User Experience and Perceived Benefits of Oral Health Impact Profile Mobile Application (OHIPMA)

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Abstract

The use of mobile applications (MA) has tremendous impact in academic life and there is lack of MA utilization for academic teaching and learning.

This study evaluated user experience and perceived benefits of MA for Oral Health Impact Profile (OHIP), in clinical teaching. An iPad equipped with Oral Health Impact Profile Mobile Application (OHIPMA) was used as the survey tool. Validated questionnaires were asked on the patients by 114 clinical year students, and subsequently, the students answered online survey regarding their perception and experience of using OHIPMA. Descriptive analysis and chi-square test were done using IBM SPSS version 27.

The results showed that 60% of students owned an iPad with 42% recorded everyday usage. The response was positive with 67.5% agreeing it was useful for patients in clinics, and 68.4% thought it was beneficial if it was made available for them online. OHIPMA's potential were given a high rating for records on personal detail (83%), patients treatment (76%), appointments (71%), patients' examination, diagnosis and treatment plan (69%). The responses by the students highlighted the user experience and benefits for digital technology, and gathering feedback on OHIP of the patients, could benefit the community in attaining quality health services.

Clinical article (J Int Dent Med Res 2023; 16(4): 1562-1566)

Keywords: Mobile application, oral health impact profile, usage, perceived benefits.

Received date: 28 August 2023 **Accept date:** 17 October 2023

Introduction

When the iPad was released in 2010, it brought a lot of attention to its potential use as a tablet device in education. Its usage is accompanied by the development of Apple Store Applications (Apps) to suit its operating system, the Apple iOS. In the medical field, the iPad is said to be more cost-effective and has effective data storage through cloud computing, to support e-health, medical education, and healthcare delivery. For researchers, the iPad can analyze data, support disease surveillance, augment existing services to track health trends, and predict outbreaks[1].

Advances in healthcare impacted on the integration and delivery of oral healthcare; with growing acceptance on the impacts of systemic health with technological innovations, changing the face of medical care and quickly becoming integrated into dentistry. Recent advances in novel antimicrobials, genomics, robotics, and artificial intelligence transform our ability to diagnose and manage the disease[2]. In the dental field, the iPad with MA in the form of a dental calendar combine with cloud computing, improved appointment arrangements significantly, and provided efficient services to both dentists and patients[3]. However, these changes in future-orientated education were not made easy, with the biggest challenge related to the burden or fear of educators themselves. No one is ever professionally trained in pedagogy, especially the seniors, who feel the technical and psychological burden of digital transformation related to the installation of software, how to use them, editing, and responding to online comments[4].

Though a recently reported study in 2022, found that features of MA enhanced a sense of relatedness, satisfaction and increased students' learning motivation, the benefits of the MA were

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contingent on the student's acceptance of learning technologies and how promptly they receive answers to their queries[5].

Reeves and Seccombe 2007 reported that patient survey has been widely used for action planning and as the main support for organizational patient-centeredness.

The perceptions toward patient surveys have become more positive due to the fact that its aim to monitor performance proved to assist health services and the utilized patient survey results could formulate action plans to improve the quality of care and assess the outcomes of individuals' performance[6]. However, lengthy questionnaires and the cost to conduct the survey became barriers, to implementing the patient survey. Other barriers included the lack of specific information for certain health departments, delays in publishing the result, lack of expertise or knowledge of the effective intervention, limited understanding of statistical methods, lack of time for clinical teams to discuss the results, and the low priority given to using survey results as part of enhancement planning. The use of MA for health surveys was low across the region except for America (42%) and Africa (31%).

The benefits of such a survey were to expand the capacity for monitoring and prospective surveillance, remove the need for paper use, monitor health outcomes, and track the utilization of health services. Studies reported accuracy, lower cost, time-consuming, and improved data quality[7]. Recent survey in Malaysia showed the readiness of patients to accept tele-dentistry as an alternative method of oral care if appropriate training and education are provided[8].

