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Abstract

Virtual Dermatology and the COVID-19 Pandemic in a Resource-Limited Country Such as Nepal

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Abstract

Background: The COVID-19 pandemic has caused nationwide lockdown, which led to the disruption of health services. Despite being a rising health care modality in Nepal, virtual dermatology services became an effective tool to provide dermatologic care through web-based consultations throughout the country. Therefore, we assessed the implementation of teledermatology services at our center to provide uninterrupted health services across the country during the pandemic.

Objective: This study aimed to evaluate the clinicodemographic profile of patients using teledermatology services and patient acceptance of this service.

Methods: A retrospective, single-center, observational study was carried out. Clinicodemographic data from the patients using teledermatology services were obtained and analyzed. A set of questionnaires regarding patients' acceptance of teledermatology services were administered to the patients through a survey via telephone calls, and the obtained data were interpreted.

Results: A total of 122 teleconsultations were carried out within the country. The mean age of patients was 33.48 (SD 17.89) years. Of these 122 patients, 79 (64.8%) were from outside and 43 (35.2%) were from inside the city where the institute is located. The average distance from the institute to the patients' residence was approximately 144.84 (SD 157.20) km, and the mean travel time was approximately 385.31 (SD 889.52) minutes. In total, 89 patients could be contacted, of whom 81 (91%) found the service easy to use, 75 (84.3%) were able to express their problems in a manner similar to that during direct visits, 49 (55.05 %) thought that the teleconsultation was the same as an in-person visit, 80 (89.9%) were satisfied, and 85 (95.5%) agreed to use teledermatology services in the future. Superficial fungal infection was the most common diagnosis (24.6 %). Newly registered patients were more satisfied than follow-up patients (96.36% vs 79.41%, respectively; *P*=.01).

Conclusions: This study highlights the importance of virtual dermatology services to deliver dermatologic care during the pandemic in Nepal. In the future, this program has a promising role in providing health care services to meet the medical needs of patients.

Conflicts of Interest: None declared.

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KEYWORDS

virtual dermatology; teledermatology; COVID-19; pandemic; resource-poor setting; Nepal

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Abstract

Interobserver and Human–Artificial Intelligence Concordance in Differentiating Between Invasive and In Situ Melanoma

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Abstract

Background: Machine learning algorithms including convolutional neural networks (CNNs) have recently made significant advances in research settings. Even though several algorithms nowadays are targeted directly to the consumer market, their implementation in clinical practice is still pending. Most melanomas are easy to recognize even without the aid of dermoscopy. Nonetheless, it is often more challenging to discriminate between invasive melanoma and melanoma in situ (MIS) in a preoperative setting even with the assistance of dermoscopy. Although several dermoscopic features suggestive of MIS and invasive melanomas have been presented, their usefulness in a larger setting is limited by how well physicians agree on their presence or absence.

Objective: The overarching aims of this research project are to identify useful dermoscopic features to help dermatologists predict melanoma thickness and to develop CNNs that can assist dermatologists in the preoperative assessment of melanoma thickness. The ultimate aim is to develop algorithms that can strengthen patient care, improve clinical decision-making, and be used in routine health care.

Methods: We have included dermoscopic images as well as clinical close-up images of invasive melanomas and MIS from our department during the time period of January 1, 2016, to December 31, 2020. Using this image material, we have trained, validated, and tested two separated CNNs based on dermoscopic and clinical close-up images. We have also invited dermatologists to review the test sets and, for a subset of the dermoscopic images, asked them to specify the presence of prespecified dermoscopic features. Subsequently, we compared CNN outputs to the combined dermatologists' output for all lesions and assessed the interobserver agreement for several dermoscopic features.

Results: The CNN developed using dermoscopic images performed on par with the invited dermatologists whereas the CNN using clinical close-up images was outperformed by the group of dermatologists. Two dermoscopic features (atypical blue-white structures and shiny white lines) both displayed a moderate to substantial interobserver agreement and were both indicative of invasive melanomas >1.0 mm.

Conclusions: CNNs used to differentiate between invasive melanomas and MIS might be an example of a clinically relevant machine learning application, but they need further refinement and evaluation in prospective clinical trials. Only a few dermoscopic features are helpful in distinguishing melanoma thickness.

Conflicts of Interest: None declared.

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KEYWORDS

artificial intelligence; clinical decision-making; melanoma; neural networks; computer; supervised machine learning

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Abstract

Race- and Ethnicity-Stratified Analysis of an Artificial Intelligence–Based Tool for Skin Condition Diagnosis by Primary Care Physicians and Nurse Practitioners

Ayush Jain[1], MS; David Way[1], ME; Vishakha Gupta[1], MS; Yi Gao[1], PhD; Guilherme de Oliveira Marinho[1], BS; Jay Hartford[1], MS; Rory Sayres[1], PhD; Kimberly Kanada[2], MD; Clara Eng[1], PhD; Kunal Nagpal[1], MS; Karen B DeSalvo[1], MSc, MPH, MD; Greg S Corrado[1], PhD; Lily Peng[1], MD, PhD; Dale R Webster[1], PhD; R Carter Dunn[1], MS, MBA; David Coz[1], MS; Susan J Huang[2], MD; Yun Liu[1], PhD; Peggy Bui[1,3], MD, MBA; Yuan Liu[1], PhD

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Abstract

Background: Many dermatologic cases are first evaluated by primary care physicians or nurse practitioners.

Objective: This study aimed to evaluate an artificial intelligence (AI)-based tool that assists with interpreting dermatologic conditions.

Methods: We developed an AI-based tool and conducted a randomized multi-reader, multi-case study (20 primary care physicians, 20 nurse practitioners, and 1047 retrospective teledermatology cases) to evaluate its utility. Cases were enriched and comprised 120 skin conditions. Readers were recruited to optimize for geographical diversity; the primary care physicians practiced across 12 states (2-32 years of experience, mean 11.3 years), and the nurse practitioners practiced across 9 states (2-34 years of experience, mean 13.1 years). To avoid memory effects from incomplete washout, each case was read once by each clinician either with or without AI assistance, with the assignment randomized. The primary analyses evaluated the top-1 agreement, defined as the agreement rate of the clinicians' primary diagnosis with the reference diagnoses provided by a panel of dermatologists (per case: 3 dermatologists from a pool of 12, practicing across 8 states, with 5-13 years of experience, mean 7.2 years of experience). We additionally conducted subgroup analyses stratified by cases' self-reported race and ethnicity and measured the performance spread: the maximum performance subtracted by the minimum across subgroups.

Results: The AI's standalone top-1 agreement was 63%, and AI assistance was significantly associated with higher agreement with reference diagnoses. For primary care physicians, the increase in diagnostic agreement was 10% (P<.001), from 48% to 58%; for nurse practitioners, the increase was 12% (P<.001), from 46% to 58%. When stratified by cases' self-reported race or ethnicity, the AI's performance was 59%-62% for Asian, Native Hawaiian, Pacific Islander, other, and Hispanic or Latinx individuals and 67% for both Black or African American and White subgroups. For the clinicians, AI assistance–associated improvements across subgroups were in the range of 8%-12% for primary care physicians and 8%-15% for nurse practitioners. The performance spread across subgroups was 5.3% unassisted vs 6.6% assisted for primary care physicians and 5.2% unassisted vs 6.0% assisted for nurse practitioners. In both unassisted and AI-assisted modalities, and for both primary care physicians and nurse practitioners, the subgroup with the highest performance on average was Black or African American individuals, though the differences with other subgroups were small and had overlapping 95% CIs.

Conclusions: AI assistance was associated with significantly improved diagnostic agreement with dermatologists. Across race and ethnicity subgroups, for both primary care physicians and nurse practitioners, the effect of AI assistance remained high at 8%-15%, and the performance spread was similar at 5%-7%.

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Acknowledgments: This work was funded by Google LLC.

Conflicts of Interest: AJ, DW, VG, YG, GOM, JH, RS, CE, KN, KBD, GSC, LP, DRW, RCD, DC, Yun Liu, PB, and Yuan Liu are/were employees at Google and own Alphabet stocks.

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KEYWORDS

deep learning; computer-assisted diagnosis; dermatology; clinical images

Multimedia Appendix 1

Results of randomized reader study comparing clinicians assisted by artificial intelligence (AI, in orange) and those without assistance ("unassisted", in blue). Performance was measured using the top-1 agreement metric, which indicates the rate at which the clinicians' primary diagnosis matched that of a panel of dermatologists. The leftmost column summarizes the overall results for all readers and cases, whereas the other columns represent subgroups based on race/ethnicity. The results for primary care physicians (PCPs, top) and nurse practitioners (NPs, bottom) were similar.

[PNG File , 94 KB - iproc_v8i1e36885_app1.png]

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Abstract

Teledermatology and Artificial Intelligence

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Abstract

Background: The use of artificial intelligence (AI) algorithms for the diagnosis of skin diseases has shown promise in experimental settings but has not yet been tested in real-life conditions. The COVID-19 pandemic led to a worldwide disruption of health systems, increasing the use of telemedicine. There is an opportunity to include AI algorithms in the teledermatology workflow.

Objective: The aim of this study is to test the performance of and physicians' preferences regarding an AI algorithm during the evaluation of patients via teledermatology.

Methods: We performed a prospective study in 340 cases from 281 patients using patient-taken photos during teledermatology encounters. The photos were evaluated by an AI algorithm and the diagnosis was compared with the clinician's diagnosis. Physicians also reported whether the AI algorithm was useful or not.

Results: The balanced (in-distribution) top-1 accuracy of the algorithm (47.6%) was comparable to the dermatologists (49.7%) and residents (47.7%) but superior to the general practitioners (39.7%; *P*=.049). Exposure to the AI algorithm results was considered useful in 11.8% of visits (n=40) and the teledermatologist correctly modified the real-time diagnosis in 0.6% (n=2) of cases. Algorithm performance was associated with patient skin type and image quality.

Conclusions: AI algorithms appear to be a promising tool in the triage and evaluation of lesions in patient-taken photographs via telemedicine.

Conflicts of Interest: None declared.

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KEYWORDS

teledermatology; artificial intelligence; diagnosis; prospective; augmented intelligence; COVID-19

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Abstract

Teledermatology in São Paolo, Brazil

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Abstract

Background: There are places in the world where access to dermatologists can be very challenging and general practitioners may not be well trained in the diagnosis and treatment of skin conditions. Store-and-forward teledermatology may improve access to specialty care, provide accurate diagnoses, and reduce time to treatment, resulting in high patient satisfaction. The early detection and timely treatment of severe skin diseases could prevent adverse health outcomes and death. On the other hand, some skin conditions such as mild atopic dermatitis, acne, and fungal infections could be managed within primary care using teledermatology.

Objective: We aimed to (1) evaluate the proportion of individuals who could be assessed in primary care using teledermatology and how this affects the waiting time for an in-person dermatologist appointment and (2) assess the most frequent dermatoses according to demographic data and referrals made by the teledermatologist.

Methods: A cross-sectional retrospective study, involving 30,976 individuals and 55,624 skin lesions, was conducted from July 2017-July 2018 in the city of São Paulo. We assessed the frequency of diagnoses and referrals to biopsy, in-person dermatologists, or primary care, and compared the waiting time for an in-person dermatologist appointment before and after the teledermatology implementation.

Results: We found that 53% of the patients were managed by the primary care physician, 43% were referred to in-person dermatologists, and 4% were referred directly to biopsy, leading to a reduction in waiting time for in-person appointments of 78% when compared to the previous period (from 6.7 months to 1.5 months). The most frequent diseases were melanocytic nevus, seborrheic keratosis, acne, benign neoplasms, onychomycosis, atopic dermatitis, solar lentigo, melasma, xerosis, and epidermoid cyst, with significant differences according to sex, age, and referrals (Multimedia Appendix 1A,B).

Conclusions: The use of teledermatology as a triage tool significantly reduced the waiting time for in-person visits, improving health care access and using public resources wisely. Knowledge of sex, age, diagnoses, and treatment of common skin conditions can enable the creation of public policies for prevention and orientation of the population, as it can be used to train general physicians to address such cases.

Conflicts of Interest: None declared.

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KEYWORDS

teledermatology; common skin lesions; primary care attention

Multimedia Appendix 1
(A) Most frequent skin diseases diagnosed and (B) triage results by disease type.
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Abstract

PASSION Project: Data Collection in Madagascar and Guinea

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Abstract

Background: Little data on dermatological conditions presenting on African skin are currently available. This is partly due to the lack of dermatologists in African countries, such as Madagascar and Guinea. There are only 13 dermatologists in Madagascar, or one dermatologist for every 2 million inhabitants. By contrast, the prevalence of common dermatosis is constantly increasing, especially among the pediatric population. According to the World Health Organization, 80% of these skin problems in Africa are grouped into the following 5 pathologies: atopic dermatitis, dermatophytosis, scabies, impetigo, and insect bites.

Objective: In the face of this dilemma, artificial intelligence (AI) is a better tool to collect data on a national scale. Madagascar began participating in the PASSION project in June 2020 and Guinea began participating in January 2021. They join other countries, like Switzerland, Australia, China, India, and Tanzania, who are also using AI in dermatology. This study mainly aimed to compare the 5 pathologies according to the different phototypes characterizing these countries and to collect cases on a national scale that will form a national database. The aim of the data collection is to add 1000 cases per year to the database.

Methods: To increase the number of cases included in phototypes III to VI, two countries were included. A total of 6 data collection sites were set up in Madagascar and one was set up in Guinea. Patients were recruited during dermatology consultations. All patients presenting the 5 pathologies were included. A total of 3 platforms were used to collect data: my.crf.one, IntelliStream, and Derma2go.

Results: A total of 323 cases are currently included in the database for Madagascar, including 76 cases of scabies, 111 cases of atopic dermatitis, 94 cases of dermatophytosis, 35 cases of impetigo and 11 cases of insect bites. The patients' ages ranged from 2 months to 68 years. A male predominance was noted, with a sex ratio of 1.19 (109 males and 91 females). Phototypes ranged from III to VI. For Guinea, 178 total cases included 32 cases of scabies, 26 cases of atopic dermatitis, 92 cases of dermatophytosis, 3 cases of impetigo, and 25 cases of insect bites. Patients' ages ranged between 1 year and 70 years, with a male predominance, a sex ratio of 1.54 (108 males and 70 females), and a predominance of phototype VI.

Conclusions: AI is a data collection solution in Africa. However, high bandwidth is needed to employ AI.

Conflicts of Interest: None declared.

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KEYWORDS

pediatric dermatology; artificial intelligence; phototypes

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Abstract

Digital Technology in Skin Cancer Prevention and Early Detection

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Abstract

Background: Mobile teledermatology is increasingly being used in clinical practice and offers the opportunity to counsel the general public about sun protection and skin cancer early detection. Growing evidence suggests that SMS text messaging interventions are an effective way to reach a large number of people and promote sun protection behaviors. Many medical practices already have SMS text message systems in place to communicate with patients, especially for appointment reminders and information. However, could we use these systems for even better outcomes? If so, how?

Objective: This presentation will outline the results of the SunText study, a theory-based SMS text messaging intervention designed to evaluate how often and in what way we could communicate with people at risk of skin cancer to have a beneficial effect on sun protection behaviors, sunburn, and participant engagement.

Methods: The SunText study was conducted between February-July 2019 in Queensland, Australia. Volunteer participants aged 18 to 40 years were randomized to 4 different intervention schedules using a Latin square design. The schedules included personalized or interactive messages with constant frequency and personalized and interactive messages with either increasing or decreasing frequency. Outcomes measured were reduction in sunburn and engagement with interactive messages, defined as responding to messages by return text.

Results: Compared to baseline, the self-reported sun protection habits index was significantly higher in all 4 interventions ($P<.01$). Overall, sunburn rates decreased from baseline to the end of the intervention (40.3% to 7.0%), and remained significantly below baseline levels (23.5%) at the 6-month follow-up ($P<.01$). All 4 interventions achieved reductions in sunburn rates (18%-48% reduction) during the intervention period. The overall engagement rate with interactive messages was 71%. The intervention involving interactive messages with constant frequency achieved the highest engagement rate. The intervention with personalized and interactive messages with increasing frequency had the lowest engagement rate.

Conclusions: This study adds to the evidence that text messages targeting sun protection are effective in improving sun protection behaviors and reducing sunburn. Results also suggest higher engagement with constant or decreasing message frequency. Although many clinics already use SMS text messaging for scheduling, this presentation may encourage its extended use to raise awareness of sun protection. Interactive messages could also be integrated into sun protection mobile health apps, and provide an opportunity for engaging in health promotion content.

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Conflicts of Interest: HPS is a shareholder of MoleMap NZ Limited and e-derm consult GmbH, and undertakes regular teledermatological reporting for both companies. HPS is a Medical Consultant for Canfield Scientific Inc, MoleMap Australia Pty Ltd, Blaze Bioscience Inc, Revenio Research Oy and a Medical Advisor for First Derm. All other authors declare no conflicts of interest.

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KEYWORDS

skin cancer; prevention; mHealth; text-delivered intervention; engagement

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Abstract

Deep Learning Skin Disease Classifiers: Current Status and Future Prospects

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Abstract

Background: Most studies on deep learning skin disease classifiers are done with binary classifications (ie, classifying lesions into malignant and benign). However, dermatology practice involves a large number of inflammatory and infective conditions that are not easily diagnosed by nondermatologist physicians.

Objective: The aim of this study is to develop a machine learning–based smartphone app for multiclass skin disease classification and evaluate its performance in different levels of dermatology practice. We will also explore similar studies in the literature.

Methods: We developed an artificial intelligence–driven smartphone app for 40 common skin diseases and tested it in primary care, tertiary care, and private practice settings.

Results: In the clinical study, the overall top-1 accuracy was 75.07% (95% CI 73.75%-76.36%), top-3 accuracy was 89.62% (95% CI 88.67%-90.52%), and the mean area under the curve was 0.90 (SD 0.07). Multimedia Appendix 1 shows the top-1 positive predictive values and negative predictive values from a clinical study of 35 diseases using the developed mobile health app on patients. In the literature, there are very few studies on image-based deep learning multiclass classification of common skin diseases and none of them included evaluations in actual clinical settings.

Conclusions: An artificial intelligence–driven smartphone app has the potential to improve the diagnosis and management of skin diseases in patients with skin of color. Nondermatologist, primary care physicians are likely to benefit from having access to such an app.

Acknowledgments: Nurithm Labs collaborated with the All India Institute Of Medical Science to develop this smartphone app. Other collaborators in this work include Rashi Pangti, Jyoti Mathur, Vikas Chouhan, Sharad Kumar, Lavina Rajput, Sandesh Shah, Atula Gupta, Ambika Dixit, Dhwani Dholakia, Sanjeev Gupta, Savera Gupta, Mariam George, and Vinod Kumar Sharma.

Conflicts of Interest: None declared.

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KEYWORDS

artificial intelligence; deep learning; skin disease classifier; skin of color; mHealth; machine learning

Multimedia Appendix 1
Top-1 positive and negative predictive values from a clinical study of 35 diseases using a mobile health app on patients.
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Abstract

eHealth in Norway Before and After the COVID-19 Pandemic

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Abstract

Background: Regular teledermatology services were implemented in Norway in the early 1990s. Based on the available technology at the time, live interactive video consultation systems were implemented to facilitate remote consultations between dermatologists and general practitioners. With the introduction of digital cameras some years later, store-and-forward systems were introduced, but the live video systems remained popular. In the 2000s and early 2010s, there were few changes in the volume of Norwegian teledermatology services. During the 2010s, private teledermatology companies emerged, which provided both store-and-forward and live interactive video consultations. While previous services involved specialists and general practitioners, the new services now offered to patients enable them to interact with dermatologists directly.

Objective: This lecture aimed to provide a brief overview of the development of telemedicine in Norway before and during the COVID-19 pandemic with special focus on teledermatology.

Methods: This lecture provides a brief history of telemedicine in Norway with special attention to the impact of the ongoing COVID-19 pandemic. The content is based on personal experiences and literature references.

Results: The COVID-19 pandemic has had a profound impact on all parts of society. In Norway, it has also affected the way telemedicine is practiced. When the number of new infections increased substantially in early 2020, Norway was under lockdown. This had major consequences on the health care system. In response, the Norwegian government and health authorities strongly encouraged the use of telemedicine and implemented measures to support its use. Since then, there has been a large increase in the number of live video consultations both in specialist and community health care.

Conclusions: When the necessary technical infrastructure is in place, the remaining barriers to telemedicine use, such as reimbursement and integration of health care systems, can easily be overcome, which would result in high adoption rates of telemedicine.

Conflicts of Interest: TS is a partner of the Norwegian teledermatology provider “Askin.”

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KEYWORDS

COVID-19; pandemic; teledermatology; telemedicine; general practitioner

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Abstract

Risks and Benefits of Artificial Intelligence in Teledermatology

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Abstract

Background: Recently, deep convolutional neural networks (DCNNs) became of interest as decision support systems for dermoscopic and clinical analysis of skin diseases. Application of artificial intelligence in teledermatology (TD) has been recently reported in several studies as a tool for augmented intelligence.

Objective: In this session, a critical discussion of the opportunities, limitations, and risks of AI in TD will be presented with special attention to recent published studies.

Methods: We reviewed the literature in PubMed and EMBASE databases in the period of January 2018 to November 2021 with the search terms of *dermatology*, *skin cancer*, *deep learning*, and *AI* (review of the Regulation of Medical Devices, EU 2017/745).

Results: A clear definition of the clinical use of AI in TD has to be considered: primary TD from patients to nurses, primary care physicians or general dermatologists; secondary TD from primary care physicians or nurses to dermatologists; or tertiary TD from dermatologists to hospital dermatologists. In some health models of TD for nurses or primary care physicians, AI assistance can lower the rates of recommending a biopsy or specialist referral, increase self-reported diagnostic confidence, and help to achieve higher diagnostic agreement rates (with dermatologists) in nonreferred cases. The main limitations of the use of AI in TD are the lack of large longitudinal studies, the lack of interpretability of the CNN, biases in the databases and unrepresented dermatological conditions for training, limited representation of different ethnicities, standardization of clinical information and of the images, liability, and privacy issues. How to implement the concept of augmented intelligence in clinical practice with referral TD consultations including structured clinical information and good-quality images will need further research and education among end users. Even if the interface is used for either store-and-forward or live TD, interactive TD is, in principle, straightforward for AI systems, and different TD modalities have particular technological requirements that can reduce their efficacy. Finally, AI systems in TD are under the umbrella of medical device regulatory frames, and specific certification is compulsory. This regulation has the benefit of assuring the quality of the new AI systems and diminishing their risks, but it can simultaneously delay the incorporation of AI tools in clinical practice.

Conclusions: AI has the potential to improve the results of the technology in different aspects in multiple modalities of TD. However, the evidence is weak, and several barriers and limitations have to be resolved for their integration in clinical practice.

Conflicts of Interest: None declared.

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KEYWORDS

artificial intelligence; deep learning; convolutional neural networks; teledermatology; risks; benefits

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Abstract

The Practice of Teledermatology Before, During, and After the COVID-19 Pandemic

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Abstract

Background: Since the beginning of the COVID-19 pandemic, the use of telemedicine has quickly expanded in many countries as clinical frameworks have been forced to shift to virtual platforms to guarantee the safety of patients and staff. Teledermatology, specifically, is well-suited for telemedicine, with evidence supporting its viability, even-handed quality and precision, and cost adequacy in comparison to in-person visits. Teledermatology holds extraordinary potential for expanding access to patients and guaranteeing coherence of care, especially for those from rural and underserved regions.

Objective: The aim of this research is to study the practice of teledermatology before, during, and after the COVID-19 pandemic.

Methods: A literature search using the following keywords was done: online consultations, teledermatology, post-covid. Reports from integrated health care companies (eg, Practo) were also considered.

Results: According to the reports, Indians consulted physicians 10 times more during the second wave (April to May 2021) of the pandemic than in pre–COVID-19 times (January to February 2020). India experienced a record 30-fold spike in web-based physician consultations for COVID-19–related symptoms during this time, as compared to a 6-fold increase during the previous peak. More than 50% of all web-based consultations were for pulmonologists and general physicians for queries related to COVID-19 and the seasonal flu. Other key specialties that were consulted during this period included gynecology (10%), dermatology (8%), and pediatrics (5%). The demand for general physicians and pulmonologists was at an all-time high, according to the data. Cutaneous manifestations were varied, and included urticaria, varicella-like vesicles, transient livedoid eruptions, livedoid vasculopathy, purpuric eruptions, lichenoid photodermatitis, erythroderma, photocontact dermatitis, and generalized pustular figurate erythema.

