



JAMSA
Journal of Asian Medical Students' Association



인문산학

17 - 23 July 2022

ABSTRACT BOOK

ASIAN MEDICAL STUDENTS' CONFERENCE

Telemedicine: Is it ideal or suboptimal?

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JAMSA

(ISSN: 2226-3403)

The Journal of Asian Medical Students' Association (JAMSA) (ISSN 2226-3403) is an international, online open-access, peer-reviewed, student-led biomedical research journal of the Asian Medical Students' Association International (AMSA International). Established in 2011, JAMSA published its first issue in the year 2012. It is currently indexed in Ulrichsweb, Google Scholar, Index Copernicus, Gale Cengage Learning, ROAD (Directory of Open Access Scholarly Resources) Indexing, BASE (Bielefeld Academic Search Engine) and Genamics Journal Seek. JAMSA's vision is to bring international recognition to the research work of young researchers, including, but not limited to, the member countries of AMSA International, without having them to pay for hefty publication costs. JAMSA welcomes all forms of scientific articles including original research articles, review (systematic as well as narrative), meta-analyses, case reports, letters to the editor, commentaries, perspectives, etc., related to medicine, public health and biomedical sciences.

Over the past 35 years, AMSA International has thrived and developed into a diverse and esteemed medical student organization, representing and connecting medical students spanning Asia-Pacific, Oceania, The United Kingdom and beyond. AMSA International, with its vision of Knowledge, Action and Friendship, encourages young and budding researchers who are beginning their careers in the medical and scientific fields to publish their research work in JAMSA. JAMSA being an indexed journal free of any publication cost is making its way into the ever-expanding world of scientific research. AMSA International provides JAMSA with an array of methods to communicate with its 29+ member chapters worldwide.

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AMSC 2022

AMSA International is a peak representative organization for medical students from across Asia, the Asia-Pacific and beyond. Standing on the three pillars of Knowledge, Action, and Friendship, AMSA International aims to nurture and give her members valuable experience outside of their medical student curricula.

The Asian Medical Students' Conference is the flagship conference of AMSA International that involves the participation of hundreds of medical students each summer, yearly. The objective of AMSC lies in creating a platform for a strong, global network of medical students- who as future medical practitioners, will explore and develop their academic knowledge, cultural appreciation, and interpersonal skills.

The AMSC comprises of three main aspects: academic, sociocultural, and community service programs. This event allows medical students from AMSA Chapters to congregate, discuss and present their projects and research which were conducted based on the theme agreed upon for the conference that year. In addition, delegates can also experience different traditions and customs through the cultural events organized throughout course of the conference and network with future doctors across Asia, regardless of nationality, ethnicity, religion, or race.

This year, the conference, organized by AMSA South Korea, has the theme of "Telemedicine: Is it ideal or suboptimal?". The Academic Competition aims to approach the technical advancements and reliability of telemedicine, while considering the medical effectiveness. The focus of the program is to understand the current status of digital health from the perspective of technical difficulties and stability, and consider the ways to improve upon them.

FOREWORD



Oshin Puri

*Chief Editor,
Journal of Asian Medical Students' Association
2021/2022*

Dear Readers,

In our pursuit of providing the medical students of Asia, Asia-Pacific and beyond, an international indexed peer-reviewed platform for publishing their scientific work, the Journal of Asian Medical Students' Association (JAMSA), a student-led biomedical journal proudly presents to you the abstracts of the scientific papers, scientific posters and white papers presented at the 43rd Asian Medical Students' Conference (AMSC) 2022, Seoul, Republic of Korea.

JAMSA is beyond thrilled to bring to its readers innovative research critically analysing if Telemedicine is ideal or suboptimal across different healthcare set-ups in the world's largest continent. This abstract book documents the effort of future physicians in exploring the feasibility of tele-medical healthcare and advocating for its use at this year's AMSC.

With the vision of revolutionising student-led research over 2020-2022 by providing students a platform to gain the well-deserved international recognition for their contribution towards enhancing the practise of medicine, JAMSA underwent a sea change over the past 2 tenures along with completing a decade of scientific publishing this year. With AMSA International tenure 2021/2022 ending at the 37th AGM during AMSC 2022, my journey as the Chief Editor of JAMSA for over 700 days also comes to a beautiful end with the first in-print publication of the JAMSA - The Abstract Book of the 43rd AMSC 2022, Seoul, one of the many dreams with which I applied for this responsibility.

Striving towards encouraging the students of Asia, Asia-Pacific and beyond to revolutionise the practise of medicine, JAMSA would continue supporting young budding researchers to embark their journey on this road not taken through Research Grants, Competitions and many more opportunities. JAMSA has always and will alwcontinue to believe that the potential of these young, ignited, curious minds, can change medicine in a way others can't.

We wish that this abstract book can become a source of inspiration and make you realize your critical thinking and problem-solving potential, encouraging you to contribute to this endless pool of medical knowledge. Along with becoming clinicians in the near future, may you all unleash the scientists within you and become the physician-scientists of tomorrow.

Viva AMSA! Happy Reading!

FOREWORD



UYeong Shim

*Head of Conference,
Asian Medical Students' Conference
2022*

Dear Readers,

AMSA International is a peak representative organisation for medical students from across Asia, the Asia-Pacific and beyond. Standing on the three pillars of Knowledge, Action, and Friendship, AMSA International aims to nurture and give her members valuable experience outside of their medical student curricula. Asian Medical Students' Conference (AMSC) is one of the biannual flagship international conferences of AMSA International hosted by one of its chapters in the month of January each year.

Despite all the COVID-19 situation, AMSC 2022 has been held physically in Seoul, South Korea in July 17-23, 2022.

Focusing around the theme of 'Telemedicine: is it optimal or suboptimal?', this year's Asian Medical Student's Conference aims not only the development of medical technology, but also the 'means of medical services' (i.e. the way they are provided to patients) by discussing about 4 subtheme: Technical advancement and stability of telemedicine, Medical effectiveness of telemedicine (clinical effect), Current legal permissible range of telemedicine (country specific), Distortion of the nature of telemedicine.

The Organising Committee is beyond grateful to JAMSA for its meticulously detailed and persistent hard work in curating this abstract book for the AMSC 2022 under the theme 'Telemedicine: is it optimal or suboptimal?'. We hope that this abstract book will be the first step to the next generation of the medical service.

Viva AMSA! Happy Reading!