Pharmacy clients who used the MA in the 2021 study, reported different health MA for different purposes, including general health (53.6%), tracking health status (47%), and fitness/wellness (38.1%). They reported inaccuracy of the app (24%), inconvenience (20.7%), and not being user-friendly (18.5%)[9]. The oral health impact profile (OHIP) survey measured self-reported dysfunction, discomfort, and disability related to the oral condition and acts as oral epidemiological indicators for dental disease. Apart from the 49-items survey[10], a shortened 14-items for Malaysia was reported by Saub et al. who developed Malay S-OHIP (M) and was found to be valid, reliable, and appropriate for use in Malaysian adult's populations[11]. OHIP-EDENT was later developed to cater to the specific questionnaire for edentulous patients and it encompasses all issues affecting edentulous patients. This surveys were adapted and used in the present OHIPMA study[12,13,14].

Materials and methods

An iPad as the tool was used to conduct both OHIP and perception surveys. For the OHIPMA, Quicktap Survey Tool provided OHIP surveys; namely, OHIP-EDENT, OHIP-14, and the Malay S-OHIP (M). The perception survey used Google Forms and was made accessible through the iPad. The research was conducted involving 114 students on their patients during their clinical sessions. After completing the OHIP survey on their respective patients, the students were then asked to respond to perception survey.

The questionnaire was designed to collect data on respondents' demographic and characteristics of iPad/tablet possess. Seven categories for purposes of tablet use namely, i) record or manage personal lifestyle ii) view audiovisual for the assignment, iii) religious purposes, iv) leisure activities v) searching on global news, vi) social networking and, vii) searching for information related to study. On the perception of OHIPMA, the questions asked were i) if it was useful ii) would you use if it is available in the online and beneficial to download iii) if downloaded would they like to use it. On OHIPMA's potential benefit, four items were asked comprising i) patient's personal data record ii) examination and diagnosis iii) treatment records and iv) treatment appointments. The types of population being sampled (dental students), methods of data collection (questionnaires), and area of study (mobile technologies) signify the study done by Khatoon et al.[15]. The validity of observations was adapted from the students' perception survey and students' feedback survey on MA conducted by the Library of International Islamic University Malaysia (IIUM). This cross-sectional study used ddescriptive analysis and chi-square test were done using IBM SPSS version 27.

Results

Respondents demographic: The total

number of respondents was 114 and the majority of them were female (80.7%). Figure 1 (Tablet possess) showed the percentage of the students owned an iPad at the time of study was 60% (n=68) and 40% (n=46) has none (Figure 1) with 42% (n=48) recording everyday usage, however, 21% (n=24) declared that they never used it before with 27% using it when needed.

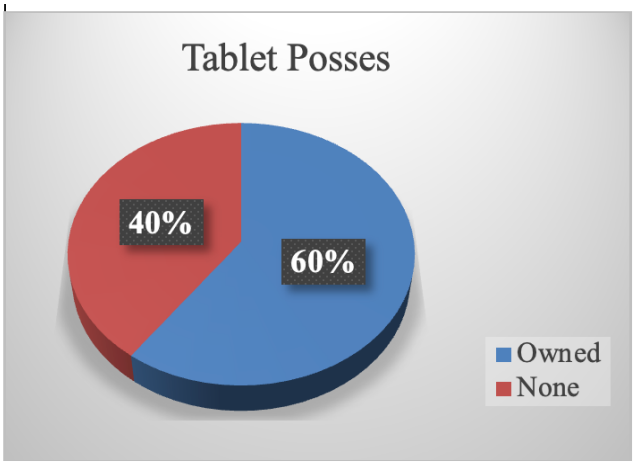

Figure1. Tablet Possess.

