifiable and positive impact on nurses' ability to deliver high-quality care and meet the complex demands of the healthcare environment, as supported by studies showing that collaboration improved team effectiveness and patient outcomes (Lin et al., 2013; Hall and Weaver, 2001).

Finally, collective leadership was found to have a positive but statistically not significant effect on team effectiveness (β=0.133, t=1.027, p=0.284), thus not

supporting H7. The finding of this study did not support H7, thereby indicating that collective leadership often involved shared decision-making and the distribution of leadership responsibilities among team members, which could enhance communication, coordination and adaptability, as suggested in previous work highlighting its growing importance in interdependent healthcare environments (Hudon et al., 2024). However, in healthcare, the intricate and specialized nature of tasks still required individual expertise and autonomy in certain situations; thus, the effect of collective leadership on team effectiveness did not consistently reach statistical significance due to the variability in team compositions, varying levels of leadership skills and the influence of other factors such as organizational culture and resources, which aligned with studies showing that collective leadership outcomes depended heavily on contextual and relational conditions (Han et al., 2021; Chiu, 2016). While collective leadership contributed positively to the team's dynamics and overall performance, its impact might have varied across different healthcare contexts, resulting in positive but not statistically significant outcomes in certain cases, as also observed in research noting that collective leadership could produce mixed effects depending on team processes and clarity of roles (Chen and Zhang, 2022; Wood and Fields, 2007).

4.7.2 Effect Size

The next analysis for the structural model evaluation was the f^2 effect size (Hair et al., 2024). The f^2 analysis was used to evaluate the independent variable incremental explanation of a dependent variable (Ringle et al., 2012). According to Cohen et al. (2013), effect size (f^2) explained the relative effect of a specific or individual variable on the dependent variable(s) by means of changes in the R-squared. It was estimated as the increase in R-squared of the variable to which the path was associated, relative to the variable percentage of unexplained variance (Cohen et al., 2013). Hence, Cohen et al. (2013) defined effect size values of 0.02, 0.15 and 0.35 as having weak, moderate and strong effect respectively. Table 4.7 presented the respective effect sizes of the variables of the structural model.

Table 4.7
Effect Size of the Latent Variables

Hypo	Path	f^2	Effect Size
H1	TSV➔TE	0.006	None
H2	TC➔TE	0.007	None
H3	TCOL➔TE	0.001	None
H4	TSV➔CL	0.780	Large
H5	TC➔CL	0.044	Small
H6	TCOL➔CL	1.183	Large
H7	CL➔TE	0.013	None

Notes: Team Shared Vision (TSV), Team Commitment (TC), Team Collaboration (TCOL), Collective Leadership (CL), Team Virtuality (TV), Team Effectiveness (TE)

As indicated in Table 4.7, the effect size for team shared vision, team commitment, team collaboration and collective leadership on team effectiveness had no effect size, implying that team shared vision, team commitment, team collaboration and collective leadership had minimal direct impact on overall team effectiveness in this study (Ringle et al., 2012; Cohen et al., 2013). However, team commitment was found to have a small effect size on collective leadership, further implying that while commitment supported leadership, its impact was less significant compared to shared vision and collaboration (Kim & Shin, 2021; Damamik et al., 2021). Finally, team shared vision and team collaboration were found to have a large effect size on collective leadership among nurses in Malaysia, indicating that the shared vision and collaboration were important in increasing a collective leadership environment among nurses (Xu et al., 2022; Hayat et al., 2024; Brun & McAuliffe, 2022). The findings suggested that collective leadership acted more as a mediating role than a direct effect on team effectiveness (D'Innocenzo et al., 2016; Han et al., 2021; Chiu, 2016).

4.7.3 Coefficient of Determination (R^2)

This section discussed another important criterion for evaluating the structural model in PLS-SEM, the value of R-squared (R^2), otherwise called the coefficient of determination (Hair et al., 2024). The value of R^2 indicated the extent of variation in

the dependent variable that could be clarified by one or more predictor variables (Hair et al., 2024). Even though the satisfactory level of the R^2 value was subjected to the research context (Hair et al., 2024), Hair et al. (2013) stated that generally R^2 values of 0.75, 0.50 or 0.25 for the endogenous construct could be described as substantial, moderate and weak, respectively. Table 4.8 presented the R^2 values of the two endogenous variables.

Table 4.8
Coefficient of Determination

Construct	R^2	%
Collective leadership (CL)	0.891	89.1%
Team Effectiveness (TE)	0.072	7.2%

Notes: Collective Leadership (CL), Team Effectiveness (TE)

As presented in Table 4.8, the research model explained 89.1% of the variance in collective leadership and 7.2% of the total variance in team effectiveness. This advocated that the three sets of exogenous latent variables, which were team shared vision, team commitment and team collaboration, collectively explained 89.1% and 7.2% of the variance of collective leadership and team effectiveness respectively. Therefore, resulting from Hair et al. (2024) and their criteria, the two endogenous latent variables showed acceptable levels of R^2 values, which were considered as substantial and weak respectively.

4.7.4 Prediction Relevance (Q^2)

Another calculation of the structural model was the model predictive relevance ability (Hair et al., 2024). The predictive relevance was evaluated using the Stone-Geisser criterion, which assumed that an inner model needed to offer evidence of prediction of the endogenous latent construct's indicators (Henseler et al., 2009). Therefore, Q^2 assessment was conducted via Stone-Geisser's Q^2 test, which was measured using blindfolding procedures (Hair et al., 2024; Henseler et al., 2009). Therefore, this study used the Stone-Geisser test to assess Q^2 through blindfolding procedures to attain the cross-validated redundancy measure for the dependent variable (Hair et al., 2024).

Table 4.9
Construct Cross-Validated Redundancy

Construct	SSO	SSE	Q^2 (1-SSE/SSO)
Collective leadership (CL)	10504.000	2660.131	0.747
Team Effectiveness (TE)	5656.000	5438.408	0.038

Notes: Collective Leadership (CL), Team Effectiveness (TE)

Table 4.9 presented the cross-validated redundancy for collective leadership and team effectiveness (Hair et al., 2024). As presented in Table 4.9, the Q^2 for all variables was more than zero, suggesting model predictive relevance (Henseler et al., 2009).

4.8 Goodness-of Fit Index (GoF)

Another evaluation criterion was the global Goodness-of-Fit (GoF) Index (Hair et al., 2024). However, there were many arguments about the usefulness of this criterion for validating the model (Hair et al., 2024; Henseler & Sarstedt, 2013). In contrast, Tenenhaus et al. (2004) recommended that GoF could be applied to PLS-SEM to compare performances produced by models. Tenenhaus et al. (2004) proposed GoF as the geometric mean of the average communalities and the average endogenous latent variables. Nevertheless, other researchers argued that no such global measure of GoF was available for PLS-SEM (Hair et al., 2024; Henseler & Sarstedt, 2013; Sarstedt et al., 2014). In addition, Henseler and Sarstedt (2013) challenged the applicability of GoF in PLS-SEM, as their simulation results indicated that it was not useful for model validation but could be useful to assess how well the model could explain different sets of data.

4.9 Mediation Testing

The mediation test conducted was to determine if a mediator construct significantly carried the ability of a predictor to have an effect on a criterion variable (Ramayah et al., 2011). Equally, the mediation test could identify the indirect effect of the independent variables on the dependent variables through a mediator variable (Hair

et al., 2024). Collective leadership was considered as a mediating variable in the relationship between team shared vision, team commitment and team collaboration with team effectiveness among nurses in Malaysia under this study. According to Baron and Kenny (1986), the variable could be regarded as a mediator based on four conditions, which were when there was a significant relationship between independent variables and dependent variable, when the independent variables' variation significantly accounted for the dependent variable, when mediator variable variation significantly accounted for the dependent variable variation, and when previous conditions were controlled, significant relationship no longer existed.

Additionally, Hayes and Preacher (2010) suggested that mediation analysis in multivariate analysis could be conducted through many methods, including simple techniques that consisted of the causal step approach (Baron & Kenny, 1986) or the Sobel test (Sobel, 1982), and newer approaches that demanded fewer unrealistic statistical assumptions, including among others the distribution of the product method (MacKinnon et al., 2004) and re-sampling approaches such as bootstrapping (Preacher & Hayes, 2008).

On the other hand, the latest mediation analysis approach was the bootstrapping method, where bootstrapping generated an empirical representation of the distribution of the sample of indirect effects (Hair et al., 2024). The mediation test used for this study was based on the PLS approach; hence, the hypotheses were tested using the PLS-SEM technique (Hair et al., 2024). Mediation was viewed by Baron and Kenny (1986) as either full or partial. Full mediation arose when, after including the mediator variable in the equation, the direct relationship between the independent variable and dependent variable became negative. A partial mediation occurred when, after including the mediator variable in the equation, the direct relationship between the independent variables and dependent variables became positive. Even though PLS used path analysis and treated simultaneously the direct and indirect effects, similar to other mediation techniques, apart from it there was no other method for treating mediating models simultaneously. The PLS-SEM technique had been discussed in the literature as a predominantly well-suited method for mediation studies (Hair et al., 2024).

The mediation method of bootstrapping began with estimating the path model of a direct relationship between the independent variables and the dependent variables

without the mediator variable (Hair et al., 2024). Under this stage, path models included the path coefficient and t-value using the PLS-SEM algorithm and bootstrapping procedure (Hair et al., 2024). In the next stage, the path model was assessed with the mediator variable (Hair et al., 2024). The emphasis was on whether the mediator relationship and independent relationship, and mediator and dependent variable relationship were significant (Hair et al., 2024). This was essential but not adequate to conclude mediation effect (Hair et al., 2024). Finally, the multiplication of the two significant path coefficients was divided by the standard deviation of the product to observe the significance of the indirect effect (Hair et al., 2024). The advantages and justification of this method on mediation had been underlined by numerous studies (Hair et al., 2024). For example, the condition of Baron and Kenny (1986) on mediation failed to involve the use of standard deviation (Hayes & Preacher, 2010). In addition, the Sobel test required the assumption of normal sample distribution effect of the indirect effect. Nevertheless, the sampling distribution of the independent variable's effect on the mediator and the mediator's effect on the dependent variable was asymmetric (Preacher & Hayes, 2007). The distribution of the product strategy was a little difficult to use without the aid of tables and required some assumptions of normal sampling distribution (Hayes, 2009).

Shrout and Bolger (2002) argued that bootstrapping methods could be used to take care of the previously mentioned error, as they allowed the distribution of the indirect effect to be tested empirically. Zhao et al. (2010) maintained that bootstrapping approaches solved these problems by generating an empirical sampling distribution (a × b). In addition, Hayes and Preacher (2010) concluded that the main advantage of the bootstrapping approach was that it did not require any assumptions about the sampling distribution of the indirect effect. Equally, bootstrapping results offered interval estimates of a population parameter that could not be acquired via other mediation tests (Lockwood & MacKinnon, 1998). Based on the advantages of the bootstrapping method over other methods, Hayes and Preacher (2010) and Hair et al. (2024) suggested testing the significance of mediation using bootstrapping methods. In general, in PLS bootstrap mediation calculation, T represented the coefficient significance level. Mediation was established if T value was equal to or greater than 1.96 at the 0.05

significance level using a two-tailed test or 1.64 at the 0.05 significance level using a one-tailed test (Hair et al., 2010).

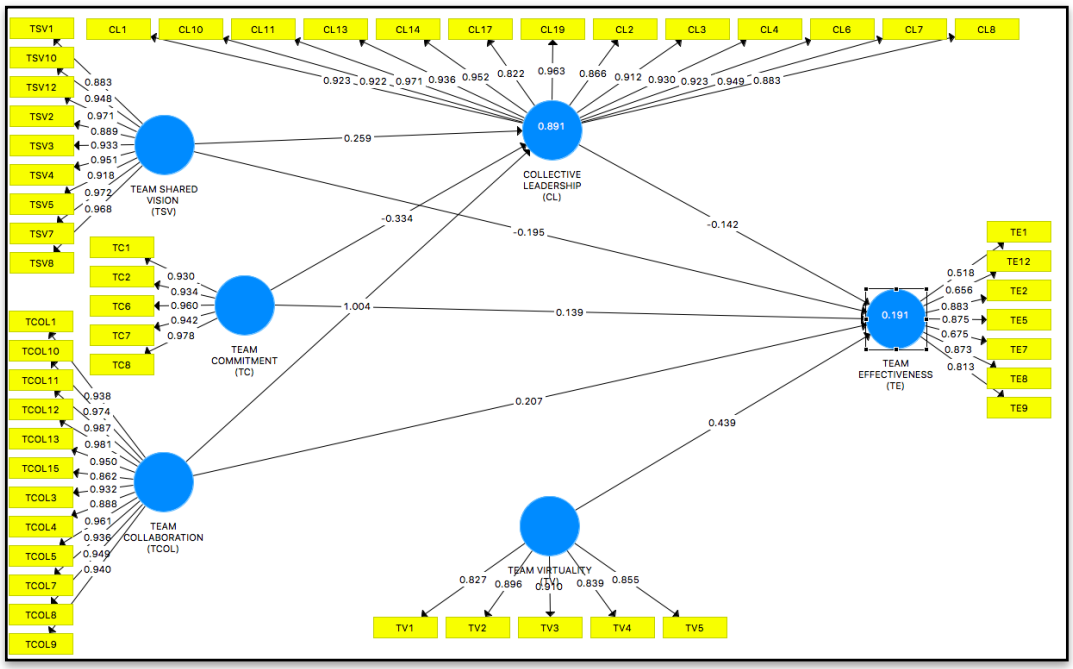

Figure 4.4 PLS Algorithm for Exogenous Variables Direct & Indirect Effect on Team Effectiveness

The outcomes of the indirect effect as shown in Figure 4.4 revealed an indirect relationship between all the variables (team shared vision, team commitment and team collaboration) and team effectiveness. Meanwhile, the result of the indirect effects as shown in Figure 4.4 showed significant indirect effects, thus signifying a potential mediating effect of collective leadership on the relationship between team collaboration and team effectiveness. Figure 4.5 revealed no mediation effect of collective leadership on the relationship between team shared vision and team commitment with team effectiveness. Subsequent segments presented the actual result of the mediation test for the proposed mediating model.

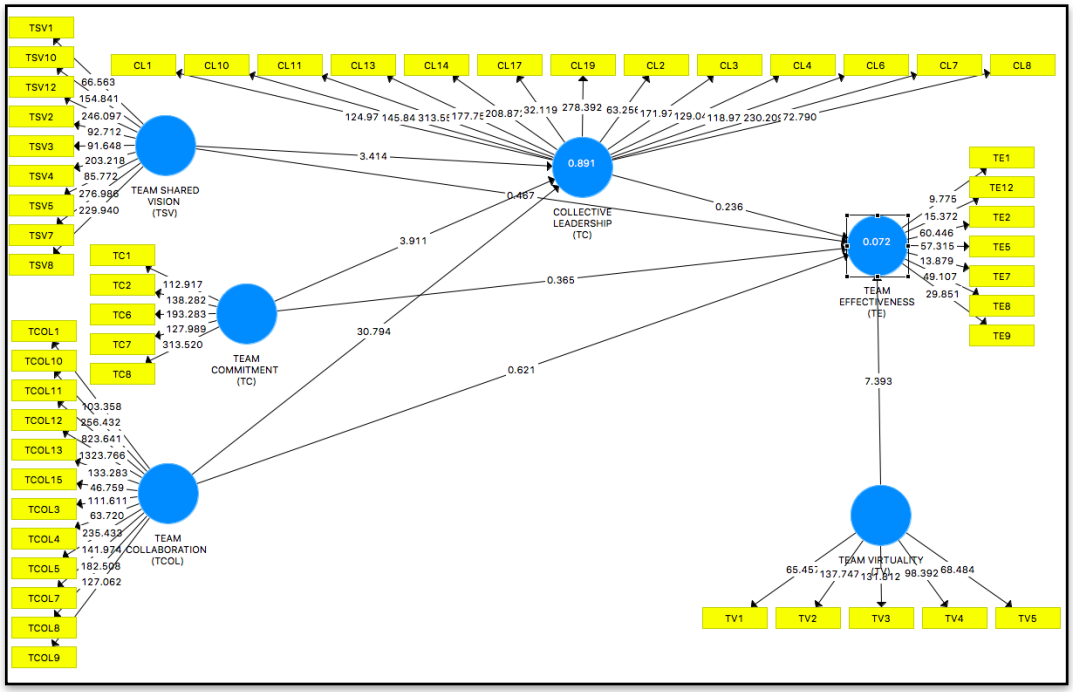

Figure 4.5 PLS Bootstrap Exogenous Variables Direct and Indirect Effects on Team Effectiveness

4.9.1 Mediation Results

This section showed results before presenting the actual mediation effect of the study on the PLS structural direct and indirect effects. Albers (2010) viewed indirect effect as the summation of both direct and indirect effects between two particular constructs. Also, Hayes and Preacher (2010) maintained that indirect effect was concerned with the effect of X on Y through intervening variable M. This study used PLS-SEM model through the means of bootstrapping analysis with formulated hypotheses to elaborate on mediating effect (Hair et al., 2024; Zhao et al., 2010). Generally, in PLS bootstrap mediation calculation, T signified the coefficient significance level. Mediation was established if T value was equal to or greater than 1.96 at 0.05 significance level using two-tailed test or 1.64 at 0.05 significance level using one-tailed test (Hair et al., 2024). Additionally, in order to evaluate the degree of the indirect effect, this study followed Hair et al. (2024) Variance Accounted For (VAF) value, which signified the ratio of the indirect effect influence to the total influence. The formula for measuring VAF is shown below:

$$\text{VAF} = \frac{a*b}{a*b+c} \quad (4.1)$$

Where:

a = is coefficient value between independent variable and mediating variable

b = is coefficient value between mediating variable and dependent variable

c = is coefficient value between independent variable and dependent variable

Table 4.10
Mediating Effect

Hypo	Relationship	Beta	t-value	CI-Min	CI-Max	Sig.	Decision
H8: Mediating Effect of Collective Leadership (CL)							
H8a	TSV➔CL➔TE	0.037	0.230	-0.069	0.087	0.409	No Mediation
H8b	TC➔CL➔TE	0.047	0.233	-0.257	0.213	0.408	No Mediation
H8c	TCOL➔CL➔TE	0.141	0.236	-.068	0.057	0.000	Mediation

Notes: Team Shared Vision (TSV), Team Commitment (TC), Team Collaboration (TCOL), Collective Leadership (CL), Team Virtuality (TV), Team Effectiveness (TE)

This study confirmed no mediating role of collective leadership on the positive influence of team shared vision, team commitment and team collaboration on team effectiveness with 5,000 subsamples and 417 cases. After including the mediator construct, collective leadership, in the model, the bootstrapping result of 5,000 samples was used to multiply path a and b. Then the product of the two significant paths was divided by the standard error of the product of the two paths to find the t-value. It was therefore clear from Table 4.10 that collective leadership had no mediation effect on the positive relationship between team shared vision and team effectiveness ($\beta = 0.037$; $t = 0.230$; $p = 0.409$), team commitment and team effectiveness ($\beta = 0.047$; $t = 0.233$; $p = 0.408$) and team collaboration and team effectiveness ($\beta = 0.141$; $t = 0.236$; $p = 0.000$).

4.9.2 Mediation Result for Team Shared Vision

Based on Table 4.10 above, this section showed results of the no mediating effect of collective leadership on the relationship between team shared vision and team effectiveness. The result revealed that a VAF value of 13.86% of the total influence of team shared vision on team effectiveness was explained by the indirect effect of collective leadership and that the mediation of collective leadership was no mediation. Thus, this study concluded that, while a shared vision could inspire and align team members toward common goals and collective leadership could enhance communication and collaboration, these factors might have operated somewhat independently in healthcare settings, consistent with literature noting that collective leadership functioned as a dynamic, shared and rotating leadership process (Brun et al., 2020; Carson et al., 2007). In many healthcare scenarios, individual decision-making and specialized expertise were crucial due to the critical and time-sensitive nature of patient care, aligning with arguments that hierarchical or highly interdependent clinical environments influenced how leadership was practiced (Song & Gu, 2024; Yoo et al., 2022). Consequently, collective leadership might not always have mediated the relationship between shared vision and team effectiveness because team members still needed to exercise their autonomy and expertise to address immediate patient needs (Lal & Khan, 2023). Additionally, the impact of shared vision on team effectiveness might have been direct, without necessarily relying on collective leadership as an intermediary, as shown in studies where shared vision improved outcomes independent of leadership mediation (Berson et al., 2014). Thus, in healthcare, the mediating role of collective leadership in the relationship between shared vision and team effectiveness might not always have been evident or statistically significant due to the unique and multifaceted demands of the field (Brun & McAuliffe, 2022; Jung et al., 2022).

$$\text{VAF (TSV)} = \frac{0.037}{0.037+0.230} = 13.86\% \tag{4.2}$$

4.9.3 Mediation Result for Team Commitment

Based on Table 4.10, this section showed results of the no mediating influence of collective leadership on the relationship between team commitment and team effectiveness (Zhao et al., 2010; Knippenberg et al., 2024). The result revealed that a VAF value of 17% of the total influence of team commitment on team effectiveness was explained by the indirect effect of collective leadership and that the mediation of collective leadership was no mediation (Hair et al., 2017). Thus, this study concluded that team members could individually contribute to patient care based on their commitment and specialized skills without the direct mediation of collective leadership (Kim & Shin, 2021; Damamik et al., 2021; Khan, 2020).

$$\text{VAF (TC)} = \frac{0.047}{0.047+0.233} = 17\% \tag{4.3}$$

4.9.4 Mediation Result for Team Collaboration

Based on Table 4.10, this section showed results of the mediating influence of collective leadership on the relationship between team collaboration and team effectiveness. The result revealed statistically and moderately significant effects, signifying a mediating effect of collective leadership ($\beta = 0.141$; $t = 0.236$; $p = 0.000$). This result was in line with Zhao et al. (2010) for mediation testing, as this result disclosed complimentary mediation, meaning that mediation existed significantly in both direct and indirect effects. Collective leadership was a medium through which team collaboration influenced team effectiveness (Brun et al., 2020; Gonzalez-Mule et al., 2016; Zhang et al., 2012).

Therefore, based on this study, the existence of collective leadership among the team served as a way through which team collaboration influenced team effectiveness. In addition, this study assessed the size of the indirect effect, which was the mediating influence of collective leadership on the relationship between team collaboration and team effectiveness, using Variance Accounted For (VAF) (Hair et al., 2017). A VAF value of 37% of the total influence of team collaboration on team effectiveness was

explained by the indirect effect of collective leadership, and the mediation of collective leadership was partial mediation (Hair et al., 2017).

$$\text{VAF (TCOL)} = \frac{0.141}{0.141+0.236} = 37\% \quad (4.4)$$

This study concluded that team collaboration increased an environment where healthcare professionals actively engaged, shared knowledge and collectively made decisions, which aligned with the essence of collective leadership (Gonzalez-Mule et al., 2016; Hayat et al., 2024). Collective leadership, in turn, enhanced communication, coordination and a shared sense of responsibility among team members (Brun et al., 2020; Brun & McAuliffe, 2022). When collective leadership was present, it could mediate the relationship between team collaboration and team effectiveness by ensuring that collaborative efforts translated into effective decision-making and coordinated actions (Zhang et al., 2012; Song & Gu, 2024). This mediation was particularly relevant in healthcare, where seamless collaboration among multidisciplinary teams was critical for optimizing patient care outcomes (Gu et al., 2020; Hadi & Chaudhary, 2021). The statistical significance of this mediation effect was demonstrated through measurable improvements in patient outcomes, quality of care and overall team performance, underscoring the importance of collective leadership as a mediator in enhancing team effectiveness within healthcare settings (Day et al., 2006; Williams et al., 2010).

4.10 Testing Moderation Effect

In order to detect and estimate the strength of the moderating effect of team virtuality on the relationship between collective leadership and team effectiveness, the present study applied a product indicator approach using PLS-SEM (Henseler & Chin, 2010). The approach was considered suitable in this study because the moderating variable was continuous (Rigdon et al., 1998).

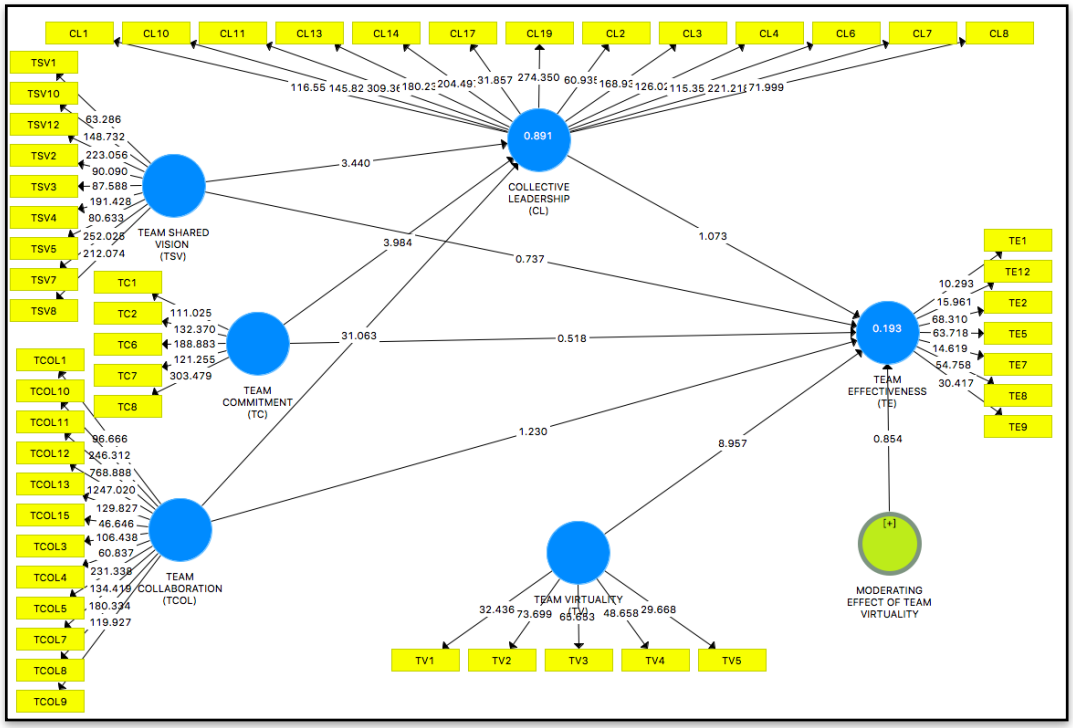

Figure 4.6 Moderation Model

According to Henseler and Fassott (2010), given that the results of the product term approach were usually equal or superior to those of the group comparison approach, they recommended always using the product term approach.

Table 4.11
Moderation Result

Hypo	Relationship	Beta	t-value	Sig.	Decision
H9	TV*CL➔TE	0.057	0.854	0.393	Not Supported

Notes: Collective Leadership (CL), Team Virtuality (TV), Team Effectiveness (TE)

To apply the product indicator approach in the moderating effect of team virtuality on the relationship between collective leadership and team effectiveness testing, the product terms among the indicators of independent variables and the indicator of the moderator variable needed to be created; hence, these product terms were used as indicators of the interaction term in the structural model (Kenny & Judd, 1984). Additionally, to determine the strength of the moderating effect, the current study applied Cohen (1988) guidelines for determining the effect size. Table 4.11 showed the estimates after applying the product indicator approach to study the

moderating effect of team virtuality on the relationship between exogenous and endogenous latent variables.

It could be recalled that hypothesis 9 stated that team virtuality moderated the relationship between collective leadership and team effectiveness. Precisely, this meant that the relationship was stronger for nurses with team virtuality than it was for hospitals with low team virtuality. The result in Table 4.11 indicated that the interaction terms representing collective leadership x team virtuality ($\beta = 0.057$; $t = 0.854$; $p < 0.393$) was statistically not significant. Therefore, hypothesis 9 was fully rejected. The result indicated no moderating effect of team virtuality on the relationship between collective leadership and team effectiveness, which aligned with studies showing that virtuality could dilute leadership influence and reduce the effectiveness of collective leadership processes (Purvanova & Kenda, 2021; Ganesh & Gupta, 2010).

The result of the study indicated that, in virtual settings, team members often collaborated remotely, which could introduce barriers to communication, coordination, and the development of collective leadership, consistent with findings that virtual communication reduced interpersonal cues and slowed information exchange (Nuratri et al., 2021; Petreska, 2022). While collective leadership was important for enhancing teamwork and decision-making in healthcare, the limitations of virtuality, such as potential working time differences, limited face-to-face interaction and reliance on technology, might have hindered the full realization of collective leadership's potential impact (Christodoulou et al., 2024; Shi et al., 2023; Yang et al., 2022). As a result, the moderating effect of team virtuality might not have been significant, as the challenges posed by virtuality could have outweighed the potential benefits of collective leadership, making it more challenging to achieve the same level of team effectiveness seen in co-located healthcare teams (Swart et al., 2022; Marrison-Smith & Ruiz, 2020).