Conclusions: Continued advocacy efforts and future studies highlighting teledermatology's impact, particularly on minorities, underserved patient populations, and in resource-poor settings, are critical for long-term legislative changes to occur and to provide coverage to our most vulnerable patients. This presentation underscores the state of teledermatology prior to the pandemic, the legal statutory changes that permitted teledermatology to rapidly expand during the pandemic, and the significance of continued work after the pandemic. In short, the interruption of everyday life worldwide caused by SARS-CoV-2 has demonstrated that our method of practicing medicine needs reexamining.

Conflicts of Interest: None declared.

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KEYWORDS

online consultations; telemedicine; teledermatology; COVID-19

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Abstract

Teledermatology: Experience in Singapore

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Abstract

Background: The COVID-19 pandemic has accelerated the development and widespread adoption of teledermatology both locally and globally. As dermatology is predominantly a visual specialty, teledermatology is particularly useful for patient care and collaboration between health care professionals.

Objective: To share lessons learned from the local experience with teledermatology in Singapore.

Methods: The main models of teledermatology are asynchronous (store-and-forward), synchronous (real-time communication), and hybrid teledermatology (mixed combination of both asynchronous and synchronous elements).

Results: During the pandemic, teledermatology has enabled suitable patients to have continued access to clinical care in the comfort of their home, while at the same time supporting safe distancing measures to mitigate exposure to and spread of SARS-CoV-2. At the National Skin Centre in Singapore, asynchronous store-and-forward teledermatology is used for telecollaboration with doctors and nurses from external health care institutions, nursing homes, and primary care clinics. A hybrid model comprising synchronous phone or video teleconsultation with the patient, together with review of recent clinical photographs submitted by the patient, is used for the remote care of selected patients with mild and/or stable dermatological conditions. There is a high diagnostic concordance of 87% between teleconsultation and in-person consultation. As not all patients are suitable for teleconsultation, preteleconsultation triage is helpful.

Conclusions: Moving forward, even as we approach a new postpandemic era, teledermatology will continue to evolve and become an integral pillar of the health care landscape.

Conflicts of Interest: None declared.

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KEYWORDS

teledermatology; teleconsultation; synchronous; asynchronous; store-and-forward; hybrid; Singapore

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Abstract

The Role of Standards in Accelerating the Uptake of Artificial Intelligence in Dermatology

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Abstract

Background: The use of artificial intelligence (AI) for dermatology is showing great promise in research contexts. However, the clinical use of AI in dermatology is still limited. The uptake of medical imaging standards for dermatology imaging is also limited. Standards adoption is more widespread in other imaging specialties (eg, radiology) as is the clinical use of AI. Digital Image Communication in Medicine (DICOM) is the standard for medical imaging. DICOM standardizes image formats and associated metadata. Further, DICOM facilitates interoperability between actors in the digital health ecosystem.

Objective: This study aimed to identify how medical imaging standards, in particular DICOM, can support the clinical use of AI.

Methods: Design Science Research Methodology was used to determine the role of DICOM in AI-based medical imaging workflows. Scenarios were identified and synthesized using expert consensus.

Results: The key benefits of using DICOM to improve the clinical use of AI were the potential to encode artefacts derived from the AI process as DICOM objects and store them alongside the original images. Such objects include downsized or down-sampled images, segmentation objects, or visual explainability maps (eg, class activation maps). DICOM can facilitate interoperability between actors in the medical imaging workflow pipeline and permits the inclusion of AI evidence creators in this pipeline. Owing to standardized image formats and metadata, DICOM can be beneficial for the curation of multi-institutional data sets. The key challenge of using DICOM is limited uptake in some specialties including dermatology.

Conclusions: DICOM offers potential to accelerate the clinical adoption of AI in dermatology by addressing several technological issues. More widespread uptake of DICOM in dermatology imaging is required to achieve this potential.

Conflicts of Interest: None declared.

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KEYWORDS

dermatology; artificial intelligence; DICOM; standards; imaging

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Abstract

Teledermatology in German-Speaking Countries: Patients' and Physicians' Perspectives

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Abstract

Background: With increasing digitalization and the current pandemic, teledermatology has gained importance in German-speaking countries in recent years. The regulation on remote consultation methods was recently relaxed, allowing for a more widespread introduction of teledermatological health care services.

Objective: The aim of this work is to evaluate a store-and-forward (SAF) teledermatology application from the patients' and physicians' perspectives.

Methods: We carried out a noncontrolled user survey of the web-based platform *derma2go* in the course of the remote consultation by German dermatologists. Through the platform, patients with dermatological requests could obtain expert advice within a few hours after entering their medical history and uploading photographs of their skin lesions.

Results: A total of 1476 (t1) and 361 (t2) patients and 2207 dermatologist ratings were included within the evaluation. A large proportion of participants were satisfied with the application (t1=83.9%; t2=81.2%). Most participants also rated the usability as high (t1=83.0% satisfied) and were satisfied with the response time of the dermatologists (t1=92.0% satisfied). In addition, a large majority agreed with the statement that they trusted the web-based application (t1=90.5%). At t2, 20.0% of those who participated stated that their skin problem had healed; for 49.8% of participants, it had already improved; for 22.0% of participants, it was unchanged; and for 3.5% of participants, skin problems had worsened. For 64.0% of users, the request was completely resolved, and for 24.2% or users, it was partly resolved as result of the consultation. For 79.7% of users, no additional information was needed by the participating dermatologists. From the practitioners' perspective, 71.2% of all requests were completely resolved and 24.7% were partly resolved.

Conclusions: Our evaluation has shown that SAF applications, exemplified by *derma2go*, are likely to improve access to dermatological care, with a high patient satisfaction and a high rate of resolved requests, from the patients' and physicians' perspectives. In the future, teledermatological SAF applications can represent a supplement to the existing routine care in dermatology. The indications, patient groups, and use cases, for which the application is particularly suitable, will be determined in further studies.

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KEYWORDS

teledermatology; telemedicine; COVID-19; pandemic; store-and-forward; synchronous; asynchronous

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Abstract

Digital Dermatology: Experience From Scotland During Lockdown and Beyond

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Abstract

Background: In Scotland, dermatology outpatient services deliver over 300,000 appointments each year. With a significant growth in both new and return attendances, there is an increasing drive for innovative transformation. In response to this challenge, a Digital Dermatology Asynchronous (DDA) consultation platform was co-developed with two National Health Service Dermatology teams. Roll-out of the platform was accelerated during Scotland's initial COVID-19 lockdown and its wider scope was prospectively evaluated.

Objective: The aims of the platform were to (1) improve the patient experience by reducing the need to attend hospital for consultations; (2) modernize delivery of outpatient care, providing clinicians with a store-and-forward form of telemedicine; (3) use an integrated digital platform—linked with booking systems and the electronic patient records—to increase efficiency and capacity, thereby creating a more sustainable outpatient service; and (4) create a positive environmental impact by reducing travel and hence the carbon footprint.

Methods: During an 11-week "lockdown" period from late March 2020, a total of 405 consultations were prospectively audited. Clinicians were asked to complete data collection proformas for each consultation detailing patient demographics, quality of images, diagnosis, and outcomes. The time taken to complete each virtual consultation was recorded for 312 consultations. Feedback surveys were completed by patients and clinicians via email.

Results: Of the 405 consultations, 297 new and 108 returning patient consultations were assessed, with 80% of submitted images being of satisfactory quality. In total, 292 consultations involved the assessment of lesions, with most referred as suspected cancers. Patients of all ages participated, with 31% of them being aged over 60 years and the parents of 12 children. The consultations were, on average, 3 minutes shorter than equivalent face-to-face (F2F) interactions, and a total of 5758 km of patient travel was avoided. Outcomes included virtual review (16%), F2F review (47%), direct to surgery (11%), discharge (22%), and other treatment or investigation (4%). The majority of those needing F2F review were scheduled for routine follow-up. Patient satisfaction was high, with 82% of respondents reporting ease of use.

Conclusions: The COVID-19 pandemic has resulted in a paradigm shift in the way we deliver outpatient care. DDA consultations are now operational in 4 health boards and have been successfully included in the choice of consultation type available for patients, helping to augment service capacity during pandemic recovery. The platform is the first of its kind in Scotland, to be integrated with the hospital booking system and electronic patient record and offering a valuable alternative to F2F, telephone, and video consultations.

Conflicts of Interest: None declared.

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KEYWORDS

outpatient; digital dermatology; consultation survey

Multimedia Appendix 1

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Patient interface. The platform, which operates through a web-based app, gives patients a 5-day window to submit information and photos of their condition. An assigned clinician responds directly to the patient within an agreed timeframe, and a summary PDF of the consultation is automatically forwarded to their GP.
[PNG File , 1483 KB - iproc_v8i1e36884_app1.png]

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Abstract

Testing Artificial Intelligence Algorithms in the Real World: Lessons From the SMARTI Trial

Claire Felmingham[1,2]; Gabrielle Byars[3]; Simon Cumming[3]; Jane Brack[2]; Zongyuan Ge[4]; Samantha MacNamara[5]; Martin Haskett[5]; Rory Wolfe[1]; Victoria Mar[1,2]

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Abstract

Background: A number of studies have shown promising performance of artificial intelligence (AI) algorithms for diagnosis of lesions in skin cancer. To date, none of these have assessed algorithm performance in the real-world setting.

Objective: The aim of this project is to evaluate practical issues of implementing a convolutional neural network developed by MoleMap Ltd and Monash University eResearch in the clinical setting.

Methods: Participants were recruited from the Alfred Hospital and Skin Health Institute, Melbourne, Australia, from November 1, 2019, to May 30, 2021. Any skin lesions of concern and at least two additional lesions were imaged using a proprietary dermoscopic camera. Images were uploaded directly to the study database by the research nurse via a custom interface installed on a clinic laptop. Doctors recorded their diagnosis and management plan for each lesion in real time. A pre-post study design was used. In the preintervention period, participating doctors were blinded to AI lesion assessment. An interim safety analysis for AI accuracy was then performed. In the postintervention period, the AI algorithm classified lesions as benign, malignant, or uncertain after the doctors' initial assessment had been made. Doctors then had the opportunity to record an updated diagnosis and management plan. After discussing the AI diagnosis with the patient, a final management plan was agreed upon.

Results: Participants at both sites were high risk (for example, having a history of melanoma or being transplant recipients). 743 lesions were imaged in 214 participants. In total, 28 dermatology trainees and 17 consultant dermatologists provided diagnoses and management decisions, and 3 experienced teledermatologists provided remote assessments. A dedicated research nurse was essential to oversee study processes, maintain study documents, and assist with clinical workflow. In cases where AI algorithm and consultant dermatologist diagnoses were discordant, participant anxiety was an important factor in the final agreed management plan to biopsy or not.

Conclusions: Although AI algorithms are likely to be of most use in the primary care setting, higher event rates in specialist settings are important for the initial assessment of algorithm safety and accuracy. This study highlighted the importance of considering workflow issues and doctor-patient-AI interactions prior to larger-scale trials in community-based practices.

Acknowledgments: This research was supported by the Victorian Medical Research Acceleration Fund, with 1:1 contribution from MoleMap Ltd. VM is supported by the National Health and Medical Research Council Early Career Fellowship. CF is supported by the Monash University Research Training Program Scholarship.

Conflicts of Interest: SM is head of clinical research and regulatory affairs at Kahu.ai Ltd, a subsidiary of MoleMap Ltd. MH was the chief medical officer and a director of MoleMap Ltd, and holds shares in MoleMap Ltd.

Trial Registration: ClinicalTrials.gov NCT04040114; https://clinicaltrials.gov/ct2/show/NCT04040114

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KEYWORDS

melanoma; artificial intelligence; algorithm; dermatology; skin cancer

Multimedia Appendix 1
Study procedure.
[PNG File , 1104 KB - iproc_v8i1e36902_app1.png]

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Abstract

Impact of the COVID-19 Pandemic on Dermatology Practice Worldwide: Results of a Survey Promoted by the International Dermoscopy Society

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Abstract

Background: The International Dermoscopy Society (IDS) conducted an online survey to investigate the impact of the COVID-19 outbreak on the daily practice of dermatologists working with patients with skin cancer, to collect data regarding the frequency of skin manifestations noticed by the members, and to obtain information about the use of teledermatology during the pandemic.

Objective: The aims of this study are to identify changes within dermatology departments during lockdowns, to evaluate the use of teledermatology during the COVID-19 pandemic, and to find the most frequent cutaneous manifestations associated with COVID-19.

Methods: All IDS members (approximately 160,000 members) were asked to fill in a questionnaire sent by email. The questionnaire was available in English and was anonymous, with a compiling time of less than 5 minutes. The survey was open for 30 days (from April 24, 2020, to May 24, 2020) and it could only be filled out once.

Results: Overall, 678 dermatologists responded to the questionnaire; of these, 334 members stated that there had been a reduction of more than 75% in daily work activity during the pandemic, 265 dermatologists worked fewer days per week, and 118 experienced telemedicine for the first time. Acrodermatitis was the most frequently observed skin manifestation (n=80), followed by urticarial rash (n=69), morbilliform rash (n=53), and purpuric manifestation (n=40). Regarding the role of teledermatology, 565 dermatologists reported an increased number of teleconsultations, and the number of melanomas diagnosed during the pandemic was practically 0 for 385 (56.8%) respondents.

Conclusions: This survey highlights that the outbreak had a negative impact on most dermatology services, with a significant reduction in consultation time spent for patients with chronic conditions, and an increased risk of missed melanoma and nonmelanoma skin cancer diagnosis. Moreover, our study confirms earlier findings of a wide range of skin manifestations associated with COVID-19.

Conflicts of Interest: None declared.

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KEYWORDS

COVID-19; pandemic; teledermatology; telemedicine

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Original Paper

Confocal Microscopy and its Role in Teledermatology: Diagnosis of Basal Cell Carcinoma in a Clinical Setting

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Abstract

Background: Reflectance confocal microscopy (RCM) is a noninvasive tool that is used to diagnose skin cancers. However, RCM requires an expert consultation, which is often performed via store-and-forward (SAF) teledermatology. Unfortunately, SAF does not mimic bedside diagnosis, nor permits interaction between the remote expert reader, physician, and patient. Recently, a live interactive method (LIM)–tele-RCM approach was shown to diagnose basal cell carcinoma (BCC) from a remote location, demonstrating advantages over SAF by providing a bedside diagnosis during consultation.

Objective: The aim of this study is to validate the LIM-tele-RCM approach to diagnose BCC in a real-world setting.

Methods: In this pilot study, 4 patients with 6 clinically suspicious BCC lesions were enrolled and imaged with RCM at a Los Angeles dermatology clinic. A Health Insurance Portability and Accountability Act–compliant teleconferencing application was used to livestream RCM images to an expert RCM reader in New York. The expert reader had remote control of the software, direct audio communication with the clinic, and the patient's clinical history with dermoscopy. During imaging, RCM features were noted, and a diagnosis was made at the bedside. After imaging, patients completed a short questionnaire (on a 5-point scale, with 5 being the highest score) about satisfaction, comfort, and communication during the session.

Results: RCM diagnosed 4/6 (67%) lesions correctly as BCC and 2/6 (33%) were false-positive diagnoses. The true-positive lesions had "tumor islands with palisading and clefting" and were directly managed with Mohs surgery. The false-positive lesions had "dark silhouettes" (a common false-positive feature for BCC) and underwent a shave biopsy for confirmation. The entire session ranged from 15 to 20 minutes (an average of 17.7 minutes), comparable to the reported RCM procedure time. On the questionnaire, all patients responded with the highest rating (5/5) for each question.

Conclusions: LIM-tele-RCM demonstrates potential advantages over the SAF method, enabling bedside diagnosis with similar diagnostic accuracy as reported in the literature and proper management. Additionally, the remote reader had access to patients' clinical backgrounds and could engage with patients. It may also be useful for training novice RCM users and beneficial in settings where remote diagnostics are desired, such as during the COVID-19 pandemic. However, technical challenges such as image quality degradation during video streaming, poor internet bandwidth, and end user latency may impact diagnosis. Larger, multicenter studies are needed to assess the accuracy of LIM-tele-RCM for the diagnosis of BCC and other neoplastic and inflammatory lesions, and to quantify technical limitations.

Acknowledgments: This work was funded by the National Cancer Institute Cancer Center (Grant P30 CA008748).

Conflicts of Interest: None declared.

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KEYWORDS

reflectance confocal microscopy; teledermatology; telemedicine; tele-RCM; skin cancer; basal cell carcinoma

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Multimedia Appendix 1
Basal cell carcinoma (BCC) diagnosed remotely using the LIM-tele-RCM method, dermoscopy, and histopathology confirmation. (a) Screenshot showing the remote expert RCM reader controlling RCM image acquisition software via the teleconferencing and screensharing application (blue arrow) to diagnose BCC, and with direct audio communication to the patient and clinic (yellow arrow). Real-time, zoomed-in RCM image navigation during the imaging session allowed the remote expert to identify BCC foci based on the recognition of “tumor islands with palisading and clefting” (yellow asterisk). (b) Dermoscopy shows pink background with telangiectatic vessels and blue-grey globules (yellow arrow). (c) The lesion was biopsied, confirming the diagnosis of a nodular BCC (yellow asterisk) on a hematoxylin and eosin–stained tissue section (10x).
[PNG File , 241 KB - iproc_v8i1e36906_app1.png]

Multimedia Appendix 2
Patient demographics, lesion characteristics, reflectance confocal microscopy (RCM) features, RCM diagnosis, histopathology diagnosis, and time of imaging.
[DOCX File , 15 KB - iproc_v8i1e36906_app2.docx]

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Abstract

A Review of International Teledermatology

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Abstract

Background: The use of teledermatology has been evolving slowly for the delivery of health care to remote and underserved populations. Advancements in technology and the recent COVID-19 pandemic have hastened its use internationally.

Objective: An international survey was done to assess teledermatology use before and during the COVID-19 pandemic.

Methods: In addition to an updated literature review from 2015 to 2021, a survey instrument was formatted in Google Forms in English and distributed electronically to international personal contacts of the authors, as well as to international dermatology and teledermatology societies of members of the International League of Dermatological Societies and members of the International Society of Teledermatology. Answers from US dermatologists were excluded.

Results: 110 survey responses were received from 33 countries. Barriers to the use of teledermatology have fallen considerably in the last year.

Conclusions: Teledermatology use has increased significantly in recent years in both government-sponsored and private health care systems and individual practices. There are no recognized international practice guidelines and there is variable use within countries. Many barriers remain to increasing the use of teledermatology.

Conflicts of Interest: None declared.

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KEYWORDS

international; COVID-19; dermatology; teledermatology; telemedicine

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Abstract

Teledermatology and Artificial Intelligence: Piction Health

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Abstract

Background: Skin diseases affect 2.3 billion people globally. Due to the scarcity of dermatologists, 2 in 3 cases are seen by primary care physicians (PCPs), who have lower diagnostic accuracy. Published studies have shown that the diagnostic accuracy of a PCP or general practitioner is close to 50%.

Objective: The aim of this study was to build artificial intelligence (AI) classifiers across 26 and 54 common and urgent adult rashes that present in a primary care setting.

Methods: We trained our AI models with approximately 50,000 total photos. The number of images within each disease or class ranged from 76 to 5505. Additionally, we further tested narrowing the differential diagnosis by adding body part information to identify how this impacts top-5 accuracy for one condition.

Results: Overall, we trained an AI model to identify 26 classes on par with the accuracy level of a dermatologist, who is, on average, 75% top-3 accurate across 26 conditions. Additionally, we trained the AI model across 54 conditions and achieved 74.3% top-5 accuracy across common conditions and 79.2% top-5 accuracy across urgent conditions. In evaluating if body part information may increase top-5 accuracy, we saw top-5 accuracy for one condition increase from 67% to 97%.

Conclusions: Overall, we concluded that including body part information to down-select possible disease matches substantially increased the overall differential diagnosis accuracy for body region–specific conditions. We also concluded that AI may assist PCPs to identify the most likely skin conditions quickly in a clinical encounter, improve overall diagnostic accuracy, and inform the most appropriate next step for the patient. These promising findings highlight the need and potential of AI and clinical decision support to augment the ability of PCPs to accurately and confidently evaluate patients with skin conditions.

Conflicts of Interest: SC is the cofounder and chief executive officer of Piction Health, a company focused on using AI to help augment frontline providers' clinical decision making to save time and improve outcomes for patients with skin diseases. SC also holds shares in Piction Health.

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KEYWORDS

artificial intelligence; machine learning; clinical decision support; dermatology; AI

Multimedia Appendix 1
Top-3 diagnostic accuracy of health care providers across 26 skin conditions, in comparison to Piction Health.
[PNG File , 25 KB - iproc_v8i1e36905_app1.png]

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Abstract

From Teledermatology to Dermatology Artificial Intelligence: Will Teledermatology Exist in the Next 2 Years?

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Abstract

Background: Dermatology has been proven to be well suited for store-and-forward telemedicine triaging. With the reduced cost of computer power and readily available deep convolutional neural networks, using the digital images collected with store-and-forward, machine learning has made it possible to create artificial intelligence (AI) models. The AI models can analyze new digital images taken with a smartphone camera and return reliable dermatology outputs within seconds.

Objective: The aim of this study is to demonstrate the shift from teledermatology to dermatology AI.

Methods: A literature search was conducted and experience from a web-based teledermatology service was also considered.

Results: There has been a slow uptake of teledermatology in a clinical setting and by consumers. The development of AI dermatology models has gained momentum over the last few years. Studies have shown that AI dermatology is on par with teledermatology to deliver accurate diagnoses for the most common dermatology pathologies.

Conclusions: Teledermatology has still not gained mass adoption, both clinically and directly by consumers. The fast pace of AI dermatology development indicates that the technology will surpass store-and-forward teledermatology as a first point of digital consultation in dermatology.

Conflicts of Interest: AB is the owner of iDoc24 Inc.

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KEYWORDS

artificial intelligence; teledermatology; dermatology

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Abstract

Cascade of HIV Prevention, Care, and Treatment Services in Morocco in 2019

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Abstract

Background: The HIV care cascade is a way to show the proportion of people living with HIV (PLHIV) engaged at each stage of HIV care. Analyzing an HIV testing, care, and treatment cascade provides a framework for evaluating and improving service delivery.

Objective: The objective of this study is to analyze the continuums of HIV prevention, care, and treatment services at the national level in Morocco for the period 2015-2019.

Methods: This is a retrospective study concerning the reference centers for HIV care in Morocco carried out in 2019. Three types of cascades of HIV prevention and care were studied: a transversal cascade at the national level (2019), a longitudinal cascade for newly diagnosed PLHIV (between 2015 and 2017), and a cascade of prevention of mother-to-child transmission of HIV (PMTCT) among pregnant women (2016-2017). The study process included collecting the data needed to construct the cascade and determining the magnitude of the deviations at each stage of the cascade.

Results: For the transversal cascade of the year 2019, the objectives of the three 90s were achieved except for the 1st 90 with a difference of 12%. For the longitudinal cascade after the start of treatment between 2015-2017, retention under treatment at 48 months was 83.3%, at 36 months was 83.8%, and at 24 months 91.0%. The 48-month loss to follow-up rate was 12.5%; 7.0% at 36 months; and 4.0% at 24 months. More than 90% of PLHIV started antiretrovirals within 3 months of diagnosis. The 2016-2017 PMTCT cascade conducted on 13 pregnant women according to available data indicated the absence of transmission of HIV from mothers to their children.

Conclusions: Our 2019 HIV cascade study demonstrated several successes. The achievement of the three 90s except for the first objective (of people who know their status), good retention of PLHIV in long-term treatment, and the success of PMTCT especially since Morocco aims to validate the elimination of mother-to-child transmission.

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KEYWORDS

Cascade; HIV; mother-to-child transmission of HIV; PMTCT; proportion of people living with HIV; PLHIV

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Abstract

Foodborne Outbreak Investigation in Al-Ahsa, Saudi Arabia, 2021: A Retrospective Cohort Study

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Abstract

Background: On September 10, 2021, Al-Ahsa General Health Directorate reported an unexpected number of patients had presented with gastrointestinal symptoms. All the patients gave a history of sharing a common meal as they ate dinner that was served at the mother's house in a family gathering on September 9, 2021, at 9 PM in Al-Ahsa.

Objective: This study aims to confirm the existence of the outbreak, confirm the diagnosis, define and identify the cases, identify the source of the outbreak, determine the causative agent or organism if possible and its mode of transmission, and recommend preventive measures to be applied to prevent similar outbreaks in the future.