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Journal of Asian Medical Students' Association

Address: Number 100, Section 1, Jingmao Road,

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SCIENTIFIC PAPER

SCIENTIFIC
PAPER

A Systematic Review of Telemedicine in Burn Care over the Last Decade

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Introduction

Technology has revolutionized medical care, allowing healthcare providers and patients to interact at a distance and access greater expertise at lower cost. Burns, which relies heavily on visual assessment and multi-disciplinary teams, may benefit from telemedicine (TM). However, uptake and further barriers to development are unclear.

Objective

To assess the use of telemedicine in burn care in the last decade through a systematic review.

Method

A PubMed search for (tele* AND burns) found 830 publications between 2010 and 2022. Paired abstract screening yielded 89 original research articles. Full-text review yielded 48, with 18 further excluded for non-English publication, no full text access, or study design. The remainder were assigned to at least 1 of 4 themes: cost-effectiveness (8), accuracy of diagnosis and triage (9), qualitative data (7), and practical challenges to implementation (8).

Result

The cost-effectiveness of TM in burn care derived from accurate triage. 5 studies involved down-triage decisions for >50% patients, avoiding unnecessary transfers. Follow-ups were effective and satisfactory. TM-supported diagnosis was more accurate for TBSA (total body surface area) compared to depth, including in dark skin and >10% TBSA, though limited in non-expert groups.

Only 4 of 9 papers included case-control assessments of accuracy. Triage decisions made via TM were generally upheld. Qualitative opinions regarding TM are mixed. The benefits of reduced costs, access to expertise, and structured clerking providing education presented with concerns around redefined responsibilities, technological inadequacy, and difficulty providing moral support. Technological difficulties presented the most significant challenge in implementing TM. Of 8 papers, 4 highlighted device or software inaccessibility creating delays or limiting image quality, while 2 noted unreliable internet connectivity. Other challenges included training required, financial reimbursement, and limited local resources.

Conclusion

TM shows promise in facilitating accurate, efficient, and satisfactory burns care. Further investigation into its quantitative impact and practical integration into effective care pathways is recommended.

Key Words

Telemedicine, burns, systematic review

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A Cross-Sectional Survey on Telemental Health: What Do Service Providers and Clients Think of Its Effectiveness?

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Introduction

While increasing evidence demonstrates equivalent effectiveness between telemedicine and direct patient care, little research has been done specifically on telemental health (TMH). TMH is a virtual delivery of healthcare and the exchange of healthcare information to provide mental health services to clients.

Objective

We aimed to establish the perceived effectiveness of TMH as compared to direct patient care, in order to identify confounding factors affecting the effectiveness of TMH, and to compare perceptions and barriers to TMH.

Method

Two sets of self-administered surveys were distributed to identified TMH service providers and clients using snowball sampling, in which the participation was voluntary and de-identified. Five-point Likert scales were used to assess perceptions across domains of usefulness, effectiveness, ease of use, interaction quality, reliability, and overall satisfaction, with safety being an additional domain for service providers. Information on barriers was also collected. The results were summarized by calculating mean scores and percentages, while parametric and non-parametric tests were performed to test for relationships between variables.

Result

TMH significantly improved access to mental health care. Among 37 service providers (SP) and 49 clients (CL) (n=86), more CL than SP favored TMH. Most participants agreed that TMH is useful (SP 68.5%, CL 83.7%), effective (SP 59.9%, CL 74.9%), easy to use (SP 65.5%, CL 85.0%), satisfactory (SP 63.1%, CL 78.6%) and were willing to use TMH again (SP 78.4%, CL 75.5%). An unsuitable environment to carry out the session was a major barrier faced by most clients (39.2%). The survey uncovered several confounding factors that may have contributed to the perceived effectiveness of TMH.

Conclusion

Service providers and clients have different views on the effectiveness of TMH. While TMH may not be comparable to direct patient care, TMH services were met with high levels of satisfaction. TMH could, therefore, be considered as a supplement to mental health management.

Key Words

Telemental health, service providers, clients, effectiveness, satisfaction

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The Efficacy of Telemedicine Interventions in promoting Drug Adherence among Solid Organ Transplant recipients compared with usual care: A Network Meta-Analysis

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Introduction

Medication adherence plays an essential role in organ transplant recipients, where clinical outcomes rely highly on post-transplant care to prevent risks of graft rejection. Telemedicine has long been used to facilitate interactions and promote clinical adherence. However, only a few studies have examined these interventions in terms of their efficacy in raising patients' adherence compared to standard care, especially in organ transplantation; therefore, we have conducted this research aiming to meet the aforementioned gap of knowledge.

Objective

To compare the medication adherence-enhancing efficacy (1) amongst telemedicine interventions and (2) between telemedicine interventions and usual care

Method

This network meta-analysis was conducted using papers from PubMed and Embase published between 2012 to April 2022. Randomized controlled trials that applied telemedicine intervention in solid organ transplant recipients with immunosuppressant administrations were included. The analyses of adherence-promoting efficacy were done with direct comparisons of interventions within the RCTs and indirect comparisons across trials based on a common comparator measured 6 months after the operation. The primary outcome was medication adherence using BAASIS, TAQ, and HHS as parameters.

Result

A total of six RCTs consisting of 604 patients were eligible. The analysis showed that education via telemedicine appears to be the most effective comparing to other interventions (i.e. reminder & education and reminder & monitoring - OR 2.56 [95%CI: 1.26-5.19] and OR 2.47 [95%CI: 1.42-4.27], respectively). Contrarily, the difference between all interventions and usual care is insignificant (OR 0.94 [95%CI: 0.57-1.54], $p = 0.800$).

Conclusion

Education was suggested to be the most effective telemedicine intervention in promoting medication adherence, however, the difference between standard care and every intervention altogether is insignificant. With further studies, we believe that telemedicine could be potentiated in becoming an ideal adherent tool.

Key Words

*telemedicine, medication adherence,
immunosuppressants, transplantation,
solid organ transplantation*

Telemedicine Approaches on Blood Glucose Control in Women with Gestational Diabetes Mellitus: A Systematic Review from Randomized Controlled Trials

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Introduction

Telemedicine interventions amongst studies showed great potential in improving gestational diabetes mellitus (GDM) management. It has facilitated and allowed the patients to get closer treatment, such as blood glucose monitoring and glycemic control. Considering the current situation, further studies are required to assess the intervention effects concerning another outcomes parameters being examined.

Objective

We aimed to evaluate the role of telemedicine in controlling the blood glucose level of patients with GDM.

Method

A systematic review of randomized controlled trials was undertaken by searching on 5 databases. The risk of bias was assessed in selection, performance, detection, attrition, and outcome reporting using Review Manager 5.4.1. We analyzed the blood glucose level as primary outcome and secondary outcomes, such as maternal and neonatal assessment and its significance.