4.11 Importance Performance Matrix Analysis

As an extension to the results, this study undertook a post-hoc importance-performance matrix analysis (IPMA) using team shared vision, team commitment and team collaboration as variables and collective leadership and team effectiveness as the target construct. The significance of this analysis was that it revealed the most

significant factor (Hair et al., 2024) (among the ones identified in this study) for collective leadership and team effectiveness.

Table 4.12
Performance and Total Effect

Target Construct	Collective Leadership		Team Effectiveness	
Variables	Total Effect	Performance	Total Effect	Performance
TSV	0.185	77.315	-0.095	77.315
TC	-0.278	75.516	0.085	75.516
TCOL	0.859	77.399	0.056	77.399
CL	-	-	-0.032	70.432
TV	-	-	-	-

Notes: Team Shared Vision (TSV), Team Commitment (TC), Team Collaboration (TCOL), Collective Leadership (CL), Team Virtuality (TV)

Based on Table 4.12, it could be observed that team collaboration was the most important factor in predicting collective leadership, as reflected by its highest effect value compared to the rest of the variables, followed by team shared vision and team commitment. As for the most important factor in predicting team effectiveness, it showed that team commitment had the highest effect value compared to the rest of the variables, followed by team collaboration, collective leadership and team shared vision.

4.12 Chapter Summary

This chapter presented the justification for the use of PLS path modelling to measure the conceptual model in this study. As identified in the assessment of significance of the path coefficient, the key findings on the construct of the study were presented. In particular, this chapter highlighted the background of the respondents, results of the reliability, validity and structural model using SmartPLS, a component-based SEM technique considered appropriate to estimate the proposed hypotheses and structural model, with its flexibility in modelling the construct. In general, the self-report technique had provided considerable support for the direct relationship of team shared vision, team commitment and team collaboration in the relationship with collective leadership. Specifically, the path coefficients revealed a significant positive

relationship between team shared vision, team commitment and team collaboration and collective leadership among nurses in Malaysia.

In addition, hypotheses of indirect relationship (mediation) were tested. The results of the three indirect relationship revealed that collective leadership insignificantly mediated the relationship between team shared vision and team commitment with team effectiveness; however, this study revealed that collective leadership mediated the relationship between team collaboration and team effectiveness among nurses in Malaysia. Additionally, relating to the moderating effect of team virtuality on the relationship between collective leadership and team effectiveness, PLS path coefficients revealed that the formulated hypothesis on the moderation of team virtuality on the relationship between collective leadership and team effectiveness was insignificant. Table 4.13 presented the summary of the hypothesis testing. The next chapter discussed further the findings, implications, limitations, suggestions for future research directions and conclusion of the study.

Table 4.13
Summary of hypotheses testing

No	Hypotheses Statement	Result
H1	Team shared vision has a significant positive effect on team effectiveness among Nurses in Malaysia	Not Supported
H2	Team commitment has a significant positive effect on team effectiveness among Nurses in Malaysia	Not Supported
H3	Team collaboration has a significant positive effect on team effectiveness among Nurses in Malaysia	Not Supported
H4	Team shared vision has a significant positive effect on collective leadership among Nurses in Malaysia	Supported
H5	Team commitment has a significant positive effect on collective leadership among Nurses in Malaysia	Supported
H6	Team collaboration has a significant positive effect on collective leadership among the Nurses in Malaysia	Supported
H7	Collective leadership has a significant positive effect on team effectiveness among Nurses in Malaysia	Not Supported
H8	Collective leadership significantly mediates the relationship between key elements of teamwork and team effectiveness among Nurses in Malaysia	

	H8a: Collective leadership significantly mediates the relationship between team shared vision and team effectiveness among Nurses in Malaysia	Not Supported
	H8b: Collective leadership significantly mediates the relationship between team commitment and team effectiveness among Nurses in Malaysia.	Not Supported
	H8c: Collective leadership significantly mediates the relationship between team collaboration and team effectiveness among Nurses in Malaysia	Supported
H9	Team virtuality significantly moderates the relationship between collective leadership and team effectiveness among Nurses in Malaysia	Not Supported

CHAPTER 5
DISCUSSION AND CONCLUSIONS

5.1 Introduction

In the previous chapter, the results of the study were presented. This chapter discusses the main research outcomes in the context of the research questions, hypotheses and literature review presented in the preceding chapter. Specifically, this chapter is organised into four parts as follows: Section Two discusses the findings of the study, and Section Three discusses the findings based on the underpinning theories and previous studies. The theoretical, methodological and practical implications of the study are discussed in Section Four. In Section Five, the limitations of the study are noted and, based on these limitations, recommendations for future research directions are made. In the final section, the conclusion is drawn based on the findings and discussion.

5.2 Summary of Findings

The primary objective of this study was to examine the mediating effect of collective leadership and the moderating effect of team virtuality on the relationships among team shared vision, team commitment and team collaboration with team effectiveness. Data were obtained from registered nurses working in twelve general hospitals in Malaysia, whose perceptions, attitudes and behaviours formed the empirical basis for testing the hypotheses and addressing the research objectives. The findings were discussed in relation to the research questions derived from the problem statement, allowing the study to empirically evaluate how teamwork processes translated into team effectiveness within hierarchical and resource-constrained hospital environments.

This study employed Relational Coordination Theory (RCT) and Social Information Processing Theory (SIPT) as the theoretical foundations. RCT posits that shared goals, shared knowledge and mutual respect strengthen communication and

coordination (Brun & McAuliffe, 2022; Akrour et al., 2025), while SIPT emphasises how individuals interpret and act upon social cues and work information (Salancik & Pfeffer, 1978; Azeem & Maturana-Dos-Santos, 2019). Together, these theories provided a lens to understand how teamwork inputs increase collective leadership and effectiveness in Malaysian public hospitals, where high interdependence and complex care coordination were part of daily nursing work.

Subsequently data were gathered from registered nurse in twelve general hospital in Malaysia to support the developed framework and hypotheses. A total of 417 questionnaire were distributed among the nurses with help from matron in twelve general hospital in Malaysia. Out of 417, all of the questionnaire were usable and analysed. The internal consistency of the measure was tested by computing the Cronbach alpha. The construct validity was then measured by computing the convergent and construct validity. Finally, the data were analysed using structural equation modelling (PLS technique) to test the hypotheses of the study.

The key findings revealed several important insights that advanced the understanding of how teamwork inputs, leadership processes and contextual factors interacted to influence team effectiveness within Malaysia public hospital settings. Firstly, team shared vision revealed a positive but not significantly effect on team effectiveness, suggesting that contextual constraints such as hierarchical decision-making structures, task complexity and resource pressures may have decreasing the influence of vision alignment on actual team effectiveness (Mai et al., 2022; Tredget et al., 2023; Doorn et al., 2013; Schmidt & Umans, 2024). However, shared vision remained a significant predictor of collective leadership, indicating that even within formalised hospital systems, a unifying purpose could strengthen mutual influence, distributed decision-making and coordinated action (Xu et al., 2022; Brun & McAuliffe, 2022; Ensley et al., 2006).

Second, team commitment confirmed a direct, positive but insignificants effect on team effectiveness. This finding aligned with studies showing that the effects of commitment different based on contextual and structural conditions such as workload intensity, autonomy limitations and hierarchical relationships (Paolucci et al., 2018; Kocoglu et al., 2019; Porter, 2005). In highly structured healthcare settings, competence, expertise and rapid situational judgment may overshadow the motivational

influence of commitment on effectiveness (Paolucci et al., 2018; Kocoglu et al., 2019; Porter, 2005).

Third, team collaboration also demonstrated a positive but non-significant effect on team effectiveness. This outcome reflected empirical evidence that collaboration is often moderated by professional boundaries, communication hierarchies and variability in role clarity, which can impede the full realisation of collaborative benefits (Sudeshika et al., 2021; Reeves et al., 2017; Gupta et al., 2024; Tidman, 2022). Despite its recognised importance in healthcare, collaboration may not consistently translate into measurable performance gains when overshadowed by structural or operational constraints (Noyes, 2025; Bose et al., 2025; McKinlay et al., 2019).

Fourth, collective leadership was significantly influenced by team shared vision, confirmed that when a clear and meaningful purpose is collectively understood, leadership becomes more distributed, relational and shared among team members (Han et al., 2021; Gabriel & Medina, 2022; Joniakova et al., 2021). This finding supported the theoretical proposition that shared vision enhances the relational and cognitive conditions that enable individuals to assume leadership roles based on expertise rather than hierarchy (Best et al., 2012; Gram-Hanssen, 2021). The emergence of collective leadership within Malaysian public hospitals thus highlighted the potential for shared purpose to mitigate structural barriers to distributed leadership (Royani et al., 2024).

Lastly, neither the mediating effect of collective leadership or the moderating effect of team virtuality revealed statistically significant effect on team effectiveness (Han et al., 2021; Wu et al., 2018; Xu et al., 2022; Royani et al., 2024). These results suggested that in high-acuity, fast-paced healthcare environments, the effectiveness of teams depend more heavily on structural factors, clinical competencies and real-time situational demands rather than on relational or virtual coordination indicators (Paolucci et al., 2018; Kocoglu et al., 2019; Doorn et al., 2013; Schmidt & Umans, 2024; McKinlay et al., 2019; O'Daniel & Rosenstein, 2008). Overall, these findings contributed new empirical evidence by demonstrating that while shared vision played a main role in increasing collective leadership, team effectiveness among Malaysian nurses was not significantly effect by shared vision, commitment or collaboration. Instead, the study highlighted the strong contextual influence of hierarchical structures, task complexity and resource demands on the functioning and outcomes of healthcare

teams (Paolucci et al., 2018; Kocoglu et al., 2019; Reeves et al., 2017; Sudeshika et al., 2021; Noyes, 2025; Royani et al., 2024).

5.3 Discussion of the Findings

Succeeding the summary of findings above, the following subsections discuss and justify each significant and insignificant result of this study in detail, while connecting and commenting on the implications of the findings for the employed theories and existing literature. This section discusses the research findings on the relationship found between team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness among nurses in twelve general hospitals in Malaysia. It also discusses the mediating role of collective leadership on the relationship between team shared vision, team commitment and team collaboration with team effectiveness. Finally, this section discusses the moderating effect of team virtuality on the relationship between collective leadership and team effectiveness among nurses in twelve general hospitals in Malaysia.

5.3.1 The Effect of Team Shared Vision on Team Effectiveness

The first objective of this study was to examine the relationship between team shared vision and team effectiveness among registered nurses across twelve general hospitals in Malaysia. Hypothesis 1 proposed that team shared vision would have a significant positive effect on team effectiveness. This hypothesis was tested using Partial Least Squares Structural Equation Modeling. However, the results revealed that the relationship between team shared vision and team effectiveness was positive but statistically insignificant, indicating that the hypothesis 1 was rejected. Although this study revealed contradictory result from theoretical expectations, it offered important insights when interpreted through Relational Coordination Theory and Social Information Processing Theory. Prior studies described shared vision as a guiding element that aligned team members toward a collective direction and purpose (Amiruddin et al., 2021; Mustapa et al., 2024). Researchers such as Xu et al. (2022) and Matsuo (2022) emphasised that clarity of vision enhanced collaboration and

commitment. Social Information Processing Theory similarly proposed that shared interpretive frameworks guided team members' understanding of roles and responses to situational cues (Chen et al., 2013; He et al., 2020). Despite these contradictory, the findings of this study revealed that the presence of shared vision among nurses not automatically translate into higher team effectiveness in the hospital context (Unai & Yilmaz, 2025; Long et al., 2016; Welp et al., 2016).

The insignificant relationship of this relationship showed the operational realities of healthcare work where nursing teams functioned within environments marked by urgency, unpredictability, and clinical complexity (Gao et al., 2020; Xu & Stark, 2021; Bragadottir et al., 2024). In such settings, the practical demands of patient care tended to outweigh strategic aspirations, consistent with insights from Liorens et al. (2025) and James (2021), who noted that immediate situational demands often shaped work behaviour more strongly than shared goals. When nurses were required to make immediate patient-oriented decisions, team effectiveness was shaped more by situational competence, task clarity, and real-time communication than by long-term shared visions, same result was revealed by Rich et al. (2010) and Yunyi et al. (2024). Consequently, although shared vision may have existed at the cognitive level, its impact became diluted by the dominance of immediate operational priorities (Jurd & Barr, 2024; Gong et al., 2025).

The findings further indicated that the fragmented and multidisciplinary nature of hospital work influence the direct effect of shared vision (Mrayyan & Algunmeeyn, 2025; Karatepe & Turkmen, 2022). Nursing teams operated across specialised units with differing routines, patient needs, and task structures (Chai et al., 2017). This fragmentation meant that coordination was often driven by protocol adherence, shift-based responsibilities, and clinical urgency rather than by long-term goals, consistent with Somboonpakorn and Kantabutra (2014) and Colakoglu (2012), who argued that shared vision required consistent reinforcement to influence behaviour. Through the lens of Social Information Processing Theory, nurses' interpretations of their work were more heavily influenced by immediate contextual cues, such as patient conditions or the directives of senior staff (Valentine et al., 2019), than by higher-level strategic alignment.

Relational Coordination Theory also clarified why shared vision may not have exerted a significant influence. Effective relational coordination required strength across relational dimensions including shared goals, shared knowledge, and mutual respect (Deneckere et al., 2010; Spitzer et al., 2023). In Malaysian public hospitals, where communication norms were hierarchical and decision-making autonomy was regulated, shared vision alone not sufficient to generate the relational dynamics needed for enhanced team effectiveness (Pursio et al., 2021; 2023). Nurses typically coordinated through structured reporting systems and formal communication channels (Haverhals et al., 2022), which may have reduced the functional importance of shared vision.

This study's findings aligned with study of Mai et al. (2022) and Tredget et al. (2023), who reported non-significant relationships between shared vision and performance outcomes in complex settings. Doorn et al. (2013) similarly found that the impact of shared vision varied across organisational environments, while Schmidt and Umans (2024) argued that hierarchy and communication culture could weaken its influence. These studies supported the contextual dependency of shared vision and indicated that its impact was not universal.

The contribution of this study lies in demonstrating that the influence of team shared vision on team effectiveness not same in across contexts. By integrating insights from Relational Coordination Theory and Social Information Processing Theory, this study showed that shared vision not function as a critical determinant of team effectiveness in an environment where high patient loads, resource constraints, and hierarchical structures restricted opportunities for collaborative meaning-making (Tingvold & Munkerjord, 2020; Azizan et al., 2021). This finding advanced theoretical understanding by illustrating that shared vision have been overshadowed by more immediate relational and contextual factors in healthcare settings.

In conclusion, the insignificant relationship between shared vision and team effectiveness reflected the dominance of clinical urgency, structured workflows, and hierarchical communication in shaping nurses' daily performance. These results challenged assumptions that shared vision alone strengthened team functioning and suggested that its influence may have been contingent upon supportive relational conditions, communication quality, and contextual flexibility. Future research should

investigate how shared vision interacts with relational coordination processes, psychological safety, and contextual constraints to influence team effectiveness in complex healthcare environments.

5.3.2 The Effect of Team Commitment on Team Effectiveness

The second objective of this study was to examine the relationship between team commitment and team effectiveness among registered nurses in twelve general hospitals across Malaysia. Hypothesis 2 proposed that team commitment would have a significant and positive effect on team effectiveness. However, the findings revealed that the effect was positive but statistically insignificant, indicating that the hypothesis was not supported (Paolucci et al., 2018). This result suggests that although nurses demonstrated commitment to their teams, the effect of team commitment on team effectiveness was limited by contextual, structural and operational features of the Malaysian healthcare system (Kocoglu et al., 2019).

Interpreted through Relational Coordination Theory, this finding indicates that the presence of commitment alone was not sufficient to produce high-quality coordination (Aube & Rousseau, 2005). RCT proposes that team effectiveness depends on the combined strength of shared goals, shared knowledge and mutual respect, expressed through timely, accurate and problem-solving communication (Williams et al., 2023). Commitment reflects an important relational condition, however without adequate communication structures or shared understanding of clinical tasks, it cannot fully support coordinated action (Husarek et al., 2024). The absence of a significant relationship therefore indicates that nurses' commitment existed in isolation from other relational elements required for effective coordination (Rusdi & Wibowo, 2022).

Social Information Processing Theory offers additional insight by suggesting that nurses' perceptions of their work environment and the cues they received during daily tasks shaped their behaviours more strongly than abstract feelings of commitment (McCullough et al., 2015). In environments where information flow was fragmented, decisions were shaped by urgency and communication was mediated through hierarchical structures (Alona et al., 2021). Under these conditions, commitment may have been overshadowed by the need to respond to immediate clinical demands

(Dasgupta, 2024). Thus, nurses' behaviour may have been driven more by situational cues, shift routines and task pressure than by their overall commitment to the team (Hwang & Joo, 2017).

Resource constraints provide a concrete explanation for why team commitment not improve team effectiveness (Samad et al., 2024). Many Malaysian public hospitals operated with limited staffing, high patient volumes and shortages of essential equipment (Bragadottir et al., 2023). Such structural limitations created barriers that commitment alone could not overcome (Ahn & Lee, 2021). Even highly committed nurses have struggled to deliver effective care when confronted with heavy workloads and insufficient organisational support (Zheng & Wang, 2025). When structural barriers were persistent, relational factors such as commitment lost their predictive power (Dasgupta, 2024). Nurses may have felt motivated and loyal to their teams, however remained unable to translate these attitudes into practice due to systemic constraints (Husarek et al., 2024). The findings therefore highlight that commitment required adequate resources before it could meaningfully contribute to team effectiveness (Rusdi & Wibowo, 2022).

Leadership also played an essential role in shaping whether commitment could influence effectiveness (Aube & Rousseau, 2005). RCT emphasises the importance of respectful and problem-solving communication, conditions shaped largely by leadership practices (Williams et al., 2023). However, many Malaysian hospitals relied on hierarchical decision-making structures where communication flowed downward and team-level autonomy was limited (Alona et al., 2021). Under such conditions, nurses may have remained committed to their work but lacked clarity, guidance or empowerment to act on that commitment (Hwang & Joo, 2017). When leaders not articulate shared goals or facilitate collaboration, commitment could not translate into coordinated team performance (Nunes et al., 2014). SIPT similarly suggests that when nurses received inconsistent messages or unclear expectations, they relied more on immediate contextual cues than on attitudinal commitments (Rusdi & Wibowo, 2022). This study's results therefore indicate that leadership behaviours and communication patterns weakened the link between commitment and team effectiveness (Paolucci et al., 2018).

The complexity of nursing work also helps explain the insignificant effect found by Ahn & Lee, (2021). Nursing involved diverse tasks requiring clinical judgment, technical competencies and rapid decision-making (Samad et al., 2024). These requirements often overrode relational or motivational influences (Bragadottir et al., 2023). In demanding clinical settings, effectiveness depended heavily on specialised knowledge and immediate coordination rather than on commitment (Marchand & Vandenberghe, 2013). SIPT suggests that individuals respond strongly to situational cues;, therefore, complex scenarios may have drawn nurses' attention away from relational attitudes and toward task-specific actions (Rusdi & Wibowo, 2022). This dynamic weakened the direct influence of commitment on team effectivenss (Van Beek, 2011). These findings suggest that emotional or attitudinal factors have played secondary roles in high-stakes environments (Senel & Ulas, 2022).

The finding of this study are consistent with earlier studies that documented limited direct effects of commitment on effectiveness in demanding or resource-limited contexts (Porter, 2005). Kocoglu et al. (2019) found that the influence of commitment depended strongly on structural features such as hierarchy, leadership style and autonomy. Uraon et al. (2023) demonstrated that in large teams, high commitment could reduce open communication and weaken the link between trust and listening. Paolucci et al. (2018) noted that affective commitment was influential during early team development but weakened as teams matured. These studies collectively show that although commitment generally supports effectiveness, its influence varies based on contextual and structural conditions (Paolucci, 2019).

This study also contributes a theoretical understanding by showing that the assumptions of Relational Coordination Theory could not be realised when relational dimensions were not sufficiently present (Aube & Rousseau, 2005). While team commitment aligns with mutual respect, it cannot support coordinated performance without shared knowledge and shared goals communicated through timely and accurate exchanges (Williams et al., 2023). The absence of these broader relational conditions in Malaysian hospitals helps explain why commitment did not contribute significantly to team effectiveness (Husarek et al., 2024).

In summary, the insignificant relationship between team commitment and team effectiveness suggests that commitment, although psychologically important, not

independently drive performance in highly complex and resource-constrained environments (Kocoglu et al., 2019). Structural barriers, hierarchical leadership, communication limitations and the demanding nature of nursing tasks all interacted to weaken this relationship (Alona et al., 2021). The study contributes to the literature by demonstrating that relational attributes such as commitment must be supported by communication processes, structural resources and shared situational understanding before they can exert meaningful influence on team effectiveness (Zheng & Wang, 2025). These findings underscore the need for an integrated approach to improving team performance, one that enhances relational coordination, strengthens communication systems and ensures adequate resources to translate commitment into improved effectiveness in Malaysian hospitals.

5.3.3 The Effect of Team Collaboration on Team Effectiveness

The third objective of this study was to examine the relationship between team collaboration and team effectiveness among registered nurses working in twelve general hospitals across Malaysia. Hypothesis 3 proposed that collaboration would have a significant and positive effect on effectiveness, consistent with the finding of Akrour et al., (2025), stated that, shared work processes and interdependent tasks are strengthened by coordinated teamwork. However, the finding of this study revealed an insignificant effect, and the hypothesis was therefore not supported (Udensi et al., 2025). This unexpected finding provides important insights into how collaboration functioned within the realities of Malaysian public healthcare settings and contributes to a more nuanced understanding of teamwork through the perspectives of Relational Coordination Theory and Social Information Processing Theory (Abelsen & Fosse, 2024).

Using Relational Coordination Theory, collaboration represents a relational process that requires shared goals, shared knowledge and mutual respect, supported by timely and problem-solving communication (Ullah et al., 2023). Although collaboration is widely recognized as essential in healthcare, the findings of this study suggested that these relational dimensions not sufficiently present or sustained to meaningfully influence effectiveness (Greilich et al., 2023). In highly pressured

environments where nurses must respond to emergencies, follow strict protocols and act quickly, collaboration often becomes fragmented, brief or/and task-specific (Reeves et al., 2017). As a result, the full relational complexity of collaboration envisioned by Relational Coordination Theory not have been achieved, weakening its relationship to enhance team effectiveness (Sudeshika et al., 2021). Social Information Processing Theory offers further insight by highlighting how nurses' behaviours were shaped by immediate cues within their work environment (Salancik & Pfeffer, 1978). When nurses operated in situations requiring rapid decisions and immediate responses to patient needs, they often relied more on personal judgment, clinical experience and established routines rather than collaborative interaction (McGuier et al., 2023). Social Information Processing Theory suggests that in such environments, information exchanged through quick situational cues can become more influential than the relational attitude of collaboration (Ding et al., 2024). This helps explain why collaboration, although valued, not emerge as a strong predictor of effectiveness in this study (Abelsen & Fosse, 2024).

The high workload commonly observed in Malaysian hospitals also contributes to the insignificant finding (Primanto & Puspitasari, 2023). Heavy patient loads, staff shortages and time pressures restricted opportunities for nurses to engage in meaningful collaborative practices (Sudeshika et al., 2021). In such contexts, nurses often worked independently to complete time-sensitive tasks (Gupta et al., 2024). For instance, during medical emergencies, the priority shifted toward swift action based on individual expertise rather than collective discussion (Reeves et al., 2017). This necessity for immediate action reduced the scope for collaboration and limited its measurable influence on overall team functioning (Hedqvist et al., 2024). Communication challenges shaped by cultural and linguistic diversity within the workforce also help explain the weak relationship between collaboration and effectiveness (Gupta et al., 2024). Malaysian hospitals employ nurses from multiple ethnic and linguistic backgrounds, which, while enriching the workforce, may create communication gaps or hesitation in seeking clarification (Tidman, 2022). Misinterpretations or incomplete communication can limit the depth and quality of collaborative exchanges (Bose et al., 2025). When communication is impaired, the relational processes central to Relational

Coordination Theory are weakened, reducing the potential for collaboration to influence effectiveness (Noyes, 2025).

Hierarchical organizational structures further constrained collaborative engagement (O'Daniel & Rosenstein, 2008). In Malaysian hospitals, junior nurses often deferred to senior nurses or physicians, consistent with broader cultural norms that emphasize authority and respect (Arallah et al., 2021). This form of deference can limit open communication, discourage questioning and restrict shared decision-making (Noyes, 2025). Collaboration under such conditions becomes directive rather than mutual, limiting the opportunity for shared understanding and reducing its impact on effectiveness (McKinlay et al., 2019). In such settings, collaboration may resemble compliance rather than genuine relational coordination (Steward, 2018). Resource limitations add another explanatory dimension to inconsistent finding of this study (Primanto & Puspitasari, 2023). When hospitals faced shortages of staff, equipment or time, collaboration was often simplified into procedural exchanges, such as brief handovers or documentation updates (Tan et al., 2014). These transactional forms of collaboration ensured continuity of care but not cultivate the deeper relational ties, shared knowledge or coordinated problem-solving described in Relational Coordination Theory (Mickan et al., 2010). Without these relational qualities, collaboration may have appeared present on the surface however failed to influence effectiveness (Udensi et al., 2025).

The findings of this study are consistent with previous work that reported that collaboration does not always lead to strong team effectiveness under conditions of time pressure and hierarchical decision-making (McKinlay et al., 2019). However, the results diverge from theoretical expectations that collaboration is a central driver of effectiveness (Reeves et al., 2017). This divergence reinforces the need for contextualized interpretations of teamwork (Sudeshika et al., 2021). Many of the existing theoretical literature presumes enabling conditions such as adequate staffing, open communication and shared authority, conditions that may not have fully existed in Malaysian hospitals (Arallah et al., 2021). From a critical standpoint, the findings suggest that collaboration in Malaysian healthcare have been more procedural than integrative (Bose et al., 2025). Collaboration have occurred through routine administrative practices rather than through shared problem-solving, mutual support or

collective reflection (Tidman, 2022). This instrumental form of collaboration is insufficient to produce the relational depth required for significant improvements in team effectiveness (O'Connor et al., 2016).

In conclusion, this study found that team collaboration did not significantly influence team effectiveness among nurses in Malaysian public hospitals. This result emphasizes the importance of understanding how collaboration functioned within complex, resource-limited and hierarchical environments (Primanto & Puspitasari, 2023). Although collaboration remains theoretically relevant, its practical influence depends on relational, structural and cultural conditions that allow it to flourish (Abelsen & Fosse, 2024). The contribution of this study lies in demonstrating that collaboration alone was not enough to drive effectiveness in healthcare teams; it had to be supported by strong communication structures, shared understanding, empowering leadership and a conducive organizational environment (Akrour et al., 2025). Future efforts to enhance team effectiveness should therefore focus on strengthening relational coordination, improving communication processes and addressing structural barriers that limited the impact of collaboration in Malaysian hospitals.

5.3.4 The Effect of Team Shared Vision on Collective Leadership

The fourth objective of this study was to examine the relationship between team shared vision and collective leadership among registered nurses working in twelve general hospitals across Malaysia. Hypothesis 4 proposed that team shared vision has a positive and significant influence on collective leadership. The findings confirmed a positive and statistically significant effect, thereby supporting the hypothesis four (Han et al., 2021). This result shows that when nurses held a common understanding of goals, direction and purpose, they were more inclined to participate in collective leadership behaviours, and leadership became more distributed rather than concentrated in formal hierarchical roles (Groulx et al., 2023).

Viewed through the lens of Relational Coordination Theory, a shared vision strengthened the relational foundation needed for effective coordination by creating a unified sense of purpose among team members (Brun & McAuliffe, 2022). Relational Coordination Theory emphasizes that shared goals, shared knowledge and mutual

respect are essential conditions that support high-quality communication and collaborative work processes (Cheng et al., 2025). In this study, the presence of a shared vision helped nurses develop a common frame of reference about what their team objectives to achieve (Gram-Hanssen, 2021). This shared vision encouraged them to take initiative, contribute their expertise and assume leadership responsibilities when needed (Dionne et al., 2004). Shared vision therefore strengthened the relational ties among nurses and allowed leadership to emerge collectively rather than being confined to formal supervisory positions (Ensley et al., 2006).

Social Information Processing Theory further supports this interpretation (Azeem & Maturana-Dos-Santos, 2019). According to Social Information Processing Theory, individuals interpret social cues within their environment and adjust their behaviour based on perceived norms, expectations and shared meanings (Best et al., 2012). In the context of this study, a clear shared vision provided consistent informational cues about collective priorities and team expectations (Gabriel & Medina, 2022). These cues helped shape nurses' perceptions of what behaviours were appropriate and valued within their teams (Hayat et al., 2024). When team members repeatedly interpreted these cues as supportive of shared responsibility, initiative-taking and collaborative problem-solving, collective leadership behaviours naturally emerged (Wu et al., 2018). In essence, Social Information Processing Theory explains how a shared vision functions not only as a cognitive indocators but also as an informational guide that increase leadership engagement across different members of the team (Joniakova et al., 2021).