Methods: A retrospective cohort design was used in this outbreak investigation to identify its source. Cases were defined as any person who ate dinner at the family gathering on September 9, 2021, and developed any or a combination of the following symptoms: diarrhea, vomiting, fever, or abdominal pain within 26 hours of food consumption. We collected information on demographics, symptoms, and food history using a semistructured questionnaire. We reviewed hospital records for symptoms and vital signs. We reviewed available laboratory results for cases, and we conducted an active case search to identify more cases. The data obtained was analyzed using SPSS version 21.0 (IBM Corp).

Results: A total of 20 (74%) were defined as cases and 7 (26%) as noncases. Of 20 cases, 16 (80%) were females and 4 (20%) were males. The ages ranged between 2-70 years. Among cases, 59.3% had vomiting, 59.3% had a fever, 48.1% developed diarrhea, and 25% had abdominal pain. The incubation period ranged from 10 to 26 hours, with a mean of 17.8 hours. The risk ratios (relative risks) and *P* values were calculated for each food item to assess the association between consumption of individual food items and subsequent illness. Among 8 food items consumed, red pasta with chicken (relative risk 37.3, 95% CI 3.2-424.6) and beef pizza (relative risk 6.5, 95% CI 1.74-42.2) were significantly associated with illness.

Conclusions: According to the epidemiological investigation, symptoms, incubation period, and laboratory results, there might be some differential diagnosis, but we were unable to more definitively identify the source of the outbreak. We recommend more education to the households about food safety.

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KEYWORDS

foodborne; cohort; outbreak; gastroenteritis; Saudi Arabia

Multimedia Appendix 1
Foodborne Outbreak Investigation in Al-Ahsa, Saudi Arabia, 2021: A Retrospective Cohort Study.
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Abstract

Effectiveness of Vaccination: Hospital Admission and Length of Stay

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Abstract

Background: COVID-19 vaccinations were first met with public hesitancy. There are some debates about the vaccines' effectiveness in reducing hospital admissions or length of stay.

Objective: We aim to compare the effectiveness of different vaccine statuses and types with hospital admissions and length of stay.

Methods: Data related to hospital admissions, length of stay, the need for intensive care, and vaccination data were obtained from the Jordanian Ministry of Health.

Results: A total of 17,182 hospital admissions were recorded from February 2, 2021, the earliest date a vaccinated individual who has passed the 20-day mark on the first dose was admitted with relation to COVID-19, to August 15, 2021. The mean age admitted was 53 years. From all those who were admitted, the unvaccinated group was the majority in both overall admissions (93.7% with the length of stay of 6.9 days for older groups and 8.3 days for the younger) and intensive care unit admissions for both the older and younger age groups (91.23% and 93.3%, respectively), followed by those fully vaccinated (3.4% with the length of stay by vaccine type: Pfizer 4.9-6.1 with 115 admissions; AstraZeneca 10.8-5.1 with 26 admissions; Sinopharm 5.3-6.7 with 440 admissions; Sputnik 2-4 with 4 admissions) and those with only the first dose (2.5% with the length of stay by vaccine type: Pfizer 7.05-7.25 with 133 admissions; AstraZeneca 7.73-7.53 with 109 admissions; Sinopharm 6.5-7.9 with 253 admissions; Sputnik 4 with 1 admission). The time between the vaccination and admission was noticeably longer after the second dose of each vaccine compared to only the first dose with the exception of AstraZeneca (Pfizer 35.4-35.73 to 46.8-79.85; AstraZeneca 48.3-50.7 to 33.4-43.4; Sinopharm 22.65-24.86 to 54-62.9; Sputnik 28 to 99.5-101.5).

Conclusions: The study showed a lower admission and shorter stay at the hospital for those who are vaccinated, indicating the ability of vaccines to reduce the burden on the health care system.

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KEYWORDS

Jordan; COVID-19; hospital admission; ICU; intensive care unit; vaccination; length of stay

Multimedia Appendix 1
Admissions to hospitals due to COVID-19 in Jordan from February 2021 to August 2021 in selected hospitals by vaccination status and type of vaccine. ICU: intensive care unit.
[PNG File , 372 KB - iproc_v8i1e36363_app1.png]

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Abstract

Surveillance Evaluation for Severe Acute Respiratory Infection, Sana'a city, Yemen, 2021

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Abstract

Background: Due to the war and limited access to health facilities, the surveillance of severe acute respiratory infection (SARI) has been expanded to include all hospitals since 2017.

Objective: We aimed to assess the usefulness of SARI surveillance in Sana'a city and to assess its performance in terms of attributes.

Methods: The Centers for Disease Control and Prevention's updated guideline was used for evaluating surveillance systems. Four qualitative attributes, including stability, simplicity, flexibility, and acceptability, and data quality as a quantitative attribute were assessed. An in-depth interview with stakeholders at the central level and self-administered questionnaires with 5 Likert scales and a register review at the peripheral level were used for collecting data. Scores for indicators were used to calculate the total gained scores for each attribute and percentages for ranking them as poor (<60%), average (60% to <80%), good (80% to <90%), and excellent (≥90%).

Results: SARI surveillance was useful and obtained a total gained score of 94%. The overall performance of the five attributes was average (64%). It was good (82%) at the central level where flexibility was excellent (93%) and stability was average (72%). The performance at the peripheral level was poor (51%); simplicity (61%) and acceptability (74%) were average, and the data quality was poor (20%).

Conclusions: Expanding SARI surveillance with a lack of staff training, central communication, and supervision might be the main reason for its weak performance at the peripheral level. Supporting SARI program activities and selecting SARI reporting sites and the surveillance team at each site based on World Health Organization criteria are highly recommended.

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KEYWORDS

evaluation; national influenza control program; CDC guidelines; Sana'a; Yemen

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Abstract

Effects of the COVID-19 Pandemic on Routine Immunization Coverage—Afghanistan, 2020

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Abstract

Background: The COVID-19 pandemic has been declared the worst public health crisis in the world, with over 50 million global confirmed cases and 1,256,869 global deaths across 214 countries and territories as of November 9, 2020. Among 73 GAVI-eligible countries, 69 of them have reported COVID-19 cases; Indonesia, India, and Pakistan are the countries that comprise the highest number of cases. Afghanistan reported its first case of COVID-19 on February 24, 2020, in Herat province, which was an imported case who had a travel history from Iran. Afghanistan reported 42,092 confirmed cases and 1558 deaths as of November 9, 2020. During the COVID-19 pandemic, around 300,000 Afghans returned from Iran and Pakistan, and this overwhelmed the government's attempts to control the outbreak. There is no specific treatment for COVID-19, and no vaccine has been introduced yet. However, the World Health Organization recommends some measures in order to decrease the spread of virus transmission, such as physical distancing, avoiding gatherings, closing schools and universities, wearing masks, and home quarantine. Despite the lockdown of cities, health service delivery remains open in Afghanistan during the COVID-19 pandemic. The reporting of confirmed cases remains low; only health facilities are reporting confirmed cases and deaths. Hospitals have begun to lose staff; health staff are not only becoming ill or dying, they are also not able to work under conditions with highly contaminated environments and health hazards. The reporting of COVID-19 data has been unreliable. At first, the government only managed 100 tests per day, and the majority of people did not have access to HFs for testing, which caused the virus to start spreading throughout the community. In a recent nationwide, population-based seroepidemiological study that the Ministry of Public Health conducted on July in 9 regions of Afghanistan, around 10 million people were affected by COVID-19. The total proportion of COVID-19–positive infections was 31.5%. The highest proportion of COVID-19–positive infections was in Kabul region (53%). The east region had the second highest proportion of COVID-19–positive infections, which was 43% (Ministry of Public Health, 2020). Routine immunization is a vital component in reducing morbidity and mortality and one of the top priorities for the Ministry of Public Health. The health facilities that provide EPI services remain open all over the country, but the outreach and mobile sessions have been mostly suspended due to the lockdown, and families have been unable to reach HFs due to restrictions. In Kenya, the EPI performance dropped by 20% in the second quarter of 2020. In addition, in Bangladesh, Penta-3 coverage was 50% lower in April 2020 compared to that in the same period in 2019. As per our review on the routine immunization coverage for Pakistan, the first case of COVID-19 in Pakistan was reported on February 26, 2020, and Pakistan reported 344,839 confirmed cases and 6977 deaths as of November 9, 2020. More than 1 million children had missed vaccine doses by July 1, 2020, in Pakistan. The immunization coverage decreased by 49% for Penta-3 during March to April 2020 when compared with that in 2019 for the same months in Pakistan. Generally, the immunization uptake dropped by more than half during the COVID-19 pandemic in Pakistan (GAVI, 2020).

Objective: The primary objective of this study is to analyze the data on how much the EPI performance dropped during the COVID-19 pandemic and to determine its impact on routine immunization coverage. The secondary objectives of this study are (1) to analyze the data from April, May, June, and July for 2019 and 2020 and compare the coverage of different antigens in this period; (2) to learn how much the coverage of routine immunization dropped due to the COVID-19 pandemic; and (3) to trend analyze Penta-3, Measles-1, and TT2+(PW) coverage from December 2019 to August 2020.

Methods: This was a descriptive analysis of secondary data that existed in the EPIMIS database at the national level. The EPIMIS database is a part of the HMIS at the Ministry of Public Health. It was developed in 2015, and it is used as a data collection

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and extraction tool at the national and provincial levels. We extracted routine immunization data from the EPIMIS database from April to July of both 2019 and 2020 for comparison. In addition, we reviewed the trend analysis conducted from December 2019 to August 2020 that compared the four months prior to the lockdown (from December 2019 to March 2020) with the COVID-19 lockdown period (from April to July 2020). We managed and analyzed the data by using Microsoft Excel 2016 and Epi Info 7.2.

Results: Data for the main EPI indicators were analyzed at the national and provincial levels. As shown in our graph, the routine immunization coverage dropped by 11%, 2%, and 12% for Penta-3, Measles-1, and TT2+(PW), respectively, during the COVID-19 pandemic lockdown period (April to July 2020) when compared to those in 2019 for the same period. During the lockdown, the supplementary immunization activities for polio eradication nationwide, which were scheduled for May and June, were postponed as well. However, the coverage for OPV-3 decreased by 6% during the lockdown when compared with that in the same period of last year. The table shows the dropped percentages of all antigens from April to July of 2020 compared to those in the same period in 2019. This high drop in coverage was observed for TT2+(PW) and Penta-3. Moreover, coverage at the provincial level also decreased due to the COVID-19 pandemic. The highest decrease in coverage for Penta-3 and Measles-1—45% and 43%, respectively—was observed in Paktya province during the COVID-19 pandemic (compared to those in the same period in 2019). In addition, the highest TT2+ coverage for pregnant women was observed in Kunduz province, which dropped by 67%. During the lockdown, almost 200 HFs were closed, and the provision of fixed, outreach, and mobile sessions were limited due to COVID-19. The number of fixed sessions declined by 3%, while the number of outreach sessions declined by 1% during the lockdown period. Overall, 202,408 children in fixed sessions and 24,173 children in mobile sessions were missed during the lockdown period due to COVID-19 when compared to those in the same period in 2019. This decline was observed for Penta-3, Measles-1, and TT2+(PW) coverage due to COVID-19. The trend analyses for Penta-3, Measles-1, and TT2+(PW) for December 2019 to August 2020 indicates that the coverage of routine immunization slightly declined from April to July 2020 when compared to that in the months prior to the lockdown period. Based on the trend analyses, immunization coverage started to resume in July 2020.

Conclusions: Compared to the regional countries in which the EPI performance dropped by a high percentage, routine immunization coverage in Afghanistan dropped by 11% for Penta-3 and by 2% for Measles-1 during the lockdown period due to COVID-19. This reveals that the Afghanistan EPI team performed better during a crisis than lower-middle–income countries. However, there is a need for proper planning to protect essential health services during emergencies. In addition, the performance of fixed and outreach sessions for EPI activities declined by 3% and 1%, respectively, during the lockdown, which had a minor impact on routine immunization activities.

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KEYWORDS

immunization; COVID-19

Multimedia Appendix 1
Effects of the COVID-19 Pandemic on Routine Immunization coverage – Afghanistan, 2020.
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Abstract

Behavioral and Emotional Problems Among Jordanian and Syrian Refugee Children in Noncamp Settings

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Abstract

Background: Refugee children have an increased risk of physical and psychological illness. Data on behavioral and emotional problems among Jordanian and Syrian refugee children in noncamp settings are scarce.

Objective: This study aimed to assess the behavioral and emotional problems among Syrian school children refugees living outside camps in Jordan and their Jordanian counterparts.

Methods: A cross-sectional study was conducted among Syrian and Jordanian school children, aged 12-17 years, studying in the same schools in 4 Jordanian cities with the highest density of Syrian refugees. A self-reported questionnaire was used to collect information about the sociodemographic characteristics of the children. The Strengths and Difficulties Questionnaire was used to measure behavioral and emotional problems among these children.

Results: This study included a total of 1878 Jordanian adolescents (45.6% male and 54.4% female) and 1773 Syrian refugee adolescents (43.9% male and 56.1% female). The parents of the Syrian adolescents were significantly less educated and had significantly lower total family income than Jordanian parents. More than half of the Jordanian and Syrian adolescents had peer relation problems (53.6% and 55.5%, respectively), 36.9% of Jordanian and 35.5% of Syrian adolescents had hyperactivity or inattention problems, 44.8% of Jordanian and 47.6% of Syrian adolescents had conduct problems, and 30.8% of Jordanian and 32.0% of Syrian adolescents had emotional symptoms. On the other hand, 43.0% of Jordanian and 42.5% of Syrian adolescents had prosocial behaviors. In the multivariate analysis, Jordanian and Syrian children differed significantly in emotional symptoms and peer relationship problems. Compared with Jordanian children, Syrian children were less likely to experience emotional problems (odds ratio 0.81; *P*=.04) and peer relationship problems (odd ratio 0.80; *P*=.03).

Conclusions: Emotional and behavioral problems are common among Syrian refugee schoolchildren as well as Jordanian school children. They are all in need of urgent psychosocial support.

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KEYWORDS

emotional problems; behavioral problems; schoolchildren; Syrian refugees; Jordanian

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Abstract

Estimation of Out-of-Pocket Expenditure on COVID-19 Management Among Patients Treated at Home, Iraq, 2020

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Abstract

Background: There is a global consensus that the socioeconomic impact of the COVID-19 crisis has had a substantial effect on health programs and health insurance, with losses of jobs and rising prices causing growing poverty.

Objective: This study aims to estimate the out-of-pocket expenditure spent on the management of patients with COVID-19 exclusively treated at home.

Methods: A cross-sectional study was conducted, and data were collected from participating patients with COVID-19 in Iraq through snowball sampling by using a questionnaire. Enrollment occurred from November 1 to December 31, 2020, and excluded individuals who were entering the hospitals.

Results: Among 589 participating patients with COVID-19, 328 (55.7%) were female. Female patients spent more than male patients to get cured of the illness; the mean amount of money spent by women was statistically higher than men (IQD 644,617 [US $402] and IQD 461,653 [US $307], respectively). The average total money expenditures spent was IQD 643,304 (US $428; range IQD 505,096-5,595,000 [US $336-US $3730]) among patients exclusively treated at home. The average money spent by patients with inadequate monthly income (IQD 901,424 [US $600], range IQD 220,000-5,260,000 [US $140-US $3500]) was significantly more than patients with adequate monthly income (IQD 613,252 [US $400], range IQD 48,000-5,500,000 [US $32-US $3600]). Patients with COVID-19 (25.5%) who had chronic diseases spent significantly more money (IQD 696,330 [US $460]) than those without the chronic disease (IQD 625,185 [US $416]).

Conclusions: Financial burdens affected the purchasing power and the economic situation on the management of patients with COVID-19 exclusively treated at home.

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KEYWORDS

poverty; out-of-pocket expenditure; chronic diseases; cross-section study

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Abstract

Evaluation of the Nutrition Surveillance System, Sana'a City, Yemen, 2021: Cross-sectional Study

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Abstract

Background: Malnutrition remains one of the most common causes of morbidity and mortality among children in low- and middle-income countries. It is one of the important problems that showed an increasing incidence in Yemen. The Nutrition Surveillance System started in 2018 as a pilot in five governorates to ensure that difficulties of public health importance are monitored efficiently.

Objective: This study aims to assess its usefulness and the performance of the system attributes, and to identify strengths and weaknesses to make recommendations for improvement.

Methods: The Centers for Disease Control and Prevention's updated guidelines for the evaluation of public health surveillance were used to evaluate the Nutrition Surveillance System in Sana'a City. Qualitative and quantitative attributes were measured through desk review and in-depth interviews with stakeholders from different levels by using a semistructured questionnaire for collected data. The percent mean of total scores was used for the final rank of the performance as very poor (<40%), poor (40%<60%), average (60%<80%), good (80%<90%), and excellent (≥90%). Epi Info version 7.2 was used for data entry and analysis.

Results: The Nutrition Surveillance System was found to be useful and flexible, with overall scores of 100% and 80%, respectively, and the overall system performance was average (76%). The highest attribute score was 83% for simplicity, and the lowest score was 67% for stability. Simplicity and acceptability at the governorate and district levels were good, but at the health facilities level, they were average. Timeliness of report and completeness of forms and data were 100% and 95%, respectively. The main strength of the Nutrition Surveillance System was continuous expansion in opening new health facilities and that the quality of data was strong with updated databases.

Conclusions: The Nutrition Surveillance System in Sana'a City was found to be useful and met its main objective. Overall levels of system performance were average. Regular training for health staff at the health facilities and gradual replacement of donors with government funds are recommended.

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KEYWORDS

evaluation; Nutrition Surveillance System; Yemen; Centers for Disease Control and Prevention guideline; CDC

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Abstract

Sex-Based Variations in the Clinical Manifestations, Comorbidities, and Outcomes of Patients With COVID-19 in Baghdad, Iraq, 2020

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Abstract

Background: A higher incidence of COVID-19 in males has been widely reported. However, whether clinical manifestations, comorbidities, severity, and outcomes differ between males and females remains an area of active investigation.

Objective: We aimed to compare the clinical features, comorbidities, severity, and outcomes between male and female patients with COVID-19 from Baghdad, Iraq, in 2020.

Methods: We performed a records-based cross-sectional study by extracting sociodemographic, clinical manifestation, severity, and outcome data from the records of patients with COVID-19 admitted to 2 COVID-19 hospitals in Baghdad, Iraq, between June and August 2020.

Results: We reviewed a total of 2111 patient records with a history of COVID-19, and 1175 (55.7%) patients were males. We found that respiratory symptoms, sore throat, and gastrointestinal manifestations were significantly more common among females. In contrast, males had significantly more "other" manifestations. No significant difference was noted for fever, nasal congestion, conjunctival congestion, headache, and musculoskeletal manifestations. Generally, female patients had a significantly higher proportion of comorbidities than males (42.7% vs 36%; *P*=.002). The proportion of severe and critical cases was not different between males and females. The mean time from diagnosis to the outcome was significantly longer in females (*P*=.03), but the duration of the hospital stay was not significantly different between males and females. Finally, the case fatality ratio was higher in males (16.1%) than in females (13.2%).

Conclusions: Sex affects the clinical course and outcomes of patients with COVID-19. Male patients may need more attention, considering the higher case fatality ratio.

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KEYWORDS

COVID-19; Iraq; sex; case fatality ratio; comorbidity

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Abstract

The Effect of Artificial Intelligence on the Nutritional Status of Children After Cardiac Surgery: Randomized Controlled Trial

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Abstract

Background: Malnutrition is the most common problem in congenital heart disease patients. Health-based mobile apps play an important role in the planning and tracking of diet for better nutritional status.

Objective: The aim of this paper was to assess the effect of artificial intelligence on the nutritional status of children after cardiac surgery in comparison to the usual care group. We also aimed to assess the usefulness of a diet-related mobile app in comparison to the usual care group.

Methods: This is a two-arm randomized controlled trial, which was conducted at a tertiary care hospital, Rawalpindi. The study duration was 6 months from February 2021 until July 2021. The sample size was calculated to be 88. The intervention group was given a diet-related mobile app, and the usual care group was handed a pamphlet with diet instructions on discharge.

Results: The mean weight of all participants was 15 (SD 5.7) kg at the time of discharge. However, at the end of the 8th week, the mean weight of the participants in the usual care group was 16.5 (SD 7.2) kg and that of the intervention group was 17.1 (SD 5) kg. The average calories consumed by the usual care group was 972 (SD 252) kcal and 1000.75 (SD 210) kcal by the intervention group after 8 weeks of discharge. The average proteins consumed by the usual care group was 34.3 (SD 12.5) grams and 39 (SD 6.4) grams by the intervention group after 8 weeks of discharge. At the end of the intervention, the preferred diet planning tool for 79% of the participants was mobile app. At the 8th week, 93% of the participants considered the visual cues useful, 80% thought that the mobile app's language was understandable, 79% thought nutritional goal setting is a useful feature in the mobile app, and 55% thought the recipes provided in the app were useful.

Conclusions: This study showed strength for the future of scalable modern technology for self-nutrition monitoring. There was a slight increase in the weight and nutritional intake of both groups, as the intervention period was limited.

Trial Registration: ClinicalTrials.gov NCT04782635; https://www.clinicaltrials.gov/ct2/show/NCT04782635

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KEYWORDS

artificial intelligence; diet-related mobile app; nutritional status; children; post-cardiac surgery; randomized controlled trial

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Abstract

Reported Adverse Events Following the Pfizer-BioNTech COVID-19 Vaccine in Jordan

Areej Hamed Shoubaki[1], BSc, MD; Ashraf Aqel[1], MD; Mahmoud Yacoub[1], MD; Majed Asad[1], MD

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Abstract

Background: The expediency in producing and approving vaccines for the COVID-19 pandemic is unprecedented. Regrettably, this fomented public distrust and misinformation about vaccination. The Pfizer-BioNTech mRNA-based vaccine was the first to be approved for mass use after phase 3 clinical trials affirmed its safety and efficacy. Vaccine safety monitoring is ongoing.

Objective: This study aims to describe reported adverse events following immunization with the Pfizer-BioNTech vaccine among first recipients in Jordan.

Methods: A retrospective descriptive study was conducted on data extracted from the Ministry of Health's database for the National Vaccine Adverse Event Reporting System from January to May 2021. The frequency of adverse events was compared between the first and second doses and across age groups, gender, and comorbidities. The chi-square test was used to compare categorical variables.

Results: In total 1874 individuals who received both doses of the vaccine were studied. The mean age was 68 years, with a 2:1 male to female ratio and 73% with comorbidities. About two-thirds (68%) of recipients reported side effects after the first dose, 54.3% after the second, and 53.3% after both. Most common side effects following each and both doses were pain at the injection site (32%), fatigue (16%), and headache (8%), followed by fever, myalgia, and arthralgia. Overall, reported side effects increased 1.4 times after the second dose mostly for systemic side effects. Significantly, more females reported side effects than males, while those with comorbidities reported comparatively fewer side effects (52.2%) than the medically free (59%). Further, 72.5% of recipients aged 55 years or younger reported side effects compared to 50% of older recipients. No anaphylactic reactions were reported. Severe side effects were rare and self-limiting, including tachycardia (n=4), shortness of breath (n=28), and lower limb paresthesia (n=6).

Conclusions: The Pfizer-BioNTech vaccine has proven to be safe and well tolerated among vulnerable recipients with comorbidities. Continuous adverse event surveillance and follow-up are recommended.

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KEYWORDS

COVID-19; Jordan; adverse events; side effects; vaccine

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Abstract

Evaluation of the Acute Flaccid Paralysis Surveillance System From 2016 to 2020: A Retrospective Study

Suhaib Abu Failat[1], MD; Nabil Qasem[1], MD; Majed Asad[1], MD; Ibrahim Iblan[2], MD; Ashraf Aqel[1]

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Abstract

Background: Acute flaccid paralysis surveillance played a major role in the global eradication of polio. The World Health Organization adopted this method to monitor the progress toward poliomyelitis eradication. The Expanded Program of Immunization in Jordan has routinely collected acute flaccid paralysis data since 1999, which then attained a polio-free certification. Yet, because of wars in neighboring countries such as Syria and Iraq, there is a risk of polio outbreaks occurring.

Objective: This study aims to evaluate the acute flaccid paralysis surveillance system in Jordan from 2016 to 2020 and identify areas for improvement.

Methods: This was a retrospective descriptive study that used data from the acute flaccid paralysis surveillance system in Jordan between January 2016 and December 2020. The World Health Organization standard indicators were used to evaluate the performance of the surveillance system.