Result

We included 6 randomized controlled trials in the review. There are 830 participants with GDM recruited (443 patients as intervention groups and 387 patients as control groups). Results analysis indicates that the effectiveness of telemedicine approaches to control blood glucose level in patients with GDM showed significantly in three studies ($p < 0.05$), also shows positive improvements in the observed secondary outcomes.

Conclusion

We recommend further studies in larger populations where the prevalence of GDM is still high and remains unresolved. Therefore, if it is implemented properly in the future, the risk of complications can be prevented. The implementation of blood glucose telemonitoring could be an acceptable and effective tool for sustainable blood glucose control and maintenance for GDM patients, especially those who are facing difficulty accessing conventional health care regularly.

Key Words

*gestational diabetes mellitus, telemedicine,
blood glucose*

Analysis of Necessary Legal and Regulatory Amendments to Permanently Legalize Telemedicine in South Korea.

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Introduction

Telemedicine remained illegal in South Korea until Coronavirus Disease 2019 (COVID-19) struck Korea. However, in response to COVID-19 many temporary policies have been introduced to permit telemedicine, which minimizes doctor-patient contact. Now, the Korean parliament is gradually attempting to reform medical laws to permanently legalize telemedicine in South Korea. To successfully implement telemedicine in Korea, we realized the need to identify a few legal and regulatory issues that must be adjusted before permanently legalizing telemedicine.

Objective

To identify legal and regulatory issues that can arise from legalization of telemedicine and to suggest legislative changes that are needed.

Method

A specific literature search was conducted on DBpia, Korea Law Information Center, and Google Scholar using the following keywords: Telehealth, regulations, legal issues, South Korea, USA, Japan, Sweden. The search was set to garner articles or legal cases published from 2012 to 2022. We evaluated multiple articles on telemedicine regulation and related laws in Korea. Also, we compared the Korean Medical Service Act with telemedicine laws in countries that have partially or fully legalized telemedicine: USA, Japan, and Sweden.

Result

1. Korea's National Health Insurance must reform its insurance policy to cover telemedicine.
2. National Health Insurance Service (NHIS) should adequately price telemedicine and adequately set the reimbursement rate on telemedicine to encourage doctors to perform telemedicine.
3. Discussion is required to regulate groups or individual's degree of access to medical treatment information and patient's health information.
4. The convenience of telehealth may result in overuse of medical resources. Thus, policies are necessary to prevent overuse of telehealth.
5. Discussion on legalizing medication delivery is required.

Conclusion

To successfully implement telemedicine in South Korea, legislative amendment is necessary on Patient Information Protection Act and Medical Service Act. Furthermore, NHIS must undergo major reforms to allow reimbursement of telehealth.

Key Words

telemedicine, legalize

Telehealth Interventions for improving Anti-Retroviral Therapy retention of HIV Infected Mothers and Preventing Mother-to-Child Transmission: A Systematic Review

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Introduction

The increasing prevalence of HIV and its effect on pregnancy has prompted several innovations to enhance testing & treatment of the mother, prevention of mother-to-child transmission (PMTCT), and increase early neonatal testing, telehealth interventions such as Short Message Service (SMS), and telephonic counselling being one of the Owing to the variety of interventions being tested and outcomes being analysed, it is imperative to systematically review the available evidence to reach a conclusion regarding the applications of telehealth in this field.

Objective

To assess the effectiveness of tele-health interventions in improving Anti-Retroviral Therapy (ART) retention and premother-to-child transmission (PMTCT) in HIV-infected pregnant females.

Method

Pubmed (n=12) and ClinicalTrial.gov (n=2) were searched for randomised controlled trials with keywords "Telehealth", "HIV in pregnancy", "HIV infected pregnant females/women", "Antiretroviral Therapy retention" and "preventing mother-to-child transmission" in various combinations and imported to EndNote X9 Library. Duplicates and Protocol publications (n=6) were removed. Completed trials conducted with HIV infected pregnant females (≥ 18 years of age)

between 14 & 36 weeks of gestation having received tele-health interventions compared against routine care controls were screened by title, abstract and full text (n=8-2=6). n=3 studies analysing the outcome of ART retention and PMTCT were included in this review.

Result

A total of 3 studies (N = 3681 participants) comparing telehealth interventions - SMS-based reminders, and counselling calls were studied. n=2 (N = 2857 participants) studies reported statistically significant improvement in ART retention and PMTCT relative to regular care. n=1 (N = 824 participants) did not report any statistically significant improvement in HIV outcomes but concluded an improvement in initiation of postpartum contraception. n=3 studies excluded from the review due to a different outcome measure reported significant improvement in early Ante-natal CD4 testing, STI prevention, Breastfeeding and early neonatal HIV testing after telehealth interventions.

Conclusion

Existing evidence supports that individualized counselling delivered through SMS and telephonic conversation may provide significant benefits in retaining HIV-infected mothers and preventing mother to child transmission of HIV. The current study shall form the basis for future research.

Key Words

Telemedicine, Pregnant Females with HIV, Neonatal HIV, HIV infected females, ART Retention

Effectiveness of Telemonitoring in Neonatal Surgery

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Introduction

Telemedicine and telehealth communications are emerging rapidly in health care. They have the potential to decrease medical costs and prevent disease complications. In Mongolia, the development of neonatal surgery is an important task of the health care system, because birth defects have been the most prevalent cause of infant mortality for many years. Using telesurgery to operate in conjunction with a local surgeon, telesurgery allows the remotely located expert or consultant surgeons to prevent complications including respiratory distress, hypoglycemia, bleeding, and more.

Objective

We aimed to evaluate the effectiveness of the telementoring in the practice of neonatal surgery regarding its emergency care and estimate transportation costs that could be minimized.

Method

A total of 21 cases using telementoring in remote areas were analyzed. We contacted pediatric surgeons who received telementoring services between 2019 and 2022. We developed a questionnaire with 33 questions related to telementoring and neonatal background information.

Result

Study participants' mean age was 52.1 ± 10.3 hours and 14 (66.7%) neonatal babies were male. 11 neonatal babies (52.4%) live in soums (subprovinces). 10 participants (47.6%) were diagnosed with congenital absence, atresia and stenosis of anus without fistula (ICD-10 code Q42.3). The mean duration of operation time was 70.8 ± 9.4 minutes.

During operation, complications were occurred in 2 neonates and they could recover by telementoring. Nineteen neonates (90.4%) were alive. During the online consultation, no surgeon complained internet connection and equipment problems. Mean distance between soums and provinces was 141.8 ± 33.9 kilometer and mean duration was 159.8 ± 33.6 minutes. Moreover, the mean distance between provinces and Ulaanbaatar was 736.2 ± 71.7 kilometers and the mean duration of travel was 596.1 ± 48.9 minutes. Telesurgery reduced the transportation costs by 1.472.000 MNT (460 \$).