The significant relationship found in this study also reflects the functional realities of nursing work (Brun & McAuliffe, 2022). Nurses frequently managed complex patient needs, coordinated across departments and made time-sensitive decisions (Han et al., 2021). When a shared vision existed, nurses were better equipped to coordinate their actions because they understood the broader purpose of their work and the outcomes their team was striving to achieve (Gabriel & Medina, 2022). This common understanding reduced reliance on top-down directives and nurtured a form of leadership that was fluid, adaptive and distributed based on situational demands (Groulx et al., 2023). The findings show that shared vision acted as a motivational and structural

mechanism that enabled nurses to step forward and lead when circumstances required it, even in the absence of formal authority (Xu et al., 2022).

The results are consistent with empirical evidence reported by Dionne et al., (2004), who found that shared vision contributed to greater collaboration, stronger relational bonds and more effective distributed leadership across work settings. However, the present study contributes new contextual insights by demonstrating that the relationship between shared vision and collective leadership remained strong even within the traditionally hierarchical and structurally rigid environment of Malaysian public hospitals (Royani et al., 2024). This finding is noteworthy because it suggests that a shared vision can mitigate the restrictive effects of hierarchy by providing a common platform that encourages nurses to engage in shared decision-making and collective leadership actions despite structural constraints (Zohra et al., 2023).

This study also provides an important contribution by showing that shared vision can function as a psychological enabler of leadership confidence (Ensley et al., 2006). When nurses perceived that their team held a unified purpose, they were more likely to feel responsible for contributing to team success (Gabriel & Medina, 2022). This sense of responsibility translated into behaviours such as proactive communication, initiating problem-solving and offering peer support (Hayat et al., 2024). These findings align with Relational Coordination Theory's argument that shared goals promote relational engagement and reinforce the willingness of individuals to contribute beyond formal duties (Cheng et al., 2025). They also align with Social Information Processing Theory by illustrating how shared vision serves as a social cue that signals the appropriateness of participating in leadership activities (Best et al., 2012).

Furthermore, the Malaysian healthcare environment provides a meaningful backdrop for interpreting these findings (Royani et al., 2024). Public hospitals in Malaysia often exhibit strong hierarchical cultures, with nurses expected to follow established protocols and defer to senior staff or medical officers (Zohra et al., 2023). Despite these constraints, the study's results demonstrate that shared vision can serve as a counterweight to hierarchical limitations by fostering relational alignment and shared understanding (Gram-Hanssen, 2021). This relational alignment helps create conditions in which leadership behaviour becomes more collective and less dependent

on formal authority (Brun & McAuliffe, 2022). Thus, shared vision enhances nurses' sense of ownership over their work and strengthens their willingness to contribute to team leadership processes (Hayat et al., 2024).

In conclusion, the significant and positive relationship between team shared vision and collective leadership revealed in this study confirms that a clear sense of shared purpose is an important driver of distributed leadership among nurses (Xu et al., 2022). The finding is consistent with expectations derived from Relational Coordination Theory and Social Information Processing Theory and provides strong evidence that shared vision aligns cognitions and shapes social behaviour in ways that promote collective leadership (Han et al., 2021). The study contributes to the growing understanding of how leadership emerges in healthcare teams by demonstrating that shared vision can overcome hierarchical constraints, strengthen relational coordination and support more adaptive and collaborative forms of leadership (Groulx et al., 2023). This underscores the importance of hospital management communicating clear team-level objectives and fostering a culture that supports shared purpose, thereby enhancing leadership capacity and teamwork quality within nursing teams.

5.3.5 The Effect of Team Commitment on Collective Leadership

The fifth objective of this study was to examine the relationship between team commitment and collective leadership among registered nurses working in twelve general hospitals across Malaysia. Hypothesis 5 proposed that team commitment would have a positive and significant effect on collective leadership. The results confirmed this relationship, showing that team commitment revealed a positive and statistically significant influence on collective leadership (Seibert et al., 2003). This finding demonstrates that when nurses held a strong emotional and psychological attachment to their teams, they were more willing to engage in collective leadership behaviours, participate actively in team decision-making and assume leadership responsibilities in a collective manner (Saira et al., 2020). The confirmation of this hypothesis provides insight into the role of commitment as an interpersonal and motivational resource that supports distributed leadership (Ribeiro et al., 2020).

Through the lens of Relational Coordination Theory, this significant relationship illustrates how strong interpersonal ties contributed to leadership emergence (Brun & McAuliffe, 2022). Relational Coordination Theory posits that shared goals, shared knowledge and mutual respect strengthen relational dynamics within teams, enabling members to coordinate more effectively (Binatari et al., 2022). Team commitment plays a direct role in this process by deepening mutual respect and reinforcing members' willingness to support one another (Damamik et al., 2021). When nurses felt committed to their team, they experienced a heightened sense of responsibility for collective success (Khan, 2020). This relational commitment encouraged them to communicate more openly, offer assistance proactively and collaborate in solving problems behaviours that naturally created conditions for leadership to be shared rather than centralized (Malloy et al., 2022). The relational bonds that developed through team commitment thus became a structural foundation that sustained collective leadership within nursing teams (Bakar & Connaughton, 2025).

Social Information Processing Theory also helps explain why committed nurses engaged more readily in collective leadership (Chiu et al., 2016). Social Information Processing Theory suggests that team members interpret and respond to social cues in their environment, learning what behaviours are expected and valued (Azeem & Maturana-Dos-Santos, 2019). In teams where strong commitment was visible, social cues signalled the importance of shared responsibility, cooperation and mutual support (Mustaqim, 2021). Nurses who observed these cues internalized them and mirrored the behaviours in their own actions (Ziegert et al., 2021). As a result, leadership became a distributed activity shaped by ongoing social interactions, not simply formal role assignments (Malloy & Kavussanu, 2021). In this context, team commitment functions as both a behavioural driver and an informational signal that reinforces collective engagement and leadership participation among team members (Bakar & Connaughton, 2025).

The significance of the relationship is also consistent with prior studies by Seibert et al., (2003), who found that committed teams were more likely to adopt participatory and reciprocal forms of leadership. Khan, (2020) emphasize that commitment fosters trust, cooperation and a willingness to coordinate efforts

voluntarily. The present study extends this evidence by confirming that such dynamics also occurred within the demanding and hierarchical environment of Malaysian hospitals (Malloy & Kavussanu, 2021). This contributes to the literature by demonstrating that even in systems with strong structural authority, team commitment enables leadership to surface collectively, particularly when clinical tasks require interdependence and coordination (Men & Jia, 2021). In high-pressure healthcare environments, committed nurses are more likely to step forward during emergencies, guide less experienced colleagues and contribute to team stability and performance (Mustaqim, 2021).

This finding has particular relevance in the Malaysian healthcare context, where hierarchical structures and bureaucratic processes often dominate organisational culture (Royani et al., 2024). In such environments, formal leadership not always be accessible in real time, particularly during emergencies or rapid changes in patient conditions (Zohra et al., 2023). Team commitment becomes an important mechanism that encourages nurses to transcend formal boundaries, take initiative and contribute to decision-making processes (Malloy & Kavussanu, 2021). The study therefore provides evidence that commitment can act as an informal counterbalance to structural hierarchy, creating space for more adaptive and participatory forms of leadership (Brun & McAuliffe, 2022). This contribution is valuable because it shows how relational and motivational factors can compensate for structural constraints within public hospitals (Men & Jia, 2021).

The finding also highlights an important cultural dimension (Kim & Shin, 2021). Malaysia's collectivist culture places strong emphasis on group harmony, loyalty and social relationship (Zohra et al., 2023). These cultural characteristics strengthen the influence of commitment on leadership emergence (Royani et al., 2024). In collectivist contexts, individuals who identify closely with their teams are more likely to engage in behaviours that reinforce unity and shared responsibility (Awen et al., 2024). Thus, the significant relationship observed in this study reinforces the idea that cultural values interact with relational dynamics to shape leadership patterns in healthcare teams (Hayat et al., 2024). The study's findings also address inconsistencies found in previous research across different sectors, where the relationship between commitment and leadership was sometimes reported as weak or non-significant (Brun

& McAuliffe, 2022). These mixed results can be attributed to differences in task interdependence, workplace culture and organizational climate (Malloy & Kavussanu, 2021). Unlike individualistic or competitive industries, nursing work relies heavily on teamwork, coordinated action and collective problem-solving (Damamik et al., 2021). This high level of interdependence increase the importance of commitment as a relational indicator that supports collective leadership (Ribeiro et al., 2020). The present study therefore contributes new empirical evidence showing that in interdependent, socially oriented and high-stakes environments, team commitment becomes an especially powerful predictor of collective leadership (Kim & Shin, 2021).

In summary, the significant effect of team commitment on collective leadership demonstrates that commitment serves as a crucial psychological and relational resource that motivates nurses to participate actively in collective leadership processes (Seibert et al., 2003). This study confirms that committed team members are more likely to exhibit initiative, responsibility and collaboration, strengthening the collective functioning of nursing teams (Damamik et al., 2021). Through Relational Coordination Theory and Social Information Processing Theory, the findings show that commitment enhances relational coordination and shapes social cues that encourage distributed leadership (Chiu et al., 2016). The study contributes to the literature by providing context-specific evidence from Malaysian hospitals, highlighting the potential of commitment to increase collective leadership even within hierarchical and resource-constrained settings (Royani et al., 2024). These results underscore the importance of strengthening team commitment through supportive leadership practices, recognition, empowerment and inclusive communication to enhance collective leadership and ultimately improve team performance and patient care outcomes.

5.3.6 The Effect of Team Collaboration on Collective Leadership

The sixth objective of this study was to examine the relationship between team collaboration and collective leadership among registered nurses working in twelve general hospitals across Malaysia. Hypothesis 6 proposed that team collaboration would have a positive and significant effect on collective leadership. The empirical results confirmed this relationship, revealing that team collaboration had a positive and

statistically significant effect on collective leadership (Asumadu et al., 2024). This finding indicates that nurses who worked collaboratively by sharing information, coordinating tasks and supporting one another created the relational conditions necessary for leadership to emerge collectively rather than through formal hierarchical structures (Morian et al., 2024).

The significant positive relationship suggests that collaboration served as the behavioural and relational foundation upon which collective leadership developed (Hayat et al., 2024). Within the demanding environment of Malaysian hospitals, collaborative practices strengthened the connections among nurses, enabling them to coordinate patient care, exchange clinical knowledge and respond effectively to complex situations (Bakht et al., 2024). As nurses engaged in ongoing collaboration, they naturally built trust, shared understanding and mutual respect, elements identified in Relational Coordination Theory as essential for high-quality teamwork (Fredericks, 2023). According to Relational Coordination Theory, shared goals, shared knowledge and mutual respect enhance relational coordination, and this improved relational fabric creates the conditions for leadership roles to shift fluidly among team members (Tai & Chang, 2023). Thus, in teams where collaboration was strong, leadership became a collectively and distributed process shaped by expertise, situational demands and communication patterns rather than by formal authority (Asumadu et al., 2024).

Social Information Processing Theory also provides insight into this finding by emphasizing how individuals interpret social cues within their work environment (Morian et al., 2024). Through repeated patterns of collaboration, nurses observed cues of mutual reliance, shared responsibility and open communication (Hayat et al., 2024). These cues signalled norms of participation, initiative-taking and peer support, which nurses internalized and reciprocated (Carron et al., 2021). Social Information Processing Theory therefore explains how collaborative behaviours shaped collective leadership by influencing how members made sense of appropriate actions within their teams (Joniakova et al., 2021). When collaboration was frequent and visible, nurses learned that leadership was not restricted to senior roles but was an expected and valued behaviour that could be enacted by anyone with the relevant knowledge or situational awareness (Asumadu et al., 2024). Consequently, leadership emerged as an outcome of ongoing social interactions rather than formal structures (Wang, 2024).

The positive relationship found in this study is consistent with earlier research showing that collaboration enhances communication, trust and shared responsibility, which in turn support collective leadership (Morian et al., 2024). Previous studies reported that collaborative environments create psychological safety, foster mutual learning and promote role flexibility, all necessary conditions for distributed leadership (Nakrem & Kvanneid, 2022). The present study adds to this body of knowledge by confirming that these relationship also occurred within Malaysian public hospitals, where collaboration was essential for responding to diverse clinical situations and high patient demands (Lin et al., 2013). From a theoretical perspective, the findings presented the central view of Relational Coordination Theory and Social Information Processing Theory by showing that collaboration is both a structural and interpretive mechanism that shapes leadership emergence (Hayat et al., 2024). Collaboration strengthens relationships, aligns actions and enhances understanding of team goals, all of which support collective leadership (Fredericks, 2023). Through Social Information Processing Theory, collaboration also provides the information cues that guide behaviour, helping nurses recognize when leadership is needed and encouraging them to assume responsibility in real time (Morian et al., 2024). This study therefore contributes to the theoretical view by demonstrating that relational and informational processes jointly explain how collaboration fosters collective leadership in highly interdependent healthcare settings (Asumadu et al., 2024).

The Malaysian healthcare context amplifies the importance of this finding (Bakht et al., 2024). Public hospitals often operate within hierarchical and bureaucratic structures where decision-making authority is concentrated among senior physicians or administrators (Osti et al., 2023). Despite this, the significant effect of collaboration suggests that informal leadership networks can form within nursing teams through relational and communicative practices (Kida et al., 2024). Collaborative engagement allows nurses to share expertise and influence clinical decisions even when formal structures limit autonomy (Cochran et al., 2023). This demonstrates that collaboration can serve as a indicators for balancing hierarchical constraints, enabling nurses to play active leadership roles in guiding patient care and coordinating team functions (D'Costa et al., 2024).

Furthermore, nursing work in Malaysia is characterized by rapidly changing patient conditions, high task interdependence and frequent cross-disciplinary interaction (Meneses-La-Riva et al., 2025). These conditions intensify the need for collaboration and make it a necessary component of effective patient care (Sudeshika et al., 2021). In such environments, leadership must remain flexible and responsive (Kerissey & Singer, 2023). Collaboration supports this flexibility by ensuring that knowledge and responsibility are distributed across the team (Lai et al., 2021). For example, in high-pressure contexts such as intensive care units, nurses relied heavily on collaborative communication to coordinate interventions, maintain situational awareness and adjust priorities (Aaberg et al., 2018). Leadership therefore shifted naturally among team members depending on who had the most relevant knowledge at a given moment, illustrating how collaboration sustained the fluidity of collective leadership (Yan et al., 2007).

Although the findings confirmed the hypothesized relationship, this also invite a critical consideration of the contextual conditions under which collaboration influenced leadership (Thistlethwaite & Nisbet, 2007). Collaboration in Malaysian hospitals may vary depending on workload intensity, resource availability and team culture (Kida et al., 2024). When staffing levels were insufficient or when communication barriers existed, collaborative efforts may have become fragmented or task-oriented rather than relationally deep (Sudeshika et al., 2021). In such cases, the capacity of collaboration to support collective leadership may be weakened (Osti et al., 2023). Nevertheless, the significant overall effect found in this study suggests that even in the presence of structural challenges, collaboration remained a strong predictor of collective leadership, highlighting the resilience of relational processes within nursing teams (Farchi et al., 2022). The contribution of this study lies in showing that collaboration is not depend on an operational necessity but a relational process that directly enables distributed leadership within Malaysian public hospitals (Bakht et al., 2024). While past research has demonstrated the importance of collaboration for team performance, this study extends the discussion by demonstrating that collaboration also drives how leadership emerges and functions collectively (Fredericks, 2023). This insight is particularly important for healthcare organisations seeking to improve team coordination, patient outcomes and staff empowerment (Meneses-La-Riva et al., 2025).

Strengthening collaborative practices through communication training, role clarity and supportive team culture can enhance nurses' collective leadership capacity and improve the adaptability of healthcare teams (Tai & Chang, 2023).

In summary, the study found that team collaboration had a positive and significant effect on collective leadership among nurses in Malaysia (Hayat et al., 2024). The finding aligns strongly with Relational Coordination Theory and Social Information Processing Theory, both of which explain how relational and communicative processes encourage leadership to emerge across team members (Morian et al., 2024). The study contributes to the understanding of collective leadership within Malaysian healthcare by demonstrating that collaboration can counterbalance hierarchical constraints and serve as the foundation for collective leadership (Asumadu et al., 2024). By fostering collaboration in nursing teams, healthcare institutions can build more cohesive, empowered and adaptive teams capable of delivering high-quality care in complex and rapidly changing clinical environments.

5.3.7 The Effect of Collective Leadership on Team Effectiveness

The seventh objective of this study was to examine the relationship between collective leadership and team effectiveness among registered nurses in twelve general hospitals across Malaysia. To address this objective, Hypothesis seven (H7) proposed that collective leadership have a positive and significant effect on team effectiveness. The hypothesis was tested using PLS path coefficient analysis. However, the results indicated that collective leadership have insignificant effect on team effectiveness. Thus, Hypothesis seven was not supported. This finding challenges conventional expectations and suggests that although collective leadership behaviours may have occurred within nursing teams, they did not directly translate into measurable improvements in performance, satisfaction or team viability within the studied context (Hadi & Chaudhary, 2021).

According to Relational Coordination Theory, team effectiveness arises from the strength of relational ties among team members, characterised by shared goals, shared knowledge and mutual respect, supported by timely and accurate communication (Zhao et al., 2024). While collective leadership theoretically enhances

these relational elements by encouraging shared influence and responsibility, its positive effects may only emerge when relational coordination is sufficiently strong (Paracha et al., 2022). In the context of Malaysian public hospitals, where hierarchical structures and formal protocols dominate team interactions, collective leadership may not have had the relational conditions necessary to fully influence outcomes (Brun & McAuliffe, 2020). Even when nurses engaged in collective leadership behaviours, these may have been constrained by limited authority, rigid role boundaries or insufficient opportunities for reciprocal communication, resulting in minimal impact on overall team effectiveness (Kjellstrom et al., 2020).

Social Information Processing Theory further clarifies the unexpected outcome by emphasising how individuals interpret and act upon social cues in their work environment (Anjara et al., 2021). Collective leadership requires team members to recognise cues that signal empowerment, shared responsibility and mutual trust (Morgeson et al., 2010). However, in fast-paced hospital settings characterised by high workload and top-down decision-making, nurses may have received competing or ambiguous cues (Chiu, 2016). For example, while peer collaboration might suggest that leadership was shared, strict procedural expectations, seniority norms or directive communication styles from supervisors may have signalled otherwise (Chen & Zhang, 2022). When such conflicting cues dominated the work environment, nurses have hesitated to enact or rely on collective leadership behaviours, restricting the extent to which collective leadership could influence team effectiveness (Wood & Fields, 2007). Social Information Processing Theory thus explains that the cognitive interpretation of workplace signals have moderated the influence of collective leadership even when such behaviours were present (Sweeney, 2022).

Several contextual and structural factors also help explain why collective leadership not significantly predict team effectiveness (Brun et al., 2020). First, Malaysian hospitals operate within highly hierarchical administrative systems where decision-making authority is concentrated at higher levels (Brun & McAuliffe, 2020). Even if nurses assumed informal leadership roles within their teams, these behaviours not have shaped outcomes that depended heavily on formal authority, such as resource allocation, policy implementation or clinical decision approval (Kjellstrom et al., 2020). Such constraints limit the practical influence of collective leadership behaviours on

measurable team effectiveness (Han et al., 2021). Second, the absence of psychological safety may have contributed to the insignificance (D'Innocenzo et al., 2016). Relational Coordination Theory emphasises that respectful, high-quality communication is central to relational coordination (Mustapa et al., 2024). When nurses worked under intense time pressure or feared negative repercussions for expressing dissent, opportunities for collective leadership diminished (Mayer et al., 2023). Social Information Processing Theory similarly suggests that workers interpret risks associated with speaking up or taking initiative (Anjara et al., 2021). If nurses perceived that shared influence was not genuinely supported, they may have engaged in leadership behaviours only minimally or inconsistently, weakening any measurable effect on team effectiveness (Han et al., 2021).

Third, the nature of nursing tasks, particularly those requiring time-sensitive and technically specialised responses, may limit the impact of collective leadership on effectiveness (Gu et al., 2020). In emergency units, intensive care settings and high-turnover wards, effectiveness depends more directly on clinical expertise, rapid decision-making and procedural accuracy than on collective leadership interactions (Kim & Han, 2019). Leadership that is collective and deliberative not have had the opportunity to shape outcomes in situations where actions must be immediate and protocol-driven (Mindeguai et al., 2021). Relational Coordination Theory acknowledges that shared knowledge and goals support coordination, but when tasks require individual precision and autonomous execution, relational processes such as collective leadership may exert weaker effects (Barnett & Weidenfeller, 2016). Social Information Processing Theory also helps explain that in these situations, nurses process situational cues that prioritise clinical urgency over relational influence, reducing the behavioural space for collective leadership to affect results (Song et al., 2019).

The contradiction between this study's findings and studies conducted in more participatory organisational environments highlights the importance of contextual fit (Hadi & Chaudhary, 2021). Research conducted in settings where empowerment, decentralisation and open communication are actively encouraged often reports strong positive relationships between collective leadership and team effectiveness (D'Innocenzo et al., 2016). In contrast, public hospitals in Malaysia remain structurally

and culturally hierarchical, which may attenuate the conditions under which collective leadership contributes to effectiveness (Brun & McAuliffe, 2020). This study therefore contributes by demonstrating that the effectiveness of collective leadership is contingent upon the organisational and relational environment (Kjellstrom et al., 2020). Without strong relational coordination and consistent cues supporting shared influence, collective leadership may not yield its expected benefits (Hudon et al., 2024).

This study suggests that although Relational Coordination Theory and Social Information Processing Theory explain how relational processes and information cues shape behaviour, they also reveal the limits of collective leadership when relational structures are weak or when situational cues suppress shared influence (Zhao et al., 2024). The absence of significance highlights that collective leadership alone is insufficient for improving effectiveness; instead, it must operate within a supportive relational context characterised by trust, clear communication channels and shared understanding (Day et al., 2004). This adds nuance to the theoretical discourse by showing that leadership distribution is heavily dependent on relational conditions rather than simply the presence of collaborative behaviours (Morgeson et al., 2010). Despite not supporting the hypothesis, this finding offers valuable contributions (Illahi et al., 2024). It demonstrates that collective leadership currently functions more as a relational process rather than an outcome determinant in Malaysian hospitals (Brun et al., 2020). It also underscores that leadership interventions require more than behavioural training, they require changes to structural conditions, communication norms and empowerment practices (Mayer et al., 2023). As such, Malaysian healthcare organisations must consider investing in relational coordination mechanisms, such as interdisciplinary communication protocols, empowerment initiatives and team-based reflection practices, to strengthen the relational foundations necessary for collective leadership to positively influence team effectiveness (Mustapa et al., 2024).

In conclusion, the study found that collective leadership have an insignificant effect on team effectiveness among nurses in Malaysian general hospitals (Brun et al., 2020). This result reflects a misalignment between collective leadership behaviours and the relational, structural and informational conditions necessary for their impact (Hudon et al., 2024). The analysis grounded in Relational Coordination Theory and Social Information Processing Theory shows that collective leadership can only enhance

effectiveness when strong relational coordination and clear informational cues support shared influence (D'Innocenzo et al., 2016). The findings contribute to the literature by demonstrating that in hierarchical and fast-paced healthcare systems, relational constraints may suppress the practical benefits of collective leadership (Kjellstrom et al., 2020). Strengthening the relational environment and organisational support systems may be essential steps before collective leadership can meaningfully improve team effectiveness in Malaysian nursing teams (Mayer et al., 2023).

5.3.8 Mediating Effect of Collective Leadership on the relationship between Team Shared Vision, Team Commitment and Team Collaboration with Team Effectiveness

In this section, research hypothesis eight (H8) was formulated in order to answer the research questions and achieve the eighth research objective, which stated that the study examined the mediating effect of collective leadership on the relationship between team shared vision, team commitment and team collaboration with team effectiveness among nurses in Malaysia. The specific hypotheses for the mediating effect of collective leadership are stated below:

5.3.8.1 Mediating effect of Collective Leadership on the relationship between Team Shared Vision with Team Effectiveness

In this section, Hypothesis 8a was formulated to examine whether collective leadership mediated the relationship between team shared vision and team effectiveness among nurses working in Malaysian public hospitals. The hypothesis proposed that when nurses shared a clear and common understanding of their team's purpose, this shared vision would increase the enactment of collective leadership, which in turn would improve overall team effectiveness (Brun & McAuliffe, 2022). Using PLS-SEM analysis, the results revealed that collective leadership not significantly mediate the relationship between team shared vision and team effectiveness (Groulx et al., 2023). Therefore, Hypothesis 8a was not supported.

This finding indicates that although a shared vision have helped nurses develop a sense of direction and unity, it not translate into improved team effectiveness through

collective leadership in the studied context (Joniakova et al., 2021). When viewed through the lens of Relational Coordination Theory, this outcome suggests that the relational conditions required for effective coordination, such as shared goals, shared knowledge, mutual respect and high-quality communication, were not sufficiently strong to transform shared vision into impactful leadership processes (Brun & McAuliffe, 2022). Relational Coordination Theory posits that shared goals alone are not enough; they must be accompanied by timely communication, respectful interaction and relational coherence (Gabriel & Medina, 2022). While nurses may have understood and endorsed the shared vision of their teams, the relational infrastructure required for collective leadership to amplify this vision into tangible outcomes may have been weak or inconsistently developed across the participating hospitals (Hayat et al., 2024).

Social Information Processing Theory offers further insight by emphasising that individuals' behaviours are shaped by the social cues present in their work environment (Azeem & Maturana-Dos-Santos, 2019). For collective leadership to serve as an effective mediator, nurses would need to interpret workplace signals as supportive of shared influence, initiative-taking and distributed decision-making (Best et al., 2012). However, in hierarchical healthcare systems such as Malaysia, the dominant cues often reinforce top-down authority, strict procedural compliance and deference to senior personnel (Royani et al., 2024). These cues overshadow any positive signals supporting collective leadership, thereby limiting the extent to which a shared vision could activate collective leadership behaviours that drive team effectiveness (Zohra et al., 2023). Social Information Processing Theory thus explains that even if nurses cognitively valued their shared vision, their behavioural responses may have been shaped by contextual signals that discouraged collective leadership practices (Asumadu et al., 2024).

Several contextual factors help explain why the mediating effect was not significant. First, the hierarchical organisational culture prevalent in Malaysian hospitals restricts the autonomy and influence necessary for collective leadership (Malloy & Kavussanu, 2021). Nurses are typically positioned at the lower end of decision-making structures, and despite their frontline expertise, they often have limited authority over clinical or organisational decisions (Men & Jia, 2021). Even if they strongly identified with a shared team vision, the opportunity to enact leadership

behaviours that influence team functioning have remained limited (Bakar & Connaughton, 2025). As a result, the shared vision have remained a cognitive alignment rather than a behavioural mechanism that shaped team effectiveness (Damamik et al., 2021).

Second, the highly demanding and time-sensitive nature of clinical work further restricts the development of collective leadership as a mediating roles (Sudeshika et al., 2021). Relational Coordination Theory acknowledges that relational coordination requires time and repeated interactions to build trust and shared understanding (Brun & McAuliffe, 2022). However, nurses often operate under severe time pressure, heavy high-workloads and strict procedural requirements, leaving limited room for reflective coordination or collective leadership practices (Nakrem & Kvanneid, 2022). Social Information Processing Theory also suggests that in such high-pressure environments, individuals prioritise cues emphasising urgency, compliance and individual competence over those supporting distributed leadership (Morian et al., 2024). Consequently, even when teams share a clear and meaningful vision, the everyday realities of clinical work may prevent the translation of that vision into collective leadership behaviours capable of enhancing team effectiveness (Aaberg et al., 2018).

Third, the disconnect between strategic-level vision and operational-level practice weaken the mediating relationship of collective leadership (Fredericks, 2023). Shared vision in healthcare organisations often centres on broad goals such as excellence in patient care or service quality (Kerissey & Singer, 2023). However, nurses' daily responsibilities revolve around immediate clinical needs and problem-solving (Tai & Chang, 2023). This misalignment lead to shared vision being acknowledged but not enacted through leadership behaviours that influence team functioning (Bakht et al., 2024). From a Social Information Processing Theory perspective, nurses interpret the shared vision as aspirational but not directly relevant to the immediate demands of their work, thus reducing its behavioural impact (Carron et al., 2021).

The finding also suggests that collective leadership function as a contingent rather than a consistent mediator (Hays, 2007). Relational Coordination Theory argues that relational coordination processes fluctuate depending on workload, trust levels and the complexity of team interactions (Lai et al., 2021). If collaborative leadership

behaviours among nurses were inconsistent or only partially developed due to contextual barriers, their ability to serve as a mediator becomes limited (Lin et al., 2013). Social Information Processing Theory further explains that inconsistent social cues can create ambiguity regarding collective leadership expectations, causing nurses to hesitate in assuming leadership roles even when they share a strong team vision (Yan et al., 2007).