Results: A total of 483 cases of nonpolio acute flaccid paralysis were reported. Most of them (n=478, 99%) were younger than 15 years, and among those, 55.6% were younger than 5 years, and 58% were male. At the national level, the surveillance achieved all the World Health Organization indicators throughout the evaluating period, except for two indicators: the proportion of stool specimens from which nonpolio enterovirus was isolated in 2016 and 2017, and the nonpolio acute flaccid paralysis detection rate per 100,000 of the population younger than 15 years in 2020. At a subnational level (governorates level), the proportion of stool specimens from which nonpolio enterovirus was isolated, as an indicator, was not achieved most of the time. This was frequently observed in each of all evaluation years of 2016 to 2020. Moreover, most indicators were not achieved at the governorate level in 2020.

Conclusions: There are some gaps that need improvement in the acute flaccid paralysis surveillance system in Jordan, especially at the governorate level. The lower performance during 2020 could have been caused by the COVID-19 crisis and the lockdown during the pandemic. Similar challenges are possible in the future and proper preparation is required.

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KEYWORDS

acute flaccid paralysis; Jordan; surveillance system; polio; eradication

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Abstract

Role of Rapid Response Teams in Response to Outbreaks in Yemen, 2020: Descriptive Study

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Abstract

Background: Yemen has been increasingly reporting public health emergencies (eg, cholera). The Ministry of Public Health and Population (MoPH&P) has put in place the Rapid Response Teams (RRTs) mechanism from the national to district level to investigate and initiate the response to public health emergencies. An RRT is a technical, multidisciplinary team that is readily available for quick mobilization and deployment in case of emergencies.

Objective: The aim of this analysis was to summarize the role of RRTs in response to outbreaks in Yemen during 2020.

Methods: Data were obtained from the electronic Diseases Early Warning System (eDEWS) in Excel format covering the period from January to December 2020, including governorates, diseases, and other variables. Data were cleaned and analyzed using Excel 2013. Qualitative data are summarized as percentages. Data are presented using tables, graphs, and maps.

Results: A total of 39,451 field descents were performed. Nearly half of the activities (n=18,565, 47.06%) were for outbreak investigation of various infectious diseases, including cholera (n=9030), severe acute respiratory infection (n=1949), diphtheria (n=1532), measles (n=1328), malaria (n=1012), dengue fever (n=1008), pertussis (n=803), mumps (n=676), chickenpox (n=583), acute flaccid paralysis (n=482), and meningitis (n=162). Approximately 1747 (4.43%) supervision visits were implemented. Regarding health education, 19,139 (48.51%) health education sessions were executed, with 3419 (17.86%) performed at health facilities and 15,720 (82.14%) performed outside health facilities (eg, schools and outdoors). A total of 559,805 people attended the health education sessions.

Conclusions: RRTs support the MoPH&P in reducing or “slowing down” disease transmission as quickly as possible through various activities such as outbreak investigations and health education. Therefore, there is a strong need to continue supporting the RRTs financially and logistically by donors. In addition, governmental financial support to the RRTs is highly recommended to ensure the sustainability of the program.

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KEYWORDS

RRT; roles; activities; Yemen; 2020

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Abstract

Public Health Workers' Knowledge, Attitude, and Practice Regarding COVID-19: The Impact of the Field Epidemiology Training Program in the Eastern Mediterranean Region

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Abstract

Background: Globally, there is a growing need for public health professionals skilled in preventing and responding to the surge of emerging and re-emerging infectious diseases. This is particularly important to the Eastern Mediterranean countries that are facing emergencies in addition to the increased public health risks of unprecedented scale during the COVID-19 pandemic. Public health professionals are instrumental in responding to the COVID-19 pandemic in terms of detecting and monitoring new cases, conducting investigations, tracing contacts, ensuring patients are being tested, applying isolation and quarantine protocols, providing up-to-date information, educating the community, and producing statistics and models to track disease progression.

Objective: This study aims to compare knowledge, attitude, and practice (KAP) regarding COVID-19 between public health workers (PHWs) that attended the Field Epidemiology Training Program (FETP trained) and those who did not attend FETP (non-FETP trained).

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Methods: A multicountry cross-sectional survey was conducted among PHWs who participated in the COVID-19 pandemic in 10 countries in the Eastern Mediterranean Region. An online questionnaire that included demographic information and KAP regarding the COVID-19 pandemic was distributed among PHWs. The scoring system was used to quantify the answers; bivariate and multivariate analyses were performed to compare FETP-trained with non-FETP–trained PHWs.

Results: Overall, 1337 PHWs participated, with 835 (62.4%) <40 years of age and 851 (63.6%) male participants. Of them, 423 (31.6%) were FETP trained, including 189 (44.7%) at an advanced level, 155 (36.6%) at an intermediate level, and 79 (18.7%) had basic level training. Compared to non-FETP–trained participants, FETP-trained participants were older and had higher KAP scores. FETP participation was low in infection control and public health laboratories. KAP mean scores for intermediate-level attendees were comparable to the advanced level.

Conclusions: FETP-trained participants had better KAP than non-FETP–trained PHWs. Expanding the intermediate level, maintaining the rapid response training, and introducing the laboratory component are recommended to maximize the benefit from the FETP. Infection control, antimicrobial resistance, and coordination are areas where training should be included.

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KEYWORDS

knowledge; attitude; practice; COVID-19; Field Epidemiology Training Program

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Abstract

Preparedness, Risk Perception, Concerns, and Risk Acceptance Among Hospital Health Care Workers in Facing the Emerging COVID-19 Outbreak in Najran Hospitals, Saudi Arabia, at the Early Phase of the Pandemic

Hassan Kasim Haridi[1], MD; Ali Dhafer Al-Swedan[1], SBIM; Mashhour Hussein Al Qannas[1], SBGS; Fahad Hamad Balharith[2], PhD; Sayed Abdelsabour Kinawy[3], MD; Abdelaziz Abdelfattah Aman[1], MD; Abbas Almakrami[1], SBIM; Ahlam Mshabab Alqahtani[1], BSc

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Abstract

Background: The COVID-19 pandemic extended to reach most countries in the world during a few months. The preparedness of health care institutions and health care workers (HCWs) is crucial for applying effective prevention and control measures.

Objective: This study aims to assess HCWs' and institutional preparedness in facing the new emerging COVID-19 infection at the early phase of the pandemic and to explore HCWs' risk perception, concerns, and risk acceptance.

Methods: A cross-sectional survey was conducted among hospital HCWs in King Khalid and New Najran hospitals, Saudi Arabia, at the early phase of the pandemic, during March and April 2020.

Results: Overall, 563 completed questionnaires were received (n=382, 67.9% from King Khalid and n=181, 32.1% from New Najran). The majority were female participants (78.6%); nurses constituted 74.7% of the sample. The age range of the participants was 20-63 years, with the mean age of physicians and nurses being 36.5 (SD 9.15) years and 31.8 (SD 7.48) years, respectively. Among participants, 65.8% attended training programs for COVID-19 infection, of whom 69.9% were satisfied with this training. Almost all (97.4%) of the participants reported reading the official circulars assigned for guidelines, case definition, and infection control measures regarding COVID-19 infection; 97.1% received basic infection control training; 98.9% checked for the best-fitted size of an N95 mask; and 89.4% were influenza vaccinated. Of the participants, 82.6% reported that they have sufficient knowledge about the COVID-19 pandemic, 82.0% reported being confident that they can protect themselves and their patients when dealing with COVID-19 cases, 92.9% reported that they understand the risk of COVID-19 infection for patients and health care staff, and 83.2% reported agreement of accepting the risk of getting the infection being a part of their job. The study participants attained a mean 20.26 (SD 2.60) knowledge score on a scale of 26 maximum points (77.9%); of them, 74.5% attained 20 points or more (>75%), indicating good working knowledge about the COVID-19 pandemic. Exploring the participants' perception about the preparedness of their institutions toward the COVID-19 pandemic, 70.8% agreed that institutional precautionary measures to COVID-19 in the workplace are sufficient, 71.6% agreed that all personal protective equipment is provided and always available in the workplace, and 90.6% mentioned that the staff in their institutions have had adequate training. Exploring risk perception and the affective aspect of the pandemic on HCWs, 79.0%, 35.2%, and 64.2% of the participants felt that they, their families, and the Najran community are at high risk of getting an infection of COVID-19, respectively, and 54.7% and 55.1% were concerned about their personal and family health, respectively.

Conclusions: The findings revealed good knowledge about the COVID-19 pandemic among HCWs in Najran hospitals, Saudi Arabia. Concerns and worries were expressed regarding working with the highly infectious patients with COVID-19. Participants

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appreciated important aspects of institutional preparedness. Experience gained from the previous Middle East respiratory syndrome–related coronavirus outbreak may explain good knowledge, risk acceptance, self-efficacy, and good and rapid institutional preparedness at the early stage of the pandemic.

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KEYWORDS

COVID-19; knowledge; concern; health care workers; institutional preparedness; Saudi Arabia

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Abbreviations

HCW: health care worker

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Abstract

Evaluation of the National Electronic Disease Surveillance System Amid the COVID-19 Pandemic in Elsahel District, Cairo Governorate, Egypt, 2020

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Abstract

Background: The Egypt National Disease Surveillance is a routine system established in 2002. The system electronically reports on 41 infectious diseases including COVID-19. Reporting sites include all Egyptian governorates, districts, governmental infectious disease hospitals, and primary health units. Surveillance is essential during the pandemic to detect cases early, describe the epidemiology of health problems, guide priority setting, and plan and evaluate public health policy and strategies.

Objective: This study aims to evaluate the surveillance system during the pandemic to assess its effectiveness in achieving its objectives and to find and fill the gaps.

Methods: The evaluation was performed using the Centers for Disease Control and Prevention guidelines. A structured questionnaire was used to evaluate the qualitative attributes including simplicity, flexibility, and acceptability through interviewing surveillance teams at the central level, health directorate, and Sahel district. Quantitative attributes, including completeness, timeliness, and predictive positive value, were performed using COVID-19 surveillance data of Sahel district in March-December 2020. Data were assessed for completeness and accuracy. The usefulness of surveillance was assessed in terms of achieving its objectives and use of data.

Results: Of 33 respondents, 90% thought that the system was simple, and 77% thought it was acceptable; work overload reduced the acceptability rate. The system is funded by the Ministry of Health and Population and was operational 53% of the time due to connectivity problems. The system was flexible when adapting to include COVID-19 in a short time with minimal cost. It is quite representative, as it covers 60% of the population. Completeness was 82%, positive value predictive was 58%, and data validity was 86%. The median duration between patient admissions and reporting was 2.7 days.

Conclusions: The evaluation of the Egypt COVID-19 surveillance system indicated that the system partly achieved its objectives in the area of simplicity and flexibility with adequate data quality. There is a need to improve acceptability and timeliness through increasing manpower and to enhance stability through effective connectivity. Expansion of the system to cover all of the Egyptian population is recommended to improve representativeness.

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KEYWORDS

NEDSS; evaluation; Egypt; surveillance; COVID-19; National Disease Surveillance

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Abstract

Descriptive Epidemiology of Acute Flaccid Paralysis Cases in Afghanistan, 2015-2018

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Abstract

Background: Polio is on the verge of eradication, while Afghanistan and Pakistan are the only endemic countries remaining where polio is still prevalent. Surveillance for acute flaccid paralysis (AFP) is one of the four cornerstone strategies of the Polio Eradication Initiative.

Objective: This study aims to describe the epidemiology of AFP cases in terms of time, place, and person.

Methods: It is a descriptive study whereby we analyzed the secondary data reported by AFP surveillance in Afghanistan. We accessed and used line lists from 2015 to 2018 to describe the epidemiological status of AFP cases in the country. With the use of Epi Info 7 and Microsoft Excel, we calculated descriptive measures, including frequencies, mean, median, SD, generated proportions, tables, and graphs.

Results: Overall, 11,513 cases were reported in the last 4 years (2015-2018) by AFP surveillance at the Ministry of Public Health. The majority of the cases (29%) were reported in 2018, while 2088 (18%) cases were reported in 2015. The trend of oral polio vaccination has increased from 2015 to 2018 (57%, 64%, 63%, and 68%, respectively). Most of the cases were reported from southern and western regions, and 57% were male cases. The highest (38%) proportions of cases were in those less than 30 months in age. Guillain-Barre syndrome was 38% of all categories. The samples were collected using appropriate procedures. However, the numbers of confirmed cases increased from 13 in 2016 to 14 in 2017, 20 in 2018, and 22 in 2019.

Conclusions: The AFP surveillance system is well established in the country. Nevertheless, with the increase in the trend of oral polio vaccine coverage, there is also an increase in the number of confirmed polio cases. Hence, the system should be sustained, and strategies should be strengthened to focus on the southern region as being the main engine of polio in the country.

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KEYWORDS

epidemiology; acute flaccid paralysis; poliomyelitis; Afghanistan

Abbreviations

AFP: acute flaccid paralysis

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Abstract

Bacterial Contamination of Intensive Care Units, Sana'a City, Yemen, 2019

Mohammed Al Amad[1], MD; Intesar Abdulsalam Al Shargabi[2]; Samar Nasher[1], MD; Sami Ahmed Al-Haidari[3]; Riham Al-Dubaiee[1]; Suaad Ameen Moghalles[1]; Khaled Abdullah Al Moayad[3]

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Abstract

Background: Bacterial contamination of the intensive care unit (ICU) is one of the risk factors responsible for the high incidence of nosocomial infections that can significantly increase the mortality among ICU patients.

Objective: The aim of this study was to investigate the bacterial contamination and pathogen isolates from the ICU environment of hospitals in Sana'a city, Yemen.

Methods: A descriptive cross-sectional study was performed in Sana'a city hospitals from December 5 to December 15, 2019. All hospitals that frequently reported mortality among ICU patients were included. A sterile swab moistened in sterile normal saline was used for sample collection. Seven ICU sites were targeted, including the patient's bed, bedside table, masks of the oxygen-supplying apparatus, intravenous (IV) stand, door knob, wall, and floor, and two samples from each site were collected. The samples were transported to the National Center of Public Health Laboratory for microbiological culture.

Results: A total of 112 swabs were collected from the ICUs of eight hospitals. Among these, 87 (77.7%) yielded positive bacterial growth and 109 bacterial strains were isolated, including 62.4% (n=68) gram-positive and 37.6% (n=41) gram-negative bacteria. Coagulase-negative *Staphylococcus*, *Staphylococcus aureus*, and *Bacillus cereus* were the predominant gram-positive bacteria isolated, which accounted for 27.5% (n=30), 21.1% (n=23), and 10.1% (n=11) of all 109 bacterial isolates, respectively. *Klebsiella* species, *Pseudomonas* species, and *Acinetobacter* were the main gram-negative isolates obtained, accounting for 12.8% (n=14), 12.8% (n=14), and 11.9% (n=13) of all 109 bacterial isolates, respectively. The common contaminated sites were the patients' beds/bedside tables (40/109 strains, 36.7%), floors (24/109 strains, 22.0%), walls (15/109 strains, 13.8%), and masks of the oxygen-supplying apparatus (12/109 strains, 11.0%). The door knobs and IV stands were contaminated by 9 strains, representing 8.3% of the total isolated bacteria.

Conclusions: The contamination of ICU environments was high and patients' surroundings were the most contaminated areas. Implementations of strict quality standards of hygienic practices and effective cleaning of inanimate surfaces by the hospitals' infection control units along with periodic monitoring by the health authority are highly recommended.

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KEYWORDS

bacterial contamination; intensive care units; Yemen

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Abstract

Crimean-Congo Hemorrhagic Fever Outbreak in the North Region of Oman in August 2019: Case Series Study

Khalid Saif Alsaadi[1*], BSc, MD, DEP; Eman Abd-Ellatif[2*], MScPH; Fatima Alhashmi[1*], MScPH; Ali Almoqbali[1*], MScPH; Vidyanand Vaidya[1*], MScPH

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Abstract

Background: Crimean-Congo hemorrhagic fever (CCHF) is a viral zoonotic tickborne disease that has been linked to a high mortality rate in a number of nations. In Oman, the first case of CCHF was discovered in 1995. The Directorate of Disease Surveillance and Control received reports of four individuals with CCHF from various places in Northern Oman between August 17 and August 23, 2019 (during the Eid Adha festival).

Objective: The aim of this study was to identify CCHF patients, determine the source and mechanism of transmission, and recommend preventive measures to avoid further outbreaks.

Methods: We arranged for a field visit with teams from the Ministry of Agriculture, Fisheries and Municipality on the same day of notice (August 23-17, 2019) in the region, and a case series study was undertaken using a semistructured questionnaire.

Results: The findings revealed that all of the patients were men (three were Omanis), ranging in age from 40 to 55 years. Three of the patients worked in slaughterhouses, and all patients had close contact with raw sheep tissues. Fever and gastrointestinal problems were the most common symptoms, with a case fatality rate of 25%. Late bleeding signs and coagulopathy were detected in the patient who died.

Conclusions: The causative agent was most likely CCHF virus, and the source of the outbreak was infected imported sheep through direct contact with contaminated biological tissues, based on symptoms, signs, lab tests, and the incubation period. All imported sheep must be tested and flagged at the main gates of the three ports in Oman's north region.

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KEYWORDS

CCHF; outbreak; slaughterhouse; sheep; patient

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Abstract

Knowledge, Attitude, and Practices Among Lebanese Obstetricians and Gynecologists With Respect to COVID-19 and Pregnancy

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Abstract

Background: The COVID-19 pandemic has seriously disrupted the daily life of the general population, particularly the life of pregnant women. Since obstetricians and gynecologists (OBGYNs) are often the primary health care providers during pregnancy, they play a critical role in preventing and managing COVID-19 in their patients.

Objective: This study aimed to assess the knowledge, attitudes, and practices of OBGYNs with respect to COVID-19 and to identify existing gaps that need to be addressed to improve patient and occupational safety.

Methods: A cross-sectional study using a web-based survey was conducted among Lebanese OBGYNs during the rapid growth of the COVID-19 pandemic in Lebanon between October 20 and November 20, 2020. The analysis was performed using the SPSS software. Knowledge, attitude, and practice scores were computed. A good level of knowledge was considered when 80% of answers from the respondents were correct.

Results: A total of 279 OBGYNs participated in the survey, of whom 57% were men. The majority of OBGYNs (64.2%) were more than 45 years of age and married (79.9%) and had extensive work experience (70.3%). Only 28.3% were reluctant to provide medical care for patients with COVID-19. Most of them were afraid of contracting COVID-19 or transmitting COVID-19 contracted through occupational exposure to their family members and 42.3% felt overwhelmed. Of the OBGYNs, 62.7% considered the policies implemented by the Ministry of Public Health to be sufficient. The majority of OBGYNs had a good level of knowledge in different basic and specific domains related to COVID-19 and pregnancy. Furthermore, the practice score was good in all relevant aspects (personal, clinic, and patient).

Conclusions: The high knowledge and practice scores among Lebanese OBGYNs indicate a strong commitment from these physicians to fulfill their responsibilities toward themselves and their patients during the COVID-19 pandemic.

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KEYWORDS

knowledge; attitudes; practices; pregnancy; COVID-19; obstetricians; gynecologists

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Abstract

Serological Evidence of SARS-CoV-2 Infection in Companion Animals in Pakistan: A Cross-sectional Survey

Aman Ullah[1]; Aitzaz Ahsan[2]; Siddra Tayyab Akhtar[3], PhD; Ambreen Chauhadry[4]; Muhammad Wasif Malik[5]; Mumtaz Ali Khan[5]; Jamil A Ansari[5]; Aamer Ikram[5]

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Abstract

Background: Coronaviruses infect both humans and animals. One of these viruses, SARS-CoV-2, associated with the COVID-19 pandemic, is believed to be zoonotic in nature with its origins from live animal markets in Wuhan, China. The virus has been reported to transmit from humans to other animals and within animal species both naturally and experimentally in many countries. Being a novel virus, studies are needed to understand how it affects animals, possible spread to humans, and other potential roles in the epidemiology of COVID-19 following a one health approach.

Objective: Therefore, we conducted a cross-sectional sero-survey among companion animals (pet dogs and cats) in twin cities of Islamabad and Rawalpindi, Pakistan with the aim to determine the seroprevalence of COVID-19 among these animals.

Methods: The study was conducted from November 2020 to April 2021, coinciding with the end of the second wave and the peak of the third wave of COVID-19 in Pakistan. We collected serum samples from 83 animals (68 dogs and 15 cats) from 10 small animal clinics and surgeries in twin cities. The data were collected on the species, age, sex, clinical history, travel history, and confirmation of COVID-19 among the owners or their families, presented with various clinical histories. The samples were tested by ID Screen SARS-CoV-2 double antigen multispecies enzyme-linked immunosorbent assay developed by ID.Vet, France.

Results: A combined seroprevalence of COVID-19 among these companion animals of 7.23% (6/83; 95% CI 2.7%-15.07%) was found. Further, the seroprevalence of COVID-19 among dogs and cats were 7.35% (5/68; 95% CI 2.43%-16.33%) and 6.67% (1/15; 95% CI 0.17%-31.95%), respectively. Both species were found to be similarly susceptible to COVID-19 (odds ratio 1.11, 95% CI 0.12-10.27; *P*=.92). Animals in families with a history of COVID-19 among owners were more likely to be seropositive for SARS-CoV-2 (odds ratio 11.8, 95% CI 1.93-71.89; *P*=.002).

Conclusions: The results suggest a possible transmission of SARS-CoV-2 from pet owners to their companion animals. However, further studies may be needed to evaluate this hypothesis and the role of pets as potential reservoirs for SARS-CoV-2 infection for humans and other animals.

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KEYWORDS

COVID-19; dogs; cats; Pakistan; serology

Multimedia Appendix 1

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Serological evidence of SARS-CoV-2 infection in companion animals in Pakistan.
[PPTX File , 294 KB - iproc_v8i1e36534_app1.pptx]

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Abstract

Electronic Integrated Disease Early Warning System Surveillance System Evaluation, Sana'a Capital, Yemen, 2021

Samar Nasher[1], MSc; Rima Alusfi[2], BSc; Rula Taher[2], MSc; Abdualqawi Qasira[1], MSc; Abdualwakeel Alsameay[1], BSc; Yasser Ghaleb[1], MSc

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Abstract

Background: The Electronic Integrated Disease Early Warning System (eIDEWS) is an essential system; it contributes to the better prevention and management of epidemics. Through the collection of complete, accurate, and timely data, countries are able to determine the priorities for suitable interventions that save the lives of communities. Regardless of the conflict in Yemen, the system is still functioning and is expanding to be the most effective epidemiological surveillance program.

Objective: We aimed to determine the usefulness of the eIDEWS, assess its performance, and identify the strengths and weaknesses of its implementation.

Methods: The usefulness and performance attributes of the eIDEWS were evaluated using the Centers for Disease Control and Prevention's updated guidelines for evaluating public health surveillance systems. The evaluation was carried out in Sana'a capital from January to March 2021 by interviewing 25 stakeholders at 3 levels—the central, governorate, and health district levels—and using a semistructured questionnaire. Attributes of the system were ranked as poor (<60%), average (60% to <80%), good (80% to <90%), and excellent (≥90%) on the basis of indicators to calculate the final scores.

Results: The eIDEWS' overall usefulness and performance score was 90%—an excellent rank. The mean score of system attributes was 100% for acceptability, completeness, and timeliness. The flexibility was good (83%), since the change in reporting method was applied difficultly. The system depends completely on foreign funds; thus, the system's stability was average (75%). However, the eIDEWS was expanded recently to add new health facilities; its representativeness was average (76%).

Conclusions: The system is working effectively at evaluated sites. The overall system performance was excellent; however, flexibility and stability were good due to the negative adaptation of the system with regard to the reporting method and the absence of other fund resources. Therefore, evaluating the newly upgraded system, strengthening its stability by finding other supporting resources, and further expanding coverage to include all public and private health care facilities are recommended.

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KEYWORDS

eIDEWS; surveillance; evaluation; Yemen

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Abstract

Risk Factors and Characterization of Post-COVID-19 Syndrome in Jordan

Mohamad-Said Almasri[1]; Rashed Alqaisi[1]; Mohammad Al-Shagahin[1]; Waqar Al-Kubaisy[1]; Ahmad Aljarajreh[1]; Hani Al-Shagahin[1]

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Abstract

Background: There is controversial information about the sequelae of COVID-19 after recovery, or post-COVID-19 syndrome (PCS). Despite the considerable number of studies on COVID-19, proportionally, there is a scarcity of literature addressing PCS, particularly the risk factors causing this syndrome. Determining the prevalence, most common manifestations of PCS, and the possible related risk factors is an important issue.

