Research Article

When AI intervene Clinical Decision-Making:

The influence of Organisational Support, Cognitive Load, and Perceived Autonomy

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Abstract: *The integration of Artificial Intelligence (AI) in healthcare holds the potential to optimise clinical decision-making. However, the effectiveness of AI intervention in clinical decision-making can influence the ability of healthcare professionals to effectively process and apply AI-generated recommendations. This research examines the influence of organisational support (OS) on cognitive load (CL) and its impact on the effectiveness of AI-assisted clinical decision-making. The study further investigates the mediating role of cognitive load and explores the moderating effect of perceived autonomy (PA). Organisational Support Theory (OST), Cognitive Load Theory (CLT), and Self-Determination Theory (SDT) are used to support these dynamics. The targeted respondents are medical doctors in Malaysia, and data are analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM). It is expected that the increased OS will reduce CL, leading to improved AI-assisted clinical decision-making, with PA strengthening this relationship. The findings offer actionable insights for healthcare institutions, suggesting strategies to strengthen AI implementation, streamline workflows, and enhance clinical decision-making.*

Keywords: Organisational Support; Cognitive Load; Perceived Autonomy AI-Assisted Clinical Decision-Making

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1. INTRODUCTION

The rapid advancement of Artificial Intelligence (AI) in healthcare has the potential to transform clinical decision-making by improving accuracy, efficiency, and patient care (Helenason et al., 2023). However, despite these advancements, the effective implementation and utilisation of AI tools remain challenging for many healthcare doctors (Hirani et al., 2024). One of the key hurdles is the cognitive load imposed on doctors, who must manage complex, technology-driven tasks alongside traditional clinical responsibilities (Anastas et al., 2024). Additionally, organisational support and perceived autonomy can significantly influence how AI tools are integrated into clinical workflows (Khanijahani et al., 2022). Organisational support, including access to training, resources, and management encouragement, is critical for ensuring that doctors can effectively leverage AI technologies (Elhaddad & Hamam, 2024). Nevertheless, limited support can lead to higher cognitive demands, which can hinder the adoption of AI tools. In addition, perceived autonomy is essential to

shape doctors in perceiving and utilising organisational resources, which affects their capacity to make independent, AI-driven decisions (Esmaeilzadeh, 2024).

Despite the increasing use of AI in healthcare, there is a limited body of research exploring the interplay between organisational support, cognitive load, perceived autonomy, and AI-assisted clinical decision-making. (Soomro et al., 2024; Khalifa et al., 2024; Hah & Goldin, 2021; Lyell et al., 2024; Pavuluri et al., 2024). Understanding these relationships is essential for optimising AI adoption and improving clinical outcomes. Thus, this study fills the research gap and seeks to address the following research objectives:

1. To examine the influence of organisational support on cognitive load experienced by doctors in AI-assisted clinical decision-making.
2. To examine the influence of organisational support on AI-assisted clinical decision-making.
3. To examine the relationship between cognitive load and the effectiveness of AI-assisted clinical decision-making.
4. To investigate how cognitive load mediates the relationship between organisational support and AI-assisted clinical decision-making.
5. To explore the moderating effects of perceived autonomy towards the impact of organisational support on AI-assisted clinical decision-making.

2. LITERATURE REVIEW

2.1 Theoretical Perspectives

Organisational Support Theory (OST) provides a foundational framework that emphasizes the role of resources, training, and encouragement in influencing performance and technology adoption. Higher levels of support are associated with reduced stress and improved job performance (Zheng et al., 2024). Cognitive Load Theory (CLT) emphasises minimising cognitive load to enhance focus and improve task performance, which is crucial for doctors using AI in clinical decision-making (Patel & Alismail, 2024). Self-Determination Theory (SDT) focuses on how perceived autonomy enhances motivation and engagement with organisational resources, making it key in moderating AI adoption (Neufeld & Malin, 2024). Collectively, these theories underpin the proposed conceptual framework for hypothesis development, contributing to the advancement of more effective AI implementation in healthcare.

2.2 Hypothesis Development

Organisational support refers to the degree to which healthcare institutions provide resources, training, and leadership to facilitate the effective use of AI tools (Soomro et al., 2024). According to Cognitive Load Theory (Sweller, 1988), external support mechanisms can alleviate the mental burden associated with complex tasks by reducing extraneous cognitive load (Patel & Alismail, 2024). For doctors, such support ensures they can focus on task-related processes, thereby improving their interaction with AI systems.