This outcome contrasts with evidence from settings where organisational cultures actively encourage empowerment and shared decision-making (Mendez et al., 2008). Studies conducted in Western healthcare systems, for example, have demonstrated that shared vision often translates into improved effectiveness through collective leadership because the relational and informational conditions required for mediation are strongly present (Clark et al., 1986). In the Malaysian context, by contrast, cultural norms of high power distance and hierarchical authority may disrupt this pathway by reducing opportunities for shared influence and participatory leadership (Hall & Weaver, 2001). From a theoretical perspective, this finding challenges the assumption of a linear relationship between shared vision, leadership processes and team effectiveness (Hudon et al., 2024). Both Relational Coordination Theory and Social Information Processing Theory highlight that shared vision cannot automatically generate leadership processes capable of affecting outcomes unless organisational structures, relational conditions and social cues support such processes (Mustapa et al., 2024). The finding therefore enriches the theoretical understanding by showing that shared vision's influence on team effectiveness is highly contingent on contextual support for relational coordination and collective leadership behaviours (Zhao et al., 2024).

Practically, this result highlights the need for organisational interventions that strengthen the relational and informational foundations necessary for collective leadership to mediate the effects of shared vision (Cochran et al., 2023). These may include building communication structures that support mutual respect, enhancing psychological safety, increase participatory decision-making mechanisms and training supervisors to encourage shared influence (Meneses-La-Riva et al., 2025). Without such supportive conditions, shared vision may remain symbolic rather than transformative (Fortin & Robinson, 2024). In summary, this study found that collective

leadership insignificantly mediate the relationship between team shared vision and team effectiveness among Malaysian nurses (Brun & McAuliffe, 2022). The findings demonstrate that shared vision, while important for cognitive alignment, does not automatically translate into behavioural processes that drive team effectiveness in environments where relational coordination is weak and workplace cues favour hierarchical control (Hayat et al., 2024). This result contributes to the literature by highlighting the contextual dependency of collective leadership's mediating role and underscores the importance of strengthening relational and informational structures to enable shared vision to influence team effectiveness more meaningfully in healthcare settings (Asumadu et al., 2024).

5.3.8.2 Mediating effect of Collective Leadership on the relationship between Team Commitment with Team Effectiveness

In this section, Hypothesis 8b was formulated to examine whether collective leadership mediated the relationship between team commitment and team effectiveness among registered nurses working in twelve general hospitals across Malaysia. This hypothesis aimed to determine whether nurses' psychological attachment and loyalty to their teams could enhance overall effectiveness through the enactment of collective leadership. However, the PLS-SEM analysis revealed that collective leadership insignificantly mediate the relationship between team commitment and team effectiveness (Brun & McAuliffe, 2022). Accordingly, Hypothesis 8b was not supported (Malloy & Kavussanu, 2021).

This finding indicates that although committed nurses were more willing to support one another and invest effort in achieving team goals, this commitment did not translate into improved team effectiveness through collective leadership within the studied context (Ribeiro et al., 2020). RCT argues that high-quality coordination emerges when team members share goals, share knowledge, and interact with mutual respect (Brun & McAuliffe, 2022). While team commitment may strengthen emotional ties, it does not automatically create the relational conditions needed for leadership to be shared (Gabriel & Medina, 2022). If communication was hindered by workload pressures, hierarchical constraints, or role boundaries, commitment have remained a

personal sentiment rather than a collaborative resource that enabled collective leadership to influence team performance (Binatari et al., 2022).

Social Information Processing Theory provides another layer of understanding by emphasizing that individuals interpret and respond to cues within their social environment (Chiu et al., 2016). SIPT suggests that the emergence of collective leadership depends on the extent to which the workplace signals that participative influence, initiative-taking, and shared decision-making are valued and rewarded (Best et al., 2012). In Malaysian hospitals, workplace cues frequently emphasized compliance, adherence to hierarchical authority, and efficiency under high workload (Royani et al., 2024). These cues may suppress the behavioural expression of commitment in leadership forms (Zohra et al., 2023). Nurses who felt highly committed to their team might have interpreted these social cues as discouraging distributed influence, leading them to maintain loyalty through diligence and conformity rather than through leadership engagement (Azeem & Maturana-Dos-Santos, 2019). This helps explain why commitment strengthened relational cohesion but failed to operate through collective leadership to enhance effectiveness (Asumadu et al., 2024).

Organizational culture and hierarchy within Malaysian healthcare settings further clarify why the mediating effect was insignificant. Commitment among nurses tends to manifest as dedication to meeting patient needs and supporting colleagues, however the opportunity to exercise leadership behaviours is often constrained by rigid command structures (Malloy & Kavussanu, 2021). Authority is typically centralized among physicians and senior administrators, limiting nurses' autonomy to lead or influence team processes (Men & Jia, 2021). In such environments, commitment becomes an emotional anchor rather than a catalyst for collective leadership (Damamik et al., 2021). Nurses committed to their work, but their influence on team effectiveness remains tightly conditioned by formal authority relations (Bakar & Connaughton, 2025).

The demanding nature of nursing work also reduces the likelihood that commitment will be channelled through collective leadership. Nursing practice is characterized by high task demands, time-sensitive decision-making, and stringent adherence to clinical protocols (Sudeshika et al., 2021). Under these conditions, commitment is directed towards performing tasks safely and efficiently rather than

towards engaging in collective leadership behaviours, which require communication, coordination, and reflection (Nakrem & Kvanneid, 2022). SIPT explains that in such fast-paced settings, nurses are more likely to process cues emphasising urgency, individual competency, and procedural compliance, leaving limited cognitive or temporal space for leadership distribution (Morian et al., 2024). As a result, the behavioural pathway linking team commitment to collective leadership, and then to team effectiveness, becomes attenuated (Aaberg et al., 2018). The insignificant mediating effect is consistent with previous studies that found commitment did not always presented indirect effects on performance through leadership mechanisms (Hays, 2007). These findings suggest that in environments where power distance is high and autonomy is limited, the motivational effects of commitment may not activate broader relational processes such as collective leadership (Yan et al., 2007). In Malaysian public hospitals, commitment interpreted as loyalty to authority figures and dedication to fulfilling prescribed duties, rather than as empowerment to influence team direction (Hall & Weaver, 2001). This cultural interpretation limits the behavioural expression of leadership sharing and, therefore, weakens the potential for mediation (Clark et al., 1986).

From a theoretical standpoint, this finding challenges linear assumptions within traditional models of leadership mediation (Hudon et al., 2024). RCT and SIPT both suggest that relational and informational conditions shape how psychological states such as commitment manifest in team processes (Mustapa et al., 2024). The absence of a mediating effect demonstrates that commitment does not automatically activate leadership behaviours unless supported by workplace cues and relational structures that permit distributed influence (Zhao et al., 2024). This extends existing theory by emphasising that the translation of commitment into collective leadership is context-dependent and requires specific organisational enablers that may be lacking in hierarchical healthcare environments (Kjellstrom et al., 2020).

Despite the insignificant mediation, this finding offers important practical implications. It demonstrates that fostering commitment among nurses, while beneficial in sustaining morale and work quality, is insufficient to cultivate collective leadership without supportive systems (D'Costa et al., 2024). For collective leadership to serve as an effective mediating pathway, healthcare administrators must create environments

that encourage participation, open communication, and shared decision-making (Meneses-La-Riva et al., 2025). Indicators such as participatory committees, interdisciplinary rounds, and peer-led initiatives help transform commitment from a psychological state into a behavioural process that strengthens leadership distribution (Cochran et al., 2023). Professional development programmes focusing on empowerment, communication, and leadership readiness may further improve the likelihood that committed nurses enact leadership behaviours that influence team effectiveness (Fortin & Robinson, 2024).

In summary, this study found that collective leadership insignificantly mediate the relationship between team commitment and team effectiveness among nurses in Malaysia (Brun & McAuliffe, 2022). Commitment, although an important motivational force, did not translate into collective leadership behaviours that improve team effectiveness due to cultural hierarchies, workload pressures, and restrictive social cues in the workplace (Hayat et al., 2024).

5.3.8.3 Mediating Effect of Collective Leadership on the relationship between Team Collaboration with Team Effectiveness

In this section, Hypothesis 8c was formulated to examine whether collective leadership mediated the relationship between team collaboration and team effectiveness among registered nurses working in twelve general hospitals across Malaysia. This hypothesis sought to determine whether collaborative practices such as information sharing, coordinated problem-solving, and mutual support could translate into higher team effectiveness through the mediating role of collective leadership (Asumadu et al., 2024). Using PLS-SEM analysis, the results revealed that collective leadership had a positive and significant mediating effect on the relationship between team collaboration and team effectiveness (Wang, 2024). Therefore, Hypothesis 8c was supported (Fredericks, 2023). This result is consistent with previous findings. Wang, (2024), Fredericks, (2023), Lin et al., (2013), which similarly demonstrated that collective leadership strengthened the impact of collaboration on team effectiveness.

The significant mediating role of collective leadership highlights several important insights that align with Relational Coordination Theory (Bakht et al., 2024).

RCT emphasizes that effective outcomes in high-pressure environments depend on high-quality relationships supported by shared goals, shared knowledge, and mutual respect (Carron et al., 2021). Collaboration among nurses naturally strengthened these relational dimensions by encouraging continuous communication, coordinated task execution, and mutual reliance (Nakrem & Kvanneid, 2022). In this study, the finding demonstrates that collaboration built the relational bonds and communication patterns that supported the emergence of collective leadership (Meneses-La-Riva et al., 2025). This leadership then facilitated coordinated team action, enabling more efficient, timely, and integrated care delivery, which ultimately increased team effectiveness (Cochran et al., 2023). Thus, RCT helps explain why collaboration, when routed through collective leadership, resulted in meaningful improvements in team effectiveness (Hayat et al., 2024).

Social Information Processing Theory further expands this understanding by illustrating how collaborative interactions provided social cues that normalized shared influence, initiative-taking, and participatory decision-making (Morian et al., 2024). SIPT posits that individuals adapted their attitudes and behaviors based on information gleaned from their social environment (Joniakova et al., 2021). When collaboration was strong, nurses repeatedly experienced cues that teamwork, open communication, and mutual support were expected and valued (Bakht et al., 2024). These cues increased their relationship of engaging in collective leadership behaviors such as coordinating decisions, offering guidance to peers, or stepping into leadership roles based on situational needs (Asumadu et al., 2024). The mediating effect roles in this study indicates that collaborative environments supplied the cognitive and social signals necessary for leadership to become distributed, which then enhanced effectiveness (Kerissey & Singer, 2023). This study provides an important theoretical contribution by demonstrating how SIPT explained the behavioural pathway through which team collaboration became transformational only when filtered through collective leadership (Fredericks, 2023).

The findings also demonstrate that collaboration increaseed effective communication patterns that strengthened leadership distribution (Carron et al., 2021). When nurses engaged in open discussions, shared clinical information, and coordinated care activities, they generated the clarity and situational awareness needed for

leadership to shift fluidly among team members (Lin et al., 2013). This supported quicker decision-making, more accurate patient assessments, and lower communication failures (Hall & Weaver, 2001). In this way, collective leadership converted collaborative energy into tangible improvements in team functioning, illustrating a clear mechanism through which collaboration contributed to effectiveness (Clark et al., 1986). This result extends the literature by showing that collaboration alone not be sufficient for optimal outcomes, but when accompanied by collective leadership processes, its effects become substantially stronger (Sudeshika et al., 2021).

Through collaboration, nurses developed an inherent sense of interdependence where team success was understood as a collective responsibility rather than the duty of a single leader (Meneses-La-Riva et al., 2025). Collective leadership further strengthened this relationship of shared accountability by distributing influence and decision-making across the team (Cochran et al., 2023). The findings of this study suggest that when collaborative teams adopted collective leadership practices, individual nurses became more willing to take ownership of tasks, contribute to problem-solving, and maintain high standards of care (Tai & Chang, 2023). This insight advances the understanding of nurse teamwork by showing how collective leadership acted as a behavioral bridge between collaboration and team effectiveness, particularly in clinical contexts where role sharing and mutual support were essential for patient safety (Fortin & Robinson, 2024).

The results also indicate that collective leadership promoted adaptability and innovation (Joniakova et al., 2021). In dynamic healthcare environments, collaboration alone may not always generate the flexibility needed to respond rapidly to evolving patient needs (Asumadu et al., 2024). However, when collaboration triggered the development of collective leadership, teams became better equipped to adapt their practices, problem-solve creatively, and integrate new clinical approaches (Hayat et al., 2024). Leadership could shift based on expertise rather than hierarchy, enabling quicker and more appropriate responses during complex or unexpected situations (Nakrem & Kvanneid, 2022). This ability to mobilize expertise through leadership sharing enhanced team effectiveness, especially in Malaysian hospitals where nurses frequently encountered fluctuating workloads and rapidly changing clinical conditions (Fredericks, 2023). The finding contributes new knowledge by showing that

collaboration promoted adaptive capacity not directly, but through the roles of collective leadership (Carron et al., 2021).

In summary, this study found that collective leadership significantly mediated the relationship between team collaboration and team effectiveness among nurses in Malaysia (Fredericks, 2023). Collaboration strengthened the relational, structural, and communicative conditions needed for leadership sharing, which in turn enhanced team performance (Lin et al., 2013). The findings provide new evidence that the benefits of collaboration on effectiveness were not automatic but emerged when teams engaged in collective leadership behaviors shaped by relational coordination and social information cues (Hall & Weaver, 2001). This insight underscores the importance of cultivating collective leadership capacities within nursing teams to translate collaborative practices into consistently high levels of team effectiveness and patient care quality (Carron et al., 2021).

5.3.9 Moderating Effect of Team Virtuality on the relationship between Collective Leadership and Team Effectiveness

The final research objective of this study was to determine whether team virtuality moderated the relationship between collective leadership and team effectiveness among registered nurses in twelve general hospitals across Malaysia (H9). This objective guided the formulation of Hypothesis 9, which proposed that team virtuality would strengthen the relationship between collective leadership and team effectiveness (Shi et al., 2023). The intention was to assess whether virtual modes of communication and collaboration could increase the positive effects of collective leadership behaviours on team effectiveness (Yang et al., 2022).

The results of the moderation analysis indicated that team virtuality not moderate the relationship between collective leadership and team effectiveness (Purvanova & Kenda, 2021). Thus, Hypothesis 9 was not supported. This unexpected outcome suggests that the extent to which nurses communicated or coordinated through digital means not meaningfully alter how collective leadership influenced team performance (Hoch & Kozlowski, 2014). This finding is consistent with previous studies by Ganesh and Gupta (2010), Hoch and Kozlowski (2014), Handke et al. (2019),

and Purvanova and Kenda (2021), which also found that virtuality does not consistently strengthen teamwork indicators in environments where core tasks remain inherently physical or relational (Schmutz et al., 2023).

The insignificant moderating effect can be better understood through the view of Relational Coordination Theory, which emphasizes that effective performance depends on timely communication and strong relational ties (Mustapa et al., 2024). In Malaysian hospitals, the communication required for safe and effective nursing practice is predominantly in-person due to the immediacy of clinical interactions (Majumdar et al., 2023). Virtual communication tools may supplement administrative coordination, but they do not replace the relational and situational immediacy that nursing work requires (Salancik & Pfeffer, 1978). As a result, virtuality does not fundamentally shape the relationship between collective leadership and team effectiveness because the communication patterns that matter most occur face-to-face (Lei et al., 2022). The patterns of collective leadership behaviours also develop through interpersonal trust and reciprocal support rather than digital channels (Simonson et al., 2021).

Social Information Processing Theory further explains why team virtuality failed to strengthen the link between collective leadership and effectiveness, as SIPT highlights the importance of social cues in shaping behaviour (Salancik & Pfeffer, 1978). In nursing teams, the most significant cues that promote collective leadership occur through direct interpersonal interaction, such as clinical judgement demonstrations and emotional exchanges (Morian et al., 2024). Virtual communication reduces access to these cues, limiting the extent to which nurses can internalize collective leadership behaviours (Schmutz et al., 2023). Without rich social cues, virtual communication does not enhance the behavioural processes through which collective leadership influences team functioning (Christodoulou et al., 2024).

The nature of nursing work provides a practical explanation for these results, as nursing fundamentally requires physical presence for assessments, interventions, and continuous monitoring (Hoegl & Muethel, 2016). These tasks cannot be performed virtually, and leadership behaviours that support them also unfold in person (Mayer et al., 2022). Even when digital tools are used for updates, essential leadership practices occur face-to-face (Nuratri et al., 2021). Additionally, opportunities for virtual collaboration are limited in Malaysian clinical settings due to high patient loads and the

immediacy of clinical demands (Aaberg et al., 2018). Virtual tools may support documentation but are not the primary medium for collaborative problem-solving or collective leadership (Sudeshika et al., 2021). Emergency and intensive care units rely heavily on direct communication and coordinated physical action, none of which can be replaced by virtuality (Cramton & Webber, 2005).

Cultural and interpersonal dynamics further help explain the lack of moderation, as Malaysian healthcare workers value direct communication for building trust and ensuring accurate information exchange (Thistlethwaite & Nisbet, 2007). Collective leadership behaviours such as mentoring and consultative decision-making are typically facilitated through face-to-face interaction rather than virtual dialogue (Jonsen et al., 2006). SIPT suggests that virtual interactions may be perceived as less reliable due to reduced social cues, limiting their ability to strengthen leadership influence (Schweitzer & Duxbury, 2010). Regulatory and privacy considerations also restrict the use of virtual communication tools in clinical settings, limiting detailed discussions involving patient care (Pridmore & Phillips-Wren, 2011). This further reduces the depth of virtual interactions and the potential moderating role of virtuality (Mangla, 2021).

In summary, this study found that team virtuality insignificantly moderate the relationship between collective leadership and team effectiveness among nurses in Malaysia (Purvanova & Kenda, 2021). This finding highlights that in clinical settings where hands-on care and interpersonal communication are fundamental, virtuality is not a determining factor in strengthening teamwork processes (Ganesh & Gupta, 2010). The result contributes to the literature by clarifying that virtuality's moderating role is context-dependent and limited in professions where work is inherently physical and relational (Hoch & Kozlowski, 2014). It also underscores the need for future research to examine context-specific moderators such as workload intensity, autonomy, or relational climate, which may offer stronger explanatory power for how leadership influences team effectiveness in hospital environments (Zaharie, 2021).

5.4 Contribution of Study

After an elaborative discussion on the findings of this study, the following sub-section would forward the contributions of present study aimed at addressing the issue

highlighted in the problem statement, in term of theory, policy and practice. As this study integrated the insight of relevant theories and existing literature to develop a complex framework for anchoring an enquiry into the drivers of collective leadership and team effectiveness using data from 417 registered nurses in Malaysia, it is expected that this study will have significant contribution for policy makers, organization, manager and future research while extending the theoretical and empirical premises of collective leadership, team virtuality and team effectiveness literature simultaneously.

5.4.1 Theoretical Contribution

This study has several theoretical contributions related to team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness, consistent with recent theoretical developments in relational and cognitive-interpretive models of teamwork (Hayat et al., 2024). The findings established empirical evidence for the theoretical relationships posited in the research framework within the nursing context, reinforcing the importance of relational and informational indicators for understanding team effectiveness in healthcare settings (Morian et al., 2024). Based on factor analysis, the study found that team shared vision, team commitment and team collaboration significantly effect collective leadership among nurses, reflecting the foundational proposition that relational strength contributes to leadership sharing in interdependent environments (Asumadu et al., 2024).

A major theoretical contribution emerged from examining the mediating role of collective leadership in the relationships between team shared vision, team commitment and team collaboration with team effectiveness, aligning with the principles of Relational Coordination Theory that emphasize shared goals, shared knowledge and mutual respect as critical mechanisms in achieving performance outcomes (Joniakova et al., 2021; Hayat et al., 2024). The findings revealed that collective leadership mediated only the relationship between team collaboration and team effectiveness, while it not mediate the relationships involving team shared vision and team commitment, indicating that collaboration is more directly connected to the relational quality required for effective coordination than vision or commitment alone (Bakht et

al., 2024; Fredericks, 2023). This pattern underscores a theoretical refinement within RCT, which argues that frequent communication, task interdependence and mutual support provide the relational depth necessary for leadership sharing to produce meaningful outcomes (Carron et al., 2021).

Social Information Processing Theory further clarifies this pattern by demonstrating that collaboration, more than shared vision or commitment, generates clearer social cues that normalise participatory influence and leadership distribution (Anjara et al., 2021; Zhao et al., 2024). Strong collaboration repeatedly exposes team members to signals that teamwork, open communication and shared decision-making are valued, increasing the relationship of engaging in collective leadership behaviours (Lei et al., 2022). In contrast, shared vision and commitment not effect the situational cues required to activate leadership-sharing processes in fast-paced clinical environments characterised by hierarchical interaction patterns (Simonson et al., 2021). Thus, the findings extend SIPT by illustrating that behavioural pathways linking cognitive alignment to team effectiveness depend on the presence of strong relational and informational cues embedded in daily interactions (Schmutz et al., 2023).

Another theoretical contribution arises from the finding that team virtuality not moderate the relationship between collective leadership and team effectiveness, a result consistent with recent evidence indicating that virtuality does not consistently strengthen leadership indicators in contexts dominated by immediate, face-to-face communication demands (Purvanova & Kenda, 2021; Ganesh & Gupta, 2010). Relational Coordination Theory helps explain this finding by emphasising that effective coordination in healthcare relies on timely, real-time communication and high-quality relational ties, which are best developed through physical presence rather than virtual exchanges (Fortin & Robinson, 2024). SIPT similarly suggests that the absence of rich social cues in virtual environments limits the ability of team members to interpret and enact collective leadership behaviours, especially when clinical tasks depend heavily on in-person interactions (Majumdar et al., 2023; Simonson et al., 2021). This study therefore contributes theoretically by identifying a boundary condition for SIPT which virtuality offers limited explanatory value in professions where work is embodied, immediate and relationally intensive (Schmutz et al., 2023).

Overall, the theoretical contributions of this study lie in demonstrating that Relational Coordination Theory and Social Information Processing Theory provide contextually grounded explanations of teamwork, leadership and effectiveness in Malaysian public hospitals (Hayat et al., 2024; Morian et al., 2024). The findings reveal how relational conditions such as communication frequency, shared respect and collaborative interdependence interact with informational cues to determine whether team characteristics are translated into leadership behaviours and performance outcomes (Asumadu et al., 2024; Zhao et al., 2024). By demonstrating that shared vision and commitment require strong relational and informational support to influence outcomes through collective leadership, this study advances theoretical understanding by situating team processes within the realities of clinical complexity, hierarchical structures and high task demands (Carron et al., 2021; Joniakova et al., 2021). The results highlight the need for future study to integrate relational coordination and social information processing indicators more explicitly to explain team effectiveness in healthcare, particularly within systems marked by structural hierarchy and acute task interdependence (Bakht et al., 2024; Fortin & Robinson, 2024).

5.4.2 Practical Contribution

This study provides several practical contributions to the Ministry of Health and hospital management in strengthening the effectiveness of nursing teams by identifying the key factors involved in team functioning, consistent with evidence that teamwork quality is central to safe patient care (Hayat et al., 2024). The study identifies that poor leadership quality, weak individual commitment and limited teamwork skills can reducing effective team performance in healthcare, a pattern also noted in studies highlighting deficits in coordination and communication as major barriers to quality care (Carron et al., 2021; Sudeshika et al., 2021). These findings suggest the need for structured approaches that incorporate teamwork competencies and effective communication channels, such as formal training and continuous professional development, in line with recommendations that healthcare teams benefit from systematic skill-building and interprofessional training (Bakht et al., 2024; Meneses-La-Riva et al., 2025). Implementing such measures requires hospital-wide quality

management systems that support relational coordination, as strong relational ties and clear communication processes are essential for coordinated clinical work (Hayat et al., 2024). Improving nursing teamwork performance is therefore likely to enhance the quality of patient care, consistent with research showing that collaborative practice leads to better patient outcomes (Lin et al., 2013; Aaberg et al., 2018).

In addition, the study highlights that if teams are to work effectively by coordinating their efforts to achieve shared objectives, they must engage in regular meetings where information can be exchanged, decisions can be made collectively and shared understanding can be established, reflecting the core view of Relational Coordination Theory (Joniakova et al., 2021; Carron et al., 2021). Building shared understanding about tasks and processes is an essential component of team functioning, particularly in high-pressure healthcare environments where clarity and coordination directly affect patient safety (Sudeshika et al., 2021; Nakrem & Kvanneid, 2022). Staff nurses with clear objectives, strong participation, an emphasis on quality and support for innovation are more likely to deliver high-quality patient care, consistent with findings showing that empowered and well-coordinated teams demonstrate better clinical performance (Fredericks, 2023; Tai & Chang, 2023).

Furthermore, the study shows that clear collective leadership support contributes to effective team processes and to high-quality patient care, increasing evidence that supportive collective leadership improves communication, coordination and team cohesion (Hayat et al., 2024; Cochran et al., 2023). It would therefore be valuable for the Ministry of Health and nursing management to provide additional training and mentoring programmes for matrons and sisters to strengthen their supervisory capacity, consistent with research calling for leadership development to enhance relational coordination within clinical teams (Mustaqim, 2021; D'Costa et al., 2024). Such initiatives would help immediate supervisors provide greater support to staff nurses, including emotional support, assistance with clinical tasks and informational guidance, all of which have been shown to enhance engagement and work quality (Kerissey & Singer, 2023; Fortin & Robinson, 2024). Strengthening leadership support would also help create a more cohesive and communicative work environment, enabling nurses to be more engaged in their work and more effective in providing patient care (Bakht et al., 2024; Lai et al., 2021).

5.4.3 Methodological Contribution

This study has several methodological implications that contribute to research on nursing teams and team effectiveness in Malaysia (Carron et al., 2021; Hayat et al., 2024). One of the methodological contributions is that previous studies on team effectiveness have mainly used SPSS or AMOS, whereas the present study employed PLS-SEM 4.0, which is increasingly recommended for complex models involving mediating and moderating effects (Illahi et al., 2024). Few empirical studies examining healthcare teamwork have adopted PLS-SEM, and the use of this approach provides additional analytical robustness that aligns with contemporary methodological trends in leadership and teamwork studies (Hayat et al., 2024; Cochran et al., 2023).

The measurement scales of the variables in this study were adopted from earlier research, as detailed in the operationalization section, and repeated application in a new context was necessary to confirm reliability and validity, consistent with recommendations for cross-context validation (Lin et al., 2013; Meneses-La-Riva et al., 2025). Cronbach's alpha reliability was examined and exceeded minimum thresholds, supporting the internal consistency of the scales (Carron et al., 2021; Bakht et al., 2024). Another methodological contribution lies in the use of PLS path modelling to assess composite reliability, convergent validity and discriminant validity, which reflects best practices in structural equation modelling within organisational and healthcare research (Lai et al., 2021). Individual item reliability, composite reliability and AVE values for each latent variable were found to be satisfactory, reinforcing the psychometric soundness of the measurement model (Nakrem & Kvanneid, 2022; Tai & Chang, 2023). Convergent validity was confirmed by evaluating AVE values, consistent with established thresholds in teamwork studies (Fredericks, 2023; Carron et al., 2021).

Additionally, discriminant validity was assessed by comparing inter-construct correlations with the square root of AVE, ensuring that each construct measured a unique conceptual domain, which aligns with methodological recommendations in interprofessional collaboration research (Joniakova et al., 2021; Aaberg et al., 2018). This study therefore offers an important methodological contribution to the literature on team effectiveness among nurses by establishing the reliability and validity of the adopted measurements within the Malaysian context, addressing the need for culturally

grounded assessment tools in healthcare settings (Lin et al., 2013; Meneses-La-Riva et al., 2025). CFA and measurement model testing further supported the unidimensionality of the constructs, strengthening the evidence for the structural integrity of the scales (Sudeshika et al., 2021; Carron et al., 2021).

Overall, this study contributed by empirically confirming the reliability and validity of the adopted scales and items within a new healthcare context, which is consistent with calls for validating teamwork constructs across diverse environments (Bakht et al., 2024; Fredericks, 2023). The comprehensive confirmatory and validation procedures using PLS-SEM represent a methodological contribution to the literature on team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness by offering additional evidence on the robustness of these constructs from a new methodological perspective (Hayat et al., 2024; Cochran et al., 2023).

5.5 Limitations and Future Research Directions

This study has several limitations that should be acknowledged to guide future research, consistent with broader observations in teamwork and healthcare studies that contextual and methodological constraints influence empirical findings (Carron et al., 2021; Hayat et al., 2024). One limitation is that the study was conducted exclusively among nurses working in Malaysian public hospitals, which restricts the generalisability of the findings to other healthcare settings such as private hospitals or interdisciplinary teams involving physicians or allied health professionals (Lin et al., 2013; Meneses-La-Riva et al., 2025). Although nurses play a central role in patient care, the dynamics of team interaction may differ in teams with mixed professional compositions, which may influence the operation of relational coordination and social information processes (Aaberg et al., 2018; Joniakova et al., 2021).