Objective: To fill these gaps, the aim of this study was to detect the prevalence and risk factors for the development of PCS, and to identify the symptoms and their relation to the sociodemographic and medical characteristics of patients who survived COVID-19 after more than 3 months from onset of illness throughout Jordan.

Methods: A cross-sectional, online questionnaire–based study was conducted. This questionnaire was posted to the association of "My experience with COVID-19" in Jordan. Sociodemographic and COVID-19 illness information was collected from 657 patients who had recovered from COVID-19 at least 3 months after the illness started.

Results: The PCS prevalence was 71.9%, including patients who experienced at least one PCS symptom. The most common symptoms included dyspnea, fatigue, taste and smell impairment, cough, and depression. Six factors were found to significantly increase the risk of PCS: being female (odds ratio [OR] 2.06, 95% CI 1.409-2.856), aged ≥30 years (OR 1.64, 95% CI 1.16-2.33), diabetes mellitus (OR 2.978, 95% CI 1.08-8.21), hypertension (OR 2.22, 95% CI 1.118-4.423), respiratory disease (OR 2.33, 95% CI 1.21-4.501), and neuropsychological disturbance during illness (OR 3.79, 95% CI 2.574-5.573). These patients also showed a significantly higher rate of PCS than their counter groups. Therefore, females, aged ≥30 years, comorbidity, and neuropsychological disturbance during illness are considered to be risk factors for PCS.

Conclusions: The PCS prevalence is high in Jordan, particularly among certain populations such as females; aged ≥30 years; those with a neuropsychological disturbance during illness; and having a comorbidity such as diabetes, hypertension, and respiratory diseases, which were associated with a significantly higher risk for the development of PCS manifestations. In other words, these populations should be considered as a risk group for PCS occurrence. Therefore, COVID-19 infection treatment should not only be administered during the acute episode but should continue for several months after recovery of the patient. In addition, the PCS period will require further scientific study and investigation along with early interventions, including rehabilitation. Therefore, we now have to start the steps in preparing for this unavoidable problem to improve the health care system and enhance the management of patients during the PCS period. Psychological and medical support is highly recommended during and after a COVID-19 episode, particularly for the high-risk groups.

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KEYWORDS

post-COVID-19 syndrome; COVID-19; postacute sequelae of SARS-CoV-2 infection; long haul; long COVID-19; chronic COVID-19 syndrome; epidemiology; risk factors; symptoms; Jordan

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Abstract

Noncommunicable Diseases Household Survey Data Analysis, Sana'a City, Yemen, 2017

Ghamdan Gamal Alkholidy[1], MBBS; Labiba Saeed Anam[1], MD; Abdulwahed Al Serouri[1], PhD; Chaoyang Li[2], MD, PhD

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Abstract

Background: Noncommunicable diseases (NCDs) kill 41 million people each year, accounting for 71% of all deaths globally. The burden of NCDs is rising faster in developing countries of the Middle East than in other regions. The morbidity and mortality of NCDs are still not well-studied in Yemen.

Objective: The aim of this study was to describe the epidemiology of NCDs in Sana'a City, Yemen, for 2017.

Methods: Raw data of a house-to-house survey that was conducted by the Ministry of Public Health and Population in 2017 were analyzed. Data were collected from household heads who were asked if any household member had one of the following five NCDs: hypertension (HTN), diabetes (DM), bronchial asthma (BA), mental disorders (MD), and epilepsy. Data were entered and analyzed using Epi info 7.2. For calculations of prevalence, 2017 projections from the 2004 census were used.

Results: A total of 241,310 households were surveyed (1,592,646 household members), 59,061 (24.48%) of which included 70,178 members who had at least one NCD. The overall prevalence of NCDs was 4.4%. The disease-specific prevalence was as follows: HTN, 2.3%; DM, 2.2%; BA, 0.4%; MD, 0.27; and epilepsy, 0.19%. The overall NCD prevalence was significantly higher among females than males (5.1% vs 3.8%; odds ratio [OR] 1.35, 95% CI 1.33-1.35), which was also the case for the prevalence of HTN (3.1% vs 1.6%; OR 1.94, 95% CI 1.90-1.98), DM (2.3% vs 2.1%; OR 1.11, 95% CI 1.09-1.13), and BA (0.5% vs 0.3%; OR 1.56, 95% CI 1.49-1.65). In contrast, the prevalence of MD was significantly higher among males than females (0.35% vs 0.16%; OR 2.2, 95% CI 2.06-2.31). The prevalence of NCDs progressively increased with age. Nearly 18% of patients had more than one NCD; 35.2% of the patients with HTN also had DM.

Conclusions: One-quarter of the surveyed households had at least one member with one or more of the five NCDs and the overall prevalence of NCDs was 4.4%. These data reflect only the tip of the iceberg as the findings are based on self-reported diagnosed cases rather than standardized measures. More attention to NCDs, strengthened health care provision, the ability to obtain high-reliability data, an NCDs stepwise survey, and establishing an NCDs surveillance system are recommended.

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KEYWORDS

NCDs; survey; hypertension; diabetes; bronchial asthma; mental disorder; epilepsy; Yemen

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Abstract

Prevalence and Factors Associated With Transfusion-Transmitted Infections Among Blood Donors at the National Blood Transfusion and Research Center, Sana'a, Yemen, 2017

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Abstract

Background: Yemen is facing major challenges in ensuring the safety and availability of blood transfusion to meet the increased demand due to the protracted conflict. However, transfusion-transmissible infectious agents (TTIs) such as hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), syphilis, and malaria remain the greatest threats for blood transfusion safety in such fragile, conflict-affected, and vulnerable settings.

Objective: The aim of this study was to determine the magnitude of TTIs among blood donors attending the National Blood Transfusion and Research Center (NBTRC) and the associated factors.

Methods: A cross-sectional study was conducted on 340 blood donors at the NBTRC during November and December 2017. Data were collected through face-to-face interviews using a predesigned questionnaire that covered sociodemographic characteristics and possible TTI-associated factors. Blood samples were drawn and tested for HBV surface antigen (HBsAg), HCV antibodies, HIV1, and HIV2 using electrochemiluminescence immunoassays, and syphilis and malaria antibodies were screened with rapid immunochromatographic techniques.

Results: The overall prevalence of TTIs was 8.8%, with HBV, HCV, HIV, syphilis, and malaria accounting for 2.5%, 1.2%, 0.3%, 1.2%, and 3.2% of all TTIs, respectively. HBV was significantly associated with a history of jaundice and cupping. Furthermore, urethro-vaginal excretion was significantly associated with syphilis, whereas malaria detection was significantly higher among donors from malaria-endemic areas. Nearly three-quarters of donations were from replacement donors who had a significantly higher TTI prevalence than that of the voluntary donors (10.4% vs 3.3%; odds ratio 3.4, 95% CI 1.1-11.6).

Conclusions: Although the prevalence of TTIs is low, they still pose a serious risk for blood recipients, especially in fragile, conflict-affected, and vulnerable settings where the needs for blood transfusion are increasing and resources are limited. Therefore, using more sensitive screening methods and establishment of a TTIs surveillance system should be considered. Efforts should be made to improve donor recruitment procedures and increase the proportion of regular and voluntary blood donation.

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KEYWORDS

transfusion-transmitted infections; blood donors; HIV; syphilis; malaria; conflict

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Abstract

Evaluation of a Malaria Surveillance System in Hodeidah City, Yemen, 2021

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Abstract

Background: Despite continuing control and elimination efforts, malaria continues to represent a major public health problem. Evaluation of the Malaria Surveillance System (MSS) is critical to obtain credible data that can be used for providing information. Hodeidah City, Yemen, is a worthy region to conduct an evaluation of the MSS because it has the greatest malaria burden.

Objective: The aim of this study was to determine the usefulness of the MSS and assess its performance in terms of qualitative and quantitative attributes.

Methods: The updated Centers for Disease Control and Prevention guideline was used to evaluate the MSS in Hodeidah City. After desk reviews and in-depth interviews were conducted, self-administered questionnaires with 5-point Likert scale and yes/no questions were used to collect data from stakeholders at four levels. The indicator's score percent was interpreted according to the following criteria: excellent, ≥90%; good, 80% to <90%; average, 60% to <80%; poor, 40% to <60%; and very poor, <40%. EPI info version 7.2 was used to enter and analyze the data.

Results: Thirty-one stakeholders participated; 55% of the respondents were men. The system was found to be useful (88%) to portray the trend of malaria and to guide policy and intervention, with excellent scores (100%) for timeliness and completeness. The overall simplicity, representativeness, acceptability, and stability scores were 78%, 66%, 62%, and 61%, respectively, representing an average rank. However, flexibility scored 40% and sensitivity only scored 5.5%. The overall performance scores for the MSS were average (68%), good (82%), and average (73%) in central, governorate, and district and health facilities, respectively.

Conclusions: Although the MSS was found to be useful and stable, and the data quality and timeliness were deemed excellent, flexibility and sensitivity were considered to be poor. To ensure sustainability of the MSS, there is a need for gradual replacement of donors' funds with governmental funds. Furthermore, enhancing laboratory diagnosis and proper training of health workers should be adopted for improving flexibility and sensitivity.

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KEYWORDS

malaria; evaluation; surveillance; Yemen

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Abstract

The Impact of Comorbidities on COVID-19 Severity and Mortality in Egypt

Shereen Elghazaly[1]; Hanaa Abu El Sood[1]; Sahar Samy[1]; Mohamad AbdelFatah[1]; Mohamed Hassany[1]; Yousef Khader[2]; Salma Afifi[1]; Alaa Eid[1]

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Abstract

Background: Older persons and people of any age with certain underlying comorbidities such as diabetes mellitus, cardiovascular disease, lung disease, kidney disease, liver disease, and cancer are at a higher risk of severe disease course and death if they become infected with COVID-19. Identifying at-risk groups and risk factors for COVID-19 severity and mortality is important for guiding the efficient and appropriate prevention and management of patients with COVID-19.

Objective: This study aimed at describing the demographics and epidemiologic characteristics of confirmed COVID-19 cases in Egypt and determining the impact of different comorbidities on patients' outcomes.

Methods: The data of all confirmed COVID-19 patients admitted to 408 governmental hospitals all over Egypt from February to May 2020 were collected retrospectively from the National Egyptian Disease Surveillance System. The cases were confirmed using RT-PCR.

Results: Overall, 28,415 patients (55% male and 45% female) were identified. Their median age was 44 years. Of those, 743 (2.6%) were admitted to ICU, 408 (1.4%) required ventilator, and 1045 (3.7%) died. Of the 21,617 (76.1%) patients with completed data, 4687 (21.7%) had comorbidities. Overall, 11.8% had diabetes, 5.3% cardiovascular disease, and 4.3% chronic obstructive pulmonary disease. Those who had 1 comorbidity were more likely to die (odds ratio 2.83), were admitted to ICU (odds ratio 6.36), and needed a ventilator (odds ratio 5.95) compared to patients with no comorbidities. Having multiple comorbidities increased the risk of mortality (odds ratio 3.53), ICU admission (odds ratio 8.62), and requiring a ventilator (odds ratio 9.06).

Conclusions: COVID-19 patients with comorbidities had a higher risk of disease severity and mortality. Multiple comorbidities further increase the risk to a higher extent. All necessary precautions should be taken for patients with comorbidities to avoid COVID-19 infection in order to prevent the worst prognosis.

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KEYWORDS

COVID-19; comorbidities; mortality; severe outcome; public health surveillance.

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Abstract

Trend of Chickenpox in Jordan (2013-2020)

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Abstract

Background: Chickenpox is the primary infection of varicella-zoster virus (VZV), which is a highly contagious disease.

Objective: The main goal of this epidemiological descriptive study was to analyze the medical chickenpox data from 2013 to 2020 in Jordan. The aim of the study was to obtain in-depth statistics for all Jordan cities comparing the year semesters for these years, with comparisons of gender and age categories. In addition, we aimed to determine the status of the epidemiological situation in Jordan with concern of the effects of Syrian refugees and the COVID-19 epidemic.

Methods: This was an epidemiological descriptive study focusing on children under 15 years old. Data were collected based on a clinical diagnosis by doctors. Chickenpox data were obtained from the Ministry of Health as computerized and manual weekly reports from public and private health centers and hospitals. SPSS was used to statistically analyze the data.

Results: The total number of chickenpox cases reported from 2013 to 2020 in Jordan was 40,988. There was an obvious rise in cases in 2014 (19.24%) with possible outbreaks due to the influx of Syrian refugees, whereas the lowest number of cases (2.44%) was reported in 2020 due to the COVID-19 pandemic and associated quarantine that occurred in Jordan, especially because of closing schools and clinics. Although the total number of chickenpox cases varied from 2013 to 2020, all years showed the same seasonal distribution, with the highest numbers in the spring (especially May), at 16.12%. Geographic distribution analysis showed that the highest numbers of cases were reported in the cities of Amman and Zarqa, with 18.15% and 12.81%, respectively, according to the highest population and gatherings. In gender distribution, there was a sustained preponderance for males over females with 54.48% of the cases reported in males. The age category of 5-9 years was the most likely to be affected by this disease, accounting for 43.34% of cases. This is because these younger children are newly entering school and starting to interact with others. However, the age category of over 20 years showed the lowest number of cases, accounting for 3.98%. There is more concern in Mafraq city (which has the greatest number of Syrian refugees), and we found that children in the age categories of 1-4 years and less than 1 year were more likely to be infected than others.

Conclusions: Our analysis showed a possible outbreak of chickenpox in 2014, and the lowest number of cases occurred in 2020. In addition, the spring season is the time with the highest number of infected cases. Chickenpox is a highly transmissible childhood disease that becomes more severe with age, and is especially prevalent in children 5-9 years of age in Jordan. Moreover, the gender distribution of cases throughout the years showed a sustained preponderance for males over females. Due to the high populations in Amman and Zarqa cities, these areas had the highest numbers of people infected with chickenpox.

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KEYWORDS

chickenpox; varicella-zoster virus

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Abstract

Evaluation of the Leishmania Surveillance System, Yemen, 2021

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Abstract

Background: Control of preventive chemotherapy-targeted neglected tropical diseases (PC-NTDs) depends on strengthened health systems. Efficient health information systems provide a stimulus to reaching the sustainable development goal aimed at ending PC-NTD epidemics. However, there is limited assessment of surveillance system functions linked to PC-NTDs that are hinged on the optimal performance of surveillance system attributes.

Objective: The aim of this study was to assess the usefulness and performance of the National *Leishmania* Control Program (NLCP), and to estimate the strength and weakness points of the system.

Methods: We followed the updated six steps of Centers for Diseases Control and Prevention (CDC) guidelines for evaluating public health surveillance systems. Data were collected using in-depth interviews with relevant stakeholders at the central level and semistructured questionnaires at the peripheral level. We used questions (yes, no) to assess the usefulness and a 5-point Likert scale to measure the attributes. The final score was interpreted as poor (<60), average (60-80), and good (>80).

Results: The NLCP seemed to be useful (86%) and some of its objectives were met. The system has average performance in flexibility (78%), simplicity (64%), acceptability (80%), and data quality (65%). Poor performance was indicated for stability (33%) and timeliness (8%). The overall performance of the NLCP was deemed to be poor (55%). Continuation of the system was the strongest point, whereas the lack of governmental and agency funds was the weakest point.

Conclusions: The NLCP was found to be useful regarding the attributes assessed; simplicity, flexibility, acceptability, and data quality were deemed to be average, whereas stability and timeliness were considered to be poor. Governmental financial support to the program is highly recommended. In addition, creating a database for staff at the peripheral level and expanding the number of health facilities that serve as *Leishmania* units are required.

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KEYWORDS

evaluation; surveillance system; Leishmania; Yemen

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Abstract

Mixed Outbreak of Falciparum and Vivax Malaria and Dengue Fever Among the Egyptian Five-a-Side Ball Team Returning From Nigeria After Participation in the African Cup of Nations (Egypt, July 2021)

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Abstract

Background: On July 28, 2021, the Port Saeed health directorate was reported of a team member of the Egyptian five-a-side ball team who was admitted to the Port Saeed Fever Hospital on the same day with acute onset of high fever, headache, malaise, and delirium. The patient has recently returned from Nigeria with his teammates after participation in the African Cup of Nations. On asking the patient about other cases among his teammates, he informed of 1 who started to feel sick in Nigeria and was quarantined in the Abasia Fever Hospital in Cairo and another 2 who were currently at their homes in Port Saeed.

Objective: This study aims to confirm an outbreak, identify possible causes, and implement necessary control measures.

Methods: All 26 team members were contacted in their governorates. Active case finding among them and their contacts was performed using sensitive case definition. A case was defined as anyone from the Egyptian five-a-side ball team returning from Nigeria or their contacts who complained of sudden onset of fever, malaise, or respiratory or gastrointestinal symptoms. Symptomatic patients were swabbed for SARS-CoV-2 by reverse transcription polymerase chain reaction (RT-PCR). Blood samples were collected for malaria film and immunoglobulin M (IgM) for dengue testing.

Results: Of 26 team members, 7 (27%) complained of symptoms, with an attack rate of 26.9%. Their mean age was 37.1 (8.6) years, and all of them were males. Of the 7 cases, 6 (86%) were from Port Saeed, their clinical symptoms ranged from fever (n=3, 43%) malaise (n=7, 100%), headache (n=4, 57%), nausea (n=3, 43%), and delirium (n=1, 14%). Laboratory testing confirmed 4 (57%) cases with malaria falciparum, including 1 (14%) positive for COVID-19. In addition, the blood film of 2 (28%) patients showed malaria falciparam and vivax, and 1 (14%) patient was positive for SARS-CoV-2 and dengue. All patients recovered and were discharged from the hospitals. Patients did not receive malaria prophylaxis before traveling, and they were sleeping in tents near a forest, where they exposed to mosquito bites. A vector survey was performed, and mosquito spraying and larvae destruction near the residential areas of all team members were implemented.

Conclusions: An outbreak of malaria and dengue occurred among the Egyptian five-a-side ball team that recently returned from Nigeria. The outbreak was caused by defective malaria-preventive measures with no prophylaxis. Outbreak was controlled through early patient detection, isolation, and treatment. In addition to entomological and environmental preventive measures, it is necessary to ensure that all sports teams traveling to malaria- and dengue-endemic areas receive prophylaxis and apply protective measures against mosquito bites.

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KEYWORDS

malaria; dengue; COVID-19; mixed infection

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Abstract

Consumers' Food Safety Knowledge and Practices During COVID-19 in Jordan: Web-based Survey

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Abstract

Background: In Western countries, several studies have reported changes in consumers' behaviors regarding food safety in response to the COVID-19 pandemic. The shared responsibility of food safety, between governments, food businesses, and consumers, has been well recognized and calls for extra preventive measures and recommendations to be introduced for food handlers, producers, and consumers. Little, however, is known about food safety in developing countries, including Jordan.

Objective: This study assessed the food safety knowledge and behaviors during the COVID-19 pandemic era in Jordan.

Methods: A web-based, self-administered questionnaire, published via the Jordan Food and Drug Administration website and social media platforms (March-July 2021), was utilized. The questionnaire assessed COVID-19 preventive measures (11 questions), food safety knowledge, (13 questions), and food safety practices (12 questions). Descriptive statistics were presented.

Results: In total, 969 respondents gave valid responses, of which 588 (60.7%) were females, 325 (33.5%) were 38-49 years old, 628 (64.8%) were married, 623 (64.3%) had college or bachelor degrees, 376 (38.8%) were from the central region, 809 (83.5%) were living in urban settings, and 313 (32.3%) had a medical background. The mean (SD) food safety knowledge score was 8.34 (2.33; range 0-13). Mean food safety knowledge scores were significantly different (P<.05) by age, marital status, education, field of study, training in food safety, employment status, monthly family income, and area of residence but not by gender and number of family members. Statistically significant correlations between mean knowledge scores and COVID-19 practice scores (P<.001, r=0.183) and food safety practice scores (P<.001, r=0.346) were detected.

Conclusions: Consumers seem to have adequate food safety knowledge and follow COVID-19-related preventive measures, which may transfer to better food practices and prevention of diseases, such as foodborne illnesses and COVID-19. Further studies and interventions in this regard are needed in Jordan.

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food safety; COVID-19; knowledge; practices

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Abstract

Impact of Multiple Hygienic Interventions on Caregivers' Behaviors in a Conflict Setting, Yemen: Cluster-Randomized Controlled Trial

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Abstract

Background: Several household hygiene programs have been implemented by the Ministry of Public Health and Population and international nongovernment organizations to reduce the risk factors related to child morbidity and mortality in Yemen. However, no research has been conducted to assess the impact of such interventions on caregivers' hygiene behavior. We therefore carried out a cluster-randomized controlled trial to assess whether such interventions could improve caregivers' hygiene behavior.

Objective: The study aims to identify the impact of hygiene promotion interventions on mothers' practices related to water, sanitation, and hygiene.

Methods: A 6-month cluster-randomized controlled trial was conducted in Hufash District of Al-Mahweet Province in Yemen from May to October 2015. In total, 20 villages were randomly selected and assigned to an intervention arm that received hygiene promotional interventions and a control arm. In total, 358 households were interviewed at baseline and the endpoint. A logistic regression model was fitted to data, and the adjusted odds ratio (AOR) was used to estimate the effect size of the intervention.

Results: The intervention made significant improvements in caregivers' handwashing after using a latrine (AOR 2.6, 95% CI 1.75-3.90) and before feeding the baby (AOR 1.8, 95% CI 1.14-2.92), safe disposal of child feces (AOR 2.0, 95% CI 1.35-2.53), covering of remaining food (AOR 1.1, 95% CI 1.08-1.19), cleaning of cooking utensils (AOR 1.27, 95% CI 1.08-1.51), and cleanness of drinking water storage containers (AOR 1.3, 95% CI 1.17-1.46). However, the intervention had no effect on caregivers' handwashing practices after cleaning child feces, before preparing food, and before eating a meal, as well as no improvement in cleanness of the floor of the kitchen.

Conclusions: The findings from this trial reveal the important role that hygiene promotion can play in improving caregivers' behaviors that could lead to better child health in high-risk communities where access to primary health care is limited.

Trial Registration: ClinicalTrials.gov NCT03810430; https://clinicaltrials.gov/show/NCT03810430

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KEYWORDS

hygiene; intervention; Yemen

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Abstract

Evaluation of the Dengue Surveillance System in Islamabad (2019)

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Abstract

Background: Dengue is a major public health threat since 2005 in Pakistan. Because of their rapid expansion and long duration, dengue epidemics reduce the productive capacity and economic development of many sections of society. Evaluation is an important step of the planning cycle to improve the utilization of resources.

Objective: The overall objective of the study is to assess how quickly the system can detect epidemics and to measure the capacity of the system to monitor trends in its geographical distribution over time.

Methods: A cross-sectional study was conducted from July to September 2019 in Islamabad, Pakistan. Quantitative and qualitative assessments of system attributes were carried out according to updated Centers for Disease Control and Prevention (CDC) guidelines for evaluating public health surveillance systems for 2001. Stakeholders were identified and approached. Four different types of semistructured questionnaires were prepared for each level of stakeholders.

Results: Simplicity was good, and case definition was uniform and easily understandable. Flexibility was poor, and the system was not capable of incorporating changes. Timeliness was excellent in terms of case reporting as well as case response by relevant stakeholders. Data entry operators were few but expert in their work; however, the quality of data remained a challenge as 40% forms were deficient in demographic and clinical information. Acceptability by the workers as well as the population was good. Sensitivity was high (87%). The predictive value positive (PVP) was excellent (76%). Stability was good in terms of finances and logistics, whereas representativeness was insufficient (only 30%).

Conclusions: The overall performance of the surveillance system for dengue in Islamabad is excellent in terms of sensitivity and the PVP. Timeliness is excellent, and acceptability is good, whereas representativeness is poor. Coverage of the system needs to be extended and private setups and laboratories included. Feedback being an important aspect of the planning cycle needs improvement.

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KEYWORDS

surveillance; PVP; sensitivity; specificity

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Abstract

Evaluation of a Dengue Surveillance Control Program, Yemen, Hodeiadah (2021)

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Abstract

Background: The number of dengue cases reported to the World Health Organization (WHO) increased over 8-fold over the past 2 decades, from 2.4 million in 2010 to 4.2 million in 2019. In Yemen, from January to December 2019, 59,486 suspected dengue cases and 219 deaths with a case fatality rate (CFR) of 0.4% were reported. The dengue surveillance system (DSS) provides necessary information for outbreak response.

