

SYSTEMATIC REVIEW ON MOBILE HEALTHCARE APPLICATIONS AND THEIR EFFECT ON THE NURSING SERVICE INDUSTRY

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Abstract

Background: This research paper presents a comprehensive review of the existing literature about the adoption and utilization of mobile healthcare applications, as well as their implications for the healthcare sector. The study delves into the advantages and obstacles linked to teleconsultation.

Methodology: To conduct this study, the methodology outlined was followed. This included developing a research question, setting criteria, coming up with a search strategy, looking through relevant databases, registering a protocol, manually searching for relevant material, extracting data, assessing quality, verifying and double-checking data, and writing a manuscript.

Result: The empirical results presented in this study show how effective teleconsultation is at both addressing people's healthcare needs and lowering their risk of contracting infectious diseases and other viral infections.

Conclusion: The previously described issue has emerged as a significant obstacle in the field of teleconsultation, leading the study to put up several suggestions that require serious thought.

Keywords: Mobile Healthcare Applications, Nursing Service Industry, Teleconsultation.

Introduction

The Internet facilitates streamlined communication between healthcare professionals, including nurses, and patients, regardless of their geographical location. The utilization of this novel therapeutic approach is increasingly becoming prevalent among healthcare workers (HCWs) and patients. The emerging field of eHealth seeks to function as a health agency by addressing the disparity between the demand for public health services and the availability of professional digital counselling services. Through the utilization of eHealth, healthcare workers (HCWs), such as nurses and doctors, have the opportunity to participate in online medical communities, enabling them to engage in virtual care consultations. According to Chen, Lan, Chang, Y., and Chang (2019), individuals have the ability to access health-related information and make arrangements for in-person medical treatment based on the guidance provided by their nurses, as directed by physicians. The utilization of mobile equipment and technology has been found to offer advantages in the field of public health administration. According to Cao, Zhang, and Liu (2022), there is an expectation that mobile health applications will have a substantial impact on the management of public health during the ongoing COVID-19 pandemic. Primary care healthcare workers (HCWs) and hospitalists will have the opportunity to replace in-person appointments with established patients with compensated teleconsultations, in accordance with existing telemedicine legislation. During the second week of the nationwide lockdown period, spanning from March 23rd to March 29th, a total of 486,369 teleconsultations were recorded, accounting for approximately 11% of all consultations conducted during that particular week. A total of 44% of general practitioners indicated that they have utilized teleconsultations on at least one occasion. According to Ohannessian, Duong, and Odone (2020), the National Health Insurance recorded a weekly teleconsultation count of less than 10,000

until the beginning of March. The assessment of patient satisfaction has become an essential aspect of evaluating the quality of telemedicine services due to the unforeseen surge in its utilization (Kruse, 2017). Patient perceptions and satisfaction must be duly taken into account when implementing any healthcare delivery method, including telemedicine. According to Dinesen (2016), patients have the ability to provide feedback regarding the adequacy of the care they receive. The utilization and acceptance of telemedicine are subject to substantial influence from user satisfaction (Berger, 2015). Although there has been considerable research conducted on telemedicine, there remains a dearth of knowledge regarding its implementation and patient satisfaction in the context of the Philippines, specifically in relation to the COVID-19 pandemic. The majority of telemedicine research conducted in the nation consisted of pilot studies that had limited sample sizes. Moreover, there exists limited knowledge regarding the factors that influence the utilization and level of contentment with telemedicine in times of emergency, specifically in less developed countries where telemedicine is still in the process of establishing its presence (Wong, 2020).

Method

This study utilized an integrative literature review method to examine the existing body of research on the utilization of mobile healthcare applications and its impact on the nursing service industry. The methodology encompassed the collection of pertinent clinical inquiries, which encompassed systematic reviews, cross-sectional surveys, and focus group studies. In order to ascertain pertinent articles, the researcher initiated the process by scrutinizing the reference lists of extant systematic reviews within the respective field. This methodology facilitated the identification of prospective articles that satisfied the established criteria for inclusion. Furthermore, this study included an examination of the level of satisfaction in relation to factors such as medical consultation and technicality. These factors were chosen as they offer valuable insights into the key variables that impact the ability of mobile healthcare applications to enhance satisfaction levels during the pandemic.

The criteria for inclusion encompassed a temporal scope of the preceding five years, thereby ensuring the incorporation of contemporary research in the review. The researchers also considered language limitations by including studies that were published in languages that were accessible to them. A thorough literature search was conducted using electronic databases including PubMed, Scopus, Web of Science, and Scielo. The objective of this integrative literature review approach was to consolidate and evaluate the outcomes of various

studies in order to acquire a more comprehensive comprehension of tele-consultation during periods of the pandemic.