The reliance on self-reported survey data constitutes another limitation, as perceptions of leadership, collaboration and team effectiveness may be influenced by social desirability or individual differences in interpretation (Bakht et al., 2024; Fredericks, 2023). Although self-report measures are widely used in healthcare teamwork research, they may not fully capture behavioural aspects of relational

coordination or the subtle social cues emphasised in SIPT (Carron et al., 2021; Sudeshika et al., 2021). The cross-sectional design further restricts the ability to infer causal relationships among the constructs, as longitudinal or experimental designs are better suited to observe how relational dynamics develop over time (Nakrem & Kvanneid, 2022; Lai et al., 2021).

Another limitation concerns the level of virtuality present in Malaysian hospitals, which was relatively low compared with virtual or hybrid work environments examined in other sectors (Purvanova & Kenda, 2021; Ganesh & Gupta, 2010). The limited reliance on digital communication tools may explain why virtuality did not act as a significant moderator in this study, as suggested by research showing that virtuality effects emerge more strongly in teams with higher dependence on technology-mediated interaction (Hoch & Kozlowski, 2014; Handke et al., 2019). This contextual constraint may limit the applicability of virtuality-related theories within traditional clinical environments where direct patient care remains dominant (Christodoulou et al., 2024; Shi et al., 2023). The complexity of relational and informational cues in clinical settings also presents challenges for capturing the underlying processes described by RCT and SIPT. Relational coordination involves nuanced communication patterns and trust-building processes that not be fully represented through quantitative measures alone (Hayat et al., 2024; Cochran et al., 2023). Similarly, the social information cues that influence leadership interpretation may vary across units, shifts, or workload intensity, contributing to unexplained variance in the results (Joniakova et al., 2021; Aaberg et al., 2018).

Future studies could expand the scope by including interdisciplinary healthcare teams or comparing public and private hospitals to examine whether relational coordination and social information processes operate differently across organisational structures (Lin et al., 2013; Meneses-La-Riva et al., 2025). Longitudinal designs would help capture how shared vision, commitment and collaboration evolve over time and how collective leadership emerges in response to relational and situational cues, consistent with calls for dynamic analysis in teamwork research (Carron et al., 2021; Sudeshika et al., 2021). Future research could also incorporate multi-source data such as supervisor ratings, peer assessments or observational methods to complement self-report measures and reduce potential bias (Bakht et al., 2024; Fredericks, 2023).

Given the limited role of virtuality observed in this study, future research might explore other potential moderators such as psychological safety, workload intensity, autonomy or relational climate, which better reflect the interpersonal nature of clinical teamwork in Malaysian hospitals (Nakrem & Kvanneid, 2022; Tai & Chang, 2023). Experimental or intervention-based studies could further examine whether training in communication, distributed leadership or relational coordination enhances the conditions necessary for collective leadership to influence team effectiveness (Hayat et al., 2024; Cochran et al., 2023). Overall, the limitations identified in this study highlight important directions for extending the theoretical and practical understanding of team effectiveness in healthcare. The findings stated the need to examine contextual conditions that shape how relational coordination and social information cues influence leadership and teamwork, contributing to broader efforts to refine theoretical and empirical approaches in nursing and organisational research.

5.6 Conclusion

The main objectives of this study were to examine the mediating role of collective leadership on the relationship between team shared vision, team commitment and team collaboration with team effectiveness, and to examine the moderating effect of team virtuality on the relationship between collective leadership and team effectiveness among nurses in Malaysia. The first, second and third objectives focused on determining the direct relationships between team shared vision, team commitment and team collaboration with team effectiveness among nurses in Malaysia. These objectives were achieved by testing three direct relationship hypotheses, and the study found insignificant positive relationships between team shared vision, team commitment and team collaboration with team effectiveness.

The fourth, fifth and sixth objectives examined the effects of team shared vision, team commitment and team collaboration on collective leadership among nurses in Malaysia. These objectives were achieved through the testing of three additional direct relationship hypotheses. The study provided empirical evidence of significant positive relationships between team shared vision, team commitment and team collaboration on collective leadership among nurses in Malaysia. The seventh objective was to examine

the relationship between collective leadership and team effectiveness among nurses in Malaysia. This objective was achieved by testing the direct relationship hypothesis, and the findings showed an insignificant positive relationship between collective leadership and team effectiveness. The eighth objective was to determine whether collective leadership mediated the relationships between team shared vision, team commitment and team collaboration with team effectiveness. Three sub-hypotheses were tested to accomplish this objective, and the study found that collective leadership mediated only the relationship between team collaboration and team effectiveness.

The final objective was to determine whether team virtuality moderated the relationship between collective leadership and team effectiveness. The results indicated that team virtuality did not moderate this relationship. Overall, the study provided theoretical contributions by examining the mediating role of collective leadership and the moderating effect of team virtuality within the context of nursing teams. These findings offer new theoretical insights that contribute to industry practice, professional development and the broader body of knowledge. The study also offered methodological contributions by examining how these variables influence team effectiveness within the Malaysian healthcare context. Based on the limitations identified, several directions for future research were suggested to further explore the relationships between team shared vision, team commitment, team collaboration, collective leadership, team virtuality and team effectiveness.

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APPENDICES

APPENDIX A
Questionnaire

Questionnaire / *Borang Soal Selidik*

Title: The Impact of Team Shared Vision, Team Commitment and Team Collaboration of Team Effectiveness among Nurses in Malaysia: The Mediating Role of Collective Leadership and The Moderating Effect of Team Virtuality

Dear Participants,

I am Wan Nurulasiah Wan Mustapa, from Universiti Teknologi Mara Kampus Arau. I am conducting a research and your response is of the utmost importance to me. I would like to seek your participation in my study. The objective of this study is to examine the effect of the key elements of teamwork (team shared vision, team commitment, team collaboration) on the collective leadership and team effectiveness and the moderator effect of team virtuality on the collective leadership with team effectiveness among the Healthcare practitioners in Malaysia.

The survey contains sections A and B. Participation in this research involves completing this survey. Section A is about your background information, Section B.1 is about your perception on team effectiveness, Section B.2 is about your perception on team shared vision, Section B.3 includes questions about your perception on team commitment, Section B.4 is about your perception on team collaboration, Section B.5 is about your perception on collective leadership and Section B.6 is about your perception on team virtuality.

This survey will take around 10-15 minutes to complete. Please answer each question honestly and with careful consideration. The responses you make in the questionnaire will be kept CONFIDENTIAL and ANONYMOUS. All the data collected will be used for academic purpose only.

If you require more information about the questionnaire, please contact:

Wan Nurulasiah Wan Mustapa, Faculty of Business and Management, Universiti Teknologi MARA (UiTM) Perlis Branch

H/p: 019-3715264; e-mail: xiaojienurulmustapa@gmail.com

Peserta yang dihormati,

Saya, Wan Nurulasiah Wan Mustapa, dari Universiti Teknologi Mara Kampus Arau. Saya sedang menjalankan penyelidikan dan maklum balas anda adalah amat penting untuk saya. Saya ingin memohon bantuan anda untuk menengkapkan maklum balas ini. Objektif kajian ini adalah untuk mengkaji kesan elemen utama kerja berpasukan (berkongsi visi secara berpasukan, komitmen berpasukan, kerjasama berpasukan) terhadap kepimpinan kolektif dan keberkesanan berpasukan dan kesan moderator iaitu berpasukan dalam talian keatas kepimpinan kolektif dengan keberkesanan berpasukan di kalangan pengamal kesihatan di Malaysia.

Maklum balas ini mempunyai bahagian A dan B. Penyertaan dalam penyelidikan ini melibatkan untuk melengkapkan maklum balas ini. Bahagian A adalah tentang maklumat latar belakang anda, bahagian B.1 adalah tentang persepsi anda tentang keberkesaan berpasukan, bahagian B.2 adalah tentang persepsi anda tentang berkongsi visi secara berpasukan, bahagian B.3 termasuk soalan tentang persepsi anda tentang komitmen berpasukan, bahagian B.4 ialah tentang persepsi anda tentang kerjasama berpasukan, bahagian B.5 ialah tentang persepsi anda tentang kepimpinan kolektif dan bahagian B.6 ialah tentang persepsi anda tentang berpasukan dalam talian.

Soal selidik ini akan mengambil masa selama 10-15 minit untuk diselesaikan. Sila jawab setiap soalan dengan jujur dan pertimbangan yang telilti. Jawapan yang anda berikan dalam soal selidik ini akan DIRAHSIAKAN dan TANPA NAMA. Semua data yang dukumpulkan akan digunakan untuk tujuan akademik sahaja.

Jika anda memerlukan maklumat tambahan berkenaan soal selidik ini, sila hubungi:

Wan Nurulasiah Wan Mustapa, Faculty of Business and Management, Universiti Teknologi MARA (UiTM) Perlis Branch

H/p: 019-3715264; e-mail: xiaojienurulmustapa@gmail.com

SECTION A
SEKSYEN A

Demographic Information
Maklumat Demografi

The following information is strictly confidential and will only be used for research purposes. I will be grateful if you could kindly fill in the required information.
Maklumat berikut adalah sulit dan hanya akan digunakan untuk tujuan kajian sahaja. Saya amat berterima kasih sekiranya anda dapat memberikan maklumat berikut.

The following are questions related to demographic background and social characteristics. Please tick (/) or answer each of the following questions:
Berikut merupakan soalan-soalan berkaitan latar belakang demografi dan ciri-ciri sosial. Sila tandakan (/) atau jawab bagi setiap soalan yang berikut:

1. Jantina / *Gender*
(i) Lelaki / *Male* ( )
(ii) Perempuan / *Female* ( )

2. Ethnicity / *Etnik*
(i) Malay / *Melayu* ( )
(ii) Chinese / *Cina* ( )
(iii) Indian / *India* ( )
(iv) Bumiputra / *Bumiputera (Sabah & Sarawak)* ( )
(v) Other / *Lain-lain*; Please specify/ *Sila Nyatakan* (……)

3. Umur Responden / *Respondent's Age* (Tahun/*Years*)

4. Taraf Pendidikan / *Level of Education*

(i) SPM / SPM ( )
(ii) Sijil / Certificate ( )
(iii) Diploma / Diploma ( )
(iv) Ijazah Sarjana Muda / Bachelor Degree ( )
(v) Ijazah Sarjana / Master Degree ( )
(vi) Others (please specify)/ Lain-lain (sila nyatakan) ……..……

5. Department/ Unit/ Hospital / *Jabatan/Unit/Hospital* ……..
6. Length of service in the current hospital/ *Tempoh perkhidmatan di hospital sekarang*: ……. (Years)
7. Length of service in the nursing profession/ *Tempoh perkhidmatan dalam profesion kejururawatan*: ……. (Years)
8. Length of service in current ward/ *Tempoh perkhidmatan di wad sekarang*: ……..(Years)
9. Position / *Jawatan*: ……
10. Grade/ *Gred*: ……
11. Lokasi pekerjaan anda / *Location of the Profession*: ……..

SECTION B / *SEKSYEN B*

B.1 Team effectiveness *(Keberkesanan Berpasukan)*

The statements below are designed to capture your opinion on team effectiveness. It include your satisfaction and ability to work together. Please indicate your level of agreement with each statement with (1) being Strongly Disagree and (5) being Strongly Agree. Please circle the number as appropriate.

Pernyataan berikut adalah mengenai pandangan anda tentang keberkesanan pasukan. Keberkesanan merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama. Sila nyatakan tahap kesetujuan anda untuk setiap pernyataan yang dinilaikan antara (1) Sangat Tidak Bersetuju dengan (5) Sangat Bersetuju. Sila bulatkan pilihan nombor yang bersesuaian.

1 → 5

Strongly Disagree/ *Sangat Tidak Bersetuju* Strongly Agree/ *Sangat Bersetuju*

	TEAM EFFECTIVENESS / *KEBERKESANAN BERPASUKAN*	**1**	**2**	**3**	**4**	**5**
In general, team effectiveness is conceptualised as a team potential to retain its members through their attachment and their willingness to stay together to increase the effectiveness of the team. *Umumnya, keberkesanan pasukan bergantung kepada kemampuan ahli pasukan untuk melalui keterikanan dan kesediaan mereka bekerja sama untuk meningkatkan keberkesanan pasukan..*						
1	Working with team members is an energizing and uplifting experience. *Bekerja dengan ahli pasukan adalah pengalaman yang bertenaga dan meningkatkan pengalaman.*					
2	Sometimes, one of us refuses to help another team member out. *Kadang-kadang salah seorang daripada kami enggan membantu ahli pasukan lain.*					
3	There is a lot of unpleasantness among members in the team. *Terdapat banyak ketidakselesaan di kalangan ahli dalam pasukan.*					
4	Working as a team will improve patient satisfaction. *Bekerja sebagai satu pasukan akan meningkatkan kepuasan pesakit.*					
5	Some members in the team do not carry their fair share of the overall workload. *Sesetengah ahli dalam pasukan tidak membawa bahagian mereka yang saksama daripada keseluruhan bebanan kerja.*					
6	Working as team show signs of falling apart. *Bekerja sebagai pasukan menunjukkan tanda-tanda berpecah-belah.*					
7	Every time we attempt to straighten out a member of the team whose behavior is not					

	acceptable, things seem to get worse rather than better. *Setiap kali kami cuba meluruskan ahli pasukan yang tingkat lakunya tidak boleh diterima, keadaan kelihatan menjadi lebih buruk berbanding lebih baik.*					
8	I am satisfied with my present team member. *Saya berpuas hati dengan ahli pasukan saya yang sekarang.*					
9	I am satisfied with working in this team. *Saya berpuas hati bekerja dalam pasukan ini.*					
10	As soon as I can find a better place, I will leave this hospital. *Sebaik sahaja saya dapat mencari tempat yang lebih baik, saya akan meninggalkan hospital ini.*					
11	I am actively looking for a job at other hospitals. *Saya sedang giat mencari kerja di hospital lain.*					
12	I am seriously thinking about quitting my job. *Saya serius memikirkan untuk berhenti kerja.*					
13	This team is very competent. *Pasukan ini sangat cekap*					
14	I think I will still be working at this hospital five years from now. *Saya rasa saya akan bekerja di hospital ini sehingga lima tahun dari sekarang.*					
15	This team gets its work done very effectively. *Pasukan ini melakukan kerjanya degan sangat berkesan*					

B.2 Team Shared Vision / *Berkongsi Visi secara Berpasukan*

The statements below are designed to capture your opinion on team shared vision. It include your satisfaction and ability to work together. Please indicate your level of agreement with each statement with (1) being Strongly Disagree and (5) being Strongly Agree. Please circle the number as appropriate.

Pernyataan berikut adalah mengenai pandangan anda tentang berkongsi visi yang sama di kalangan ahli pasukan. Berkongsi visi secara berpasukan merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama. Sila nyatakan tahap kesetujuan anda untuk setiap pernyataan yang dinilaikan antara (1) Sangat Tidak Bersetuju dengan (5) Sangat Bersetuju. Sila bulatkan pilihan nombor yang bersesuaian.

	TEAM SHARED VISION/ ***BERKONGSI VISI SECARA BERPASUKAN***	**1**	**2**	**3**	**4**	**5**
In general, team shared vision as an individual team member have a same ambition, same goal and same image of the future. *Secara umumnya, visi yang dikongsi secara berpasukan, setiap individu dalam pasukan mempunyai cita-cita yang sama, matlamat yang sama dan imej masa depan yang sama.*						
1	In my hospital, there is a clear vision guiding the strategic goal and missions. *Di hospital saya, terdapat visi yang jelas untuk membimbing matlamat dan misi secara strategic.*					
2	Our matron shares a common vision of the future. *Matron kami berkongsi visi yang sama.*					
3	The shared vision guiding change in the hospital is appropriate. *Berkongsi visi yang sama membimbing perubahan di hospital adalah bertepatan.*					
4	My team agree on what is important for our hospital. *Ahli pasukan saya bersetuju tentang perkara-perkara yang penting untuk hospital kami.*					
5	My team shares the same ambitions and vision with others unit at work. *Ahli pasukan saya berkongsi visi yang sama dengan unit yang lain ditempat kerja.*					
6	People on my unit are enthusiastic about pursuing the collective goals and mission of the whole hospital. *Kakitangan di unit kami bersemangat untuk mengejar matlamat dan misi kolektif untuk keseluruhan hospital.*					
7	My team fully understands the meaning of the hospital's vision and mission and can fully explain them in detail. *Pasukan saya memahami sepenuhnya maksud visi dan misi hospital dan boleh menerangkan kedua-duanya secara terperinci.*					

8	My team understands the meaning of culture which is embedded in the vision. *Pasukan saya memahami maksud budaya yang tertanam di dalam visi.*					
9	My team is fully committed and align with the vision and mission of our hospital. *Pasukan saya sangat komited dan selaras dengan visi dan misi hospital kami.*					
10	My team can explain our hospital's vision and mission as wellas the organization's direction in detail. *Pasukan saya boleh menjelaskan visi dan misi hospital kami dan menerangkan hala tuju organisasi secara terperinci.*					
11	My team believes our hospital's vision and direction are adequately set. *Pasukan saya percaya visi dan hala tuju hospital kami telah ditetapkan dengansebaiknya.*					
12	My team knows what to do in order to achieve our hospital's vision. *Pasukan saya tahu apa yang perlu dilakukan untuk mencapai visi hospital kami.*					

B.3 Team Commitment / *Komitmen Berpasukan*

The statements below are designed to capture your opinion on team commitment. It include your satisfaction and ability to work together. Please indicate your level of agreement with each statement with (1) being Strongly Disagree and (5) being Strongly Agree. Please circle the number as appropriate.

Pernyataan berikut adalah mengenai pandangan anda tentang komitmen anda dalam berpasukan. Komitmen berpasukan merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama. Sila nyatakan tahap kesetujuan anda untuk setiap pernyataan yang dinilaikan antara (1) Sangat Tidak Bersetuju dengan (5) Sangat Bersetuju. Sila bulatkan pilihan nombor yang bersesuaian.

TEAM COMMITMENT / *KOMITMEN BERPASUKAN*		**1**	**2**	**3**	**4**	**5**
Generally, team commitment involves each member's dedication to maintain the relationship and possess diverse skills for the team's collective tasks. *Secara umumnya, komitmen pasukan melibatkan dedikasi setiap ahli untuk mengekalkan hubungan dan memiliki pelbagai kemahiran untuk tugas-tugas kolektif pasukan.*						
1	I talk up my team to my friend as a great team to work on. *Saya bercakap (membesarkan) pasukan ini kepada rakan saya sebagai pasukan yang hebat untuk diusahakan.*					
2	I would accept almost any job in order to keep working with my team. *Saya akan menerima hampir semua pekerjaan untuk terus bekerja dalam pasukan ini.*					
3	I find that my values and the my team's values are very similar. *Saya mendapati bahawa nilai saya dan nilai pasukan sangat serupa.*					
4	I am proud to tell others that I am part of my team. *Saya berbangga untuk memberitahu orang lian bahawa saya adalah sebahagian daripada pasukan ini.*					
5	My team really inspires the very best in me in increasing my job performance. *Pasukan ini benar-benar memberi inspirasi yang terbaik dalam diri saya dalam meningkatkan mutu kerja saya.*					
6	I am extremely glad that I chose my team to work with over other teams. *Saya sangat gembira kerana saya memilih untuk bekerjasama dengan pasukan ini berbanding dengan pasukan lain.*					
7	I really care about the fate of my team.					

	Saya sangat mengambil berat tentang nasib pasukan ini.					
8	For me this is the best of all possible teams for me to work with. *Bagi saya ini adalah yang terbaik daripada semua pasukan yang mungkin ada untuk saya bekerja.*					

B.4 Team Collaboration / *Kerjasama Berpasukan*

The statements below are designed to capture your opinion on team collaboration. It include your satisfaction and ability to work together. Please indicate your level of agreement with each statement with (1) being Strongly Disagree and (5) being Strongly Agree. Please circle the number as appropriate.

Pernyataan berikut adalah mengenai pandangan anda tentang kerjasama berpasukan. Kerjasama berpasukan merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama. Sila nyatakan tahap kesetujuan anda untuk setiap pernyataan yang dinilaikan antara (1) Sangat Tidak Bersetuju dengan (5) Sangat Bersetuju. Sila bulatkan pilihan nombor yang bersesuaian.

	TEAM COLLABORATION / *KERJASAMA BERPASUKAN*	**1**	**2**	**3**	**4**	**5**
In general, team collaboration includes sharing the responsibilities of problem solving and decision-making in formulating and carrying out plans to achieve the organizational goal. *Secara umumnya, kerjasama berpasukan merujuk kepada perkongsian tanggungjawab dalam menyelesaikan masalah dan membuat keputusan dalam merangka dan melaksanakan rancangan untuk mencapai matlamat organisasi.*						
1	My team understands the role of other professions in clinical situations. *Pasukan saya memahami peranan pekerjaan lain dalam situasi klinikal.*					
2	My team recognizes and respects roles and contribution of another ward. *Pasukan saya mengiktiraf dan menghormati peranan dan sumbangan jabatan lain.*					
3	My team acknowledged and respects the skills and expertise of other team members. *Pasukan saya mengakui dan menghormati kemahiran serta kepakaran ahli pasukan yang lain.*					
4	My team is capable of working as a team with people from other wards. *Pasukan saya mampu bekerja sebagai satu pasukan dengan orang dari wad lain.*					
5	My team is capable of communicating, coordinating and resolving conflicts. *Pasukan saya mampu berkomunikasi, menyelaras dan menyelesaikan konflik.*					
6	My team recognizes and respects leadership in collaboration practice. *Pasukan saya mengiktiraf dan menghormati kepimpinan dalam amalan bekerjasama.*					
7	My team is capable of facilitating collaborative practice. *Pasukan saya mampu memudahkan amalan kolaboratif.*					

8	My team is confident in its own ability as well as others'. *Pasukan saya yakin dengan kemampuan sendiri dan juga orang lain.*					
9	My team is capable of patient-centered collaborative practice. *Pasukan saya mampu melaksanakan amalan kerjasama berpusatkan pesakit.*					
10	My team is willing to work as a team and share the same goal with people from other ward. *Pasukan saya bersedia bekerja sebagai satu pasukan dan berkongsi matlamat yang sama dengan orang dari wad lain.*					
11	My team members plan together in decision making. *Ahli pasukan saya merancang bersama dalam membuat keputusan.*					
12	My team promotes open communication among team members in fostering collaborative decision making. *Pasukan saya menggalakkan komikasi secara terbuka di kalangan ahli pasukan dalam memupuk pembuatan keputusan secara kolaboratif.*					
13	My team shares responsibilities for decision-making. *Pasukan saya berkongsi tanggungjawab dalam membuat keputusan.*					
14	My team member cooperates in decision making. *Ahli pasukan saya bekerjasama dalam membuat keputusan.*					
15	My team members concern will be considered in decision-making. *Keperihatinan ahli pasukan saya akan dipertimbangkan dalam membuat keputusan.*					
16	My team will coordinate the decision making among the team members *Pasukan saya akan menyelaras membuat keputusan di kalangan ahli pasukan*					
17	My team has a high level of collaboration among team members in decision-making. *Pasukan saya mempunyai tahap kerjasama yang tinggi dalam membuat keputusan.*					
18	I am satisfied with the decision-making process among my team members. *Saya berpuas hati dengan proses membuat keputusan di kalangan ahli pasukan saya.*					

B. 5 Collective Leadership/ *Kepimpinan Kolektif*

The statements below are designed to capture your opinion on collective leadership/ shared leadership. It include your satisfaction and ability to work together. Please indicate your level of agreement with each statement with (1) being Strongly Disagree and (5) being Strongly Agree. Please circle the number as appropriate.

Pernyataan berikut adalah mengenai pandangan anda tentang kepimpinan kolektif/ kepimpinan bersama. Kepimpinan kolektif/ kepimpinan bersama merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama. Sila nyatakan tahap kesetujuan anda untuk setiap pernyataan yang dinilaikan antara (1) Sangat Tidak Bersetuju dengan (5) Sangat Bersetuju. Sila bulatkan pilihan nombor yang bersesuaian.

	COLLECTIVE LEADERSHIP/ *KEPIMPINAN KOLEKTIF*	**1**	**2**	**3**	**4**	**5**
Generally, collective leadership is a dynamic process where leadership roles are distributed, diverse skills and expertise are shared within the team members and effective information exchange among the team members is leveraged to align their roles, behavior and expertise within group. *Secara umumnya, kepimpinan kolektif merupakan proses dinamik dimana peranan kepimpinan diagihkan, pelbagai kemahiran dan kepakaran dikongsi di kalangan ahli pasukan dan pertukaran maklumat yang efektif di antara ahli pasukan dimanfaatkan untuk menyelaras peranan, tingkat laku dan kepakaran mereka dalam kumpulan.*					
1	I collaborate regularly with my team members to achieve goals. *Saya kerap bekerjasama dengan ahli pasukan saya untuk mencapai matlamat.*					
2	My team has collective vision with agreed upon goals. *Pasukan saya mempunyai visi kolektif dengan matlamat yang dipersetujui*					
3	The formal matron in my team is willing to delegate some control to informal leaders. *Matron sedia ada dalam pasukan saya bersedia untuk menyerahkan beberapa kawalan kepimpinan kepada pemimpin tidak formal.*					
4	My team members rely on each other to work effectively and get the job done. *Ahli pasukan kami bergantung pada satu sama lain untuk bekerja dengan berkesan dan menyelesaikan kerja.*					
5	I understand my team's purpose and goals. *Saya memahami tujuan dan matlamat pasukan saya.*					
6	When major decisions must be made,my team members are involved in the decision process in a meaningful way. *Apabila keputusan pentingharus dibuat, ahli pasukan terlibat dalam proses keputusan dengan cara yang bermakna.*					

7	Each team members' unique expertise is valued and utilized. *Kepakaran unik setiap ahli pasukan dihargai dan digunakan.*					
8	When I think of leadership, I think of collective mission to learn and construct knowledge collaboratively. *Apabila saya memikirkan tentang kepimpinan, saya memikirkan misi kolektif untuk belajar dan membina penegtahuan secara kolaboratif.*					
9	I have an excellent rapport with at least two other team members. *Saya mempunyai hubungan yang sangat baik dengan sekurang-kurangnya dua ahli pasukan yang lain.*					
10	When a new task arises, leadership responsibilities are determined by members' strength, not by formal titles. *Apabila diberi tugas baru, tanggungjawab kepimpinan ditentukan oleh kekuatan ahli, bukan melalui gelaran rasmi.*					
11	I feel confident taking on leadership responsibilities in my team. *Saya berasa yakin memikul tanggungjawab kepimpinan dalam pasukan ini.*					
12	If the team's matron left, my team would continue to make progress towards its goals. *Jika matron meninggalkan pasukan, pasukan ini akan terus melakukan kemajuan dalam mencapai matlamat.*					
13	When my team members work together as leaders, they share beliefs, values, and goals. *Apabila ahli pasukan bekerjasama sebagai pemimpin, mereka berkongsi kepercayaan, nilai dan matlamat yang sama.*					
14	As a leader in my team, I have responsibilities in multiple roles/positions. *Sebagai ketua dalam pasukan, saya mempunyai tanggungjawan dalam pelbagai peranan/ jawatan.*					
15	All members of my team value collective efficacy. *Semua ahli pasukan saya menghargai keberkesanan secara kolektif.*					
16	I know what strengths and skills each of the others'team members possesses. *Saya tahu kekuatan dan kemahiran yang dimiliki oleh setiap ahli pasukan yang lain.*					

17	In addition to the team's formally designated leaders, I can identify at least two other team members who act as informal leaders. *Sebagai tambahan kepada ketua pasukan yang dilantik secara rasmi, saya boleh mengenal pasti sekurang-kurangnya dua ahli pasukan yang lain yang boleh bertindak sebagai pemimpin tidak formal.*					
18	The leadership roles available in my group result from the needs arising from our goals. *Peranan kepimpinan yang ada dalam kumpulan saya terhasil daripada keperluan yang timbul daripada matlamat kami.*					
19	I feel that every other team member in my team has a capacity for leadership. *Saya merasakan bahawa setiap ahli pasukan lain dalam pasukan saya mempunyai kapasiti dalam kepimpinan.*					
20	Multiple people are trusted with information and decision-making for every activity our group undertakes. *Berbilang orang diberi kepercayaan dengan maklumat dan membuat keputusan untuk setiap aktiviti yang dilakukan dalam kumpulan kami.*					

B.6 Team Virtuality / Berpasukan dalam Talian

The statements below are designed to capture your opinion on team virtuality. It include your satisfaction and ability to work together. Please indicate your level of agreement with each statement with (1) being Strongly Disagree and (5) being Strongly Agree. Please circle the number as appropriate.

Pernyataan berikut adalah mengenai pandangan anda tentang berpasukan dalam talian. Berpasukan atas talian merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama. Sila nyatakan tahap kesetujuan anda untuk setiap pernyataan yang dinilaikan antara (1) Sangat Tidak Bersetuju dengan (5) Sangat Bersetuju. Sila bulatkan pilihan nombor yang bersesuaian.