H1: Organisational support negatively affects cognitive load.

AI-assisted clinical decision-making involves using AI systems to analyse patient data and provide insights to enhance medical judgments (Khalifa et al., 2024; Hah & Goldin, 2021). Organisational support plays a pivotal role in fostering a conducive environment for AI adoption by reducing resistance, providing training, and ensuring access to technology (Hameed et al., 2023; Rane et al., 2024). A supportive organisational climate increases the likelihood of doctors effectively leveraging AI tools to improve decision-making.

H2: Organisational support positively affects AI-assisted clinical decision-making.

Cognitive load, defined as the mental effort required to process information and complete tasks (Steyvers & Kumar, 2023), can act as a barrier to effective AI adoption. High cognitive load, caused by poorly designed interfaces or insufficient support, hinders doctors' ability to engage with AI tools (Lyell et al., 2024). Conversely, reducing cognitive load allows for more effective use of AI in clinical decisions.

H3: Cognitive load negatively affects AI-assisted clinical decision-making.

When doctors receive adequate organisational support, such as structured training programs, user-friendly AI interfaces, and continuous managerial encouragement, their extraneous cognitive load decreases, enabling them to allocate more mental resources toward understanding and utilising AI tools effectively (Asgari et al., 2024; Egala & Liang, 2023). This reduction in cognitive load facilitates a more seamless integration of AI systems into clinical workflows, enhancing the quality of decision-making. Empirical studies support this perspective. For instance, Pavuluri et al. (2024) found that external support mechanisms reduced cognitive load, leading to better engagement with clinical decision-support systems. Similarly, Patel and Alismail (2024) emphasised the critical role of reducing extraneous cognitive load in improving task performance and learning outcomes.

H4: Cognitive load mediates the relationship between organisational support and AI-assisted clinical decision-making.

Perceived autonomy refers to the degree to which doctors feel empowered to make independent decisions while interacting with AI tools (Ackerhans et al., 2024). Rooted in Self-Determination Theory, perceived autonomy is a critical psychological factor influencing motivation and task engagement (Neufeld & Malin, 2024). Autonomy fosters a sense of control and ownership, which can shape how individuals perceive and utilize external support, including organisational resources (Le et al., 2023). In the context of AI-assisted clinical decision-making, when doctors experience high levels of autonomy, they are more inclined to integrate organisational support, such as training, managerial guidance, and user-friendly AI systems, into their workflows effectively (Lockwood & Schober, 2024; Schlicht & Raker, 2023). This enhanced integration can lead to improved decision-making quality and efficiency (Ackerhans et al., 2024).

The moderating role of perceived autonomy has been highlighted in prior research. For example, Lockwood and Schober (2024) found that higher perceived autonomy enhanced the effectiveness of external support by fostering intrinsic motivation. Similarly, Schlicht and Raker (2023) emphasised that autonomy-supportive environments amplify individuals' ability to internalise and utilise external resources. In healthcare, doctors who perceive greater autonomy are likely to view organisational support not as prescriptive but as enabling, which enhances their willingness and capacity to engage with AI tools.

H5: Perceived autonomy moderates the relationship between organisational support and AI-assisted clinical decision-making.

Figure 1 illustrates the conceptual framework developed based on the hypothesis.