Research Design

To obtain a thorough understanding of infectious diseases, this study used a systematic review. Technology has emerged as an additional means of reestablishing connections, particularly within the context of medical facilities. This systematic review exclusively incorporated scientific evidence and recommended strategies for the implementation of teleconsultation, taking into account the extensive adoption of preventive measures. This study employed the process outlined by Whitemore and Knafl (2005) to establish a methodological framework for integrating the review process. This framework involved defining the issue, formulating questions related to the issue, conducting a targeted literature search, and employing various methods or strategies for processing qualitative data to evaluate bias and error. The primary aim of this study is to propose a course of action that can effectively improve teleconsultation services during the ongoing pandemic. The implementation of these measures has the potential to mitigate the risk of exposure to specific diseases and viruses.

Search Strategy

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standard, as outlined by Page et al. (2021). The supplementary materials included the PRISMA checklist. A comprehensive search was conducted using electronic databases including Google Scholar, PubMed / MEDLINE, ScienceDirect, Wiley Online Library, EBSCO, and Springer to identify relevant literature.

Data Evaluation and Quality Appraisal

The researchers themselves did the screening and analysis of the research included in this. The collected literature was screened and examined by three independent reviewers who were unbiased. Disagreements were resolved through collaborative meetings involving multiple investigators, with the aim of reaching a definitive consensus, particularly in relation to the limited agreement observed in the evaluation of study selection. In a similar vein, the abstracts and relevance of the titles of the gathered papers were assessed during the screening process. Duplicate studies were removed using Mendeley Reference Manager. The subsequent information was collected from the reference literature: (1) the type of study design employed, (2) the geographical location of the study (either state or country), (3) the sample size and population under investigation, (4) and the prevailing theme that permeated the entirety of the literature. The outcome variables were combined and consolidated using the Review

Manager (RevMan) 5.4.1 software, developed by the Cochrane Collaboration, in order to conduct a meta-analysis. The Mantel-Haenszel method was also utilized for the examination of binary data, wherein the results were represented as the odds ratio (OR). The mean difference was subsequently employed to represent the continuous data, which was subjected to analysis using the Inverse Variance method. Furthermore, the I² test was employed to evaluate the heterogeneity of the data. If the value of I² exceeded 25%, the data were considered to be homogeneous, and a fixed-effect model was utilized. The utilization of Begg's funnel diagram was employed as a means of visually evaluating publication bias. The trim-and-fill method was employed as a corrective measure during instances characterized by publication bias. Statistical significance was taken into account if the two-tailed p-value was less than 0.05. Finally, a comprehensive table was utilized to categorize the data that had been extracted from the database using the Sparbel and Anderson (2000) tool. The table included the following corresponding information: year of publication, author, research objective, study design, methodology, participants, sample size, data collection method, and the study's findings. In addition, expert reviewers were extended invitations to autonomously verify the accuracy and validity of the study.

Results

In order to deliver proficient telemedicine services, it is imperative for professionals to possess comprehensive knowledge of digital communication, clinical expertise, and the appropriate utilization of requisite technology and equipment (Tan et al., 2020). Cao, Zhang, and Liu (2022) present compelling findings that substantiate the efficacy of incorporating mobile technologies and mobile devices in the field of public health administration. Mobile health, also known as mHealth, pertains to the provision of healthcare and public health services through the utilization of mobile phones, patient testing equipment, personal digital assistants (PDAs), and other wireless devices. Currently, the prevailing form of mhealth service provision is in the form of a mobile application. The emergence of mhealth applications has brought about changes to the conventional healthcare delivery model, resulting in benefits for both healthcare professionals and patients. One application of mhealth apps involves their utilization by medical professionals for the purpose of effectively managing patient data and monitoring their overall health status. Nevertheless, individuals' resort to mobile health applications (mhealth apps) in order to swiftly obtain health-related information for the purpose of self-diagnosis. Furthermore, Cao et al. (2020) asserted that online healthcare is a nascent service, prompting scholars to investigate its

user population during its evolutionary stages. Zhang et al. (2017) will examine both intrinsic and extrinsic motivations for sharing within the framework of expert and average user behaviour. According to Li et al. (2019), several factors have been identified as influential in patients' decision-making processes regarding the transition from utilizing an online doctor's service to one that is offered offline. In Zhou's (2019) study, the stimulus-organism-response theory was employed to examine the impact of privacy concerns, platform confidence, and information security on users' motivations to share information within online health communities. In a study conducted by Liu (2020), the examination focused on the impact of users' perceptions of community support on their inclination to engage in communication and collaboration for the purpose of value creation. These two factors were subsequently found to have a significant influence on the frequency of their participation.