	TEAM VIRTUALITY / ***BERPASUKAN DALAM TALIAN***	**1**	**2**	**3**	**4**	**5**
In general, team virtuality is a group of people or stakeholders from different locations and possibly different departments and time zones, who are collaborating on a common task and use information and communication technologies (ICTs) intensively. *Secara umumnya, pasukan dalam talian adalah sekumpulan orang atau pihak bekepentingan dari lokasi, jabatan dan zon masa yang berbeza, yang bekerjasama dalam melakukan tugasan dan menggunakan teknologi maklumat dan komunikasi (ICT) secara intensif.*						
1	My team works through internet-based video conferencing. *Pasukan saya bekerja melalui video berasaskan internet.*					
2	My team works through internet-based audio conferencing (Phone/Conference calls). *Pasukan saya bekerja melalui audio berasaskan internet (Panggilan telefon/persidangan dalam talian).*					
3	My team works through email. *Pasukan saya bekerja melalui e-mel.*					
4	My team communicates through WhatsApp/Telegram *Pasukan saya berkomunikasi whatapp/tekegram*					
5	My team work and collaborates in real time (there are no delay due to differences in work hours). *Pasukan saya bekerjasama dalam masa yang sama (tiada kelewatan waktu walaupun berbeza waktu bekerja).*					
6	Collaborate with people who speak different dialects from my own through internet-based video conferencing can lead to delays in completing our tasks on time. *Bekerjasama dengan orang yang bercakap menggunakan dialek yang berbeza daripada dialek anda melaui persidangan video*					

	berasaskan internet boleh menyebabkan kelewatan dalam menyelesaikan tugasan tepat pada waktunya.					
7	My teams work at different sites. *Pasukan saya bekerja di lokasi yang berbeza.*					
8	Work with my team that have different ways to track their work using different technologies can lead to delays in completing our tasks on time. *Bekerjasama dengan pasukan yang mempunyai cara berbeza dalam melakukan kerja bersama-sama dengan menggunakan teknologi yang berbeza boleh menyebabkan kelewatan dalam menyelesaikan tugasan tepat pada waktunya.*					
9	Collaborate with people that use different collaboration technologies can enhance teamwork. *Bekerjasama dengan orang yang menngunakan teknologi yang berbeza dapat meningkatkan kerjasama dalam pasukan.*					

End of the Question / *TAMAT*

Thank You For Your Cooperation / Terima Kasih kerana Membantu Kami

APPENDIX B
Ethic Endorsement Letter

PEJABAT TIMBALAN REKTOR
Bahagian Penyelidikan, Jaringan Industri, Masyarakat, Alumni & Keusahawanan
Universiti Teknologi MARA
Cawangan Perlis, Kampus Arau
02600 Arau Perlis, MALAYSIA
Tel: (+604) 9582302/2029/2028

Universiti Teknologi MARA Cawangan Perlis
Kampus Arau
02600 Arau, Perlis, MALAYSIA
Tel.: (+604) 988 2000 / 2999 / 3000 Faks: (+604) 988 2019
Laman Web: http://perlis.uitm.edu.my

UNIVERSITI TEKNOLOGI MARA

Our ref : 600-UiTMPs (PJIM&A/UPK– REC-END 32/2023)
Date : 4 December 2023

Wan Nurulasiah Binti Wan Mustapa
Faculty of Business and Management
Universiti Teknologi MARA
02600 Arau PERLIS

Dear Madam,

ENDORSEMENT LETTER - UiTM RESEARCH ETHICS COMMITTEE

Thank you for submitting your research proposal to Branch Ethical Research Committee of UiTM Perlis. After considering your application, the Committee endorse your proposal entitled "The Mediating Role of Collective Leadership and the Moderating Effect of Team Virtuality on Team Effectiveness among the Healthcare Practitioners in Malaysia".

Details of the endorsement are as follows:

Ref. number:	REC-END 32/2023
Endorsement date:	1/12/2023
Authorised personnel:	1. **Wan Nurulasiah Binti Wan Mustapa**

This endorsement is meant to verify the research ethical application from the system of Research Ethics Depository (RED). The application had been checked by the UiTM Branch Ethical Research Committee of UiTM Perlis and can be proceed on the next step of the ethical approval procedure.

If you require further information, please contact REC Secretariat at 04-988 2509 oremail at **nurulfarha@uitm.edu.my**

Yours Sincerely,

Ts. Gs. DR. ERNIEZA SUHANA MOKHTAR
Deputy Rector
Research, Industry, Community, Alumni, Entrepreneurship & Network (RICAEN)
Co-chair of State Research Ethics Committee
UiTM Perlis Branch

APPENDIX C
Ethics Approval Letter

www.uitm.edu.my

UNIVERSITI TEKNOLOGI MARA

Pejabat
Timbalan Naib Canselor
(Penyelidikan dan Inovasi)

Reference : 600-TNCPI (5/1/6)
Our reference : REC/12/2023 (PG/MR/499)
Date : 1445H جمادي الثاني 9
22 December 2023

Ms Wan Nurulasiah binti Wan Mustapa - 2022671846
(Supervisor: Dr Farah Lina binti Azizan)
Faculty of Business and Management
UiTM Perlis Branch
Arau Campus
02600 Arau
PERLIS

السلام عليكم ورحمة الله وبركاته and Greetings

Ms Wan Nurulasiah

APPROVAL LETTER - UiTM RESEARCH ETHICS COMMITTEE

Thank you for submitting your research proposal to the Research Ethics Committee (REC). After considering your application, the Committee approved your proposal titled "The Mediating Role of Collective Leadership and the Moderating Effect of Team Virtuality on Team Effectiveness among the Healthcare Practitioners in Malaysia (*Peranan Kepimpinan Kolektif dan Kesan Berpasukan dalam Talian terhadap Keberkesanan Pasukan dalam kalangan Pengamal Kesihatan di Malaysia*)" at Hospital Tuanku Fauziah, Hosptal Sultanah Bahiyah, Hospital Pulau Pinang, Hospital Raja Permaisuri Bainun, Hospital Sungai Buloh, Hospital Putrajaya, Hospital Tuanku Ja'afar, Hospital Melaka, Hospital Sultanah Aminah, Hospital Tengku Ampuan Afzan, Hospital Sultanah Nur Zahirah and Hospital Raja Perempuan Zainab II.

Details of the approval are as follows:

Ref. number:	REC/12/2023 (PG/MR/499)
Approval Period:	22 December 2023 until 31 October 2024
Authorised personnel:	1. Wan Nurulasiah binti Wan Mustapa 2. Dr Farah Lina binti Azizan

The UiTM Research Ethics Committee operates in accordance to the ICH Good Clinical Practice Guidelines, Malaysian Good Clinical Practice Guidelines and the Declaration of Helsinki. The approval of this project is conditional upon your continuing compliance with these guidelines and declaration.

We draw to your attention the requirement that a report on this research, must be submitted every 12 months from the date of the approval or on the completion of the project, whichever occurs first. Failure to submit reports will result in withdrawal of consent for the project to proceed. Amendments, if any, to the study documents are to be submitted to the REC for approval.

If you require further information, please contact the REC Secretariat at 03-55448069/03-55442794 or email at recsecretariat@uitm.edu.my.

لون مايكوى، جلي!
"MALAYSIA MADANI"
"BERKHIDMAT UNTUK NEGARA"

Yours sincerely,

EMERITUS PROFESSOR DATO' DR RAYMOND AZMAN ALI
Chairman
UiTM Research Ethics Committee

c.c.: Deputy Rector (PJIM&A), UiTM Perlis Branch

Universiti Teknologi MARA
Aras 3, Bangunan Wawasan
40450 Shah Alam, Selangor, MALAYSIA
Tel: (+603) 5544 2004/2255
Faks: (+603) 5544 2070

ISO 9001:2015 No. Sijil: 10120156

UiTM di hatiku

APPENDIX D1
Hospital Permission Request Letter

Fakulti Pengurusan Dan Perniagaan
Bahagian Hal Ehwal Akademik
02600 ARAU, PERLIS
Tel : 04-9882517 Fax : 04-9882526
http://perlis.uitm.edu.my

Universiti Teknologi MARA Cawangan Perlis
Kampus Arau
02600 Arau, Perlis, MALAYSIA
Tel: (+604) 988 2000 / 2999 / 3000 Faks:(+604) 988 2019
Laman Web: http://perlis.uitm.edu.my

No. Rujukan : 500-UiTMPs (HEA/FPP 23/1)
Tarikh : 2 Januari 2024

Pengarah
Hospital Tuanku Fauziah
Jalan Tun Abdul Razak
01000, Kangar
Perlis.

YBhg Dato' / Tuan / Puan,

PERMOHONAN KEBENARAN PENGGUNAAN HOSPITAL TUANKU FAUZIAH, KANGAR UNTUK MENJALANKAN PENYELIDIKAN

Dengan hormatnya saya merujuk kepada perkara tersebut di atas.

2. Saya perlu menggunakan fasiliti YBhg Dato'/Tuan/Puan untuk aktiviti penyelidikan bertajuk, "[*NMRR ID-23-02531-00O (IIR) – DEVELOPING AN EMPIRIAL MODEL OF COLLECTIVE LEADERSHIP INTERVENTIONS FOR MALAYSIAN HEALTHCARE*]". Penyelidikan ini telah diluluskan oleh Jawatankuasa Etika Penyelidikan Perubatan JEPP (*Medical Research Ethics Committee MREC*). Bersama-sama ini disertakan surat kebenaran MREC (Lampiran 1) dan kertas kajian (*protocol*) / makluman ringkas projek (Lampiran 2).

3. Pegawai dari fasiliti YBhg Dato'/Tuan/Puan yang terlibat dalam penyelidikan ini adalah seperti berikut: (jika berkenaan)

i. Jururawat

4. Fasiliti/Jabatan di tempat YBhg Dato'/Tuan/Puan yang diperlukan adalah seperti berikut:

i. Wad Perubatan

5. Aktiviti penyelidikan yang akan dijalankan di fasiliti YBhg Dato' / Tuan / Puan adalah seperti berikut:

i. Temubual berkelompok terhadap dua kumpulan terdiri daripada enam orang jururawat
ii. Edaran soal selidik kajian kepada jururawat

Kami berharap mendapat kebenaran YBhg Dato' / Tuan / Puan.

Sekian, terima kasih.
Saya yang menurut perintah,

.....
(Dr. Farah Lina Azizan)
s.k.
Bahagian Penyelidikan, PJIM&A UiTM Perlis
Pusat Penyelidikan Klinikal Hospital Tuanku Fauziah
ANG Wei Chern

APPENDIX D2
Hospital Permission Request Letter

Fakulti Pengurusan Dan Perniagaan
Bahagian Hal Ehwal Akademik
02600 ARAU, PERLIS
Tel : 04-9882517 Fax : 04-9882526
http://perlis.uitm.edu.my

Universiti Teknologi MARA Cawangan Perlis
Kampus Arau
02600 Arau, Perlis, MALAYSIA
Tel: (+604) 988 2000 / 2999 / 3000 Faks:(+604) 988 2019
Laman Web: http://perlis.uitm.edu.my

No. Rujukan : 500-UiTMPs (HEA/FPP 23/1)
Tarikh : 4 Januari 2024

Pengarah
Hospital Sultanah Bahiyah
Km 6, Jln Langgar, Bandar
05460 Alor Setar, Kedah

YBhg Dato' / Tuan / Puan,

PERMOHONAN KEBENARAN PENGGUNAAN HOSPITAL SULTANAH BAHIYAH, ALOR STAR UNTUK MENJALANKAN PENYELIDIKAN

Dengan hormatnya saya merujuk kepada perkara tersebut di atas.

2. Saya perlu menggunakan fasiliti YBhg Dato'/Tuan/Puan untuk aktiviti penyelidikan bertajuk, "*[NMRR ID-23-02531-00O (IIR) – DEVELOPING AN EMPIRIAL MODEL OF COLLECTIVE LEADERSHIP INTERVENTIONS FOR MALAYSIAN HEALTHCARE]*". Penyelidikan ini telah diluluskan oleh Jawatankuasa Etika Penyelidikan Perubatan JEPP (*Medical Research Ethics Committee MREC*). Bersama-sama ini disertakan surat kebenaran MREC (Lampiran 1) dan kertas kajian (*protocol*) / makluman ringkas projek (Lampiran 2).

3. Pegawai dari fasiliti YBhg Dato'/Tuan/Puan yang terlibat dalam penyelidikan ini adalah seperti berikut: (jika berkenaan)

i. Jururawat

4. Fasiliti/Jabatan di tempat YBhg Dato'/Tuan/Puan yang diperlukan adalah seperti berikut:

i. Wad Perubatan

5. Aktiviti penyelidikan yang akan dijalankan di fasiliti YBhg Dato' / Tuan / Puan adalah seperti berikut:

i. Temubual berkelompok terhadap dua kumpulan terdiri daripada enam orang jururawat
ii. Edaran soal selidik kajian kepada jururawat

Kami berharap mendapat kebenaran YBhg Dato' / Tuan / Puan.

Sekian, terima kasih.
Saya yang menurut perintah,

.....
(Dr. Farah Lina Azizan)
s.k.
Bahagian Penyelidikan, PJIM&A UiTM Perlis
Pusat Penyelidikan Hospital Sultanah Bahiyah

APPENDIX D3
Hospital Permission Approval Letter

APPENDIX 5 (b)

MAKLUMBALAS PERMOHONAN KEBENARAN PENGLIBATAN JURURAWAT UNTUK MENJALANKAN PENYELIDIKAN

Tajuk Penyelidikan : Developing an Empirical Model of Collective Leadership Interventions for Malaysian Healthcare

Nama dan Jabatan Ketua Penyelidik : Dr.Farah Lina Azizan,Fakulti Pengurusan & Perniagaan UiTM Cawangan Perlis

Pihak hospital/institusi dengan ini membuat keputusan seperti berikut : -

☑ Membenarkan projek penyelidikan dijalankan

☐ Tidak membenarkan projek penyelidikan dijalankan

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah

.....

(Matron Mariah Kiro)
Ketua Penyelia Jururawat
Hospital Sultanah Bahiyah

MARIAH BINTI KIRO
PENYELIA JURURAWAT U44
HOSPITAL SULTANAH BAHIYAH
ALOR SETAR KEDAH

DR SITI NORHANI NAZRAH BT KHALID
MPK : 46595
Timbalan Pengarah (Perubatan) I
Hospital Sultanah Bahiyah
Alor Setar, Kedah

.....

(Dr. Fauziah Binti Abdul Wahab)
Pengarah Hospital Sultanah Bahiyah
Alor Setar Kedah.

S.K.
<Dr.Mohd Azri Bin Mohd Suan (Ketua Unit CRC)

APPENDIX D4
Letter Of Ethical Approval

JAWATANKUASA ETIKA & PENYELIDIKAN PERUBATAN
(*MEDICAL RESEARCH & ETHICS COMMITTEE*)
KEMENTERIAN KESIHATAN MALAYSIA
MINISTRY OF HEALTH MALAYSIA
Kompleks Institut Kesihatan Negara (NIH)
No.1, Persiaran Setia Murni U13/52,
Seksyen U13 Setia Alam,
40170 Shah Alam, Selangor.
Tel.: +(6)03-33628888/ 33628205

Ruj.Kami/ *Ref.*: **23-02531-00O**
Tarikh/ *Date* : **19-12-2023**

FARAH LINA BINTI AZIZAN
UNIVERSITI TEKNOLOGI MARA

Dato'/ Dr/ Tuan/ Puan,

SURAT KELULUSAN ETIKA/ *LETTER OF ETHICAL APPROVAL*:

NMRR ID-23-02531-00O (IIR)
DEVELOPING AN EMPIRICAL MODEL OF COLLECTIVISTIC LEADERSHIP INTERVENTIONS FOR MALAYSIAN HEALTHCARE

Dengan hormatnya perkara di atas adalah dirujuk.

This letter is made in reference to the matter above.

2. Bersama dengan surat ini dilampirkan surat kelulusan saintifik dan etika bagi projek ini. Segala rekod dan data subjek adalah SULIT dan hanya digunakan untuk tujuan kajian dan semua isu serta prosedur mengenai *data confidentiality* mesti dipatuhi. Kebenaran daripada Pengarah Hospital / Institusi di mana kajian akan dijalankan mesti diperolehi terlebih dahulu sebelum kajian dijalankan. Dato'/ Tuan/ Puan perlu akur dan mematuhi keputusan tersebut dan undang-undang lain yang berkaitan.

   *The Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia (MOH) has provided ethical approval for this study. Please take note that all records and data are to be kept strictly **CONFIDENTIAL** and can only be used for the purpose of this study. All precautions are be taken to maintain data confidentiality. Permission from the District Health Officer / Hospital Administrator/ Hospital Director and all relevant heads of departments /units where the study will be carried out must be obtained prior to the study. You are required to follow and comply with their decision and all other relevant regulations.*

3. Penyelidik- penyelidik dan lokasi penyelidikan yang terlibat ialah:

   The investigators and sites involved in this study are:

   HOSPITAL TUANKU FAUZIAH, KANGAR
   Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
   Ang Wei Chern

   HOSPITAL SULTANAH BAHIYAH, ALOR SETAR
   Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
   Ang Wei Chern

   HOSPITAL PULAU PINANG
   Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
   Ang Wei Chern

…/5-

Ruj.Kami/ *Ref*: **23-02531-00O**

HOSPITAL RAJA PERMAISURI BAINUN, IPOH
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

HOSPITAL SUNGAI BULOH
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

HOSPITAL PUTRAJAYA
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

HOSPITAL TUANKU JAAFAR, SEREMBAN
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

HOSPITAL MELAKA
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

HOSPITAL SULTANAH AMINAH
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

HOSPITAL TENGKU AMPUAN AFZAN, KUANTAN
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

HOSPITAL SULTANAH NUR ZAHIRAH, KUALA TERENGGANU
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

HOSPITAL RAJA PEREMPUAN ZAINAB II
Farah Lina binti Azizan (Penyelidik Utama/ *Principal Investigator*)
Ang Wei Chern

4. Dokumen- dokumen kajian berikut telah diterima dan disemak dengan merujuk kepada kajian di atas:

   The following study documents have been received and reviewed with reference to the above study:

Senarai dokumen yang diterima dan disemak/ *List of documents received and reviewed:*

1. Surat iringan kepada JEPP
   Cover letter to MREC
   (Versi/ *Version* 3, bertarikh/ *dated* 01-11-2023)

2. Pengisytiharan Konflik Kepentingan
   Declaration of Conflict of Interest (COI)
   (Versi/ *Version* 3, bertarikh/ *dated* 01-11-2023)

3. Protokol
   Protocol
   (Versi/ *Version* 3, bertarikh/ *dated* 15-11-2023)

4. Lembaran maklumat pesakit & borang persetujuan
   Participant information sheet & informed consent form
   Versi Bahasa Inggeris/ *English version* (Versi/ *Version* 2, bertarikh/ *dated* 15-11-2023)
   Versi Bahasa Melayu/ *Malay version* (Versi/ *Version* 2, bertarikh/ *dated* 15-11-2023)

5. Borang pengumpulan data
   Data collection form
   (Versi/ *Version* 3, bertarikh/ *dated* 01-11-2023)

6. Garis panduan temuduga
   Interview guideline
   (Versi/ *Version* 3, bertarikh/ *dated* 15-11-2023)

7. Carta *Gantt*
   Gantt Chart
   (Versi/ *Version* 1, bertarikh/ *dated* 02-08-2023)

8. Borang IA-HOD-IA dan *Curiculum Vitae (CV*)
   IA-HOD-IA form, Curiculum Vitae (CV) of:
   - Farah Lina binti Azizan

9. *Curiculum Vitae (CV)* dan sijil *Good Clinical Practice (GCP)*
   Curiculum Vitae (CV) and Good Clinical Practice (GCP) certificate of:
   - Ang Wei Chern

5. Adalah dimaklumkan bahawa kelulusan ini adalah sah sehingga **18-12-2024**. Tuan/ Puan perlu menghantar dokumen-dokumen seperti berikut selepas mendapat kelulusan etika. Borang-borang berkaitan boleh dimuat turun daripada laman web *National Medical Research Registry (NMRR)*.

   *Please note that the approval is valid until **18-12-2024**.The following are to be reported upon receiving ethical approval. Required forms can be obtained from the National Medical Research Registry (NMRR) website.*

   i. ***Continuing Review Form*** harus dihantar kepada JEPP selewat-lewatnya dalam tempoh 2 bulan (60 hari) sebelum tamat tempoh kelulusan ini bagi memperbaharui kelulusan etika.

      Continuing Review Form *has to be submitted to MREC within 2 months (60 days) prior to the expiry of ethical approval.*

   ii. ***Study Final Report (Closure Notification)*** harus dihantar kepada JEPP pada penghujung kajian.

      Study Final Report (Closure Notification) *has to be submitted to MREC upon study completion.*

   iii. Mendapat kelulusan etika sekiranya terdapat **pindaan ke atas sebarang dokumen kajian/ lokasi kajian/ penyelidik**. Pihak JEPP mempunyai hak untuk menarik balik kelulusan etika sekiranya terdapat perubahan dokumen kajian yang tidak diisytiharkan.

      *Ethical approval is required in the case of **amendments/ changes** to the **study documents/ study sites/ study team**. MREC reserves the right to withdraw ethical approval if changes to study documents are not completely declared.*

iv. **Kajian berkenaan intervensi klinikal sahaja:** Laporan mengenai ***all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs)*** dan ***Protocol Deviation/Violation*** di lokasi kajian yang diluluskan oleh JEPP jika berkenaan. *SAE* perlu dilaporkan dalam tempoh 15 hari kalender dari kesedaran kejadian (*awareness of event)* oleh penyelidik. Laporan awal *SUSAR* perlu dikemukakan seawal mungkin tapi tidak melewati 7 hari calendar dari kesedaran kejadian oleh penyelidik, disusuli dengan laporan lengkap dalam tempoh tambahan 8 hari kalender.

Applicable for Clinical interventional Studies only: *Report occurrences of* ***all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs)*** *and* ***Protocol Deviation/Violation*** *at all MREC approved sites to MREC. SAEs are to be reported within 15 calendar days from awareness of event by investigator. Initial report of SUSARs are to be reported as soon as possible but not later than 7 calendar days from awareness of event by investigator, followed by a complete report within 8 additional calendar days.*

6. Bilangan **subjek/ pesakit/ responden** yang akan terlibat dalam kajian ini di Malaysia adalah seramai **12 orang**.

   There will be ***12 subjects/ patients/ respondents*** *involved in this study within Malaysia.*

7. Sila ambil maklum bahawa sebarang urusan surat-menyurat berkaitan dengan penyelidikan ini haruslah dinyatakan nombor rujukan surat ini untuk melicinkan urusan yang berkaitan.

   Please take note that the reference number of this letter must be stated in all future correspondence related to this study to facilitate the administrative processes.

8. Jawatankuasa Etika & Penyelidikan Perubatan, Kementerian Kesihatan Malaysia, beroperasi mengikut *Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Use (ICH)*. Mana-mana ahli JEPP yang terlibat dalam kajian/ projek yang dinilai tidak akan mengambil bahagian dalam kelulusan kajian/ projek.

   The Medical Research & Ethics Committee, Ministry of Health Malaysia, operates in accordance to the International Council for Harmonization of Technical Requirements for Pharmaceuticals for Human Use (ICH). Any member of the MREC who is involved in the study/ project under review will not participate in the approval of the study/ project.

Ruj.Kami/ *Ref*: **23-02531-00O**

Lokasi kajian/ *Project Sites*:
HOSPITAL TUANKU FAUZIAH, KANGAR
HOSPITAL SULTANAH BAHIYAH, ALOR SETAR
HOSPITAL PULAU PINANG
HOSPITAL RAJA PERMAISURI BAINUN, IPOH
HOSPITAL SUNGAI BULOH
HOSPITAL PUTRAJAYA
HOSPITAL TUANKU JAAFAR, SEREMBAN
HOSPITAL MELAKA
HOSPITAL SULTANAH AMINAH
HOSPITAL TENGKU AMPUAN AFZAN, KUANTAN
HOSPITAL SULTANAH NUR ZAHIRAH, KUALA TERENGGANU
HOSPITAL RAJA PEREMPUAN ZAINAB II

Keputusan Jawatankuasa Etika & Penyelidikan Perubatan/
Decision by Medical Research & Ethics Committee:
(√) Lulus/ *Approved*
( ) Tidak lulus/ *Disapproved*

Tarikh Kelulusan Etika/ *Date of Ethical Approval*: **19-12-2023**

Sekian terima kasih.
Thank you.