Objective: As there was an increase in the number of dengue outbreaks, especially in Hodeida, last year, this study aims to evaluate the DSS between January and March 2021 to assess its usefulness and performance and identify its strengths and weaknesses.

Methods: We used the Centers for Disease Control and Prevention (CDC) updated guidelines for evaluation of surveillance systems. For data collection, desk review and interviews with stakeholders at a central level were conducted and semistructured questionnaires distributed for the sentinel site's coordinators. Indicators were developed to evaluate the usefulness based on 8 attributes: flexibility, stability, simplicity, acceptability, sensitivity, data quality, representativeness, and overall performance. The score percentage was calculated and interpreted as poor (<60%), average (60% to <80%), or good (≥80%).

Results: The DSS was found to be useful (ie, using data for detecting changes in trends in morbidity and mortality). Regarding system attributes, flexibility (22.7%), stability (33.3%), sensitivity (76%), and data quality (31%) were poor, while simplicity (79%), acceptability (76%), and representativeness (65%) were average. The overall DSS performance was poor (47%).

Conclusions: The DSS was useful. Although acceptability and representativeness were average, flexibility, stability, sensitivity, and data quality were poor. Strengthening the DSS by providing basic infrastructure, ensuring sustainability, improving supplements, supervising laboratory testing for dengue fever, and expanding DSS coverage to include private health care facilities are necessary. For data quality, supervision and training are recommended.

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KEYWORDS

dengue surveillance system evaluation; CDC guidelines; Yemen Field Epidemiology Training Program

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Abstract

Epidemiological Determinants for Mortality from Neonatal Tetanus in Punjab Province, Pakistan (2020)

Fawad Khurshid[1*]; Muhammad Khalil Ahmad[2*]; Ali Sher Khan[3*]; Muhammad Mehroze Saleem[4*]; Zahida Fatima[5*]; Ambreen Chaudary[5*]; Zeeshan Iqbal Baig[5*]; Khurram Shehzad Akram[5]; Muhammad Wasif Malik[6*]; Nosheen Ashraf[6*]; Mumtaz Ali Khan[5]; Jamil Ahmad Ansari[6]; Aamir Ikram[6*]

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Abstract

Background: Neonatal tetanus (NNT) is a vaccine-preventable disease that occurs at higher incidence in resource-poor countries, presumably because of low maternal immunization rates and unhygienic cord care practices. NNT remains an important cause of infant mortality in rural areas of Punjab Province.

Objective: This study aims to evaluate and determine the risk factors for mortality in NNT cases and to make recommendations for future strategies.

Methods: A descriptive study was conducted from July 6 to 14, 2021, at Directorate General Health Office Lahore. The surveillance data set for the year 2020 and clinical notes were reviewed and analyzed. Demographic information, clinical presentation progression, and outcomes were evaluated for all investigated cases, and a comparison analysis was performed between those who survived and those who died.

Results: Of a total of 176 reported cases, 145 (82.3%) were notified from rural areas of Punjab. The mean age was 9 days, 65 (37%) infants were females, and 111 (63%) were males. The overall mortality was 77 (43.6%), while 31 (17.6%) maternal deliveries were conducted by untrained birth attendants. In addition, 119 (67.6%) women received zero tetanus toxoid (TT) shots in their life. Clinical notes revealed that the group that survived had a significantly greater mean body weight on admission, had later onset of disease, was hospitalized early, and received tetanus immunoglobulin (TIG). The children who could not survive had significantly common clinical features, such as generalized rigidity, fever, and respiratory arrest.

Conclusions: The increased mortality in rural and tribal areas is suggestive of poor TT immunization coverage. Low literacy, poor socioeconomic status of families, lack of awareness regarding antenatal care, and poor hygienic deliveries conducted by untrained persons remain the main risk factors. Improvement in TT coverage, deployment of trained community midwives, and awareness sessions regarding TT vaccination in hard-to-reach areas are recommended.

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KEYWORDS

epidemiological determinants; neonatal tetanus; Punjab; TT immunization

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Abstract

Assessment of Farmers' Knowledge, Attitude, and Practices Related to Milk-borne Zoonosis in District Muzaffarabad, Azad Jammu and Kashmir

Javaria Alam[1]; Javaria Alam[1]; Syed Nadeem ur Rehman[2]; Ambreen Chaudhry[3]; Muhammad Athar Abbas[4], DVM; Zahida Fatima[3], DVM; Muhammad Wasif Malik[3], DVM; Muazzam Abbas Ranjha[3], MBBS; Zeeshan Iqbal Baig[3], MLT; Nosheen Ashraf[3], MBBS; Mumtaz Ali Khan[3], MBBS; Jamil A Ansari[3], MBBS; Aamer Ikram[3], MBBS

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Abstract

Background: Milk-borne zoonotic diseases can be acquired by the consumption of nonpasteurized and infected dairy products. Zoonotic infections present a serious public health concern that is responsible for approximately 2.7 billion deaths annually worldwide. However, little is known about the attitudes and knowledge of the farmers regarding milk-borne zoonosis.

Objective: This study was performed with an aim to assess the knowledge, attitude, and practices (KAP) of farmers regarding milk-borne zoonosis.

Methods: This cross-sectional KAP study was conducted in District Muzaffarabad, Azad Jammu and Kashmir, from September 1 to October 30, 2019. A pretested structured questionnaire was used to collect information from respondents regarding different aspects of milk-borne zoonosis. All small dairy farms (n=56) with more than 5 animals in District Muzaffarabad were included in this study. Data were collected from respondents (n=100), with an inclusion criterion of having a dairy experience of more than 6 months.

Results: The findings show that almost 86% of the farmers were unable to name any milk-borne zoonotic disease. About 45.5% of the farmers were unaware of the fact that milk can be a potential source of disease transmission. None of the respondents had any idea about the pasteurization method, and 50% of them had no habit of checking milk quality. However, 81% of the respondents preferred to use boiled milk. Almost 28% of the farmers with high-level education were able to name at least one milk-borne zoonotic disease. The majority of the respondents (99%) did not receive any formal training about zoonotic diseases.

Conclusions: According to the study, the overall knowledge of farmers regarding milk-borne zoonosis is not adequate. Despite having a positive attitude, the practices of the respondents regarding milk handling were found to be poor. Awareness about important zoonotic diseases and their source of transmission should be created, and a one-health approach to deal with zoonotic infections should be adopted.

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KEYWORDS

Field Epidemiology and Laboratory Training program; attitude; knowledge; milk-borne zoonosis; Muzaffarabad; practices, AJK; KAP

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Abstract

The Pattern of Referral of Sick Omani Pilgrims From the Omani Medical Mission During Hajj 2019

Ahmed Obaid Almashaykhi[1], PhD, MD; Randa M Nooh[2], PhD; Sami Said Almudarra[3]; Abdulaziz Saad ALMutari[2]; Naif Saud ALBudayri[2]; Khalid Masoud AlGhamdi[2]; Ali Aldarwish[2]

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Abstract

Background: Annually, in the month of Dhul hijjah, over 2 million Muslims travel to Saudi Arabia to perform hajj. Hajj is the biggest mass gathering globally, which creates a substantial influence on hajjes' health. The Omani medical mission is the official delegation from the Omani government to Saudi Arabia to serve the Omani hajjees regarding their health issues.

Objective: This study investigates the referral rate and pattern of diseases among hajjees referred by the Omani medical mission during Hajj 1440 H.

Methods: We conducted a cross-sectional study at the Omani Medical missions in Makkah, Madinah, Mina, and Arafat. Data was collected via a predesigned form. All Omani pilgrims presenting to the mission who were referred to local hospitals were included.

Results: The total number of cases was 5000, of which 106 (2.1%) were referred to local hospitals (21.2 per 1000 hajjees). The most common causes of referral were cardiovascular diseases (23.6%), followed by gastrointestinal disease (17.9%) and trauma (16.9%). Male patients comprised 60.1% of the sample. Their mean age was 47.3 (SD 11.27) years, with the highest referrals in the 51-60 years age group (30%). Over half (55.7%) had comorbidities. Patients' mean time to reach the clinic was 8.87 (SD 6.41) minutes, with 65% arriving in 5 minutes or less. The mean time needed to reach the hospital by ambulance was 11.39 (SD 6.6) minutes, with 36% arriving within 5 minutes. Of the referrals, 42% were admitted into the hospital. Hospitalization was significantly higher among patients with chest pain (P<.006), diabetics (P<.001), and patients with heart disease (P=.01).

Conclusions: The most common causes for referral of hajjees from the Omani Medical Mission were cardiovascular diseases, gastrointestinal disease, and trauma. This information should assist the Omani government in planning their medical services in the hajj season in future years.

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KEYWORDS

hajj; referral; Omani; pilgrims

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Abstract

Diagnostic Accuracy of Rapid Antigen Tests in Asymptomatic Close Contacts of Individuals With Confirmed SARS-CoV-2 Infections in the Herat Province of Afghanistan in 2021: Cross-sectional Study

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Abstract

Background: Early detection and isolation are key strategies for containing the COVID-19 pandemic in resource-poor countries, including Afghanistan, where access to the vaccines is limited. These strategies could reduce burden on the health care system, which is already weak because of conflicts and war. The first COVID-19 case in Afghanistan was detected in the Herat province close to Iran. Currently, both rapid antigen tests and reverse transcription–polymerase chain reaction (RT-PCR) have been used for the diagnosis of COVID-19 in the Herat province.

Objective: This study aimed to assess the accuracy of the rapid antigen test in asymptomatic close contacts of individuals with confirmed COVID-19 in the Herat province.

Methods: This was a cross-sectional study conducted by contact-tracing surveillance teams in the Herat province. The teams listed 200 asymptomatic close contacts of individuals with confirmed COVID-19, and 2 separate nasopharyngeal specimens were collected. The rapid antigen test (Biosensor) was used on the fourth and seventh day after contact, and the second specimen was sent to the reference lab for RT-PCR testing. Descriptive statistics were calculated. The sensitivity and specificity of the rapid antigen tests were compared with those of RT-PCR.

Results: The median age of the contacts was 35 years (range 11-90 years), and 138 (70%) were women. Of the 196 (98%) contacts for whom RT-PCR was used, 105 (53%) had confirmed results for SARS-CoV-2 infection. Only 30 (15%) cases of SARS-CoV-2 infection were confirmed by the rapid antigen test, which indicates a sensitivity of 20.1%. However, the specificity of the rapid antigen test was high (90%).

Conclusions: The sensitivity of the rapid antigen tests was relatively low to confirm COVID-19 in asymptomatic close contacts of individuals with confirmed COVID-19. Therefore, if resources allow, RT-PCR would be the best choice with its high sensitivity rate to diagnose COVID-19 in asymptomatic close contacts of individuals with confirmed COVID-19. Further study with a large sample size is needed.

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KEYWORDS

rapid antigen test; SARS-CoV-2; diagnostics; close contacts

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Abstract

Evaluation of the Dengue Surveillance System in Khyber Pakhtunkhwa Province, Pakistan, in 2020

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Abstract

Background: Installation and actualization of a disease surveillance system are prerequisites for early detection of outbreaks. Prompt response is possible when a robust surveillance system is in place. Dengue is one of the many diseases endemic to Pakistan and is potentially fatal.

Objective: This study aimed to assess the current dengue surveillance system and its performance and to provide recommendations to stakeholders for its actualization and improvement.

Methods: A cross-sectional study was conducted in 2020 to document the outcomes. The evaluation was guided by the updated Centers for Disease Control and Prevention guidelines for public health surveillance for the year 2019. A structured questionnaire was designed and piloted to estimate the simplicity, flexibility, acceptability, and stability of the current dengue surveillance system. The sample included 45 provincial- and district-level staff involved in dengue surveillance. Provincial data on dengue were analyzed to evaluate completeness, quality, positive predictive value, sensitivity, and representativeness. Field visits to districts were performed to assess data flow and timeliness.

Results: The reporting rate ranged from 12/100,000 in 2017 to 21/100,000 in 2019, with a total of 7641 reported cases in the province. The mean time of reporting cases was 1 day (range 0-2 days). The simplicity of the dengue surveillance system was at 90% with respect to structure and data flow. The stability of the system was at 84% because of data backup. System flexibility was at 81% and allowed the addition and modification of variables. The average completeness of the selected variables was 65%. About 59% of the staff interviewed considered the system acceptable. Data quality was suboptimal at 48%. The representativeness of the system was at 40%, and it was mainly representative of secondary and tertiary health care hospitals, particularly inpatients. The system positive predictive value for dengue was 15% and sensitivity was 14%, which were below par. The dengue surveillance system can detect dengue outbreaks early.

Conclusions: An immediate, collaborative, multisectoral, and transdisciplinary plan is needed to enhance reporting from all health facilities. Adequate government funding is needed to improve data quality, and a monitoring mechanism is needed at all levels for prompt functioning of the surveillance system.

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KEYWORDS

evaluation; dengue; surveillance; Khyber Pakhtunkhwa

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Abstract

Descriptive Analysis of Health Screening for COVID-19 at Points of Entry in Pakistan According to the Centers for Disease Control and Prevention Guidelines From February 2020 to March 2021

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Abstract

Background: Points of entry (POE) in Pakistan serve as key conduits for international travel, transport, and trade. The Central Health Establishment is the key stakeholder in the implementation of the International Health Regulations (2005) core capacities at POE and National Action Plan 2020 for COVID-19. A comprehensive screening plan (involving more than 4 million passengers to date) was carried out effectively despite a few limitations.

Objective: This study aimed to evaluate the system attributes of health screening measures for COVID-19 at POE according to the Centers for Disease Control and Prevention (CDC) guidelines with the aim of identifying the strengths and weaknesses of the system and formulating recommendations to improve the system.

Methods: A descriptive study on the CDC guidelines for health screening at POE was conducted at the Directorate of Central Health Establishments from February 2020 to March 2021. The CDC guidelines are based on 11 attributes to be implemented for COVID-19 health screening at POE; these include legal and regulatory bodies to detain the traveler as suspect, isolation and coordination at POE, funds for screening, quarantine facilities equipped with basic necessities and communication channels for the quarantined travelers, referral health care facilities for POE, protocols for primary and secondary screening, capacity building, supply of personal protective equipment and screening tools, isolation areas, and provision of basic facilities at POE. Data were collected using both qualitative and quantitative methods. Web-based questionnaires and in-depth interviews for personnel in charge and quarantine assistants at POE were completed. Analysis of the Central Health Establishment's information system was performed to assess management of traveler surveillance.

Results: The 11 attributes for health screening according to the CDC guidelines were addressed and well implemented at POE by the Central Health Establishment under the flagship of the Ministry of National Health Services, Regulation, and Coordination. Primary health screening of 4,088,119 inbound travelers was conducted. Secondary health screening led to the referral of 415 suspected cases of COVID-19 to hospitals. A total of 74,833 polymerase chain reaction tests for COVID-19 were performed at airports for inbound travelers, with a positivity rate of 0.6%. A total of 19,130 international flights were screened during the study period.

Conclusions: Preparedness and response for COVID-19 at POE are in line with the National Action Plan of the Government of Pakistan and International Health Regulations (2005).

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KEYWORDS

points of entry; health screening; National Action Plan; isolation; quarantine

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Abstract

Impact of COVID-19 on the Noncommunicable Disease Programs Provided in the Primary Health Care Centers in Al-Rusafa Directorate of Health, 2020

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Abstract

Background: In recent years, noncommunicable diseases (NCDs) have globally shown an increasing impact on health status with disproportionately higher rates in developing countries. During the outbreak, health workers, equipment, and facilities have been reallocated to address the influx of patients with COVID-19. Restructuring of the health system could result in the closure of some health facilities.

Objective: The aim of this paper was to determine the impact of COVID-19 on the performance of NCD programs implemented in the primary health care centers in Al-Rusafa DOH through comparing the performance indicators of 2019 and 2020, and to identify the potential causes of the changes.

Methods: The study was conducted in Baghdad, Al-Rusafa, during the period from April to June 2021. A systematic sample was used to enroll 20 primary health care centers. The descriptive analysis focused on frequencies and percentages. Continuous variables are presented as mean (SD), and the independent *t* test was used to assess statistical significance. A *P* value of less than .05 is considered statistically significant.

Results: There was a decrease in the number of served patients, even reaching zero in some units. Most staff were partially or completely assigned to the COVID-19 pandemic. There was a decline in yearly need of education material and folders for programs in 2020 and awareness campaigns performed in 2019 and 2020. The main reasons in the decline of these services were the closure of outpatient services as per government directive, the closure of outpatient disease-specific consultation clinics, and the decrease in outpatient volume due to patients not presenting.

Conclusions: The COVID-19 pandemic affected the NCD services in Iraq, including the disruption of many aspects of these services.

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KEYWORDS

Iraq; noncommunicable diseases; NCDs; primary health care centers; PHCCs; COVID-19

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Abstract

The Impact of COVID-19 Pandemic on Health Care-Associated Infections in Intensive Care Units: Results From the Egypt National Health Care-Associated Infections Surveillance, 2019-2020

Essam Mostafa Roshdy[1], BA, MD; Ehab Attia[1]; Sahar Samy[1]; Salma Afifi[1]; Hanaa Abuelsood[1]; Hala BahaaEldin[1]; Alaa Aied[1]; Mohammad Abdelfattah[1]

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Abstract

Background: The COVID-19 pandemic resulted in the unexpected influx of patients leading to high rates of hospitalization. Focusing resources to mitigate the pandemic unintentionally reduced attention to health care-associated infections (HAIs) prevention programs. Intensive care units (ICUs) have suffered the most burden due to requirement of ventilation.

Objective: In this paper, we aimed to estimate the national HAI rates at ICUs before and during the COVID-19 pandemic to better identify the pandemic's impact on HAIs.

Methods: Egypt's HAI Surveillance was established in 2016 in 177 governmental ICUs. CDC case definitions and questionnaire were used to collect patients' data. The types of HAIs targeted included bloodstream infections, pneumonia, and urinary tract infections. Pathogen identification and antimicrobial resistance were performed at the central laboratory. Surveillance data 2019-2020 were obtained, and a descriptive data analysis was performed. HAI rates per 100 patient days and device-associated infections (DAIs) per 1000 device days were compared between 2019 and 2020.

Results: In 2020, 4028 HAIs were reported, including 777 (19.3%) ICU-acquired reports; however, in 2019, 6242 were reported, including 1084 (17.4%) ICU-acquired ones. Incidence significantly decreased in 2020 compared with 2019 (2.67 vs 2.72, $P<.001$). The percentages of bloodstream infections, pneumonia, and urinary tract infection in 2020, compared with 2019, were 64.0% versus 61.6%, 10.9% versus 12.1%, and 25.1% versus 23.8%, respectively. DAIs decreased significantly, including CLABSI (2.6 vs 2.5, $P<.001$), VAP (0.75 vs 0.87, $P=.04$), and CAUTI (1.5 vs 1.6, $P=.02$). *Klebsiella spp.* was the predominant pathogen in both years representing (35.6% and 38.1%), followed by *S. aureus* (11.2% and 15.4%). The rate of carbapenem-resistant *K. pneumoniae* insignificantly increased (25% vs 23%, $P=0.3$), and that of Methicillin-resistant *S. aureus* decreased (68% vs 70%, $P=0.4$).

Conclusions: Egypt's HAI Surveillance successfully described the impact of COVID-19 pandemic on HAIs. It identified a significant decrease in ICU-acquired HAIs and DAIs at the first pandemic year, which could reflect better the infection control measures. The types of HAIs, causative pathogens, and antimicrobial resistance pattern did not change significantly. Surveillance should be maintained to guide HAIs' preventive and control measures.

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KEYWORDS

COVID-19; hospital-acquired infection; intensive care unit; device-associated infection

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Abstract

Adverse Events Following COVID-19 Immunization Reported Through Hotlines, February-August 2021, Bangladesh: Descriptive Study

Kyaw Thowai Prue Prince[1], MBBS; Mallick Masum Billah[1], MSc; Farzana Islam Khan[1], MSc; ASM Alamgir[1], PhD; Mahbubur Rahman[1], MPH; Tahmina Shirin[1], MPhil, PhD, Prof Dr

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Abstract

Background: For COVID-19 vaccine safety, the vaccination program of Bangladesh started facility-based passive surveillance to address adverse events following immunization (AEFIs) with COVID-19 vaccination. The Institute of Epidemiology, Disease Control and Research (IEDCR), Bangladesh, has been using emergency hotlines for outbreak reporting since 2008. During the COVID-19 pandemic, these hotlines are being used for pandemic-related information and reporting. Thus, COVID-19 vaccinees also use these hotlines to report AEFIs.

Objective: We analyzed the documented AEFIs records of the IEDCR to characterize the vaccinees who reported AEFIs through IEDCR hotlines.

Methods: We performed a descriptive analysis of COVID-19 vaccinees who reported AEFIs through IEDCR hotlines from February to August 2021. We defined AEFIs as untoward medical occurrences that follow immunization and that do not necessarily have a causal relationship with the usage of the vaccines. We analyzed the vaccinees who reported AEFIs through IEDCR hotlines by age, gender, occupation, the severity of AEFIs, and the time intervals of reporting.

Results: Of 819 vaccinees who reported AEFIs through IEDCR hotlines, 555 (67.8%) were male and their median age was 41 years (IQR 32-51 years). Of them, 494 (89%) reported AEFIs following the first dose of vaccination. Among females, 186 (70.5%) of 264 were housewives. Among males, 249 (44.9%) of 555 were service holders, 90 (16.2%) were businessmen, and 46 (8.3%) were students. About 638 (77.9%) of 819 vaccinees were from urban vaccination centers. Mild AEFIs, such as fever (508/819, 62%), injection-site pain (336/819, 41%), and headache (205/819, 25%), were reported through IEDCR hotlines. Although 534 (65.2%) of 819 vaccinees who reported AEFIs through IEDCR hotlines developed symptoms within 24 hours of vaccination, only 196 (23.9%) of 819 vaccinees reported them within 24 hours.

Conclusions: Middle-aged, male, and urban vaccinees who developed mild AEFIs commonly reported AEFIs through IEDCR hotlines. We recommended that AEFI data generated from different reporting systems, including hotline numbers, be incorporated together for an efficient COVID-19 vaccine safety surveillance system.

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KEYWORDS

AEFI; adverse events; Bangladesh; COVID-19 vaccine; hotline.

Multimedia Appendix 1
Poster presentation titled "Adverse Events Following COVID-19 Immunization, February to August 2021, Bangladesh".
[PDF File (Adobe PDF File), 478 KB - iproc_v8i1e36636_app1.pdf]

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Abstract

An Imported Measles Outbreak in Al Buraimi Governorate, Oman, in April 2020

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Abstract

Background: On April 16, 2020, the communicable disease department of Al Buraimi Governorate, Oman, was notified about 3 cases of measles. On laboratory confirmation of measles on April 19, 2020, further field investigation was conducted. Oman has had few cases of measles since 1995; however, Al Buraimi Governorate has had imported cases of measles in recent years.

Objective: We conducted this study to investigate the epidemiology of imported cases of measles in Al Buraimi, Oman, in April 2020.

Methods: This case series retrospectively reported measles cases. Epidemiological investigation began by meeting the families of the affected children. The data obtained included clinical symptoms, exposure information, travel history, immunization, and history of contact with others.

Results: Among the positive cases of measles, 75% were in girls and 25% were in boys. In addition, 6 patients were Afghani nationals and 2 were Pakistani nationals. A detailed investigation that included virus isolation and genotyping identified the B3 genotype in all measles cases and traced the virus to Pakistan as the country of origin. Despite Pakistan being the place of origin of the virus, most cases of measles (75%) were reported in Afghani nationals because of low vaccination coverage. We also found that most of the children affected were 10 to 19 years old (75%). All children who did not have vaccination records or were unvaccinated, regardless of whether they had contracted the virus, were given the measles-mumps-rubella vaccine. This was done to prevent future outbreaks and to increase measles vaccination coverage.

Conclusions: This study demonstrated that the greatest challenge in eliminating measles in Oman is imported cases among non-Omani expatriates and unvaccinated children. It should therefore be a priority to vaccinate all expatriate children. Only when everyone is vaccinated in Oman can the goal of creating a measles-free country be realized.

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KEYWORDS

imported measles; Al Buraimi; Oman; children; Afghanistan; Pakistan; vaccinated; unvaccinated

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Abstract

Dengue Fever Outbreak in Al-Garrahi District, Al-Hudaydah Governorate, Yemen, 2019

Khaled Mohammed Al-Jamrah[1], BSc, MSc; Abdulkareem Nassar[1], MPH; Ibrahim Mohathab[2], BSc; Mohammed Al Amad[1], MPH

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Abstract

Background: Dengue fever (DF) has re-emerged in Yemen with a higher frequency during the last years. On November 6, 2019, an increased number of suspected DF cases in Al-Garrahi district was reported. On November 7, 2019, a team was sent to investigate.