Conclusion

Using telementoring in neonatal emergency surgery is effective in decreasing neonatal mortality diagnosed with congenital defects, emergencies requiring surgery, and transportation-related costs. It can also prevent complications related to cost time and heavy transportation.

Key Words

Telemedicine, Telemonitoring, Neonatal surgery

Efficacy and Acceptability of Telecounseling for Smoking Cessation: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Introduction:

It remains unclear whether telemedicine is justified for smoking cessation in clinical application.

Objective:

This systematic review and meta-analysis aimed to compare smoking cessation and dropout rates between telecounseling (TC) provided by health professionals and control interventions in active smokers.

Methods:

The inclusion criteria were randomized controlled trials (RCTs) of TC in healthy and unhealthy smokers. If TC alone provided to the experimental groups, the control groups would receive no intervention or health education. If TC was an add-on, the control groups would receive the same care programs as the experimental groups, except for TC. The primary outcome was the smoking cessation rates during 1-4 months (short-term) and > 4 months (long-term) determined by 7 to 30-day smoking abstinence. Dropout rates were the secondary outcome. PubMed, EMBASE, and CINAHL were searched on April 20, 2022. The revised tool for assessing the risk of bias in randomized trials (RoB2) was utilized. The cessation rates were compared and pooled between groups using risk ratios (RRs) based on a random-effects model.

Results:

Of 192 records retrieved from database searches, this meta-analysis included 7 RCTs (N = 3,939) of TC in active smokers. Participants in 5 of 7 RCTs were general people. Five and 2 RCTs were conducted in adults only and a mixed group of adolescents and adults, respectively. While 5 RCTs provided TC add-

on, the other 2 RCTs gave TC alone. The most common type of TC was telephone counseling. TC group had significantly higher cessation rates both in short- (5 RCTs, RR = 3.32, 95% CI = 2.54-4.33, I² = 15%) and long-term outcomes (4 RCTs, RR = 1.49, 95% CI = 1.11-1.99, I² = 64%). Dropout rates were not significantly different.

Conclusion:

Limited evidence suggests that TC is well accepted and potentially effective. TC should be utilized in smoking cessation programs.

Keywords:

Smoking cessation, telemedicine, video counseling, quitline, nicotine dependence, randomized control trial, meta-analysis, systematic review



SCIENTIFIC POSTER

SCIENTIFIC
POSTER

A Qualitative Systematic Literature Review of Patient and Service Provider Barriers in Implementing Diagnostic Teledermatology: Implications for Policy

Introduction

Both synchronous and 'store-and-forward' teledermatology has risen significantly in the COVID-19 pandemic, enabling clinicians to remotely triage and diagnose multiple conditions without hindrance. Its utilization has increased by over 700% during the first wave of the pandemic in the United States. In the United Kingdom, evidence of a nationwide triage model suggested modest cost savings and conservation of in-person appointment slots, while maintaining high diagnostic concordance and patient satisfaction. However, multiple roadblocks still exist in embracing teledermatology worldwide.

Objective

To evaluate the barriers faced by patients and service providers in diagnostic teledermatology, while proposing policy recommendations to overcome these barriers.

Method

Studies from 2020-2022 meeting the inclusion criteria were sourced from databases MEDLINE and EMBASE, generating 575 abstracts. COVidence was used to perform single-member abstract and full-text screening, generating 23 studies for data extraction, which were compiled onto a spreadsheet.

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Thematic analysis was undertaken following Braun & Clarke's model. Identified themes were evaluated and categorized into a framework of barriers faced by patients and service providers.

Result

Based on the thematic analysis, our framework identified 2 main themes to the barriers which patients and service providers faced respectively. Patient themes include 1) incongruent patient beliefs and outcome expectancies, and 2) technological inaccessibility. Themes of barriers to service providers include 1) low confidence in clinicians' own capabilities; and 2) failure of administration, coordination and strategy.

Conclusion

This qualitative analysis identified the most important barriers to patients and service providers. Universally, patients lack insight into the added value of a teledermatology service, preventing engagement. In developed countries, the most important concern was privacy, while in developing countries, the main issue was language barriers with technological interfaces. For service providers, the main concerns were legal regulation uncertainty and lack of training, preventing uptake of teledermatology. We proposed policy recommendations to mitigate and address these barriers.

Keywords

Barriers, Dermatology, Facilitators, Telemedicine, Teledermatology, Policy

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Current Legal Status and Promotion of Telemedicine in Thailand: A Systematic Review

Introduction

Telemedicine has been introduced in Thailand for a while. However, little information is available regarding how telemedicine is regulated and how the government currently supports it. Furthermore, there is no systematic review that directly addresses Thai telemedicine law.

Objective

This study aimed to collect and review progress in the use of telemedicine and current Thai legislation to promote the use of telemedicine in Thailand.

Method

A systematic literature review was conducted in Scopus and PubMed. Inclusion criteria were English-written articles published in the period 2000-2022 in the fields of medicine, health professions, computer science, and social sciences with accessible full-text. This study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines 2020. The legal status and present situation of telemedicine in Thailand were also analyzed.

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Result

A total of 4,796 records were identified after the initial search (Scopus 1,468 and PubMed 3,328). Twenty-six full-text articles fulfilled eligibility criteria, including the current Thai legislation. The results revealed that telemedicine was a potential strategy for healthcare delivery. Nonetheless, in Thailand it was still poorly developed and regulated. These studies suggest that 5 major factors need to be considered when promoting telemedicine as follows: cost effectiveness, information and communication technology (ICT) development, patient perception, health insurance coverage, and public-private sector partnership.

Conclusion

Telemedicine is an effective tool to deliver remote healthcare to patients. However, under the current situation, Thai legislation remains incomprehensible and unclear. Reviewing, updating, and implementing legislation and policies should be targeted to promote telemedicine in Thailand.

Key Words

Telemedicine, Thailand, Legislation, Current situation, Promotion

Sentiments and Data Analysis of Social Media-Based Mental Health Hotline in Thailand by Machine Learning

Introduction

The Thai Mental Health Hotline has been utilized to help people with their mental health issues, bridging the gap in mental health access. However, no previous article has identified its drawbacks. Evidence from social media might reflect real world feedbacks and show substantial impediments to the provision of mental healthcare via telepsychiatry in Thailand.

Objective

Our research aimed to describe and analyze feedback on social media after receiving mental health services from the Thai Mental Health Hotline by using sentiment analysis, machine learning, visualization of data, and text analytics.