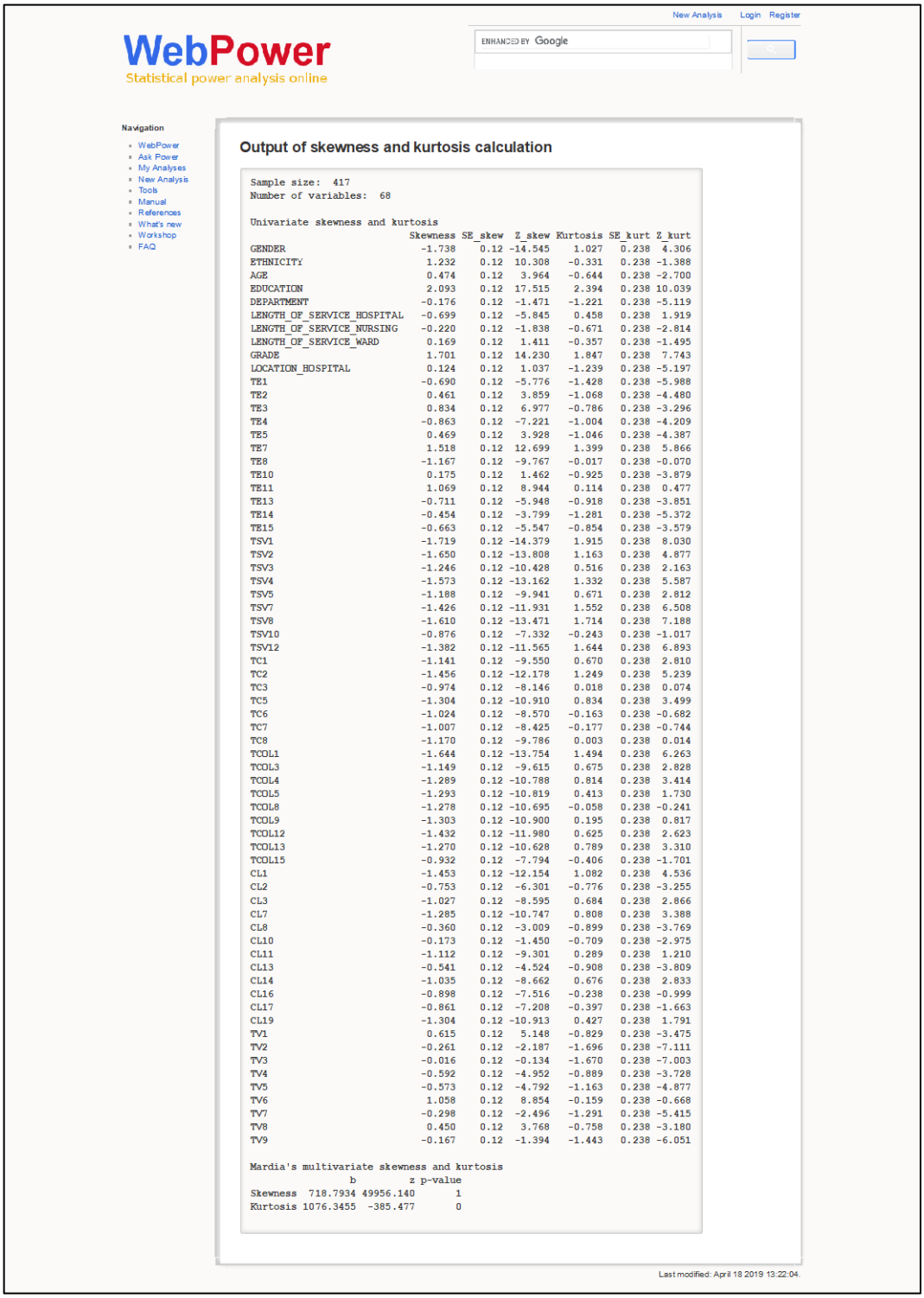
"MALAYSIA MADANI"

"BERKHIDMAT UNTUK NEGARA"

Saya yang menjalankan amanah,
I who carry out the trust,

.....
DR. NURAIN BINTI MOHD NOOR
Pengerusi/ *Chairperson*
Jawatankuasa Etika & Penyelidikan Perubatan/ *Medical Research & Ethics Committee*
Kementerian Kesihatan Malaysia/ *Ministry of Health Malaysia*
(No. MPM/ *MMC No*: 31576)

APPENDIX E
Mardia's Multivariate Skewness and Kurtosis



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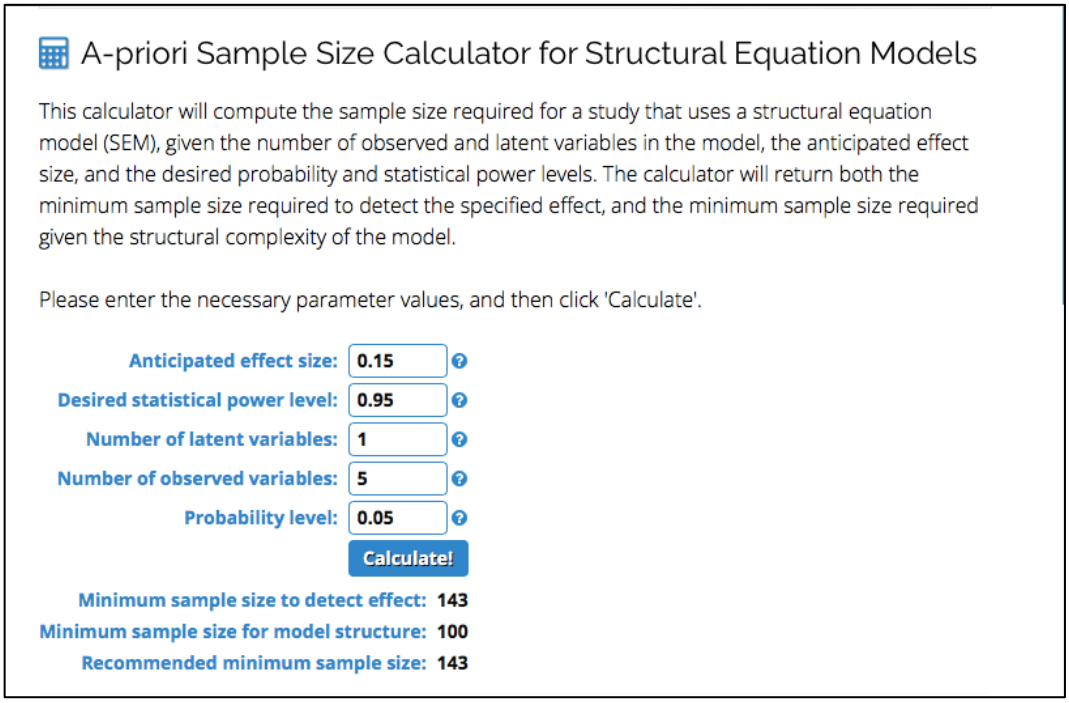
- References
- What's new
- Workshop
- FAQ

Output of skewness and kurtosis calculation

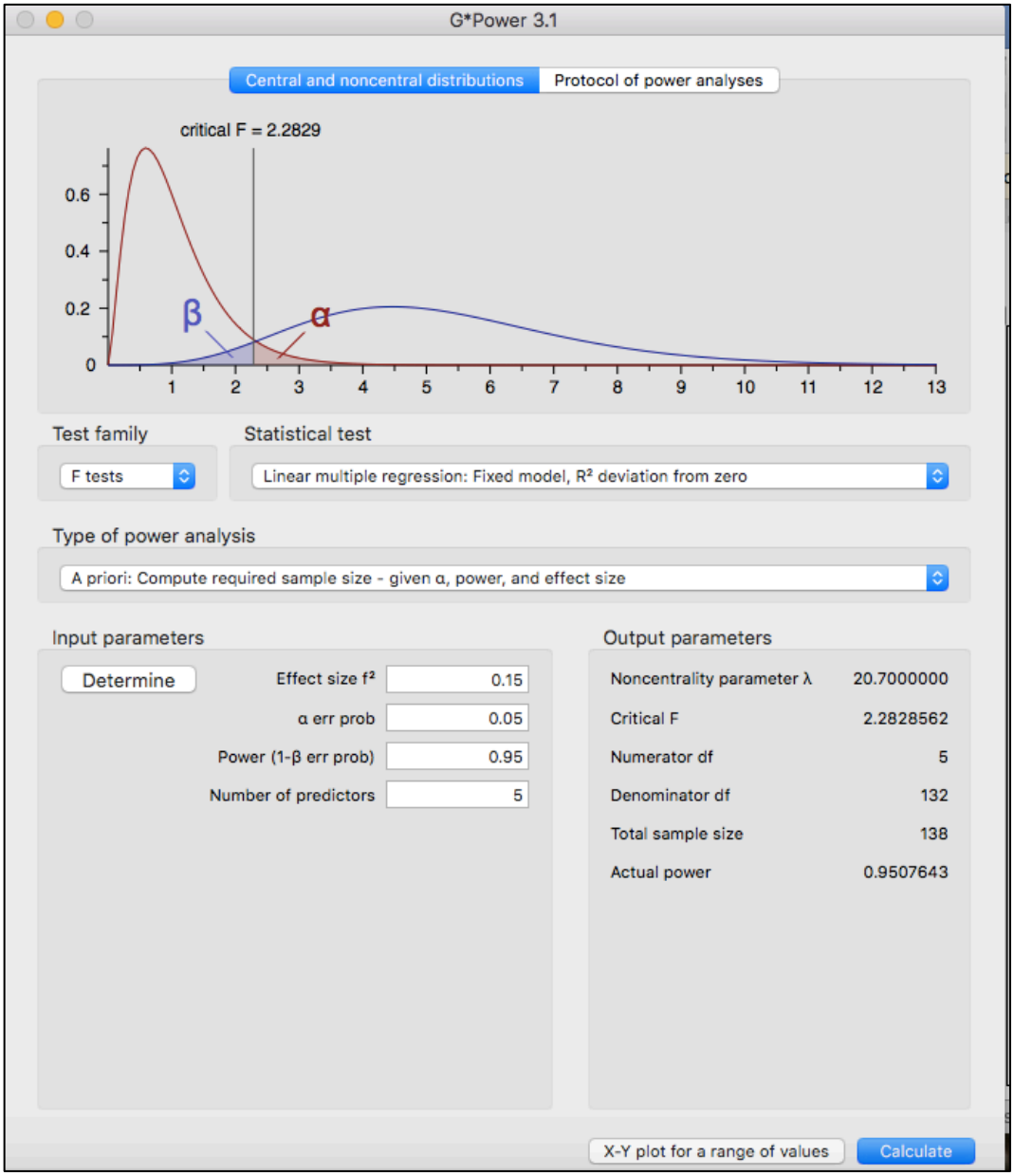
```
Sample size:  417
Number of variables:  68

Univariate skewness and kurtosis
                              Skewness SE_skew  Z_skew Kurtosis SE_kurt Z_kurt
GENDER                          -1.738    0.12 -14.545    1.027   0.238  4.306
ETHNICITY                        1.232    0.12  10.308   -0.331   0.238 -1.388
AGE                              0.474    0.12   3.964   -0.644   0.238 -2.700
EDUCATION                        2.093    0.12  17.515    2.394   0.238 10.039
DEPARTMENT                      -0.176    0.12  -1.471   -1.221   0.238 -5.119
LENGTH_OF_SERVICE_HOSPITAL      -0.699    0.12  -5.845    0.458   0.238  1.919
LENGTH_OF_SERVICE_NURSING       -0.220    0.12  -1.838   -0.671   0.238 -2.814
LENGTH_OF_SERVICE_WARD           0.169    0.12   1.411   -0.357   0.238 -1.495
GRADE                            1.701    0.12  14.230    1.847   0.238  7.743
LOCATION_HOSPITAL                0.124    0.12   1.037   -1.239   0.238 -5.197
TE1                             -0.690    0.12  -5.776   -1.428   0.238 -5.988
TE2                              0.461    0.12   3.859   -1.068   0.238 -4.480
TE3                              0.834    0.12   6.977   -0.786   0.238 -3.296
TE4                             -0.863    0.12  -7.221   -1.004   0.238 -4.209
TE5                              0.469    0.12   3.928   -1.046   0.238 -4.387
TE7                              1.518    0.12  12.699    1.399   0.238  5.866
TE8                             -1.167    0.12  -9.767   -0.017   0.238 -0.070
TE10                             0.175    0.12   1.462   -0.925   0.238 -3.879
TE11                             1.069    0.12   8.944    0.114   0.238  0.477
TE13                            -0.711    0.12  -5.948   -0.918   0.238 -3.851
TE14                            -0.454    0.12  -3.799   -1.281   0.238 -5.372
TE15                            -0.663    0.12  -5.547   -0.854   0.238 -3.579
TSV1                            -1.719    0.12 -14.379    1.915   0.238  8.030
TSV2                            -1.650    0.12 -13.808    1.163   0.238  4.877
TSV3                            -1.246    0.12 -10.428    0.516   0.238  2.163
TSV4                            -1.573    0.12 -13.162    1.332   0.238  5.587
TSV5                            -1.188    0.12  -9.941    0.671   0.238  2.812
TSV7                            -1.426    0.12 -11.931    1.552   0.238  6.508
TSV8                            -1.610    0.12 -13.471    1.714   0.238  7.188
TSV10                           -0.876    0.12  -7.332   -0.243   0.238 -1.017
TSV12                           -1.382    0.12 -11.565    1.644   0.238  6.893
TC1                             -1.141    0.12  -9.550    0.670   0.238  2.810
TC2                             -1.456    0.12 -12.178    1.249   0.238  5.239
TC3                             -0.974    0.12  -8.146    0.018   0.238  0.074
TC5                             -1.304    0.12 -10.910    0.834   0.238  3.499
TC6                             -1.024    0.12  -8.570   -0.163   0.238 -0.682
TC7                             -1.007    0.12  -8.425   -0.177   0.238 -0.744
TC8                             -1.170    0.12  -9.786    0.003   0.238  0.014
TCOL1                           -1.644    0.12 -13.754    1.494   0.238  6.263
TCOL3                           -1.149    0.12  -9.615    0.675   0.238  2.828
TCOL4                           -1.289    0.12 -10.788    0.814   0.238  3.414
TCOL5                           -1.293    0.12 -10.819    0.413   0.238  1.730
TCOL8                           -1.278    0.12 -10.695   -0.058   0.238 -0.241
TCOL9                           -1.303    0.12 -10.900    0.195   0.238  0.817
TCOL12                          -1.432    0.12 -11.980    0.625   0.238  2.623
TCOL13                          -1.270    0.12 -10.628    0.789   0.238  3.310
TCOL15                          -0.932    0.12  -7.794   -0.406   0.238 -1.701
CL1                             -1.453    0.12 -12.154    1.082   0.238  4.536
CL2                             -0.753    0.12  -6.301   -0.776   0.238 -3.255
CL3                             -1.027    0.12  -8.595    0.684   0.238  2.866
CL7                             -1.285    0.12 -10.747    0.808   0.238  3.388
CL8                             -0.360    0.12  -3.009   -0.899   0.238 -3.769
CL10                            -0.173    0.12  -1.450   -0.709   0.238 -2.975
CL11                            -1.112    0.12  -9.301    0.289   0.238  1.210
CL13                            -0.541    0.12  -4.524   -0.908   0.238 -3.809
CL14                            -1.035    0.12  -8.662    0.676   0.238  2.833
CL16                            -0.898    0.12  -7.516   -0.238   0.238 -0.999
CL17                            -0.861    0.12  -7.208   -0.397   0.238 -1.663
CL19                            -1.304    0.12 -10.913    0.427   0.238  1.791
TV1                              0.615    0.12   5.148   -0.829   0.238 -3.475
TV2                             -0.261    0.12  -2.187   -1.696   0.238 -7.111
TV3                             -0.016    0.12  -0.134   -1.670   0.238 -7.003
TV4                             -0.592    0.12  -4.952   -0.889   0.238 -3.728
TV5                             -0.573    0.12  -4.792   -1.163   0.238 -4.877
TV6                              1.058    0.12   8.854   -0.159   0.238 -0.668
TV7                             -0.298    0.12  -2.496   -1.291   0.238 -5.415
TV8                              0.450    0.12   3.768   -0.758   0.238 -3.180
TV9                             -0.167    0.12  -1.394   -1.443   0.238 -6.051

Mardia's multivariate skewness and kurtosis
                b          z p-value
Skewness  718.7934 49956.140       1
Kurtosis 1076.3455  -385.477       0
```

Last modified: April 18 2019 13:22:04.

APPENDIX F1
Sample Size Calculator (A-Priori)



APPENDIX F2
Sample Size Calculator (G-Power)



APPENDIX G
Back To Back Translation Questionnaire Form

Expert name: Dr. Razlina Razali
Position: Senior Lecturer, Academy of Language Studies, UiTM Perlis Branch

Section B.1: Team Effectiveness / *Keberkesanan Berpasukan*
The statements below are designed to capture your opinion on team effectiveness. It includes your satisfaction and ability to work together. / *Pernyataan berikut adalah mengenai pandangan anda tentang keberkesanan pasukan. Keberkesanan merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama*

No	**Team effectiveness *(Keberkesanan Berpasukan)***		Comments and Amendment
	In general, team effectiveness is conceptualised as a team potential to retain its members through their attachment and their willingness to stay together to increase the effectiveness of the team.	*Secara umumnya, keberkesanan pasukan sebagai satu pasukan berpotensi untuk mengekalkan ahlinya melalui keterikatan mereka dengan pasukan dan kesediaan mereka untuk kekal bersama sebagai satu pasukan dalam meningkatkan keberkesanan pasukan.*	BM version is too wordy. Please rephrase. Rephrase as written below: *Umumnya, keberkesanan pasukan bergantung kepada kemampuan ahli pasukan untuk melalui keterikanan dan kesediaan mereka bekerja sama untuk meningkatkan keberkesanan pasukan.*
1	Working with team members is an energizing and uplifting experience.	*Bekerja dengan ahli pasukan adalah pengalaman yang bertenaga dan meningkatkan pengalaman.*	Clear and complete. Thank You. No amendment for this question.
2	Sometimes, one of us refuses to help another team member out.	*Kadang-kadang salah seorang daripada kami enggan membantu ahli pasukan lain.*	Clear and complete. Thank You. No amendment for this question.
3	There is a lot of unpleasantness among members in the team.	*Terdapat banyak ketidakselesaan di kalangan ahli dalam pasukan.*	Clear and complete. Thank You. No amendment for this question.
4	Working as a team will improve patient satisfaction.	*Bekerja sebagai satu pasukan akan meningkatkan kepuasan pesakit.*	Clear and complete. Thank You. No amendment for this question.
5	Some members in the team do not carry their fair share of the overall workload.	*Sesetengah ahli dalam pasukan tidak membawa bahagian mereka yang saksama daripada keseluruhan bebanan kerja.*	Clear and complete. Thank You. No amendment for this question.
6	Working as team show signs of falling apart.	*Bekerja sebagai pasukan menunjukkan tanda-tanda berpecah-belah.*	Clear and complete. Thank You. No amendment for this question.

7	Every time we attempt to straighten out a member of the team whose behavior is not acceptable, things seem to get worse rather than better.	*Setiap kali kami cuba meluruskan ahli pasukan yang tingkat lakunya tidak boleh diterima, keadaan kelihatan menjadi lebih buruk berbanding lebih baik.*	Thank You. No amendment for this question.
8	I am satisfied with my present team member.	*Saya berpuas hati dengan ahli pasukan saya yang sekarang.*	Clear and complete. Thank You. No amendment for this question.
9	I am satisfied with working in this team.	*Saya berpuas hati bekerja dalam pasukan ini.*	Clear and complete. Thank You. No amendment for this question.
10	As soon as I can find a better place, I will leave this hospital.	*Sebaik sahaja saya dapat mencari tempat yang lebih baik, saya akan meninggalkan hospital ini.*	Clear and complete. Thank You. No amendment for this question.
11	I am actively looking for a job at other hospitals.	*Saya sedang giat mencari kerja di hospital lain.*	Thank You. No amendment for this question.
12	I am seriously thinking about quitting my job.	*Saya serius memikirkan untuk berhenti kerja.*	Clear and complete. Thank You. No amendment for this question.
13	This team is very competent.	*Pasukan ini sangat cekap.*	Clear and complete. Thank You. No amendment for this question.
14	I think I will still be working at this hospital five years from now.	*Saya rasa saya akan bekerja di hospital ini sehingga lima tahun dari sekarang.*	Thank You. No amendment for this question.
15	This team gets its work done very effectively.	*Pasukan ini melakukan kerjan dengan sangat berkesan.*	Clear and complete. Thank You. No amendment for this question.

Section B.2: Team Shared Vision / *Berkongsi Visi secara Berpasukan*

The statements below are designed to capture your opinion on team shared vision. It includes your satisfaction and ability to work together. / *Pernyataan berikut adalah mengenai pandangan anda tentang berkongsi visi yang sama di kalangan ahli pasukan. Berkongsi visi secara berpasukan merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama*

NO	**Team Shared Vision / *Berkongsi Visi secara Berpasukan***		Comments and Amendment
	In general, team shared vision refers to every individual team member having the same	*Secara umumnya, visi yang dikongsi secara berpasukan merujuk kepada setiap individu dalam pasukan mempunyai cita-*	Thank You. No amendment for this question.

	ambition, goal same image of the future.	*cita yang sama, matlamat yang sama dan imej masa depan yang sama.*	
1	In my hospital, there is a clear vision guiding the strategic goal and missions.	*Di hospital saya, terdapat visi yang jelas untuk membimbing matlamat dan misi secara strategic.*	Clear and complete. Thank You. No amendment for this question.
2	The hospital manager shares a common vision of the future.	*Pengurus hospital berkongsi visi yang sama.*	Clear and complete. Thank You. No amendment for this question.
3	The shared vision guiding change in the hospital is appropriate.	*Visi yang sama ke arah perubahan di hospital adalah sesuai.*	Thank You. No amendment for this question.
4	My team agrees on what is important for our hospital.	*Ahli pasukan saya bersetuju tentang perkara-perkara yang penting untuk hospital kami.*	Clear and complete. Thank You. No amendment for this question.
5	My team shares the same ambitions and vision with other units at work.	*Ahli pasukan saya berkongsi visi yang sama dengan unit yang lain di tempat kerja.*	Clear and complete. Thank You. No amendment for this question.
6	People in our unit are enthusiastic about pursuing the collective goals and mission of the whole hospital.	*Kakitangan di unit kami bersemangat untuk mengejar matlamat dan misi kolektif untuk keseluruhan hospital.*	Clear and complete. Thank You. No amendment for this question.
7	My team fully understands the meaning of the hospital's vision and mission and can fully explain them in detail.	*Pasukan saya memahami sepenuhnya maksud visi dan misi hospital dan boleh menerangkan kedua-duanya secara terperinci.*	Thank You. No amendment for this question.
8	My team understands the meaning of culture which is embedded in the vision.	*Pasukan saya memahami maksud budaya yang tertanam di dalam visi.*	Thank You. No amendment for this question.
9	My team fully engages and in accordance with our hospital vision and mission.	*Pasukan saya terlibat sepenuhnya dan selaras dengan visi dan misi hospital kami.*	This statement is a bit ambiguous for both English and BM. Please rephrase. Rephrase as written below: My team is fully committed and align with the vision and

			mission of our hospital. *Pasukan saya sangat komited dan selaras dengan visi dan misi hospital kami.*
10	My team can explain our hospital's vision and mission as wellas the organization's direction in detail.	*Pasukan saya boleh menjelaskan visi dan misi hospital kami dan menerangkan hala tuju organisasi secara terperinci.*	Thank You. No amendment for this question.
11	My team believes our hospital's vision and direction are adequately set.	*Pasukan saya percaya visi dan hala tuju hospital kami telah ditetapkan dengansebaiknya.*	Thank You. No amendment for this question.
12	My team knows what to do in order to achieve our hospital's vision.	*Pasukan saya tahu apa yang perlu dilakukan untuk mencapai visi hospital kami.*	Thank You. No amendment for this question.

Section B.3 Team Commitment / *Komitmen Berpasukan*

The statements below are designed to capture your opinion on team commitment. It includes your satisfaction and ability to work together. / *Pernyataan berikut adalah mengenai pandangan anda tentang komitmen anda dalam berpasukan. Komitmen berpasukan merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama*

No	**Team Commitment / *Komitmen Berpasukan***		Comments and Amendment
	In general, team commitment is an intention by an individual team member to make a maximum effort to maintain the relationship and an individual team member have the variety of skills necessary to perform tasks that are the collective responsibility of the team.	*Secara umumnya, komitmen pasukan adalah niat setiap individu dalam pasukan untuk melakukan usaha semaksimum untuk mengekalkan hubungan dan setiap individu dalam pasukan mempunyai pelbagai kemahiran yang diperlukan untuk melaksanakan tugas yang menjadi tanggungjawab kolektif pasukan.*	This statement for both English and BM is too wordy and contains more than one idea in a sentence. Please rephrase. Rephrase as written below: Generally, team commitment involves each member's dedication to maintain the relationship and possess diverse skills for the team's collective tasks. *Secara umumnya, komitmen pasukan melibatkan dedikasi setiap ahli untuk mengekalkan hubungan dan*

			memiliki pelbagai kemahiran untuk tigas-tugas kolektif pasukan.
1	I talk up this team to my friend as a great team to work on.	*Saya bercakap (membesarkan) pasukan ini kepada rakan saya sebagai pasukan yang hebat untuk diusahakan.*	Thank You. No amendment for this question.
2	I would accept almost any job in order to keep working with this team.	*Saya akan menerima hampir semua pekerjaan untuk terus bekerja dalam pasukan ini.*	Clear and complete. Thank You. No amendment for this question.
3	I find that my values and the team's values are very similar.	*Saya mendapati bahawa nilai saya dan nilai pasukan sangat serupa.*	Clear and complete. Thank You. No amendment for this question.
4	I am proud to tell others that I am part of this team.	*Saya berbangga untuk memberitahu orang lain bahawa saya adalah sebahagian daripada pasukan ini.*	Clear and complete. Thank You. No amendment for this question.
5	This team really inspires the very best in me in increasing my job performance.	*Pasukan ini benar-benar memberi inspirasi yang terbaik dalam diri saya dalam meningkatkan mutu kerja saya.*	Thank You. No amendment for this question.
6	I am extremely glad that I chose this team to work with over other teams.	*Saya sangat gembira kerana saya memilih untuk bekerjasama dengan pasukan ini berbanding dengan pasukan lain.*	Thank You. No amendment for this question.
7	I really care about the fate of this team.	*Saya sangat mengambil berat tentang nasib pasukan ini.*	Clear and complete. Thank You. No amendment for this question.
8	For me this is the best of all possible teams for me to work with.	*Bagi saya ini adalah yang terbaik daripada semua pasukan yang mungkin ada untuk saya bekerja.*	Thank You. No amendment for this question.

Section B.4 Team Collaboration / *Kerjasama Berpasukan*

The statements below are designed to capture your opinion on team collaboration. It includes your satisfaction and ability to work together. / *Pernyataan berikut adalah mengenai pandangan anda tentang kerjasama berpasukan. Kerjasama berpasukan merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama.*

No	**Team Collaboration / *Kerjasama Berpasukan***		Comment
	In general, team collaboration includes sharing the responsibilities of problem solving and decision-making in formulating and carrying out plans to achieve the organizational goal.	*Secara umumnya, kerjasama berpasukan merujuk kepada perkongsian tanggungjawab dalam menyelesaikan masalah dan membuat keputusan dalam merangka dan melaksanakan rancangan untuk mencapai matlamat organisasi.*	Thank You. No amendment for this question.
1	My team understands the role of other professions in clinical situations.	*Pasukan saya memahami peranan pekerjaan lain dalam situasi klinikal.*	Thank You. No amendment for this question.
2	My team recognizes and respects roles and contribution of another departments.	*Pasukan saya mengiktiraf dan menghormati peranan dan sumbangan jabatan lain.*	Thank You. No amendment for this question.
3	My team recognizes and respects the competence of other.	*Pasukan saya mengiktiraf dan menghormati kecekapan orang lain.*	English statement is not complete. Rephrase as written below: My team acknowledged and respects the skills and expertise of other team members. *Pasukan saya mengakui dan menghormati kemahiran serta kepakaran ahli pasukan yang lain.*
4	My team is capable of working as a team with people from other departments.	*Pasukan saya mampu bekerja sebagai satu pasukan dengan orang dari jabatan lain.*	Thank You. No amendment for this question.
5	My team is capable of communicating, coordinating and resolving conflicts.	*Pasukan saya mampu berkomunikasi, menyelaras dan menyelesaikan konflik.*	Thank You. No amendment for this question.
6	My team recognizes and respects leadership in collaboration practice.	*Pasukan saya mengiktiraf dan menghormati kepimpinan dalam amalan bekerjasama.*	Thank You. No amendment for this question.

7	My team is capable of facilitating collaborative practice.	*Pasukan saya mampu memudahkan amalan kolaboratif.*	Thank You. No amendment for this question.
8	My team is confident in its own ability as well as others'.	*Pasukan saya yakin dengan kemampuan sendiri dan juga orang lain.*	Thank You. No amendment for this question.
9	My team is capable of patient-centered collaborative practice.	*Pasukan saya mampu melaksanakan amalan kerjasama berpusatkan pesakit.*	Thank You. No amendment for this question.
10	My team is willing to work as a team and share the same goal with people from other departments.	*Pasukan saya bersedia bekerja sebagai satu pasukan dan berkongsi matlamat yang sama dengan orang dari jabatan lain.*	Thank You. No amendment for this question.
11	My team members plan together in decision making.	*Ahli pasukan saya merancang bersama dalam membuat keputusan.*	Thank You. No amendment for this question.
12	My team open communication among team members in decision-making.	*Komunikasi secara terbuka di kalangan ahli pasukan saya dalam membuat keputusan.*	Both the English and BM statements are incomplete. Please add some words to clearly communicate the statement. Rephrase as written below: My team promotes open communication among team members in fostering collaborative decision making. *Pasukan saya menggalakkan komikasi secara terbuka di kalangan ahli pasukan dalam memupuk pembuatan keputusan secara kolaboratif.*
13	My team shares responsibilities for decision-making.	*Pasukan saya berkongsi tanggungjawab dalam membuat keputusan.*	Thank You. No amendment for this question.

14	My team member cooperates in decision making.	*Ahli pasukan saya bekerjasama dalam membuat keputusan.*	Thank You. No amendment for this question.
15	My team members concern will be considered in decision-making.	*Keperihatinan ahli pasukan saya akan dipertimbangkan dalam membuat keputusan.*	Thank You. No amendment for this question.
16	My team will coordinate the decision making among the team members.	*Pasukan saya akan menyelaras membuat keputusan di kalangan ahli pasukan.*	Clear and complete. Thank You. No amendment for this question.
17	My team has a high level of collaboration among team members in decision-making.	*Pasukan saya mempunyai tahap kerjasama yang tinggi dalam membuat keputusan.*	Thank You. No amendment for this question.
18	I am satisfied with the decision-making process among my team members.	*Saya berpuas hati dengan proses membuat keputusan di kalangan ahli pasukan saya.*	Thank You. No amendment for this question.

Section B. 5 Collective Leadership/ *Kepimpinan Kolektif*

The statements below are designed to capture your opinion on collective leadership/ shared leadership. It includes your satisfaction and ability to work together. / *Pernyataan berikut adalah mengenai pandangan anda tentang kepimpinan kolektif/ kepimpinan bersama. Kepimpinan kolektif/ kepimpinan bersama merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama.*

No	**Collective Leadership/ *Kepimpinan Kolektif***		Comment
	In general, collective leadership is a dynamic process that emerges at the crossroads of the distribution of the leadership role, diverse skill and expertise within the network, and the effective exchange of information among team members in order to capitalize on and coordinate their role and behavior and expertise to the achievement of group or organizational goals and both.	*Seacra umumnya, kepimpinan kolektif merupakan proses dinamik yang muncul dalam melakukan peranan kepimpinan, kemahiran dan kepakaran yang pelbagai rangkaian, dan pertukaran maklumat yang berkesan di kalangan ahli pasukan untuk memanfaatkan dan menyelaraskan peranan dan tingkat laku mereka dan kepakaran kepada pencapaian matlamat sesebuah pasukan atau organisasi dan kedua-duanya.*	It would be helpful is you could rephrase and simplify the statements for both English and BM. Rephrase as written below: Generally, collective leadership is a dynamic process where leadership roles are distributed, diverse skills and expertise are shared within the team members and effective information exchange among the team members is leveraged to align their roles, behavior and expertise within group.

