UNIVERSITI TEKNOLOGI MARA

A STUDY OF THE USABILITY OF ELECTRONIC MEDICAL RECORD (EMR) IN PRIMARY CARE SETTING BASED ON USER EXPERIENCE

TUAN YUSWANA BINTI TUAN SOH
(2019839618)

Dissertation submitted in fulfilment of
the requirements for the degree of
Master of Science in Dental Public Health
(DCR702)

Faculty of Dentistry

OCTOBER 2020

ABSTRACT

Introduction: The Malaysia Ministry of Health's ICT Strategic Plan includes a standardised digital health agenda where the vision is for an integrated healthcare system to provide comprehensive healthcare services to the people. The TelePrimary Care - Oral Health Clinical Information System (TPC-OHCIS) is an electronic medical record system developed in pursuant of this agenda. However, the usability of the system which is a critical attribute of any system's quality has largely gone unchecked.
Objectives: This study was conducted to evaluate the usability of the TPC-OHCIS which is being piloted in the Ministry of Health medical and dental facilities in Negeri Sembilan by determining the validity and reliability of the QUIS™ 7.0 for measuring the usability of TPC – OHCIS in Malaysia, evaluating the user perception towards TPC – OHCIS in term of usability as measured by QUIS™ 7.0 questionnaire, identifying the Socio demographic factors associated with usability of TPC – OHCIS, and identifying the user experience factors associated with usability of TPC – OHCIS.
Methods: The questionnaire in this study was tested for three types of validity namely; content validity, construct validity and criterion validity, and 2 types of reliability namely internal consistency (Cronbach alpha) and intraclass correlation coefficient (ICC). A cross-sectional study involving healthcare providers using TPC – OHCIS in their clinical service was conducted. Usability was evaluated using the validated questionnaire which measures usability along 6 domains on a 9 point Likert scale: overall satisfaction, screen, terminology and system information, learning, system capabilities and technical manual and online help.
Results: The validation of the QUIS^{TM} 7.0 resulted in a new set of questionnaire named as TPC-OHCIS adapted QUIS^{TM} 7.0 which consists of 61 questions spread over 3 sections. Two hundred and seventy four healthcare personnel participated in this study giving a response rate of 91.64%. The mean score for the overall reaction domain was 5.78 ±SD 1.48 indicating a more positive than negative response. Similarly, the mean scores for domain screen, terminology, learning and technical manual and online help all indicated a more positive than negative response. The domain system capabilities had the lowest mean score (4.89±1.49) suggesting a more negative than positive response. Participants from the dental service [n=89(32.5%)] had a more positive perception towards all domain in TPC-OHCIS (p<0.05) as compared to participants from the medical service. No association was found between usage pattern, user experience and all usability domains.
Conclusions: The findings indicate an overall positive perception on usability of TPC-OHCIS although the mean value scores were around the lower end with the exception of the domain of system capabilities suggesting that enhancements pertaining to system capabilities should be considered to increase usability satisfaction.

Keywords: Electronic Medical Record, Usability, TPC-OHCIS

ACKNOWLEDGEMENTS

TABLE OF CONTENT

CHAPTER ONE :
INTRODUCTION

This chapter serves as an introduction to the study that was conducted; bringing forward the research background, the problem statement, the research objectives as well as the significance of the study.

1.1   RESEARCH BACKGROUND

This study was conducted to determine the usability of Electronic Medical Record (EMR) that is used by the Ministry of Health, Malaysia in their primary care and dental clinics. The EMR system used by the Ministry of Health, Malaysia is the TelePrimary Care – Oral Health Clinical Information System (TPC-OHCIS) which combines medical services with primary dental care services. This project is currently being piloted in the Ministry of Health's medical and dental facilities located in the Seremban district of Negeri Sembilan.

EMR is a computerized medical information system that collects, stores, and displays patient information (Hayrinen et al., 2008). They serve as a means to establish organized and legible recordings, consequently making individual clinical information readily accessible. EMRs are set out to replace existing paper based medical records currently used by clinicians. EMRs also claim to constitute a technology that will positively impact the future of the healthcare industry (Mohd & Mohamad, 2005). A comprehensive and fully functioning EMR system with features including electronic clinical documentation, electronic clinical lab test results, electronic lab images, computerized physician order entry and decision support could potentially be used in other capacities such as improving the quality of service that further adheres to guidelines and principles, enhancing the capacity of healthcare providers to conduct disease surveillance, refining information exchange, reducing the occurrences of medical errors as well as decreasing the likelihood of medical resource abuse (Li et al., 2011). The proposed advantages of EMRs include optimized patient documentation, improved communication and information exchange between physicians, convenient access to patients' medical records, reduced human errors, optimized billing and reimbursement services, an established data repository for research and reduced paper