Method

Thai Mental Health Hotline comments were gathered manually from Facebook and Pantip, and automatically from Twitter by using related keywords. Data preparation and sentimental analysis were applied to interpret comments by using WangchanBERTa, the latest and largest Thai language NLP model. Exploratory Data Analysis was performed through Python and Excel to clean and investigate trends of feedback by time.

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The negative opinion was focused to identify causes of adverse outcomes. The overall data was visualized to discuss and conclude the outcome.

Result

From 555 comments gathered between 2013-2020, 52.40% were neutral, 35.05% were negative, and 12.55% were positive. The number of comments from social media was low from 2013 - 2019, and then rose extremely to climax (213 comments) during 2020. Focused on the complaints, most of them were about absent response issues (79.47% out of all negative response), service quality (13.16% out of all negative response), and others.

Conclusion

The peak of comment in 2020 may be influenced by Covid-19. Moreover, aside from neutral reactions, the data suggested that there were more negative than positive responses. To deal with negative feedbacks, including absent response and poor service quality, more psychologists should be provided, and more expenditure should be spent on training consultants.

Key Words

machine learning, mental health hotline, sentiment analysis, social media

Breaking Through Barriers on Improving Balance and Gait in Parkinson's Disease: A Systematic Review and Meta-Analysis of Virtual Reality Telerehabilitation

Introduction

Parkinson's disease (PD) is the most common neurodegenerative and movement disorder globally with prevalence increasing 155.50% in the last 20 years. While being proven beneficial, early rehabilitation has been unoptimized during the Covid-19 pandemic. Virtual reality (VR) telerehabilitation as a novel approach has been shown to be as effective as face-to-face treatment, yet there have been no systematic reviews and meta-analyses specifically assessing its efficacy in improving PD patients' balance and gait.

Objective

To investigate the efficacy of VR telerehabilitation for improving motor function, specifically balance and gait, in PD patients.

Method

A systematic review was performed based on PRISMA guideline and the literature search was conducted in PubMed, Cochrane Library, Science Direct, EBSCOHost, ProQuest, Wiley Library, and Google Scholar. A meta-analysis was conducted using RevMan 5.4 to compute the summary of mean difference (MD) and 95% confidence intervals (CI) for the Berg Balance Scale (BBS) outcome.

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Result

Nine randomized controlled trials (RCTs) with a total of 467 participants were included and evaluated for risk of bias. The pre- and post- VR intervention forest plot of BBS score depicts a significant effect without heterogeneity (MD: -4.29; 95% CI: -5.90--2.68; $p < 0.00001$; $I^2 = 0.00$). In terms of control and intervention efficacy, the forest plot of BBS score also depicts a significant effect (MD: 2.31; 95% CI: 0.41-4.21; $p = 0.02$; $I^2 = 0.23$). The overall gait function was found to be significantly better in the VR group compared to the control group.

Conclusion

PD patients with VR telerehabilitation significantly had better improvement in balance and gait. Therefore, VR can be a preferential choice of rehabilitation for PD patients, especially during this Covid-19 pandemic. However, further large-scale RCTs are still needed to ensure the applicability of VR telerehabilitation.

Key Words

virtual reality, VR, telerehabilitation, balance, gait, parkinson's disease

Mobile-Based Telemedicine as a Milestone for Lifestyle Monitoring Non-Alcoholic Fatty Liver Disease Patients: A Systematic Review and Meta-Analysis

Introduction

NAFLD is the most common liver disease worldwide which can progress to fibrosis, cirrhosis, liver failure, hepatocellular carcinoma, and death. Currently, there is no therapeutic treatment and non-adherence to lifestyle modifications still possess problems. Diet and exercise are the main treatment for patients with NAFLD. Mobile-based telemedicine provides a powerful approach to dealing with behavioral changes.

Objective

The study aims to assess the efficacy of mobile-based telemedicine in improving liver function and body weight among NAFLD patients.

Method

The literature search was performed using PubMed, Plos One, Proquest, EBSCO Essentials, Wiley, and Cochrane using the keyword: Non-alcoholic fatty liver disease, smartphone, and telemedicine. The data was screened based on inclusion and exclusion criteria. Risk of bias assessment was done using ROB 2.0 tool. Meta-analysis was done using Review Manager 4.1 to measure the mean difference of AST, ALT, and weight improvement.

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Result

Five randomized controlled trials with a 513 total number of participants were included. Overall study considered as low risk of bias. The meta-analysis showed AST, ALT and weight improvement with MD -9.68 (random effect; 95 % CI -16.48 to -2.88; P = 0.005), MD -19.72 (random effect; 95 % CI -32.26 to -7.18; P = 0.002), and MD -2.34 (fixed effect; 95% CI -3.52 to -1.15; P = 0.0001) respectively.

Conclusion

Mobile-based telemedicine has been proved to significantly improve liver function by reducing AST and ALT levels and body weight in NAFLD patients.

Key Words

AST, ALT, NAFLD, telemedicine, weight

Assessment of Telemedicine Coverage and Factors Affecting its Utilization among Medical Practitioners in India

Introduction

Telemedicine, conventionally defined as remote healing, encompasses health care delivery, education, research, health surveillance, and public health promotion. Cell phone and internet use have become practically universal as wireless broadband technology evolves. India's 12-week curfew during the COVID-19 outbreak limited access to healthcare. Consequently, India's Ministry of Health and Family Welfare established the first telemedicine guidelines. However, the views of Indian medical practitioners around the use of telemedicine need to be captured for effective implementation.

Objective

The primary objective is to determine the proportion of Indian doctors using telemedicine. The secondary objective is to study the feasibility and factors affecting telemedicine use in India from the medical practitioners' perspective.

Method

This research used a sequential explanatory mixed-methods approach. A probability proportionate to the population sampling was done (openEpi) for 384 doctors at cluster level distribution across India to gather the quantitative data.

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For a deeper understanding of the feasibility and factors affecting the use of telemedicine, in-depth interviews were done with 30 doctors across the country using purposive sampling. Data will be analyzed using RStudio.

Result

As per the pilot study of 35 doctors, 57.16% use some form of telemedicine in their practice. The data collection for the main phase of the study shall end by 15 June 2022. The analysis shall be presented following the completion of the data collection phase. The transcripts are also under the analysis phase.

Conclusion

Our interim analysis concludes that telemedicine can make healthcare more accessible and egalitarian in India. Guidelines must be expanded to address concerns around limited internet access, weak telecom infrastructure, widespread adoption of telemedicine and the need to rapidly train the Indian doctors in telemedicine. Addressing these challenges can make telemedicine equitable.