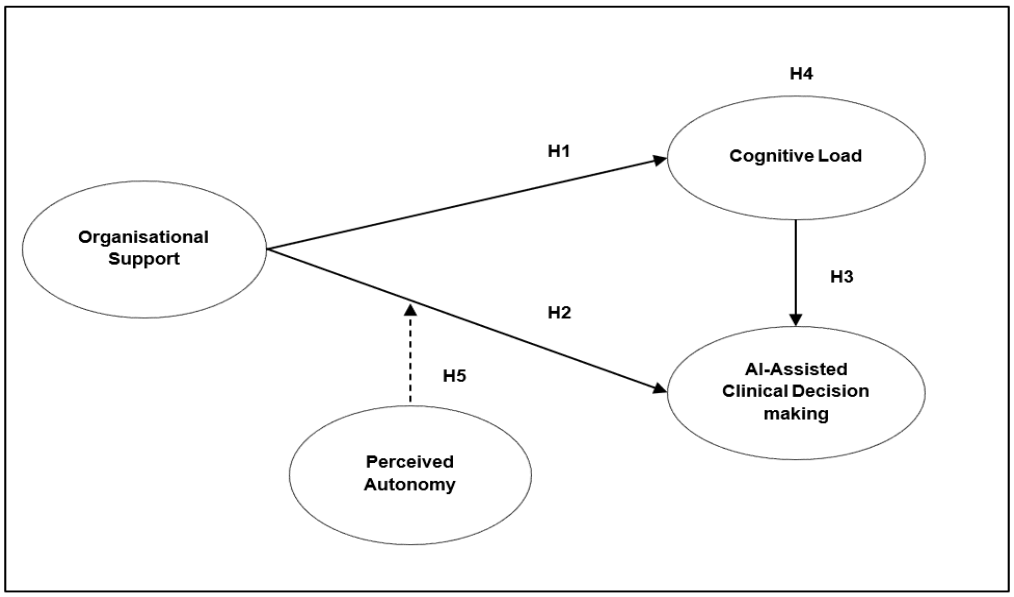

Figure 1: Conceptual Framework

3. METHODS

The research will focus on doctors who utilise AI-based decision-making tools in healthcare institutions across Malaysia. A sample of 300 respondents will be carefully selected through purposive sampling to ensure that respondents possess relevant experience with AI in clinical settings, providing a more accurate representation of the study's objectives. Respondents will complete a structured survey using a Likert scale to evaluate organisational supports (OS), cognitive load (CL), perceived autonomy (PA) and AI-assisted clinical decision making.

Table 1: Measurements for Variables

Variables	No of items	Sources
Organisational Support (OS)	5	Shamszare & Choudhury (2023)
Cognitive Load (CL)	5	Elhaddad and Hamam (2024)
Perceived Autonomy (PA)	5	Ackerhans et al. (2024)
AI-Assisted Clinical Decision Making	5	(Helenason et al., 2023)

Data analysis will be performed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with Smart PLS 4.1. Following a two-step approach (Anderson & Gerbing, 1988), the measurement model will first examine the reliability and validity of the instruments, as outlined by Hair et al. (2022). Subsequently, the structural model will test the proposed hypotheses.

4. EXPECTED OUTCOMES

The study is expected to reveal the extent to which organisational support impacts the cognitive load experienced by doctors when using AI tools. Greater support is anticipated to reduce cognitive load, enabling doctors to focus more effectively on clinical tasks, thereby improving the efficiency and accuracy of decision-making. This outcome may assist healthcare institutions in prioritising providing adequate resources, training, and managerial support to minimise cognitive strain, which will improve doctors' engagement with AI systems and lead to better clinical outcomes. Aside, this research will offer insights into how cognitive load mediates the

relationship between organisational support and AI-assisted clinical decision-making. By understanding this dynamic, healthcare institutions can adopt strategies to minimise unnecessary cognitive demands, enhancing the overall utility of AI in clinical practices. Perceived autonomy is expected to play a critical role in moderating the relationship between organisational support and AI-assisted decision-making. Higher perceived autonomy is likely to strengthen the impact of organisational support, allowing doctors to leverage AI tools more effectively when making clinical decisions.

4.1 Implications

The study expands existing research on AI-assisted clinical decision-making in healthcare by integrating key concepts such as organisational support, cognitive load, and perceived autonomy via organisational support theory, cognitive load theory and self-determination theory. The findings contribute to a deeper understanding of how these factors interact and influence AI-assisted clinical decision-making by providing empirical evidence of these relationships. The study provides advanced theoretical knowledge and provides a foundation for future studies to explore more nuanced aspects of AI implementation in clinical environments. Practically, healthcare institutions are increasingly investing in AI technologies to enhance clinical decision-making. Yet, the success of these tools depends heavily on how well they are integrated into existing workflows. Without sufficient organisational support and consideration of cognitive load, adopting AI tools may fall short of its potential. By addressing these factors, healthcare providers can optimise the use of AI, which may likely to improve patient care, streamline operations, and ensure more effective utilisation of resources.

5. CONCLUSION

In conclusion, the study provides a valuable framework for understanding the complexities of AI adoption in healthcare, offering insights into how organisational support, cognitive load, and perceived autonomy interact to shape the use of AI in clinical decision-making. These findings contribute to both academic research and practical applications, paving the way for more effective and sustainable AI implementations in healthcare systems.

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