UNIVERSITI TEKNOLOGI MARA

PERCEPTION OF USERS ON AN ACADEMIC BASED INSTITUTION ELECTRONIC DENTAL RECORD'S (EDR) USABILITY

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ABSTRACT

Introduction: Electronic Dental Record (EDR) is a valuable tool that could improve patient management and increase efficiency in clinical services. In dental education, EDR has enhanced the quality of care, education, and research. The effectiveness and usage of EDR are influenced by many factors. While evaluation to ensure an EDR's ability to meet the technical and usability standards is commonly done, currently, user experience (UX) evaluation is considered an essential component of a system evaluation as both usability and UX could provide input to the betterment of the system. **Objectives:** This study was conducted to assess the perception on usability of an academic institution based EDR; iDeRMS, among staffs and students in Faculty of Dentistry, Universiti Teknologi MARA. It also aimed to evaluate users experience in utilizing the preventive modules in iDeRMS for tobacco cessation and caries risk management, to explore the factors associated with users experience and to identify opportunities for future improvement of iDeRMS. **Methods:** A cross-sectional study involving users of iDeRMS was conducted. A modified CLICS questionnaire consisting of four constructs: computerisation, usability and safety, clinical and organisational management and patient flow measured via a mixed method of close-ended and open-ended questions made up the first part of the questionnaire used. Part 2 of the questionnaire consisted of the User Experience Questionnaire Short Version (UEQ-S). Four preventive modules namely the tobacco cessation, caries risk assessment (CRA), plaque score monitoring and dietary assessment were assessed based on 8 UEQ-S items measured on a 7-point Likert scale. Findings were analysed using UEQ-S data analysis tool, independent T-test and Pearson correlation analysis. **Results:** A total of 259 respondents completed part 1 questionnaire giving a response rate of 88%. More than half of the respondents (78.1%) felt that iDeRMS was fast enough and was worth their time and effort (56.8%)) and felt that they did not need more training on iDeRMS. Majority of the respondents also agreed that iDeRMS help move patients quickly through the service, information recorded in iDeRMS is complete and accurate and the system ensured appropriately controlled access. Part 2 questionnaire involved only the UG students yielded a response rate of 93.0%. The mean UX score for tobacco cessation, caries risk assessment, plaque score monitoring and dietary assessment were 1.20 ($\pm$1.02), 1.74($\pm$0.89), 1.73($\pm$0.99), 1.31($\pm$1.22) respectively which indicates an above average UX for tobacco and dietary module and a good UX for CRA and plaque score module. No significant difference was found between UX across all modules with gender and level of computer skills. The themes that emerged from the qualitative analysis included accessibility, system structure, support system and payment system. Other themes that emerged were suggestions regarding efficiency & effectiveness, referral system, prescribing, assessment, training, usability, technical support, system update and training. **Conclusions:** This study has shown that majority of the respondents agreed that iDeRMS fulfilled the computerisation, usability and safety, clinical and organisational management and patient flow criteria. The UX for preventive modules, was found to be above average for tobacco and dietary modules and good for CRA and plaque score modules. Opportunities for future improvement exists for both the clinical and logbook components iDeRMS.

Keywords: Electronic Dental Record (EDR), Usability, User Experience (UX)

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CHAPTER ONE

INTRODUCTION

The first chapter of this research provides an overview of the research project which consists of several sections: research background, research questions, objectives, problem statement and significance of the research.

1.1   Research Background

This study was conducted for the simultaneous exploration of Electronic Health Record's (EHR) usability and its impact on users' experience throughout its application and utilization by the Faculty of Dentistry, Universiti Teknologi MARA; it was incorporated into their academic programs in both, dentistry and provision of health care services. The EDR system used by the faculty is the Integrated Dental Record and Management Systems (iDeRMS) which combines clinical services and academic modules. This project was launched in 2017 and is currently being used in the main faculty premise and its satellite clinics.

Patient demographics, notes relating to patient's personal progress, problems in regards to patient's health, medications, vital signs, previous medical history, history of immunization, laboratory data and radiology reports are mainly the particulars systematically presented in an Electronic Health Record (EHR) (ADA, 2020). EHR has the potential to convert health care systems from a predominantly paper-based operation, into one that incorporates several forms of medical records; the latter enables the delivery of optimal patient care. (ADA, 2020).

The continuous advancement of information technology has contributed to the emergence of technology that simultaneously monitors patients and promotes their wellbeing. The growing usage of electronic health record (EHR) systems has held up the prospect of more efficient information sharing among clinical professionals in recent years (Baumann et al., 2018) . It was thought that converting from paper to electronic health records would allow personnel to spend more time on direct patient care and less time on documentation (Baumann et al., 2018).

EHRs, electronic medical records (EMRs), electronic dental records (EDRs) are the most common terms used to describe types of health IT record-keeping systems