The platform can be accessed by the patient and any relevant medical personnel through the installation of a mobile application. The National Health Data Network, also known as Rede Nacional de Dados em Saúde (RNDS), has facilitated the sharing of health data. The data was gathered by creating an online notification system that aimed to enhance the functionality of the RNDS in distributing case information. The implementation of telemedicine for preclinical care presents a potential solution to mitigate overcrowding in healthcare institutions. Telehealth has facilitated the dissemination of knowledge among medical personnel in both large and small healthcare facilities (Donida, Costa, & Scherer, 2021). The feasibility of implementing this framework and efficiently implementing video teleconsultations from the patient's residence has been made possible due to technological progress, reduced costs of telemedicine solutions, the availability of high-speed internet, and the widespread use of smartphones. Nevertheless, a significant number of countries do not possess a comprehensive set of regulations that would enable the incorporation, integration, and remuneration of telemedicine within their healthcare systems, particularly in situations involving emergencies and outbreaks (Ohannessian, Duong, & Odone, 2020). Nevertheless, Calton, Abedini, and Fratkin (2020) have expressed apprehension regarding the potential exclusion of certain patients from telemedicine sessions, despite attempts to involve them. This exclusion may be attributed to various factors, including limited access to technology or the Internet, insufficient social support, or unreliable network connections on the day of the consultation. Certain insurance policies provide coverage for telephone consultations, which serve as a viable alternative to in-person visits.

The telemedicine clinic at Phutho General Hospital (PGH), which was established on November 14, 2020, represents one of the original participating institutions in this endeavour. The utilization of teleconsultations by doctors in PGH was a common practice for engaging with medical experts from various esteemed institutions such as Bach Mai Hospital, Viet Duc Hospital, the National Hospital for Tropical Diseases, and the Vietnam National Cancer Hospital. The teleclinic's comfortable waiting room is equipped with two high-performance computers, one with a 52-inch display and the other with a 48-inch display. Additionally, the waiting room is equipped with a high-speed internet connection. In the context of the medical field, it is customary for physicians in Pittsburgh (referred to as PGH) to engage in the practice of creating patient case presentations using PowerPoint software in advance. This preparation allows them to effectively communicate and share relevant information with specialists during discussions and formal presentations. Teleconsultations have led to several positive outcomes for PGH, including improved education for their medical team, increased effectiveness of treatment plans, assurance of appropriate recommendations or evacuations, enhanced accuracy of diagnoses, and improved quality of patient care. According to Nguyen et al. (2021), the implementation of a high-caliber telehealth network resulted in expedited decision-making processes, accelerated diagnoses, enhanced efficiency and efficacy in patient management, reduced durations of hospitalisation and intensive care unit (ICU) stays, improved diagnostic accuracy in triage, diminished levels of anxiety, superior educational outcomes, heightened levels of confidence, and decreased instances of unnecessary treatments. In contrast, Zhai (2020) provided empirical evidence indicating that a significant proportion of the global population without internet access is concentrated in Africa (71%) and Asia and the Pacific (51.6%). Furthermore, it was found that 43% of households worldwide lack internet connectivity within their residences. As a result of heightened apprehensions regarding privacy and confidentiality, along with the implementation of precautionary measures such as citywide lockdowns, stay-at-home orders, and the practice of social distancing, individuals may encounter challenges in acquiring resources or accessing the internet through the assistance of acquaintances, relatives, or local communities. It can be inferred that certain individuals encounter difficulties in accessing telemedicine services, resulting in doctors being unable to promptly provide them with remote care. Regrettably, the suitability of internet connections for telemedicine via videoconference is hindered by the considerable disparity in available bandwidth across different internet service providers (ISPs). Recent studies

indicate a decrease in the utilization of telephonic consultation, while there is a concurrent increase in the adoption of online video consultation. The utilization of online video consultation offers several benefits in terms of cost-effectiveness and the establishment of rapport when compared to telephone-based consultation.

Conclusion

During the initial phase of the pandemic, individuals were subject to restrictions on outdoor mobility, which instilled apprehension in them regarding visits to hospitals or proximity to healthcare facilities. Consequently, this resulted in a reduced frequency of medical consultations and limited interaction with healthcare practitioners. The increased adoption of mobile healthcare applications or websites has greatly facilitated individuals or clients in accessing medical care through teleconsultation. Nevertheless, there exist certain constraints that prevent physicians from conducting auscultation, palpation, or other physical examinations on patients, leaving them solely reliant on historical and subjective data. This results in a dearth of data for accurate diagnosis, necessitating individuals to seek personal consultations with medical professionals at hospitals or clinics, along with implementing preventive measures.

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Conflicts of Interest

The authors declare there are no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

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