Key Words

Telemedicine, medical practitioners, healthcare

Preparedness of Diabetic Patients for Receiving Telemedical Healthcare: A Cross-Sectional Study

Introduction

The advent of telemedicine comes with certain technological requirements the availability, accessibility & affordability of which might prove to be a hurdle in employing tele-medical solutions for day-to-day care.

Objective

To understand the feasibility of telemedicine among diabetic patients by assessing Knowledge, Attitude and Practice towards diabetes management & Tele-preparedness of Diabetic patients.

Method

Patients aged >18 years participating in Free Diabetes Screening Camps, either previously diagnosed with diabetes or undiagnosed with a random blood sugar level of more than 200 mg/dL were interviewed regarding their Knowledge, Attitude, Practice and Preparedness for Telemedicine.

Result

Among $n=223$ (females 52.01%, mean age 57.21 ± 13.68 years) patients, only 11.65% knew the normal blood glucose range, 73.09% were taking oral hypoglycemics & 15.69% were on Insulin Therapy.

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67.26% considered taking their medicine very important. 15.24% had physical limitations (08.52% in walking, 02.69% in hearing & 01.79% in vision) that affected their ability to perform self-care. 58.74% were having comorbidities out of which Hypertension (30.49%), was the most prevalent. When assessed for self-care behavior 49.32% participated in regular exercise (walking, jogging & yoga, being the most common) and 41.25% agreed that physical exercise is very important for diabetes. In terms of Tele-preparedness, 64.57% were technically equipped and capable of independently operating video conferencing applications. 51.56% of the population had Glucometers in their homes, out of which only 46.95% (n=54) were able to use Glucometers themselves.

Conclusion

While most of the study population were aware of the importance of regular monitoring for Diabetes and practiced self-care behavior, challenges like lack of technical resources and their utilization still remain a limitation and need to be tackled for strengthening the care of such patients through Telemedicine.

Key Words

Telemedicine, Diabetes, Telemedical Healthcare, Preparedness, Cross-sectional

Advancement of Telemedicine due to Wearable Device

Introduction

Telemedicine was applied to medicine to overcome the barrier of distance limit, but medical information that could be obtained only through a simple phone call or video call was limited. However, with the development of IT technology, and semiconductors, medical devices have been miniaturized. Therefore, medical devices appeared in the form of wearables. So, we would like to investigate how the development of these medical devices has affected telemedicine.

Objective

How wearable devices developed telemedicine was divided into three major contents. First, the EKG and PPG used in cardiology were investigated. Second, the measurement and monitoring of vital signs were investigated. Lastly, we investigated artificial intelligence.

Method

A research direction was set to "Advancement of telemedicine due to wearable device" and nine people conducted a literature survey. The inclusion criteria were set as telemedicine, wearable device, IoT, advancement, and outcome.

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Result

First, wearable devices are used to determine the presence or absence of cardiovascular disease by measuring continuous data. Second, Wearable devices aim to predict and evaluate underlying health conditions, enabling continuous and ambulatory measurement of vital signs including blood pressure, heart rate, respiratory rate, body temperature, and blood oxygen saturation, which are valuable clues to be monitored in order to identify clinical deterioration. Finally, as telemedicine is developed, a flood of data was applied in the medical area. Artificial intelligence medical devices using medical data can significantly reduce misdiagnosis and the problem due to the lack of supply of specialists.

Conclusion

Wearable devices made physicians receive objective data and continuous measurements. Patients also receive quality care without going hospital and are not affected by external factors such as Whitegown syndrome. However, it is necessary to consider who should be responsible for the misdiagnosis, and more research should be done to minimize the error.

Key Words

Telemedicine, wearable

The Impact of Technology-Based Interventions on Informal Caregivers of Persons with Dementia: A Systematic Review

Introduction

Poised to revolutionise healthcare, 'telemedicine' is the new buzzword disrupting the global healthcare industry. Increasingly, telehealth services are being integrated into our everyday care. Yet, there is a lack of consensus regarding the efficacy of telehealth interventions in improving the wellbeing of caregivers of patients with dementia (PwD).

Objective

To systematically review current literature on the efficacy of telehealth interventions in improving caregiver well-being and (2) explore possible interventions that would improve its efficacy.

Method

The review was conducted in accordance with the PRISMA guidelines. All studies that reported on the outcomes of telemedicine interventions targeted at the informal caregivers of PwD were included.

Result

A total of 4176 participants across 32 RCTs were included in our analysis, with 2243 participants in the intervention arm. Overall, a statistically significant improvement in caregiver self-efficacy and caregiver gain was observed together with a

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significant reduction in anxiety. Telemedicine was also noted to have modest but non-significant effects on improving caregiver stress, QoL, and social support. No consensus was reached with respect to caregiver burden and depression. Additionally, telehealth interventions were not found to have an effect on emotional well-being and psychosocial distress.

Conclusion

Telehealth is not a panacea for the concerns of caregivers. A non-specific, 'one-size-fits-all' approach is neither sustainable nor effective in improving caregiver well-being. Given how the efficacy of telehealth interventions, as well as the recommended approach, remains unclear, further large-scale longitudinal studies involving novel telehealth interventions are recommended to delineate the most effective intervention or combination of interventions that promote caregiver well-being.

Key Words

Telemedicine, wearable

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Giving Reproductive Education to Adolescent Girls Through Application

Introduction

In recent years, the number of unintended pregnancies, abortions and Sexual Transmitted Infections among adolescent girls in Mongolia has been increasing due to inadequate reproductive health education. Regarding this issue, we see possibilities of a solution through a mobile application.

Method

Among total 4 disparate high schools in Ulaanbaatar, the capital city of Mongolia, are selected randomly from public and private schools and educated 213 students regarding reproductive health. To evaluate girls' fundamental understandings of the sex education, test issued by the World Health Organization was obtained pre and after instruction.

Findings

About one-third of all students had insufficient comprehension of reproductive health education. 43% of the girls obtain the information from their health subject syllabus and 41% of them from social media. Thirty-five percent informed that they prefer an e-doctor or mobile application to get sex education and any other related issues however, half of them preferred an e-doctor for advice if it is confidential.

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Proposed solution

We proposed to create sections for teenage girls in the “Emch” (Doctor) application including telemedicine or online screening section that provides examination, diagnosis, and advice on sexual education from professional gynecologists who are selected by the Ministry of Health and the Ministry of Education. Moreover, the early detection and counseling section with comprehensible information on girls' health, physiology, and more, reproductive education section using the Medicaid system for people who are in need, welfare support, and free section such as menstrual calendar, and experience sharing video blogs.

Conclusion

Inadequate sexual health education among adolescent girls is mostly associated with other psychological issues, such as hesitation and anxiety. Therefore, we need to provide health education applications using mobile phones and other communication technologies.