Objective: This study aims to confirm the existence of an outbreak, describe the outbreak characteristics, and recommend suitable intervention for control.

Methods: A descriptive study was conducted. The World Health Organization case definition was used to identify patients. An active search from house to house, along with entomological investigation and health education, was conducted. A line list was used to collect data. Blood specimens were collected and tested by enzyme-linked immunosorbent assay for dengue IgM. Frequency, percentage, and rates were calculated, and the population from the central statistical organization was used.

Results: A total of 2067 cases met the case definition. Of them, 51% were males and 32% were aged <10 years. All patients complained of fever, headache, and arthralgia (100%), followed by myalgia and retro-orbital pain (67% and 39%, respectively). The first case patient was in week 41, and the peak was reached with 1058 patients in week 46. The overall attack rate was 16 of 1000, significantly higher among patients aged 10 years to <50 years and ≥50 years compared with patients aged <10 years (17 and 19/1000 vs 14/1000; *P*<.001). Of 20 tested blood samples, 12 (60%) were IgM positive. The house index was 70%, the container index was 50%, and the Breteau index was 140. Vector control measures with community participation were intensified in week 46, and patient cases decreased to 140 in week 48.

Conclusions: A dengue outbreak was confirmed in Al-Garrahi district. The spread of infection was facilitated by storing water and the presence of indoor larvae. The findings emphasize the importance of health awareness and community participation for containing DF outbreaks.

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KEYWORDS

dengue fever; outbreak investigation; Yemen; FETP

Multimedia Appendix 1
A line-list was used to collect data.
[DOCX File , 14 KB - iproc_v8i1e36466_app1.docx]

Multimedia Appendix 2
Epidemic curve of suspected DF cases by day of onset, Al-Garrahi district, Al-Hodiedah governorate, Nov 2019.

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[PNG File , 15 KB - iproc_v8i1e36466_app2.png]

Multimedia Appendix 3
Distribution of suspected DF cases by age, Al-Garrahi district, Al-Hodiedah governorate, Nov 2019.
[PNG File , 13 KB - iproc_v8i1e36466_app3.png]

Multimedia Appendix 4
Distribution of suspected DF cases by gender, Al-Garrahi district, Al-Hodiedah governorate, Nov 2019.
[PNG File , 11 KB - iproc_v8i1e36466_app4.png]

Multimedia Appendix 5
Distribution of suspected DF cases by symptoms, Al-Garrahi district, Al-Hodiedah governorate, Nov 2019.
[PNG File , 20 KB - iproc_v8i1e36466_app5.png]

Multimedia Appendix 6
Dengue fever outbreak in Al-Garrahi District, Al-Hudaydah Governorate, Yemen, 2019.
[PPTX File , 2011 KB - iproc_v8i1e36466_app6.pptx]

Abbreviations

DF: dengue fever

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Abstract

Willingness to Change Health Behaviors During the COVID-19 Pandemic in the Population of Rawalpindi City, Pakistan

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Abstract

Background: During the COVID-19 pandemic, despite the Pakistan government's precautionary policies, people are not practicing the standard preventive measures. People need to change their health behaviors to control the transmission of the disease. The purpose of this study is to assess the willingness of people in Rawalpindi city to change/adapt their health behaviors during the pandemic and to associate this willingness with their various demographic variables during the pandemic. Willingness was determined through respondents' knowledge, risk perceptions, attitudes, and practices during the COVID-19 pandemic.

Objective: The main objectives of this study are to assess the general population's willingness to change their health behaviors during the COVID-19 pandemic in Rawalpindi city, Pakistan, and to determine the association between demographic variables and the willingness to change health behaviors.

Methods: A cross-sectional study was conducted in Rawalpindi city, Pakistan. A community household survey was conducted in 4 randomly selected union councils of Rawalpindi city. The survey was done via the systemic sampling of the households. A structured questionnaire was used for data collection, and it was made based on the guidelines of the National Institute of Health, Pakistan. It comprises 66 questions consisting of 5 sections. A Cronbach α of .92 was calculated with SPSS (IBM Corporation).

Results: The results of the study showed that 89.2% of the respondents showed a willingness to change their health behaviors during the COVID-19 pandemic. A chi-square test of association revealed that 7 demographic characteristics were statistically significant, including age, gender, marital status, income, occupation, number of children, and the diagnosed comorbidities of respondents. A regression analysis showed that the monthly income of the respondents was the true predictor, with an odds ratio of 8.69.

Conclusions: The respondents with higher scores for knowledge, risk perceptions, attitudes, and practices during the COVID-19 pandemic showed a high willingness to change their health behaviors in Rawalpindi city, Pakistan.

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KEYWORDS

willingness; health behaviors; attitudes; risk perceptions; practices; pandemic; household community survey

Multimedia Appendix 1
Willingness to change health behaviors during Covid-19 pandemic in the population of Rawalpindi City, Pakistan.
[PDF File (Adobe PDF File), 384 KB - iproc_v8i1e36550_app1.pdf]

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Abstract

Effect of Screen Time on Behavior of Preschoolers in Islamabad: Descriptive Cross-sectional Study

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Abstract

Background: The early years of childhood form the basis of intelligence, personality, social behavior, and the capacity to learn and nurture oneself as an adult. It is increasingly recognized that early and longer exposure to screens has adverse effects on the development of children. This research was significant in finding out the effects of screen time on the behavior of preschoolers, which could provide scientific grounds to the control of digital screen time.

Objective: We aimed to determine the effect of electronic exposure on the behavior, emotional development, and sleep quality of preschoolers and determine the average number of hours preschoolers spend with electronic devices in Islamabad.

Methods: A cross-sectional survey was conducted in 4 private preschools of Islamabad. A sample of 200 children aged 3 to 5 years was selected through multistage random sampling. The sociodemographic characteristics and screen time of the children were acquired by using parental questionnaires. Children were grouped based on a daily screen time of ≤60 minutes or >60 minutes. An analysis was conducted based on the results of the Child Behavior Checklist for children aged 1.5 to 5 years. The Cronbach α coefficient was found to be .925. It was analyzed by using SPSS version 22 (IBM Corporation). A chi-square test, an independent sample *t* test, and multilinear regression were applied to determine the associations and significance levels between the variables.

Results: The study results indicate that increased screen time was found to be statistically significant with regard to a child's age, their education level, and the employment status of mothers. It was observed that preschoolers with a screen time of >60 minutes (mean 11.94, SD 3.91; *P*=.01) tend to more commonly experience withdrawn syndrome than those with a screen time of ≤60 minutes (mean 10.72, SD 3.01). Similarly, sleep problems were also more commonly observed in preschoolers with a screen time of >60 minutes (mean 10.97, SD 3.20; *P*=.01) when compared to those with a screen time ≤60 minutes (mean 9.90, SD 2.59). It was also observed that increased screen time had an association with autism spectrum problems among preschoolers with a screen time of >60 minutes (mean 17.66, SD 5.89; *P*=.047) when compared to those among preschoolers with a screen time of ≤60 minutes (mean 16.17, SD 4.58). The strongest predictor of the outcome variable was found to be mothers' education level (ß=21.53).

Conclusions: The findings reveal that excessive screen time is a deleterious factor associated with the behavioral problems of preschoolers. Parents must also think about their child's screen time. This requires parents' active engagement and constant attention, so that the development and growth of their children are not affected adversely.

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KEYWORDS

preschoolers; screen time; withdrawn syndrome; autism spectrum problems; Child Behavior Checklist

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Abstract

Outbreak Investigation of a Foodborne Illness in Village Bachal Soomro, District Tharparkar, Sindh, Pakistan (December 2020): Retrospective Cohort Study

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Abstract

Background: On December 3, 2020, district health authorities reported 15 suspected cases of gastroenteritis, including 4 deaths, from Village Bachal Soomro after a mourning ceremony.

Objective: Field Epidemiology and Laboratory Training Program (FELTP) fellows investigated the suspected outbreak, with the objective to determine the magnitude of the outbreak and to evaluate associated risk factors.

Methods: A retrospective cohort study was conducted on December 3, 2020, at Village Bachal Soomro. The complete cohort was traced back, and a pretested structured questionnaire was adopted to obtain demographic, clinical, and risk factor information. A case was defined as "any individual who attended the mourning ceremony at Village Bachal Soomro on December 3, 2020, and presented with any of the following symptoms: diarrhea, abdominal pain/cramps, and drowsiness." Descriptive analysis followed by multiple logistic regression was performed. Different blood, stool, oropharyngeal swab, drinking water, and milk samples were sent for microbiological and chemical investigation.

Results: Of 61 participants, 32 (52%) were males and the median age was 23 years (range 1-70 years). The overall attack rate was 72%, while the most affected age group was 10-19 years, with an attack rate of 85%. The majority of cases presented with diarrhea (47/61, 77%), followed by abdominal pain (44/61, 72%), vomiting (43/61, 70%), body ache (29/61, 48%), drowsiness (10/61, 16%), and fever (4/61, 7%). Among all food items, dessert had the highest food-specific attack rate of 90%. Among all risk factors, consumption of dessert (adjusted odds ratio [aOR] 61.3, 95% CI 6.1-613.1), water (aOR 23.9, 95% CI 2.0-276.7), and buffalo milk (aOR 7.9, 95% CI 1.22-51.8) were found to be significantly associated with the attack. Distribution of cases showed a common point source that was probably due to a single pathogen source.

Conclusions: Dessert was prepared 10-12 hours prior to meal intake, so the outbreak was probably caused by dessert prepared with contaminated milk and water, with enterotoxins of *Staphylococcus aureus*. Community awareness of personal hygiene, proper storage/preservation of food items, and provision of safe drinking water are suggested.

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KEYWORDS

foodborne illness; outbreak investigation; retrospective cohort study

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Abstract

Prevalence of Obesity Among Adults in Jordan: National Survey

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Abstract

Background: Obesity is a national and global public health problem in terms of morbidity, mortality, and economic burden. In 2014, 5% of deaths worldwide were attributable to obesity, with an estimated economic impact of 2.8% of the global gross domestic product. A survey in 2008 showed a high prevalence of overweight and obesity among adults in Jordan.

Objective: This study aimed to determine the prevalence of obesity, assess its trends, and identify the factors and comorbidities associated with this condition.

Methods: A multipurpose national household survey was conducted among Jordanian adults over 4 months in 2017. Data were collected using a structured validated questionnaire. Obesity was defined according to the International Diabetes Federation criteria.

Results: This study included 4056 adults (1193 men, 29.4%; 2863 women, 70.6%). Their age ranged from 18 to 90 years, with a mean age of 43.8 (SD 14.2) years. According to the International Diabetes Federation criteria, the age-standardized prevalence of obesity was 60.4% in men and 75.6% in women. After adjusting for age, the odds of obesity in 2017 were twice the odds in 2008 in men (odds ratio [OR] 1.98) and women (OR 1.96). In the multivariate analysis, age, place of living, and marital status were significantly associated with obesity in men and women. Obesity was significantly associated with increased odds of diabetes mellitus (OR 2.1 for men; OR 2.9 for women), hypertension (OR 2.4 for men; OR 2.5 for women), elevated triglyceride levels (OR 2.5 for men; OR 4.2 for women), and low high-density lipoprotein levels (OR 2.2 for men; OR 2.1 for women) after adjusting for age.

Conclusions: The prevalence of obesity is high in Jordan, and this condition is associated with other metabolic abnormalities. Well-defined programs to manage, control, and prevent obesity as well as intersectoral action are urgently required to reverse current trends in Jordan.

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KEYWORDS

obesity; survey; waist circumference; metabolic abnormality

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Abstract

Evaluating the Role of Veterinarians in the One Health Approach to Antimicrobial Resistance in Jordan

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Abstract

Background: Antimicrobials, including antibiotics, antivirals, antifungals, and antiparasitics, are drugs used to prevent and treat infections in humans, animals, and plants.

Objective: This study aimed to evaluate the role of knowledge, attitudes, and practices of Jordanian veterinarians in combating antimicrobial resistance (AMR), and to summarize the registered veterinary drugs between 2017 and 2020.

Methods: The descriptive study data were collected using a standardized questionnaire focusing on knowledge, attitudes, and practices of Jordanian veterinarians.

Results: The results were analyzed descriptively and showed that the mean knowledge of the participants who agreed with the statement on AMR definition was 84%. The majority (95.65%) agreed that AMR is a challenge for the veterinary sector in Jordan and should be prioritized among other zoonotic diseases. Around 69% of the participants believe that the misuse and overuse of antimicrobials by quacks—fraudulent and unauthorized practitioners—are the main reasons for AMR challenge. The most common practice among the respondents was recommending clients (farmers, owners, etc) to practice good animal husbandry (80%). The study also revealed that there was a significant difference (P=.02) between attending training about AMR and their professional sector (private, public, and academic).

Conclusions: This study showed the importance of implementing a continuous education program on antimicrobial resistance to improve veterinarians' knowledge in all aspects of antimicrobial resistance and to increase their advisory skills. Laws should also be enacted to ensure that veterinarians prescribe the correct antimicrobials and improve the surveillance system to monitor the use of antimicrobials in veterinary medicine.

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KEYWORDS

antimicrobial resistance; veterinarians; knowledge; practices; attitudes; Jordan

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Abstract

Surveillance System Evaluation for COVID-19 Vaccine–Associated Adverse Events Following Immunization (AEFI), Sindh Pakistan (2021)

Samreen Ashraf Qureshi[1], MBBS, Diploma Family Health; Naveed Masood[2], MBBS, MSPH; Asif Syed[3], MBBS, MPH, PhD; Mudassar Hussain[4], MBBS, MSPH, MSc; Kashif Hussain[4], MBBS; Saeed Ahmed Bhurt[5], MBBS, MSc; Muhammad Ali Gadehi[5], MBBS, MPH; Fahad Memon[5], MBBS, MPH; Muhammad Juman Bahoto[4], MBBS, DCH, MBeth, MScHPM

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Abstract

Background: In February 2021, a mass vaccination campaign commenced in Sindh Province in response to the COVID-19 epidemic. An adverse-events-following-immunization surveillance system (AEFI-SS) was established to monitor the adverse events following vaccination.

Objective: We evaluated the AEFI-SS with the aim to identify its strengths and weaknesses and suggest recommendations.

Methods: In May-June 2021, a descriptive evaluation study was conducted in Sindh Province, Pakistan. The Centers for Disease Control and Prevention's (CDC) updated guidelines for evaluation of SS-2001 were followed to measure the qualitative, quantitative, and utility attributes of the AEFI-SS. Key stakeholders were identified based on their involvement in the AEFI-SS and were interviewed. Case investigation proformas for the AEFI were randomly reviewed for data quality, timeliness, and completeness. Sensitivity was calculated. Each attribute was rated as good, fair, or poor based on a scoring legend.

Results: The SS was useful in effectively identifying 7147 cases of AEFIs. Timeliness of all AEFI cases was good and was found to be 100%, as all cases were reported within 24 hours. The World Health Organization (WHO)-approved case definition was used for the identification of AEFI cases and had a simple flow of information. The AEFI-SS was good in data quality and completeness (100%), and data collection tools were filled by trained medical officers. Sensitivity was 100%, and the predictive value positive (PVP) was not calculated due to the absence of a laboratory component. Good representativeness (>80%) of the population was covered by 1004 vaccination centers. The system was found to be stable as resources of the health department government of Sindh were being used. The AEFI-SS was paper based and deficient in a feedback mechanism.

Conclusions: Sindh Province has an appropriate surveillance mechanism for AEFI detection and management for the ongoing COVID-19 vaccination SS. The representativeness can be increased by involvement of the private health sector. Establishment of a feedback mechanism and digital data transformation and integration of the AEFI system with the Expanded Program on Immunization (EPI) are recommended.

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KEYWORDS

surveillance system evaluation; COVID-19 vaccine–associated AEFI

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Abstract

A Food Poisoning Outbreak Caused by Shigella in Al-Mafraq, Jordan, in 2019

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Abstract

Background: On October 6, 2019, 55 residents of Bala'ama town in Al-Mafraq, Jordan, were admitted to the local health care center with symptoms of food poisoning.

Objective: This study aimed to identify the cause of the food poisoning outbreak.

Methods: This descriptive study is a cross-sectional study. Data were obtained from the Directorate of Communicable Diseases in the Ministry of Health. A total of 25 stool samples from patients and an additional 2 samples from workers in the restaurant were collected and tested. An environmental survey of the food and water was also conducted.

Results: The period of the outbreak was from October 6 to 10, 2019. The highest proportion of patients were children under 5 years of age. More females than males were affected. Stool test results were positive for *Shigella sonnei* in 15 samples and rotavirus in 7 samples. Chloride concentration was 0 in the water samples.

Conclusions: The food poisoning outbreak was caused by consumption of hummus from a neighborhood restaurant, which was contaminated with *S. sonnei*.

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KEYWORDS

food poisoning; outbreak; Shigella

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Abstract

Evaluation of Routine Immunization Coverage in 12- to 23-Month Children in Sarepol Province, 2018: Descriptive Cross-sectional Study

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Abstract

Background: Afghanistan has the lowest routine immunization coverage, according to the WHO-UNICEF reports. The coverage rate of Penta3 in Iran, India, Pakistan, and Afghanistan are estimated to be 99%, 89%, 75%, and 66%, respectively.

Objective: This study aimed to find the real immunization coverage in urban areas and factors related to vaccinated and unvaccinated 12- to 23-month children, in 2018, in Sarepol province.

Methods: A descriptive cross-sectional study with probability proportional to size (PPS) cluster sampling was conducted and modified for application to surveys of immunization coverage. We selected 30 clusters and randomly selected 7 households from each cluster in the urban setting of Sarepol province. The children's age was calculated, in months, with respect to the 1st day of the survey. We designed a comprehensive questionnaire, and 210 questionnaires were filled. The data were managed and analyzed in Epi Info v.7.

Results: This survey shows EPI routine coverage for 12- to 23-month children for BCG, Meales-1, Penta1, and Penta3, which were 97.14%, 77.14%, 93.81%, and 83.81%, respectively. A full immunization coverage by gender—80.18% for girls and 71.15% for boys—was reported. The dropout rate of vaccination among Penta1, Penta3, and BCG was 9.27%, and for Measles-1 was 18.90%. Moreover, 2.86% of 12- to 23-month children did not receive any vaccine in these urban areas. Children's illness, emigration, distant health facilities, and the gaps between the doses were reported by the respondents as the main reasons for incomplete or no vaccination. The valid doses administered for BCG, measles, and Penta3 were calculated to be 93.80%, 71.43%, and 80%, respectively.

Conclusions: It is observed that access and use of immunization services in urban areas have improved because full immunization was 75% compared with the AHS-2018 survey's 61%. However, there are still many children who have not received any vaccine. High immunization dropout rates could be overcome by creating awareness of the program and of the importance of second and third doses of penta, polio, and measles vaccines. Measles coverage is very low, and we are expecting more outbreaks in urban areas. We therefore suggest that the Ministry of Public Health better enhance awareness and implement measles campaigns.

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KEYWORDS

immunization survey; Sarepol; EPI

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Abstract

The Immunization Data Quality Assessment, Sana'a Capital, 2021

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Abstract

Background: The Expanded Program of Immunization (EPI) aims to increase immunization coverage. However, this cannot be achieved without an efficient data management system and without ensuring data quality.

Objective: We aimed to assess the quality of immunization data at Sana'a capital.

Methods: The World Health Organization data quality self-assessment tools were used. Three random urban districts and the only rural district (Bani-Al Hairth) at Sana'a capital were selected. From each district, one-third of the public health facilities (HFs) that were providing EPI services were randomly selected. Accuracy ratios (ARs), discrepancy levels (DLs), completeness, and timeliness were calculated from tally sheets and reports for Bacillus Calmette-Guerin (BCG) vaccines, third doses of pentavalent-3 (Penta-3) vaccines, and first doses of measles and rubella (MR-1) vaccines. The quality index was assessed for the five components (ie, recording and reporting, archiving, demographic information, core output/analysis, and using data for action) through a prestructured questionnaire.

Results: While the overall ARs and DLs for BCG, Penta-3, and MR-1 indicated overreporting at the HF level, there was overreporting for BCG and Penta-3 and underreporting for MR-1 at the district level. With regard to the overall quality index, recording and reporting achieved the highest score (90% and 96%, respectively), while using data for action had the lowest score (61% and 78%, respectively) at the HF and district levels. While completeness and timeliness were scored 100% at all HFs, both were inadequate at the Al-Sabain (93% and 99%, respectively) and Bani-Al Hairth (75% and 83%, respectively) districts.

Conclusions: The findings showed that the quality of immunization data in Sana'a capital's HFs and districts was inadequate, with weaknesses in using data for action. Furthermore, completeness and timeliness were found to be unsatisfactory at the rural district and one of the urban districts. Ensuring data quality through strengthening the EPI data management system should be prioritized. Larger-scale and regular assessments of the EPI data management system are recommended.

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accuracy ratio; data quality self-assessment; quality index; health facilities; Yemen

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Abstract

Risk Factors Associated With Dengue in District Khyber, Khyber Pakhtunkhwa, Pakistan, From September 2 to November 24, 2019: Case-Control Study

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Abstract

Background: Dengue is a vector-borne disease endemic to Pakistan as well as to Khyber Pakhtunkhwa. A total of 300 confirmed cases of dengue were reported in District Khyber in 2019, where a prompt response was initiated by the Disease Surveillance and Response Unit. Subsequently, a study was planned to identify the risk factors associated with dengue and to propose recommendations for containment of the disease.

Objective: This study aimed to assess the risk factors associated with dengue in District Khyber and to provide recommendations for improving the existing system and preventing dengue.

Methods: A case-control study was conducted in District Khyber from September 2 to November 24, 2019. Cases were enrolled from health care facilities based on predefined criteria, which included the presence of clinical signs and symptoms as well as laboratory confirmation of dengue NS1 antigen. Controls were enrolled from the community at a case-control ratio of 1:2. Data were collected using a pretested questionnaire in face-to-face interviews.

Results: A total of 300 cases were enrolled; 87% (263) of cases were men. This study found that 45% (269/601; odds ratio [OR] 15, 95% CI 9.9-24.07; *P*<.001) of enrolled participants did not use bed nets and 39% (236/601; OR 1.7, 95% CI 1.1-2.4; *P*<.001) did not use mosquito repellents. A total of 39% (233/601; OR 16.6, 95% CI 11.11-24.93; *P*<.001) of enrolled participants who tested positive for dengue were neighbors, 35% (213/601; OR 1.47, 95% CI 1.04-2.0; *P*<.001) lived in a joint family, and 40% (241/601; OR 3.32, 95% CI 2.3-4.7; *P*<.001) slept outdoors; these factors were significantly associated with dengue.

Conclusions: Dengue is a preventable disease and can be controlled by the proper use of bed nets and mosquito repellents, modification of sleeping habits, and improvement in family structure. Dengue management training for health care personnel and community awareness are recommended.

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KEYWORDS

bed nets; mosquito repellent

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Abstract

Pattern of Comorbidities and the Impact on Outcomes in Patients With COVID-19 in Babel Governorate, Iraq, in 2020

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Abstract

Background: Comorbidities pose a major clinical challenge to the care and treatment of patients with COVID-19.

Objective: This study aimed to evaluate the effects of common comorbidities on the severity, outcome, and length of stay in the hospital for patients with COVID-19 in Babel Governorate, Iraq, in 2020.

Methods: All laboratory-confirmed cases of COVID-19 in the 2 COVID-19 hospitals in Babel Governorate from March through September 2020 were included. We developed a form to document sociodemographic data, clinical presentation, severity, comorbidities, length of hospital stay, and outcomes.

Results: A total of 2574 patients were included; 1581 (61.4%) were men. The mean age was 48.7 (SD 16.4) years. There were 1212 (47.1%) severe cases and 489 (19%) critical cases. There were 1543 (59.9%) patients with no comorbidity, 536 (20.9%) patients with 1 comorbidity, and 495 (19.2%) patients with 2 or more comorbidities. The most common comorbidity was diabetes mellitus (643/1599, 25%), followed by hypertension (598/1599, 23.4%). The proportion of severe or critical cases among the patients with comorbidities was 84% (865/1031) compared to 54.1% (836/1543) among the patients with no comorbidity (P<.001). About 12% (125/1031) of patients with comorbidities had a mean hospitalization time >2 weeks compared to the 8% (123/1543) of patients with no comorbidity (P<.001). The case-fatality ratio was 26.4% (272/1031) in patients with comorbidities compared to 10.6% (163/1543) in patients with no comorbidity (P<.001).