			Secara umumnya, kepimpinan kolektif merupakan proses dinamik dimana peranan kepimpinan diagihkan, pelbagai kemahiran dan kepakaran dikongsi di kalangan ahli pasukan dan pertukaran maklumat yang efektif di antara ahli pasukan dimanfaatkan untuk menyelaras peranan, tingkat laku dan kepakaran mereka dalam kumpulan.
1	I collaborate regularly with my team members to achieve goals.	*Saya kerap bekerjasama dengan ahli pasukan saya untuk mencapai matlamat.*	Clear and complete. Thank You. No amendment for this question.
2	My team has collective vision with agreed upon goals.	*Pasukan saya mempunyai visi kolektif dengan matlamat yang dipersetujui.*	Clear and complete. Thank You. No amendment for this question.
3	The formal leader in my team is willing to delegate some control to informal leaders.	*Pemimpin sedia ada dalam pasukan saya bersedia untuk menyerahkan beberapa kawalan kepimpinan kepada pemimpin tidak formal.*	Thank You. No amendment for this question.
4	Our team members rush each other to work effectively and get the job done.	*Ahli pasukan kami menggesa satu sama lain untuk bekerja dengan berkesan dan menyelesaikan kerja.*	Thank You. No amendment for this question.
5	I understand my team's purpose and goals.	*Saya memahami tujuan dan matlamat pasukan saya.*	Clear and complete. Thank You. No amendment for this question.
6	When major decisions must be made, team members are involved in the decision process in a meaningful way.	*Apabila keputusan pentingharus dibuat, ahli pasukan terlibat dalam proses keputusan dengan cara yang bermakna.*	Thank You. No amendment for this question.
7	Each team members' unique expertise is valued and utilized.	*Kepakaran unik setiap ahli pasukan dihargai dan digunakan.*	Clear and complete. Thank You. No amendment for this question.
8	When I think of leadership, I think of collective mission to	*Apabila saya memikirkan tentang kepimpinan, saya memikirkan misi kolektif*	Clear and complete.

	learn and construct knowledge collaboratively.	*untuk belajar dan membina pengetahuan secara kolaboratif.*	Thank You. No amendment for this question.
9	I have an excellent rapport with at least two other team members.	*Saya mempunyai hubungan yang sangat baik dengan sekurang-kurangnya dua ahli pasukan yang lain.*	Clear and complete. Thank You. No amendment for this question.
10	When a new task arises, leadership responsibilities are determined by members' strength, not by formal titles.	*Apabila diberi tugas baru, tanggungjawab kepimpinan ditentukan oleh kekuatan ahli, bukan melalui gelaran rasmi.*	Clear and complete. Thank You. No amendment for this question.
11	I feel confident taking on leadership responsibilities in this team.	*Saya berasa yakin memikul tanggungjawab kepimpinan dalam pasukan ini.*	Clear and complete. Thank You. No amendment for this question.
12	If the team's chairperson left, the team would continue to make progress towards its goals.	*Jika pengerusi meninggalkan pasukan, pasukan ini akan terus melakukan kemajuan dalam mencapai matlamat.*	Thank You. No amendment for this question.
13	When team members work together as leaders, they share beliefs, values, and goals.	*Apabila ahli pasukan bekerjasama sebagai pemimpin, mereka berkongsi kepercayaan, nilai dan matlamat yang sama.*	Thank You. No amendment for this question.
14	As a leader in the team, I have responsibilities in multiple roles/positions.	*Sebagai ketua dalam pasukan, saya mempunyai tanggungjawan dalam pelbagai peranan/ jawatan.*	Clear and complete. Thank You. No amendment for this question.
15	All members of my team value collective efficacy.	*Semua ahli pasukan saya menghargai keberkesanan secara kolektif.*	Thank You. No amendment for this question.
16	I know what strengths and skills each of the others'team members possesses.	*Saya tahu kekuatan dan kemahiran yang dimiliki oleh setiap ahli pasukan yang lain.*	Thank You. No amendment for this question.
17	In addition to the team's formally designated leaders, I can identify at least two other team members who act as informal leaders.	*Sebagai tambahan kepada ketua pasukan yang dilantik secara rasmi, saya boleh mengenal pasti sekurang-kurangnya dua ahli pasukan yang lain yang boleh bertindak sebagai pemimpin tidak formal.*	Clear and complete. Thank You. No amendment for this question.
18	The leadership roles available in my group	*Peranan kepimpinan yang ada dalam kumpulan saya terhasil daripada keperluan*	Clear and complete.

	result from the needs arising from our goals.	*yang timbul daripada matlamat kami.*	Thank You. No amendment for this question.
19	I feel that every other team member has a capacity for leadership.	*Saya merasakan bahawa setiap ahli pasukan lain mempunyai kapasiti dalam kepimpinan.*	This statement is a little ambiguous. Are you referring to members of other teams or members in your team? This statement referring to the members in the team. Thus, rephrase as written below: I feel that every other team member in my team has a capacity for leadership. *Saya merasakan bahawa setiap ahli pasukan lain dalam pasukan saya mempunyai kapasiti dalam kepimpinan.*
20	Multiple people are trusted with information and decision-making for every activity our group undertakes.	*Pelbagai orang diberi kepercayaan dengan maklumat dan membuat keputusan untuk setiap aktiviti yang dilakukan dalam kumpulan kami.*	Thank You. No amendment for this question.

Section B.6 Team Virtuality / Berpasukan dalam Talian

The statements below are designed to capture your opinion on team virtuality. It includes your satisfaction and ability to work together. / *Pernyataan berikut adalah mengenai pandangan anda tentang berpasukan dalam talian. Berpasukan dalam talian merangkumi kepuasan anda dan keupayaan untuk saling bekerjasama*

No	**Team Virtuality / Berpasukan dalam Talian**		Comment
	In general, team virtuality is a group of people or stakeholders from different locations and possibly different departments and time zones, who are collaborating on a common task and use information and communication technologies (ICTs) intensively.	*Secara umumnya, pasukan dalam talian adalah sekumpulan orang atau pihak bekepentingan dari lokasi, jabatan dan zon masa yang berbeza, yang bekerjasama dalam melakukan tugasan dan menggunakan teknologi maklumat dan komunikasi (ICT) secara intensif.*	Thank You. No amendment for this question.

1	My team works through internet-based video conferencing.	*Pasukan saya bekerja melalui video berasaskan internet.*	Thank You. No amendment for this question.
2	My team works through internet-based audio conferencing (Phone/Conference calls).	*Pasukan saya bekerja melalui audio berasaskan internet (Panggilan telefon/persidangan dalam talian).*	Thank You. No amendment for this question.
3	My team works through email.	*Pasukan saya bekerja melalui e-mel.*	Thank You. No amendment for this question.
4	My team communicates through texting/ Instant messaging/WhatsApp.	*Pasukan saya berkomunikasi melalui teks/ mesej / whatapp.*	Clear and complete. Thank You. No amendment for this question.
5	My team works and collaborates in real time (there are no delays due to differences in work hours).	*Pasukan saya bekerjasama dalam masa yang sama (tiada kelewatan waktu kerana perbezaan waktu bekerja).*	*"tiada kelewatan waktu **kerana** perbezaan waktu bekerja". Do you mean, tiada kelewatan waktu **walaupun berbeza** waktu bekerja?* Thank you for the comments. Yes, it refer to the *tiada kelewatan waktu **walaupun berbeza** waktu bekerja.Thus, the amendment as follow:* *Pasukan saya bekerjasama dalam masa yang sama (tiada kelewatan waktu walaupun berbeza waktu bekerja).*
6	Collaborate with people who speak different dialects from your own through internet-based video conferencing.	*Bekerjasama dengan orang yang bercakap menggunakan dialek yang berbeza daripada dialek anda melaui persidangan video berasaskan internet.*	The meaning of this statement is not clear for both BM and English. Rephrase as written below: Collaborate with people who speak different dialects from your own through internet-based video conferencing can lead to delays in completing our tasks on time.

			Bekerjasama dengan orang yang bercakap menggunakan dialek yang berbeza daripada dialek anda melaui persidangan video berasaskan internet boleh menyebabkan kelewatan dalam menyelesaikan tugasan tepat pada waktunya.
7	My teams works at different sites.	*Pasukan saya bekerja di lokasi yang berbeza.*	Thank You. No amendment for this question.
8	Work with team that have different ways to track their work using different technologies.	*Bekerjasama dengan pasukan yang mempunyai cara berbeza dalam melakukan kerja bersama-sama dengan menggunakan teknologi yang berbeza.*	The meaning of this statement is not clear for both BM and English. Rephrase as written below: Work with team that have different ways to track their work using different technologies can lead to delays in completing our tasks on time. *Bekerjasama dengan pasukan yang mempunyai cara berbeza dalam melakukan kerja bersama-sama dengan menggunakan teknologi yang berbeza boleh menyebabkan kelewatan dalam menyelesaikan tugasan tepat pada waktunya.*
9	Work with people that use different collaboration technologies.	*Bekerjasama dengan orang yang menggunakan teknologi yang berbeza.*	The meaning of this statement is not clear for both BM and English. Rephrase as written below: Collaborate with people that use different collaboration technologies can enhance teamwork.

			Bekerjasama dengan orang yang menngunakan teknologi yang berbeza dapat meningkatkan kerjasama dalam pasukan.

-THANK YOU FOR YOUR FEEDBACK-

Overall comments:

1. I have made the track changes for the statements that needed corrections.
Thank you for the track changes. I accept all the changes and use the latest version for amendment.
2. The definitions of the terms are somewhat wordy. Please rephrase so they are simple and easy to understand by ordinary people.
Thank you for the comments. Rephrase as suggested and highlighted with the yellow colour in the comments/amendment section.
3. Several statements are not clear be them in English or BM. Please check again the meaning that you would like to convey.
Thank you for the comments. Rephrase as suggested and highlighted with the yellow colour in the comments/amendment section.

4. Please add a full stop (.) after each statement.
Thank you for the comments. Add a full stop (.) after each of statement as suggested.

APPENDIX H1
Academic Expert Validation Form

Title of Study: The Mediating Role of Collective Leadership and the Moderating Effect of Team Virtuality on Team Effectiveness Among the Healthcare Practitioners in Malaysia
Student Name: Wan Nurulasiah binti Wan Mustapa

Purpose of Review

This form certifies that the questionnaire developed for the above-mentioned study has been reviewed by the appointed expert(s). The purpose of the review is to ensure the instrument's validity in terms of:
1. Content validity: accuracy and appropriateness of items in measuring the intended constructs.
2. Face validity: clarity, comprehensibility, and suitability for respondents.
3. Construct validity : consistency of items with theoretical concepts.
4. Language and structure: clarity, grammar, and relevance of both English and Bahasa Malaysia versions (if applicable).
5. Overall organization : logical sequence, layout, and flow of sections.

Expert's Evaluation Summary

Evaluation Criteria	Rating (/)	Comments / Suggestions
Clarity of items	( ) Excellent (/) Good ( ) Fair ( ) Poor	Most items are clearly stated and easy to understand. However, a few statements could be simplified further to ensure consistent interpretation among respondents.
Relevance to study objectives	( ) Excellent (/) Good ( ) Fair ( ) Poor	The items are generally aligned with the study's objectives
Appropriateness of language	(/) Excellent ( ) Good ( ) Fair ( ) Poor	The language used is appropriate, grammatically correct, and suitable for the target respondents. Both English and Bahasa Malaysia versions are consistent in meaning
Structure and flow	( ) Excellent (/) Good ( ) Fair ( ) Poor	The overall organization of sections is logical. However, adding clearer section headings

		or numbering could improve navigation for respondents.
Content validity	( ) Excellent (/) Good ( ) Fair ( ) Poor	The instrument sufficiently covers the intended variables
Overall suitability of instrument	( ) Excellent (/) Good ( ) Fair ( ) Poor	The questionnaire is well-developed and suitable for data collection.

Expert's Declaration

I hereby confirm that I have reviewed the questionnaire for this study. All comments, corrections, and recommendations for improvement have been provided to the researcher.

Dr A.P. Yukthamarani Permarupan
Senior Lecturer Universiti Malaysia Kelantan
Area of Specialization: Human Resource Management, Organizational Behaviour

APPENDIX H2
Academic Expert Validation Form

EXPERT REVIEW VERIFICATION FORM
(Questionnaire Validation and Evaluation)

Title of Study: The Mediating Role of Collective Leadership and the Moderating Effect of Team Virtuality on Team Effectiveness Among the Healthcare Practitioners in Malaysia
Student Name: Wan Nurulasiah binti Wan Mustapa

Purpose of Review

This form certifies that the questionnaire developed for the above-mentioned study has been reviewed by the appointed expert(s). The purpose of the review is to ensure the instrument's validity in terms of:
1. Content validity: accuracy and appropriateness of items in measuring the intended constructs.
2. Face validity: clarity, comprehensibility, and suitability for respondents.
3. Construct validity : consistency of items with theoretical concepts.
4. Language and structure: clarity, grammar, and relevance of both English and Bahasa Malaysia versions (if applicable).
5. Overall organization : logical sequence, layout, and flow of sections.

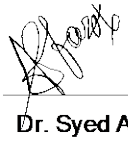
Expert's Evaluation Summary

Evaluation Criteria	Rating (/)	Comments / Suggestions
Clarity of items	( ) Excellent (/) Good ( ) Fair ( ) Poor	Most items are clearly written and convey the intended meaning
Relevance to study objectives	( ) Excellent (/) Good ( ) Fair ( ) Poor	The questionnaire items generally reflect the constructs outlined in the research objectives
Appropriateness of language	() Excellent (/) Good ( ) Fair ( ) Poor	The language level is suitable for the intended respondents. Minor stylistic adjustments could further enhance natural flow, but overall wording is precise and contextually appropriate.
Structure and flow	( ) Excellent (/) Good ( ) Fair ( ) Poor	The questionnaire layout is systematic and easy to navigate. You might consider providing brief instructions at the start of each section to guide respondents more effectively.

Content validity	( ) Excellent (/) Good ( ) Fair ( ) Poor	The content sufficiently addresses the main constructs of the study.
Overall suitability of instrument	( ) Excellent (/) Good ( ) Fair ( ) Poor	The instrument is well-structured and ready for pilot testing. With minor refinements in item sequencing and phrasing, it can be effectively implemented in the actual study.

Expert's Declaration

I hereby confirm that I have reviewed the questionnaire for this study. All comments, corrections, and recommendations for improvement have been provided to the researcher.



Dr. Syed Ali Fazal

Associate Professor

Daffodil International University, Dhaka, Bangladesh

APPENDIX I
Healthcare Practitioner Expert Validation Form

EXPERT REVIEW VERIFICATION FORM
(QUESTIONNAIRE VALIDATION AND EVALUATION)

Title of Study: The Mediating Role of Collective Leadership and the Moderating Effect of Team Virtuality on Team Effectiveness Among the Healthcare Practitioners in Malaysia
Student Name: Wan Nurulasiah binti Wan Mustapa

PURPOSE OF REVIEW

This form certifies that the questionnaire developed for the above-mentioned study has been reviewed by the appointed expert(s). The purpose of the review is to ensure the instrument's validity in terms of:
1. Content validity: accuracy and appropriateness of items in measuring the intended constructs.
2. Face validity: clarity, comprehensibility, and suitability for respondents.
3. Construct validity : consistency of items with theoretical concepts.
4. Language and structure: clarity, grammar, and relevance of both English and Bahasa Malaysia versions (if applicable).
5. Overall organization : logical sequence, layout, and flow of sections.

SECTION A: REVIEW OF QUESTIONNAIRE ITEMS

Evaluation Criteria	Rating	Comments / Suggestions by Reviewer
1. Clarity of Items	( ) Excellent (/) Good ( ) Fair ( ) Poor	*Items are generally clear, but a few statements may benefit from simpler wording to enhance understanding for younger respondents.*
2. Relevance to Study Objectives	( ) Excellent (/) Good ( ) Fair ( ) Poor	*All items strongly align with the constructs measured and adequately reflect the study objectives.*
3. Appropriateness of Language	( ) Excellent (/) Good ( ) Fair ( ) Poor	*Language is suitable, clear, and appropriate for the target respondents. No major revisions required. Please send to expert for translations English to Malay.*
4. Structure and Flow	( ) Excellent (/) Good ( ) Fair ( ) Poor	*Sequence of sections is logical; however, consider grouping similar constructs together for smoother flow.*
5. Response Format	( ) Excellent (/) Good ( ) Fair ( ) Poor	*Likert scale is appropriate. Suggest adding examples or instructions for respondents unfamiliar with rating scales.*
6. Length of Questionnaire	( ) Excellent (/) Good ( ) Fair ( ) Poor	*Length is reasonable and not burdensome for respondents.*

Evaluation Criteria	Rating	Comments / Suggestions by Reviewer
7. Overall Suitability for Data Collection	( ) Excellent (/) Good ( ) Fair ( ) Poor	*The instrument is well-designed and suitable for use in the study with minor adjustments recommended.*

SECTION B: SUMMARY OF EXPERT FEEDBACK

Strengths of the Questionnaire:

- Items closely reflect the measured constructs.
- Language is clear and appropriate for the intended respondents.
- Questionnaire is well-structured, with sufficient coverage of all key dimensions.

Areas for Improvement:

- A few items could be simplified to enhance clarity.
- Consider reordering certain sections to improve the logical flow.
- Add brief instructions or examples on how to respond to the Likert scale.

Additional Recommendations (if any):

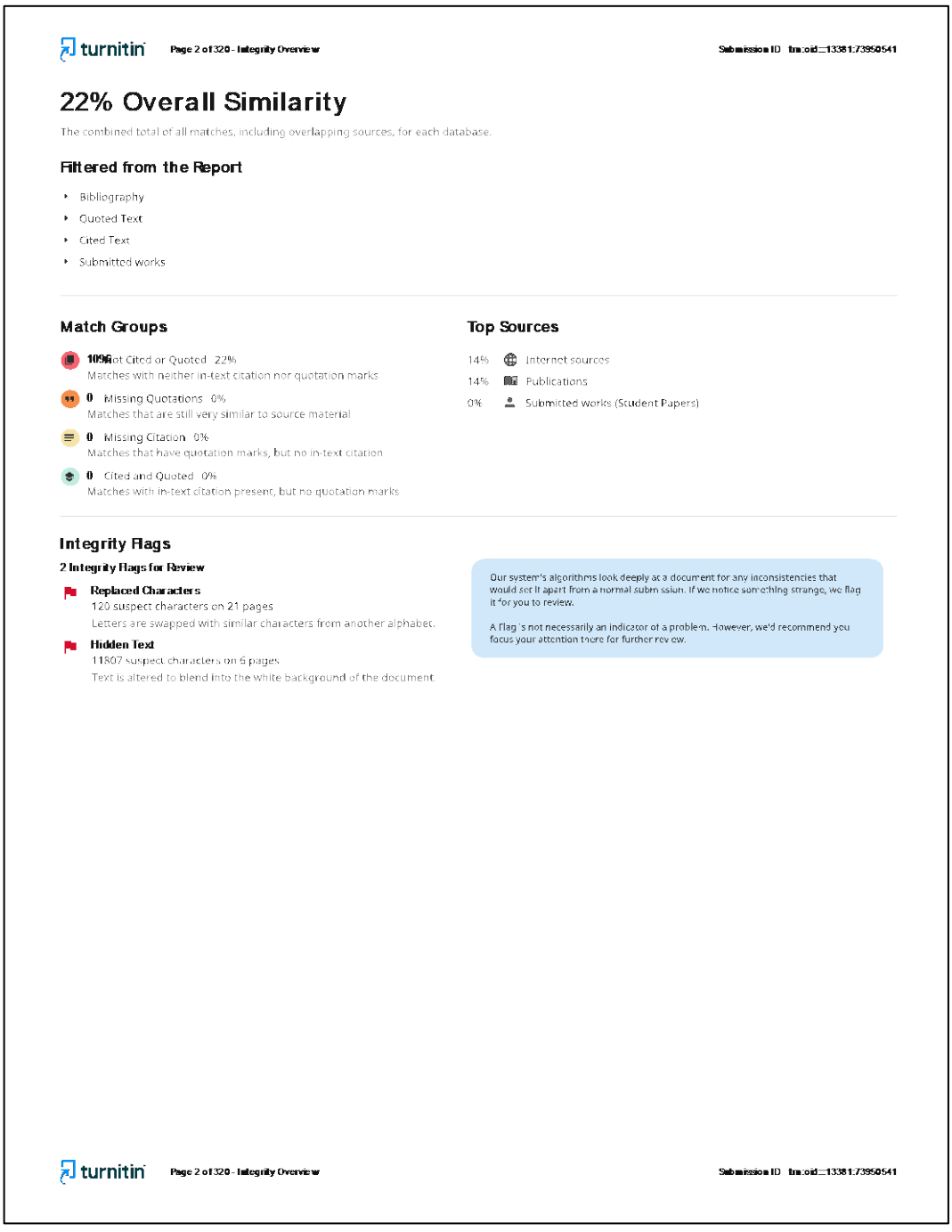
- Consider including open-ended items to capture qualitative insights, if relevant.

SECTION C: EXPERT DECLARATION

I hereby confirm that I have reviewed, validated, and evaluated the questionnaire for the above-mentioned study. All comments and suggestions provided are based on my academic and professional expertise.

Hasim Mohamad (Dr)
Consultant Urologist Kota Bharu Medical Centre, Jalan Sultan Yahya Petra, Kota Bharu
Professor of Surgey, Lincoln University College, Medical Campus Kota Bharu
Advisor to USM Tissue Bank

APPENDIX J
Similarity Index Result



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14% Internet sources
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Integrity Flags

2 Integrity Flags for Review

- **Replaced Characters**
  120 suspect characters on 21 pages
  Letters are swapped with similar characters from another alphabet.
- **Hidden Text**
  11807 suspect characters on 6 pages
  Text is altered to blend into the white background of the document.

Our system's algorithms look deeply at a document for any inconsistencies that would set it apart from a normal submission. If we notice something strange, we flag it for you to review.

A flag is not necessarily an indicator of a problem. However, we'd recommend you focus your attention there for further review.

turnitin Page 2 of 320 - Integrity Overview Submission ID trn:oid:::1381:73950541

APPENDIX K
Professional Profreading Certificate

EXPERT PROOFREADING & CONSULTANCY SERVICES
ACADEMIC RESEARCH EXPERT CONSULTANCY
REGISTRATION NO :EB
experproofreadingconsultancyse@gmail.com

PROFESSIONAL PROOFREADING CERTIFICATE

This document certifies that the material detailed below underwent a thorough proofreading process and was subsequently improved in terms of English language, grammar, punctuation, spelling, overall styling and quality of expression.

Title:

The Mediating Role of Collective Leadership and the Moderating Effect of Team Virtuality on Team Effectiveness among the Healthcare Practitioners in Malaysia

Date Issued: 20th of August 2024

Yours truly,

EXPERT PROOFREADING & CONSULTANCY SERVICES
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APPENDIX L:
Result for Defense Of Research Proposal (DRP)

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Cawangan Perlis
Kampus Arau

Rujukan : 600-UiTMPs (HEA 3/2)
Tarikh : 1446H 18 جمادى الأولى
: 25 Disember 2024

WAN NURULASIAH WAN MUSTAPA
Postgraduate Student
Fakulti Pengurusan dan Perniagaan
Universiti Teknologi MARA (UiTM) Cawangan Perlis
Kampus Arau

السلام عليكم ورحمة الله dan Salam Sejahtera

Tuan,

RESULT FOR DEFENSE OF RESEARCH PROPOSAL (DRP) – WAN NURULASIAH WAN MUSTAPA

Assalamualaikum and very good day Wan Nurulasiah Wan Mustapa.

Kindly find below your Defence of Research Proposal (DRP) Results, which was held on 3 August 2023.

Ranking 2: Thesis needs minor corrections. The student can submit his/her thesis after the necessary correction(s) has/have been made.

Ranking		Interpretation
	1	Proposal accepted without amendments. Student can proceed.
	2	Proposal accepted with minimal amendments. Proposal with amendments must be verified by the main supervisor and submitted within two (2) weeks from the date of DRP. Student can then proceed.
/	3	**Proposal accepted with minimal amendments. Proposal with amendments must be verified by the panel of assessors and submitted within one (1) month from the date of DRP.**
	4	Major amendments. Student is required to resubmit the amended proposal and present again at the Faculty within two (2) months from the date of DRP.
	5	Proposal rejected. Student is required to prepare a new proposal and present again at the Faculty.

Many thanks for your attention and action on this matter.

Regards,

اوس دامتق وى، مولي!
"MALAYSIA MADANI"
"BERKHIDMAT UNTUK NEGARA"

(DR. NURUL AIN MOHD ZAKI)
Ketua Pusat Pengajian
Pascasiswazah
UiTM Cawangan Perlis

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APPENDIX L1
Publication Output

Journal of Health Organization and Management

Exploring the scientific evolution of collective leadership: a bibliometric analysis from Scopus database

Wan Nurulasiah Wan Mustapa
Faculty of Business and Management, Universiti Teknologi MARA – Kampus Arau, Perlis, Malaysia and
Department of Business, Faculty of Business and Communication, Universiti Malaysia Perlis, Kangar, Malaysia
Farah Lina Azizan and Muhammad Aiman Arifin
Faculty of Business and Management, Universiti Teknologi MARA – Kampus Arau, Perlis, Malaysia, and
Ahmad Zulhusny Rozali
Department of Business, Faculty of Business and Communication, Universiti Malaysia Perlis, Kangar, Malaysia

Received 23 February 2024
Revised 6 May 2024
Accepted 9 June 2024

Abstract

Purpose – This study aims to review the last 50 years of academic research on collective leadership (CL) and how far it has progressed by using the Scopus database and the science mapping technique of bibliometric analysis.

Design/methodology/approach – This study has analysed 417 publications from the Scopus database on collective leadership from 1967 to 2023. Data were analysed using MS Excel and VOSviewer.

Findings – There has been research from different parts of the world on the various aspects of collective leadership. In recent years, collective leadership research has gained momentum. However, collective leadership is still at a nascent level when it comes to the applicability of the concepts. So far, the research on collective leadership has relied on themes such as shared leadership and distributed leadership, how collective leadership differs from other similar-looking leadership styles such as transformational leadership, and how this influences followers' outcomes such as team effectiveness, achievements, relations, commitment, etc. Most of the research so far has been done in the United States of America, the UK and the Australian context. There exists a huge gap for studying collective leadership in African, Middle Eastern and Asian contexts.

Research limitations/implications – Collective leadership research trends may be addressed to enable academics and practitioners to better understand current and future trends and research directions. Future studies in this field might use the findings as a starting point to highlight the nature of the topic.

Originality/value – Bibliometric techniques provide a far more comprehensive and reliable picture of the field. This article has the potential to serve as a one-stop resource for researchers and practitioners seeking information that can aid in transdisciplinary endeavours by leading them to recognized, peer-reviewed papers, journals and networks.

Keywords Bibliometric analysis, Collective leadership, Review, VOSviewer

Paper type Literature review

This research was supported by the Ministry of Higher Education (MoHE) of Malaysia through the Fundamental Research Grant Scheme (FRGS/1/2022/SS02/UITM/02/25).

Paper contribution to related field of study: The major contribution of this study is the results of examining the literature in a structured, comprehensive and objective manner. These results offer researchers and scholars guidance to further explore the collective leadership research area in the field of social sciences. More research regarding collective leadership is encouraged. In addition, team-leadership level is a rapidly growing body of research in the leadership realm.

Journal of Health Organization and Management

1477-7266
DOI 10.1108/JHOM-02-2024-0063

APPENDIX L2
Publication Output

International Journal of Public Leadership

Enhancing team effectiveness through collective leadership among nurses in Malaysian healthcare sector

Wan Nurulasiah Wan Mustapa
Faculty of Business and Management, Universiti Teknologi MARA – Kampus Perlis, Arau, Malaysia and
Faculty of Business and Communication, Universiti Malaysia Perlis, Arau, Malaysia
Farah Lina Azizan
Faculty of Business and Management, Universiti Teknologi MARA – Kampus Perlis, Arau, Malaysia
Chern Ang Wei
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Abstract

Purpose – In modern healthcare environments, collective leadership within nursing teams serves as a fundamental pillar for providing high-quality patient care. The purpose of this study is to identify the factors to improve the collective leadership among the healthcare practitioners.

Design/methodology/approach – Using data collected through an online survey of 417 registered nurses in 12 general hospital in Malaysia, the study uses partial least squares structural equation modeling to test the proposed hypotheses.

Findings – The result indicate that the collective leadership is directly driven by team shared vision, team commitment and team collaboration. Finding also shows that team shared vision, team commitment and team collaboration has a positive and significant impact on collective leadership. Finally, this study also revealed that, the team collaboration is the most significance factor that affecting the collective leadership among nurses.

Originality/value – This work contributes to a better understanding on collective leadership, ultimately improving team effectiveness and patient care outcomes.

Keywords Team shared vision, Team commitment, Team collaboration, Collective leadership, Team effectiveness

Paper type Research paper

1. Introduction

The nursing sector is part of the Malaysia healthcare industry and it plays a critical role (Ministry of Health Malaysia, 2020). As of 2020, there were a total of 92,681 nurses in the healthcare industry in Malaysia. The demand for nurses in Malaysia is very high; it is expected there will be 130,000 qualified nurses by 2025 (Ministry of Health Malaysia, 2020). Despite this progress, the nursing career is characteristic by a heavy workload and nurses

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AUTHOR'S PROFILE

Wan Nurulasiah binti Wan Mustapa completed her PhD in Business Management at the Faculty of Business and Management, Universiti Teknologi MARA (UiTM), Perlis Branch.

LIST OF PUBLICATIONS

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