Keywords

Telemedicine, Application, Reproductive Health

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Current Legal Regulation on Telemedicine Services in Mongolia

Introduction

Although a policy for telemedicine regulation was established in Mongolia in 2008, no actions and implementation was not recorded until COVID-19. As an indirect impact of the pandemic, telemedicine applications are currently being rapidly developed, yet still Health Law and Health Service Law do not include the legally permissible activities in telemedicine. Thus, it is necessary to establish gaps in the current legal regulation, and to prevent from illegal services through penalization for responsible bodies.

Method

We conducted a critical review of legal documents and comparative analysis to countries with the most advanced technological development and telemedicine services, including the Republic of Korea, the People's Republic of China, Japan, Malaysia, Australia, and the Russian Federation.

Result

In international experiences, telemedicine is strictly regulated by legal policies. If private entities or legal entity provide telemedicine services without formal permissions or violates the law in any forms, providers are subject to punishments under the Law of Infringement or Criminal Law.

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Proposed solution

- 1.To amend the definition of the term “3.1.26 Telemedicine” in Health Law of Mongolia, “13.1.3 Telemedicine service” in Health Service Law of Mongolia;
- 2.To legitimize penalties for violating the law, harming human health, and make offenders take their responsibilities under the Criminal Law of Mongolia; and
- 3.To add articles for the conflict and violation penalties in Mongolian Law of Infringement.

Conclusion

Although technology and telemedicine knowledge, sufficiency is scarce in our countries' citizens and healthcare services, it will soon be an essential part of healthcare services in the future. Therefore, it is appropriate to regulate it by a specific law.

Keywords

Telemedicine, Health Law, Legal Regulation, Mongolia

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Post-Implementation Evaluation of a Telehealth-Integrated Antenatal Care Model in Australia

Introduction

In response to the COVID-19 pandemic, the largest maternity provider in Melbourne, Australia implemented a world-first telehealth-integrated antenatal care schedule for both high- and low-risk pregnancies. Since the program has now been maintained for more than two years, clinical and economic evaluation is essential to guide its ongoing use.

Method

Clinical outcomes were compared using time-series analysis and economic outcomes evaluated with a comparative cost analysis, for all booked births between 1st January 2018 – 22nd March 2020 (pre-telehealth cohort, n=20,031) and 25th April 2020 – 31st December 2021 (post-telehealth cohort, n=~16,500), allowing for a 1-month implementation period.

Findings

Analysis to date indicates comparable outcomes and service utilization between cohorts. No significant differences in adverse pregnancy outcomes including preeclampsia, fetal growth restriction and stillbirth were seen. The proportion of telehealth appointments increased from 0.06% pre-implementation to nearly 50% post-implementation, with no statistically significant differences in patient engagement. When surveyed, most multigravida women were satisfied with telehealth-integrated care, while primigravida women preferred more in-person appointments.

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Telehealth may reduce healthcare costs, but its socioeconomic impact remains unclear as previous evaluations of smaller programs found either increased costs from added home monitoring, or cost savings from decreased travel. A cost analysis of this large-scale program is under way to clarify costs to funders and the affordability of the program.

Proposed solution

We recommend:

1. Ongoing monitoring of clinical outcomes;
2. Further research into patient engagement and experience;
3. Robust economic evaluations to inform financial sustainability; and
4. Development of national Australian telemedicine standards for safety/quality.

Conclusion

The telemedicine-integrated model for antenatal care appears to be safe and acceptable. It may also be cost-saving, but ongoing research is needed to shape its future - optimizing the quality and value of pregnancy care, and ensuring sustainable, equitable and resilient healthcare systems.

Keywords

Antenatal care, COVID-19, Obstetrics, Pregnancy, Prenatal care, Telehealth, Telemedicine

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Review of the Telepathology Implementation for the Intraoperative Rapid Diagnosis in Japan

Introduction

We used the following items for evaluation: clinical needs, cost, training, targeted diseases, accuracy, time, diagnostic concerns, and equipment and system concerns. PubMed and Google Scholar were used to search previous articles using the following keywords [Japan], [telepathology], [intraoperative frozen section], [intraoperative rapid diagnosis], [pathologist shortage], [online training], and [AI].

Method

We used the following items for evaluation: clinical needs, cost, training, targeted diseases, accuracy, time, diagnostic concerns, and equipment and system concerns. PubMed and Google Scholar were used to search previous articles using the following keywords [Japan], [telepathology], [intraoperative frozen section], [intraoperative rapid diagnosis], [pathologist shortage], [online training], and [AI].

Findings

Telepathology has been reported to be superior in terms of accuracy and time required, but it is not yet widespread in Japan. Concerns about implementing telepathology included increased workload for pathologists, specimen quality, and facilities' costs and safety.

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Proposed solution

Reducing the workload of diagnosis by actively introducing artificial intelligence (AI) or enabling collaboration and communication among hospitals and facilities would help solve these issues. Since the investment in facilities is often costly, it is important to use AI and remote consultation following the characteristics of the patients in the region so that remote pathological diagnosis can be performed in any region of Japan, thereby improving the quality of medical care.

Conclusion

Telepathology has benefits for both the health care providers and patients, such as reducing the workload of pathologists and limiting the surgical range of the patient. The solutions from the evaluation of multiple aspects illustrated in this study can improve the quality of medical care in Japan, and can also be applied overseas by promoting the introduction of remote pathological diagnosis in accordance with the situations at each facility.

Keyword

Telepathology, Intraoperative Rapid Diagnosis, Japan

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Prehospital Telemedicine: Solution to Reduce Treatment Delays and Mortality in ST-Elevation Myocardial Infarction and Acute Ischemic Stroke

Introduction

ST-elevation myocardial infarction (STEMI) and acute ischemic stroke (AIS) reperfusion treatment are critically time-dependent. In developing countries, common causes of the delays in prehospital care are lacking professional prehospital healthcare providers and collaboration among organizations. Moreover, hospitals capable of providing reperfusion treatment are limited. Telemedicine has facilitated the reach of specialists for remote diagnosis and triage in pre-hospital settings.

This white paper aims to examine the efficacy of telemedicine in reducing treatment delays and mortality and to propose strategies and policies to implement telemedicine in prehospital care for STEMI/AIS management.

Method

A search of MEDLINE, EMBASE, PubMed, and Scopus was performed, and studies will be systematically reviewed by two reviewers; if consensus is required, a third reviewer will be consulted.