No	Purposes of tablet use	Never % (n)	Seldom % (n)	Sometimes % (n)	Often % (n)	Always % (n)
i.	Record or manage personal lifestyle	16.7(19)	21.1(24)	6.7(19)	15.8(18) Often & Always	29.8(34) 45.6(52)
ii	View audio visual materials for the assignment	21.9(25)	22.8(26)	21.1(24)	15.8(18) Often & Always	18.4(21) 34.2(39)
iii	Religious purposes	13.2(15)	24.6(28)	31.6(36)	9.6(11) Often & Always	21.1(24) 30.7 (35)
iv.	Leisure activities	31.6(36)	23.7(27)	14.9(17)	11.4(13) Often & Always	18.4(21) 29.8 (34)
v.	Searching on global news	25.4(29)	18.4(21)	28.1(32)	8.8(10) Often & Always	19.3(22) 28.1(32)
vi.	Social networking	45.6(52) Never & Seldom	18.4(21) 64(73)	10.5(12)	6.1(7)	19.3(22)
vii.	Information searching related to study	34.2(39) Never & Seldom	28.9(33) 63.1(72)	14.0(16)	5.3(6)	17.5(20)

Table 1. Purpose of tablet use.

The purposes of tablet use (Table 1) recorded 45.5% of the students often and always used tablet to manage personal lifestyle (n=52) followed to view audio visual materials for assignment at 34.2% (n=39), use of tablet for religious purposes at 30.7% (n=35), leisure activities 29.8% (n=34) and searching on global news at 28.1% (n=32). Surprising for this findings,73 students never & seldom used it for social networking (63.1%) and sadly, 72 of them declared never and seldom use for information searching related to study._For the perception of OHIPMA in dental teaching clinic, 67.5% of students agreed OHIPMA was useful, if available online, its beneficial to be downloaded and however only 37.5% would like to use it as illustrated in Figure 2.

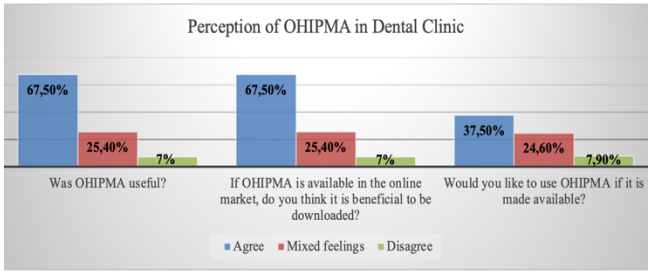

Figure 2. Perception of OHIPMA in Dental Teaching Clinic.

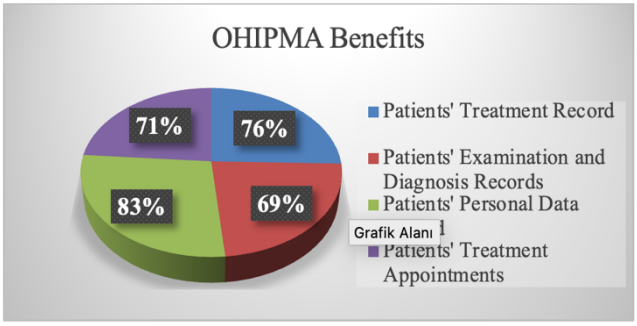

Figure 3. OHIPMA's Potential Benefits.

OHIPMA potential benefits in Figure 3 provided findings on the student's perception regarding OHIPMA. The most favorable were on patients' personal details records (83%), patients' treatment records (76 %), patients' treatment appointments (71%) and patients' examination, diagnosis, and treatment plan (69%). There were 14 comments given by the students, 8 of them encouraged the implementation of OHIPMA in the clinical setting. The other 4 comments were basically recommendations that suggested OHIPMA be more interactive and required only small memory space. They also recommended that OHIPMA include procedural steps and dental materials. On the contrary, there were other comments that oppose the implementation of OHIPMA as the respondents prefer to use a computer compared to a tablet, and a few who were afraid of misuse of the App.

Discussions

The majority of the students possessed MA and based on 2022 study, most of the students agreed that uses of mobile phones in

learning; increase flexibility to learn, create interest in learning, helpful in independent learning, and improve the discussion skill on social media[16]. However, they never heard of OHIPMA before as it was not discussed in the teaching syllabus.

However, highest usage experience by the respondents was to record or manage personal lifestyle, view audiovisual materials for the assignment, purposes, and leisure activities. Searching for information for the assignment was the seventh place of tablet usage experience indicating their preference to use laptops to accomplish their tasks[17]. This study agrees with a recent study in 2021 where a total of 506 dental professionals participated with a response rate of 89.4%. More than half of the participants (50-75%) endorsed that tele dentistry was a useful tool for improving clinical practice as well as patient care, 70% considered that it would reduce costs for dental practices. On the other hand, about 50-70% of dental professionals expressed their concerns regarding the security of the data and the consent of patients. The majority of participants recommended the use of tele dentistry in the specialty of oral medicine, operative dentistry, and periodontics[18]. In comparison to this study, the perception of OHIPMA ventured into more options of potential benefits reporting the usefulness of health-diagnosis MA for professionals, the ethical challenges that accompany them, and the digital developers to increase apps' use in everyday medical practice for better healthcare and social outcomes [19].

Mixed opinions were recorded on the use of health-related MA for oral health education. The preferred features in a health-related MA were disease detection, education, easy access to dentists, reminders, and user-friendliness. Adolescents were aware of the positive aspect of using MA oral health education; however, they were wary of the need to install one. Nevertheless, identifying adolescents' preferred features of an oral health education MA is the first step in developing a MA tailored to their needs. MA could be a timely strategy to improve oral health education delivery and behaviour improvement for this age group[20].

Conclusions

The responses by the students indicated the benefit of OHIPMA for patient data and treatment records. It highlighted users experience of technology for clinical teaching and learning, information and feedback from the students and patients regarding the quality of treatment received, assessed the students' competence in treating patients, and recorded patients' oral health-related quality of life (OhrQoL). The use of auto data transfer for data collection, and for analysis helped to reduce human error that may affect the results thus making the study more accurate.

This paperless study also reduced cost, space needed for storage, and misplacement of data collected. The implementation of a paperless computerized system for data storage, records keeping, ensure they are medico-legal compliance. Limitation observed were time constrain to conduct the study during patient management, limited data space causing lagging and disturbance to function of OHIPMA if reinstallation was needed, as data might be lost and the study needed redoing and resubmission.

Acknowledgments

In memory, we acknowledge the main supervisor of this research Almarhumah Dr. Teh Adilla Mustaza from the Center of Studies for Prosthodontics UiTM, and to all lecturers, students, staff, family, and friends who were involved directly and indirectly in this OHIPMA study.

Declaration of Interest

The authors report no conflict of interest.

References

1. Marceglia S., Bonacina S., Zaccaria V., Pagliari C., Pinciroli F. How might the iPad change healthcare? Journal of the Royal Society of Medicine 2012; 105(6):233-241. https://doi.org/10.1258/jrsm.2012.110296.
2. Nayyar N., Ojcius DM , Dugoni AA. The role of medicine and technology in shaping the future of oral health. Journal of the California Dental Association 2020; 48(3): 127-130.
3. Lin CY., Peng KL., Chen J., Tsai JY., Tseng YC., Yang JR., Chen MH. Improvements in dental care using a new mobile app with cloud services. Journal of the Formosan Medical Association 2014; 113(10): 742-749. https://doi.org/10.1016/j.jfma.2014.02.009.
4. Park JC., Kwon HJE., Chung CW. Innovative digital tools for the new trend in teaching and assessment methods in medical and dental education. Journal of Educational Evaluation for Health Professions 2021; 18(13): published online 2021: doi:10.3352/jeehp.2021.18.13.
5. Molina F., Molina MD., Molina C. Motivating learning through