Findings

From 446 reviewed articles, 64 met the criteria and were analyzed; 36 and 28 studies focused on STEMI and AIS, respectively. Overall, the reviewed studies suggested that implementing telemedicine in prehospital care efficiently reduced time to reperfusion and mortality. The common limitation in developing countries is the absence of efficient technological/medical devices in ambulances.

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Proposed solutions

- Devise the STEMI/AIS network and facilitate the implementation of telemedicine to collaborate between prehospital healthcare providers and on-call specialists; therefore, remote diagnosis and triage are efficiently performed, then patients should be transported to the prealerted potential hospital for immediate definitive treatment.
- Provide ambulances with 12-lead Electrocardiogram, high-resolution video camera, and stable network connection—enabling effective telemedicine practice, with minimum delays.
- Prehospital health care providers should be trained to proficiently work in novel telemedicine-implemented prehospital care.

Conclusion

Implementing pre-hospital telemedicine with well-equipped ambulances can reduce time to reperfusion, mortality rate, and adverse complication in STEMI/AIS.

Keywords

Acute Ischemic Stroke, Emergency Medicine, Prehospital care, ST-elevation myocardial infarction, Treatment Delay

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Improving the Quality of Virtual Medical Treatment & Medicine Delivery Experience in Taiwan through Telemedicine

Introduction

Telemedicine allows the running of certain health services through telecommunication technologies, regardless of time and distance, and minimizes unnecessary contacts during pandemics. Despite the rapid development and the integrated technologies, Telemedicine in Taiwan did not truly come into service until early May 2022 when COVID-19 spread widely across the nation.

Method

A survey was carried out to evaluate the degree of Telemedicine familiarity in Taiwan. Among 476 feedback, 35% of the participants were medical personnel and 65% were from the public. Data showed that about 48.5% considered themselves to be unfamiliar with Telemedicine and 25% believed that they have a good Telemedicine foundation. Only 8% of the participants claimed they have Telemedicine experiences.

Findings

Two findings came to attention when evaluating the causes of the data results. Firstly, not only do most of the Taiwan populace, the medical personnel show concerns about Telemedicine. The main reason is being unacquainted with the concepts behind it and the technologies involved. The second part moves on to the difficulty of delivering medicine to remote areas. The current practice of medicine home delivery can only be executed by pharmacists. Consequently, the shortage of human resources has become a problem, much less the delivery to the remote regions.

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Proposed solution

Solutions to the first issue:

1. Establishment of Professional Telemedicine departments
2. Telemedicine & Patient Safety Precautions

Solutions to the second issue:

1. Medicine delivered by the Third-party logistic industry
2. Set up Medicine Lockers
3. UAV delivery of medicine

Conclusion

Living in the post-pandemic era and beyond, Telemedicine is certainly becoming a leading trend. However, with an immaturely developed system, Taiwan is no doubt facing diverse obstacles when putting Telemedicine into service. Therefore, some feasible solutions are provided in this study, in the hope that Telemedicine can benefit more people.

Keyword

Telehealth, Taiwan, Telemedicine, Medicine Delivery

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Tele-4-Life: An Application for Information Sharing among Healthcare Professionals and Referral Platform

Introduction

Although telemedicine helps to decrease miscommunication between general practitioners and specialists, it rarely includes professional consultation before deciding to refer patients. As a result, we developed Tele-4-Life, a one-stop service application for doctors in local hospitals and experts to consult for primary to secondary care.

Method

PubMed and Google Scholar were searched for causes of the miscommunication and scientific databases concerning telemedicine satisfaction. Furthermore, telemedicine errors were discovered in ThaiRefer and CarePICS, preferred applications in Thailand and the USA, respectively.

Findings

The main factor of delay in referral databases is they need to be in handwritten forms which lead to data overload, therefore, the miscommunication among physicians could happen as human error. Moreover, confidentiality is lacking because some are leaked and only 63% can willingly accept the leakage. From the report, telemedicine increased its effectiveness over standard care by 83%. The applications only provide the perspective between doctors and patients, however, the feature for general doctors to communicate with specialists has not been included yet.

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Proposed solution

Tele-4-Life integrates the Thai patient database and brings the benefits of medical consultations with these features, firstly, online access to laboratory examinations with the optional video call between general physicians and specialists. Secondly, providing online hospitals accessed referral forms. Lastly, it could be regulated by the Thai Ministry of Public Health that no information will be leaked.

Conclusion

Implementation of Tele-4-Life in the Thai healthcare system will improve the efficiency of patient care. When all required data are collected in one location, decision-making during treatment and referrals should be accelerated. Furthermore, it would alleviate the scarcity of medical professionals and equipment. Therefore, this application aims to provide a sustainable solution for comprehensive patient care and database allocation.

Keyword

Referral Platform, Tele-4-Life, Telemedicine, Local Hospitals, Database

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Improving Blood Glucose Management Through DiaBuddy: A Gamified Telehealth-based Application for Children With Type 1 Diabetes Mellitus

Introduction

Nearly 3% of all children around the world are currently suffering from type 1 Diabetes Mellitus (T1DM), making it the leading cause of disability among children. Nevertheless, more than 73% of them fail to achieve recommended blood glucose levels. This situation calls for an urgent need to find a breakthrough solution in assisting children with T1DM to improve their quality of life.

Method

We conducted a comprehensive literature evaluation followed by a mixed-method study design.

Findings

The challenges of performing T1DM self-management tasks among children patients are classified into lack of knowledge regarding low blood glucose, failure of adherence to self-care activities due to pain and inconvenience, and feeling alone and different from their peers which resulted in psychosocial difficulties and poor glucose control.

Proposed solution

Therefore, we are proposing a gamified telehealth-based application for children with T1DM called DiaBuddy which can help increase their diabetes self-care adherence, assist in blood glucose monitoring and provide alerts and help when needed, provide educational information, and minimize the mental health challenges of T1DM care through the use of gamification.

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DiaBuddy will offer various features including: a social online game where users can socialize with other T1DM children to prevent loneliness and also provide an incentive to perform diabetes self-care through customizable virtual pets (DiaTown); a dashboard for daily self-care tasks such as glucose monitoring and insulin administration schedules, logbooks, and reminders (DiaToday); interactive gamified educational content on T1DM management (DiaGames); and diet and exercise goals and challenges (DiaChallenge).

Conclusion

We believe that DiaBuddy can serve as a comprehensive solution in improving T1DM self-management adherence, educating children on T1DM care, and providing relevant mental health support to children with T1DM. We hope that DiaBuddy can assist in enhancing the lives of children with T1DM all over the world.

Keyword

Type 1 Diabetes Mellitus, Children, Blood Glucose Management, Gamification, Telehealth, Mobile Application

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Journal of Asian Medical Students' Association