digital apps: The importance of relatedness satisfaction. International Journal of Human-Computer Interaction 2022: published online: https: // doi.org /10. 1080/10447318.2022.2097777.
6. Reeves R., Seccombe I. Do patient surveys work? The influence of a national survey programme on local quality - improvement initiatives. Reeves R., Seccombe I. BMJ Quality Safety Health Care 2008; 17(6):437-441. doi:10.1136/qshc.2007.022749.
7. Kay M., Santos J., Takane M. World Health Organization (WHO). mHealth – new horizons for health through mobile technologies. Global Observatory for eHealth Series 2011; 3: 42 – 51.
8. Zain E., Rahman N., Khan SA., Farook MS., Khan E., Jubapu AS., Talreja N., Ng ALW. Patients' readiness towards teledentistry in the Malaysian urban population attending an undergraduate teaching university 2023. Published Online: 26 Jun 2023 https://doi.org/10.1089/tmj.2023.0075.
9. Bhuvan KC., Alrasheedy AA., Goh BH., Blebil A., Bangash NSA., Ibrahim MIM., Rehman IU. The types and pattern of use of mobile health applications among the general population. A cross-sectional study from Selangor, Malaysia. Patient Prefer Adherence 2021; 15: 1755-1762. https://doi.org/10.2147/PPA.S325851.
10. Slade GD. Measuring oral health and quality of life. Chapel Hill: University of North Carolina. Dental Ecology 1997: 93-104.
11. Saub R. Locker D., Allison P. Derivation and validation of the short version of the Malaysian Oral Health Impact Profile. Community Dentistry and Oral Epidemiology 2005; 33(5): 378-83. https://doi.org/10.1111/j.1600-0528.2005.00242.x.
12. Viola AP., Takamiya AS., Monteiro DR., Barbosa DB. Oral health-related quality of life and satisfaction before and after treatment with complete dentures in a Dental School in Brazil. Journal of Prosthodontic Research. 2013; 57(1): 36-41. https://doi.org/10.1016/j.jpor.2012.08.003.
13. Indrasari M, Kusdhany LS., Maharani DA., Ismail I. Development of the Indonesian version of the Oral Health Impact Profile in Edentulous Prosthodontic Patients. Journal of International Dental and Medical Research 2021; 14(4): 1531-1536.
14. Yusof H, Ishak N, Yacob N., Wan Ali W.N.S. Self-perceived oral health and awareness on replacement of missing teeth among patients at a Public University. Journal of International Dental and Medical Research 2021;14(1):309-313.
15. Khatoon B., Hill KB., Walmsley AD. Dental Students' uptake of mobile technologies. British Dental Journal 2014; 216: 669-673.
16. Amin Q., Muhammad N., Ahmad T. Perceptions of students towards mobile phones applications in education. Journal of Education and Social Studies 2021;2(1):30-34.
17. Mustaza TA., Lim TW., Ab. Ghani SM. Mobile Applications at the Dentist. International Journal on e-learning and higher education 2016; 4: 16-28, httpsps://ir.uitm.edu.my/id/eprint/16126.
18. Maqsood A., Sadiq MSK., Mirza D., Ahmed N., Lal A., Alam MK., Halim MS. The teledentistry, impacts, current trends, and application in dentistry: A Global Study. BioMed Research International 2021 (special issue): 1-9. Article ID 5437237 | https://doi.org/ 10.1155/2021/ 5437237.
19. Galetsi P., Katsaliaki K., Kumar S. Exploring benefits and ethical challenges in the rise of mHealth (mobile healthcare) technology for the common good: An analysis of mobile applications for health specialists, Technovation 2023; 121. https://doi.org/ 10.1016/ j.technovation.2022.102598.
Ab Mumin N., Yusof ZYM., Jamaludin M., Obaidellah U. Adolescents' opinions on the use a smartphone application as an oral health education tool: A qualitative study. Digital Health 2022; 8: 1-11. http://doi.org/10.1177/20552076221114190.