Conclusions: Comorbidity is a significant predictor of serious hospital course and fatal outcomes in patients with COVID-19. Patients with comorbidities must be vigilant with preventive measures and should be prioritized for COVID-19 vaccination.

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KEYWORDS

comorbidities; COVID-19; Iraq; hypertension; diabetes; 2020

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Abstract

Chickenpox Outbreak Investigation in Assabain District, Sana'a City, Yemen, January to February 2019

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Abstract

Background: Varicella zoster virus (VZV) causes chickenpox. The epidemiological profile of chickenpox varies considerably across countries, health care systems, and immunization policies. In Yemen, chickenpox remains an important public health issue and outbreaks are not uncommon since vaccination is not universal. On February 23, 2019, a medical doctor from the Al Kafji area of the Assabain district notified the Ministry of Public Health and Population of a chickenpox infection among his family members and neighbors.

Objective: The aim of this study was to confirm the existence of a chickenpox outbreak, describe the epidemiological characteristics of the outbreak, and recommend prevention and control measures.

Methods: A door-to-door search was performed for case finding and line listing with detailed epidemiological, clinical, and vaccination history collected. Four blood samples were collected and sent for laboratory confirmation by enzyme-linked immunosorbent assay. Data were analyzed with Epi info 7.2.

Results: A total of 26 cases met the case definition. The outbreak started on January 19, 2019, at one house and was then transmitted to the 2nd and 3rd neighboring houses. The Epi curve showed three peaks, with one peak for each affected house. The index case was an 11-year-old male. The overall attack rate was 34% and the highest attack rate of 56% was found in the 3rd house. More than half (58%) of cases were females and 46% were found in children in the age group of 10-14 years. All cases included symptoms of a rash with itching, 46% of cases had vesicular lesions, and 42% had <50 lesions. Overall, 8% of the cases had complications (ie, pneumonia). Approximately 25% of samples were IgM-positive. All cases were in unvaccinated individuals.

Conclusions: A chickenpox outbreak in the Al Kafji area of the Assabain district was confirmed. Females were more affected than males. Introducing the chickenpox vaccine as part of routine immunizations, and increasing community awareness about the mode of transmission and control measures for prevention are recommended.

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KEYWORDS

Yemen; Sana'a; vaccine; outbreak

Multimedia Appendix 1
Chickenpox outbreak investigation e-poster.
[PDF File (Adobe PDF File), 383 KB - iproc_v8i1e36598_app1.pdf]

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Multimedia Appendix 2
Final report of the epidemiological investigation of chickenpox cases in Al-Khafji area in Al-Sabeen district in Sana'a city, January to February 2012.
[PDF File (Adobe PDF File), 1893 KB - iproc_v8i1e36598_app2.pdf]

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Abstract

Seroprevalence of COVID-19 Among Health Care Workers in Primary Health Care Centers in Al-Sader City District, Baghdad, Iraq

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Abstract

Background: The SARS-CoV-2 infection produces detectable immune responses in most cases reported to date. A serological test could capture previous asymptomatic infections and help to assess the immune status of a subject. Health care workers are highly vulnerable to COVID-19 infection, and providing personal protective equipment is the primary strategy to prevent disease transmission within the health care setting.

Objective: The aim of this paper was to determinate the seroprevalence of COVID-19 among health care workers in primary health care centers in the AL-Sader city district.

Methods: A cross-sectional study was conducted in 9 primary health care centers, which were selected using a cluster random sampling technique from November 1, 2020, to December 31, 2020.

Results: A total of 470 participants were enrolled in the study; 101 (21.5%) of them had a history of COVID-19 infection, and 76 (16.1%) were diagnosed by polymerase reaction chain. There was a significant association between rapid tests and history of COVID-19 infection (P<.001). Rapid test sensitivity was 56.6%, and specificity was 79.2%. The rapid test was positive in 125 (26.6%) participants: IgG 104 (83.2%), IgM 5 (4%), and both IgG-IgM 16 (12.8%).

Conclusions: The percent of COVID-19 infection is higher than the expected level among participants. A significant association was found between rapid tests and COVID-19 infection, smoking, comorbidity, personal protective equipment training, and household infection.

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KEYWORDS

COVID-19; cross-sectional; health care workers; infection

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Abstract

Antimicrobial Resistant Bacteria in Health Care Facilities: Exploring Links With Water, Sanitation, and Hygiene in Gaza, Palestine

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Abstract

Background: Antimicrobial resistance (AMR) is a growing global phenomenon; however, its link to water, sanitation, and hygiene (WASH) remains underexplored, particularly in health care facilities where humanitarian crises prevail.

Objective: This study aimed to identify AMR bacteria in samples collected from WASH services in 2 hospitals in Gaza and to investigate the presence of AMR genes.

Methods: A hospital-based cross-sectional study to detect and identify antimicrobial resistance bacteria was conducted. Random samples from water, wastewater, soap, and surface swabs (n=345) were collected from Al-Shifa and European Gaza hospitals and screened for the presence of *Enterobacteriaceae*, *Pseudomonas*, *Enterococcus*, and *Staphylococcusaureus*. Antimicrobial susceptibility, extended spectrum beta-lactamase (ESBL) production, carbapenem resistance, and AMR genes were investigated.

Results: High levels of bacterial contamination were detected in water and surface swab samples with an overall percentage of 34.1%. Moreover, 22% of the identified *Enterobacteriaceae* was positive for ESBL, and 14% was positive for modified Hodge test. Over 2/3 of isolated *Enterobacteriaceae* in water and wastewater samples was found to be resistant to amikacin, ceftazidime, ceftriaxone, and imipenem. All *Enterobacteriaceae* isolates from swab samples were found to be resistant to piperacillin-tazobactam, amikacin, ceftazidime, and ceftriaxone; 13.8% of *S. aureus* in water samples was methicillin resistant. The prevalence of ESBL genes among *Enterobacteriaceae* isolates was 25% OXA, 19.4% SHV, 2.8% KPC, 66.7% TEM, 41.7% blaCTXM, and 5.6% blaCTXM-3. For carbapenem-resistant gene (MDM), the prevalence among *Enterobacteriaceae* was 11.1%, and among *Pseudomonas* was 12.5%. The antibiotic susceptibility profile was also presented for *Pseudomonas*, *Enterococcus*, and *S. aureus*.

Conclusions: The results underline the level of contamination with AMR bacteria in WASH samples and highlight the need to consider the safety of WASH service at health care facilities as an essential aspect in the fight against the spread of AMR and to interrupt nosocomial transmission.

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KEYWORDS

antimicrobial resistant bacteria; antimicrobial resistance genes; health care facilities; wastewater; water; sanitation; hygiene; WASH

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Multimedia Appendix 1
Potential transmission of antimicrobial resistant bacteria.
[PNG File , 138 KB - iproc_v8i1e37246_app1.png]

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Abstract

Assessment of Preparedness for the COVID-19 Pandemic in Schools in Al-Rusafa District, Baghdad, Iraq, 2021

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Abstract

Background: Following the international spread of the novel coronavirus (SARS-CoV-2) or COVID-19 pandemic, the Iraqi government took several steps to prevent community transmission, including the indefinite closure of schools as a measure to safeguard schoolchildren from COVID-19. The key rationale behind these decisions was the insufficient preparedness level within schools to prevent infection and the lack of appropriate vaccines for children.

Objective: Researchers assessed COVID-19 preparedness levels in schools in Al-Rusafa district, Baghdad, to prepare schools for reopening.

Methods: An observational study design was conducted to assess the schools. Stratified sampling was performed to make the sample more representative; we stratified the schools into 3 categories based on sex, level (primary or secondary), and administration (public or private). The study population comprised all students and teachers in the selected sample. The assessment was carried out retrospectively for 3 months, from May 31, 2021. Data were collected through face-to-face interviews and analyzed using Microsoft Excel. Tables and pie charts were used to display the results.

Results: The assessment was completed in 40 schools—20 (50%) primary schools, 10 (25%) high schools, 6 (15%) intermediate schools, and 4 (10%) secondary schools. Overall, the assessment covered 1162 teachers and 16,776 students. The highest infection rate, according to school category, was among primary school staff (6.14%). Moreover, 92% (n=39) of the schools did not have a contact number for a nearby ambulance, and early detection system was weak in 60% (n=24) of the schools, which reflected low levels of school participation in preparing against the COVID-19 pandemic. Referral system for any sick person to an appropriate health facility was not present or was disabled in 63% (n=25) of the schools.

Conclusions: The assessment concluded that none of the schools had a robust screening system to record students infected with COVID-19. The study discusses several actions and requirements that should be reviewed and addressed to prevent the spread of COVID-19 in the schools and the community.

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KEYWORDS

COVID-19; Al-Rusafa District; the spread of COVID-19; schools

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Multimedia Appendix 1
COVID-19 infection rates among school staff according to type of school included in the assessment from 1/3-1/6 2021, Iraq / Baghdad Rusafa .
[DOCX File , 17 KB - iproc_v8i1e37304_app1.docx]

Multimedia Appendix 2
Epidemiological factors for school staff and students in schools included in the assessment from 1/3-1/6 2021, Iraq / Baghdad Rusafa.
[DOCX File , 2077 KB - iproc_v8i1e37304_app2.docx]

Multimedia Appendix 3
Number of referred cases to PHCC, contact tracing, obligatory sick leave and total no. of confirmed cases from cases referred to PHCC for schools included in the assessment from 1/3 - 1/6 2021, Iraq / Baghdad, Rusafa.
[DOCX File , 2057 KB - iproc_v8i1e37304_app3.docx]

Multimedia Appendix 4
Health Services, Health promotion activities through social media, Hygiene practices and WASH services indicators followed by schools administrates in schools included in the assessment from 1/3-1/6 2021, Iraq, Baghdad, Rusafa.
[DOCX File , 20 KB - iproc_v8i1e37304_app4.docx]

Multimedia Appendix 5
Knowledge, Practice & Attitude about isolation termination criteria and Quarantine Criteria followed by schools administrates in schools included in the assessment from 1/3-1/6 2021, Iraq / Baghdad, Rusafa.
[DOCX File , 14 KB - iproc_v8i1e37304_app5.docx]

Multimedia Appendix 6
COVID-19 daily new confirmed cases in Iraq from the first case 24/2/2020 till school reopening decision on 29/11/2020.
[PNG File , 94 KB - iproc_v8i1e37304_app6.png]

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Abstract

An Outbreak of COVID-19 Among Health Care Workers at a Diabetes Center, Al Ahsa, Saudi Arabia, April 2020

Abdullah Alsayafi[1]; Fatema Hussain Al Bisher[2], BA; Ahmed Al Doraisi; Ahmed Al Saad

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Abstract

Background: On April 2, 2020, the Field Epidemiology Training Program was asked by a diabetes mellitus center, Facility A, in Al-Ahsa to investigate a confirmed case of COVID-19 in a health care worker. Patients with diabetes are at increased risk for serious complications from COVID-19.

Objective: This study seeks to identify any additional cases, the source of infection and mode of transmission, and implement mitigation measures to prevent further transmission. At the time of the investigation, few COVID-19 cases had been identified in the region.

Methods: We reviewed medical charts and other available data on cases in the infection control department, the public health department, and the COVID-19 center. We interviewed cases about their health status and possible sources of infection. We analyzed data using descriptive statistics.

Results: All staff (N=50) at Facility A were tested for COVID-19; 2 (4%) tested positive. The first case was a nurse that reported attending a nursing conference in Riyadh several days prior to symptom onset. She was the first recognized case of COVID-19 in Facility A, so we classified her as the index case. We identified 1 more case that reported using shared cupboard clothes, the same coffee machine, and chatting with the index case in a break room without using personal protective equipment. Both cases reported wearing personal protective equipment during patient care. Both cases survived.

Conclusions: We found evidence of person-to-person transmission between cases while socializing at work, and no evidence of transmission from health care workers to patients. We identified potentially risky practices in Facility A, although none were related to patient care. We helped Facility A develop additional policies to reduce the risk of COVID-19 transmission among staff, even when not providing direct patient care. Facility A was closed during the investigation and reopened after applying all prevention measures.

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KEYWORDS

COVID-19; SARS-CoV-2; diabetes; outbreak; Al-Ahsa; Saudi Arabia

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Abstract

Prevalence of and Factors Associated With Transfusion-Transmitted Infections Among Multi-transfused Patients, Sana'a City, Yemen, 2019

Suaad Moghalles[1]; Abdulwahed Al Serori[1]; Abd Alrahman Alhadi[2]; Ahmed Shamsan[3]

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Abstract

Background: Multi-transfused patients (MTPs) are at higher risk of transfusion-transmitted infections (TTIs) due to their frequent need for blood transfusion. Nevertheless, little is known about the prevalence of TTIs among MTPs and its associated factors in Yemen.

Objective: We aimed to determine the prevalence of hepatitis B virus (HBV), hepatitis C virus (HCV), and HIV and its associated factors among MTPs.

Methods: A cross-sectional study was conducted at the Yemeni Society for Thalassemia and at Pediatric Leukemia Unit in Sana'a City. The calculated sample size of 357 was increased to 405 to overcome any nonresponses. By using probability proportional to size sampling, 80 patients with thalassemia, 240 patients with sickle cell anemia, and 85 patients with leukemia were randomly selected. Data were collected through face-to-face interviews with patients or their caretakers by using a predesigned questionnaire covering demographic, socioeconomic characteristics and TTI-associated factors. Blood samples were drawn and were tested for HBsAg, anti-HCV, and HIV I and II by using an electrochemiluminescence immunoassay.

Results: The overall prevalence of TTIs among MTPs was 13.1% and was significantly highest (37.3%) among patients with leukemia. HBV (16.2%) and HCV (27.5%) prevalence were also highest among patients with leukemia. Only 2 (0.04%) patients were found to be HIV positive among patients with sickle cell anemia. Coinfection with HBV and HCV was only found in 5 patients with leukemia. There was a significant association between TTIs and the receipt of >30 blood units. Only 35% of MTPs were found to be vaccinated against HBV.

Conclusions: Our findings raise an alarm for the existence of a high risk of TTIs among MTPs, especially among patients with leukemia and those who undergo an increasing number of transfusions. Using advanced technology in blood screening and strict infection prevention during transfusion should be adopted. The rational use of blood/blood substitutes and ensuring that MTPs are vaccinated against HBV are recommended.

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KEYWORDS

prevalence; transfusion-transmitted infections; multi-transfused patients; Yemen

Multimedia Appendix 1
Prevalence and factors associated with transfusion-transmitted viral infections among multi–transfused patients, Sana'a City, Yemen, 2019.
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Abstract

Examining the Use of Telehealth During the COVID-19 Pandemic Among Patients With Type 2 Diabetes at a Federally Qualified Health Center

Emily Schmied[1], MPH, PhD; Sara Gombatto[1], DPT; Jessica Priest[1], BSc, MSc; Victoria Briese[1], BSc; Jie Liu[2], MD

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Abstract

Background: The COVID-19 pandemic necessitated an expedited shift toward remote health care delivery (eg, telehealth). Prior research has shown individuals from underserved communities may face greater challenges accessing telehealth services, which could exacerbate existing disparities in chronic conditions, including type 2 diabetes (T2D). As patient engagement in telehealth care is likely to persist indefinitely, it is critical to determine whether certain patients may face greater challenges in accessing remote care so that appropriate accommodations can be made.

Objective: This study aimed to examine factors associated with the use of telehealth during the COVID-19 pandemic among adults with T2D at a large federally qualified health center in Southern California.

Methods: Electronic health records (EHR) from all T2D-related medical visits completed between July 2019 and July 2021 were obtained. The following variables were extracted from the EHR: modality of visit (in person vs telehealth), patient gender (male, female, nonbinary, or transgender), age, race or ethnicity (non-Hispanic White, Hispanic, Black, Asian, Middle Eastern or Arab, Asian-Pacific Islander, Native American or Alaskan, or multiracial), and income level (below or at vs above the poverty threshold). Patients were trichotomized based on whether they completed at least one telehealth visit following the start of the pandemic, if they completed all visits in person, or if they completed no visits. Chi-square analysis and *t* tests were conducted to examine univariate group differences. Multinomial logistic regression was conducted to examine associations between telehealth use and patient sociodemographics.

Results: Participants included 14,989 patients with T2D (51.7% female, 48.1% male, and 0.2% transgender or nonbinary; 83.7% below or at the poverty threshold). Over half (59.0%) of patients completed at least one T2D-related telehealth visit, 27.6% completed only in-person visits, and 13.4% complete no visits after the start of the pandemic. Compared to male (54.9%) and transgender or nonbinary patients (52.8%), significantly more females used telehealth (62.8%; χ^2=100.89, *P*<.001). Significant differences also emerged between racial and ethnic groups, with the highest engagement among Middle Eastern or Arab (66.8%) and Hispanic patients (60.7%) and the lowest among Asian-Pacific Islander (50.0%) and Native American or Alaskan patients (52.2%; χ^2=72.33, *P*<.001). Multinomial regression analysis revealed that women (odds ratio [OR] 1.29, 95% CI 1.17-1.42), Hispanic patients (OR 1.56, 95% CI 1.06-2.30), and Arab patients (OR 2.22, 95% CI 1.32-3.76) were more likely to complete telehealth visits rather than no visits than male patients and those of all other racial and ethnic groups. Similarly, women (OR 1.42, 95% CI 1.33-1.54) and Arab patients (OR 1.62, 95% CI 1.08-2.43) were more likely to complete telehealth than in-person visits. No significant differences by age or income were identified.

Conclusions: While many patients accessed telehealth during the pandemic, observed differences by sociodemographic characteristics suggest that some patients may require additional support when accessing remote health care. Future research should explore additional factors that could impact telehealth access within underserved communities (eg, internet or broadband access, language concordance, and technology literacy) so that tailored strategies can be developed to facilitate equitable access to care.

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Conflicts of Interest: None declared.

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KEYWORDS

diabetes; electronic health records; telehealth; COVID-19

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Abstract

Within-Person Associations Among Physical Activity, Sleep, and Well-being in Situ: Opportunities for Whole-Person Well-being

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Abstract

Background: Digital tools can help cultivate states of well-being through psychological interventions. Interventions and policies with the most promise of influencing individual and population health and well-being in real-world contexts require understanding the dynamic relationships between different domains of well-being in daily life.

Objective: This study aimed to consider multiple components of the health behavior–well-being system to identify potential targets for designing ecologically relevant interventions in everyday life.

Methods: We used self-reported affective states, purpose in life, and physical activity collected via smartphone-based experience sampling twice per day over 28 days as participants (N=226 young adults; mean age 20.2, SD 1.7 years; 76% women and 25% men) went about their daily lives. We used a multilevel vector autoregressive model to isolate within- and between-person relationships among daytime physical activity, nighttime sleep duration, nighttime sleep quality, happiness, sadness, anger, anxiousness, and purpose in life. This approach generates 3 networks describing the relationships among variables of interest: (1) a directed temporal network revealing within-person, time-lagged, previous-day relationships among variables; (2) a contemporaneous undirected network revealing within-person same-day relationships among variables; and (3) an undirected between-person network identifying between-person differences in how variables are associated with one another.

Results: Our complex-system approach to the health behavior–well-being system revealed significant interplay among physical activity, sleep, affect, and purpose in life. We found that when an individual had higher than their usual levels of physical activity on a particular day, they experienced an increase in happy affect the next day. Higher sleep quality on a particular day also predicted a decrease in negative affective states the next day. We found that purpose in life predicted decreased sad, anxious, and angry affect up to 2 days later. For contemporaneous relationships, higher than usual happiness predicted increased purpose in life and lower anger, anxiety, and sadness on the same day. We found that people who, on average, were happier tended to endorse a higher sense of purpose in life and experience increased sleep quality, whereas people who, on average, were sadder tended to have increased anxiety and anger.

Conclusions: Collectively, these findings suggest that behavioral interventions targeting sleep and physical activity may observe shorter-term (up to 1 day) effects on well-being, whereas interventions cultivating a sense of purpose in life can have slightly longer effects on well-being, bleeding into the next few days. Our findings suggest that approaches simultaneously considering

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whole-person well-being rather than just one domain of well-being hold promise for informing the design of behavior interventions with the most promise of influencing health in real-world contexts. Moving forward, digital health tools should incorporate tracking multiple domains of well-being in daily life to increase opportunities for whole-person health approaches in virtual care settings.

Conflicts of Interest: None declared.

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KEYWORDS

network analyses; health behavior; ecological momentary assessment; emotions; physical activity

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Abstract

Remote Participant Recruitment for Pediatric Research During the COVID-19 Pandemic

Megan Civitello[1], BSc; Alexander Hogan[2], MD; Sigrid Almeida[2], BSc; Michael Brimacombe[2], PhD; Glenn Flores[3], MD; Jessica Hollenbach[2], PhD

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Abstract

Background: The COVID-19 pandemic exposed significant vulnerabilities of traditional in-person recruitment methodology in the context of limited access to clinical facilities. Remote recruitment is a potential solution, but its yield and efficiency are unknown.

Objective: This study aimed to determine remote recruitment and enrollment rates for a pilot feasibility trial of an electronic monitoring device (EMD) for asthma in the pediatric population.

Methods: Children aged 4-18 years with persistent asthma receiving inhaler medications compatible with an EMD were screened for enrollment in a feasibility and acceptability trial. The emergency department (ED) and inpatient wards were identified as initial in-person recruitment locations prior to the pandemic. Owing to the COVID-19 pandemic, recruitment sites transitioned from exclusive ED or inpatient enrollment to outpatient primary care or pulmonary clinics in an attempt to increase enrollment rates. Study staff called families to determine their interest in the study. Patient age, race and ethnicity, insurance, contact attempts, and reasons for enrollment or refusal were recorded. e-Consent was obtained through the REDCap database, and baseline surveys were administered by telephone.

Results: Since November 2019, the study staff reached 147 out of 278 (52.3%) eligible families by telephone. In total, 37 (13%) families contacted were enrolled in the study. It took the study staff a mean of 2 attempts to reach individuals for initial enrollment but a mean of 4 additional attempts to complete consent forms. Of the families approached, 47% were Hispanic or Latino, 26.5% were Black or African American, 24.5% were White, and 2% were Asian. Among patients approached, 20% Asian, 16% White, 14.5% Hispanic or Latino, and 12% Black patients were enrolled in the study.

Conclusions: Telephone recruitment had a low yield across all racial and ethnic groups, averaging approximately 1 successful enrollment per 8 candidates approached. A substantial number of contacts was required to obtain e-consent forms and complete survey questionnaires after participants agreement to enroll. The study findings suggest that when there are barriers to in-person recruitment, remote recruitment is a feasible alternative, but the yield is relatively low, and enrollment requires persistent, repeated follow-up contact.

Conflicts of Interest: None declared.

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KEYWORDS

pediatric; asthma; COVID-19; remote recruitment; race; ethnicity

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Abstract

Acceptability and Usefulness of a Web-Based Motivational Interviewing Session to Improve Nutrition and Oral Health Behaviors of Low-Income Children in Connecticut

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Abstract

Background: Obesity and dental decay are linked through poor diet. In the United States, >13% of 2-5–year-old children have obesity and >21% have tooth decay, with the highest rates in Black and Latino children and those from low-income families. Conflicting information, barriers, and lack of access to healthy food and dental care influence the risk of poor diet and insufficient oral hygiene. Of particular interest is whether leveraging technology can deliver tailored and motivational interventions to promote a healthier diet and oral hygiene behaviors in young children of high-need families.

Objective: This study aimed to determine the acceptability and usefulness of a web-based motivational interview (MI) and goal-setting session to promote healthy feeding and improve oral health in young children and to determine how an initial survey with tailored messages informs the session to improve the efficiency and effectiveness of goal-setting.

Methods: Low-income caregivers of children aged 2-6 years were recruited through multiple community agencies. The caregivers completed a web-based nutrition and dental health survey that delivered 2-3 tailored messages to motivate or reinforce healthier target behaviors for their children. Caregivers reported their willingness to change the target behavior of the messages and were invited to participate in an MI session via a web-based videoconference application, facilitated by trained dietitians and dietetics students. The facilitators used the messages received by the caregiver and their willingness to change, to inform the session. The facilitators also used principles of MI to provide evidence-based recommendations, address barriers to these recommendations, and determine feasible goals with participants.

Results: Of 142 caregivers who completed the initial survey, 83 indicated an interest in the MI session and were contacted. A total of 48 MI sessions were completed (41 with female participants and 24 with non-Hispanic White participants). Caregivers were willing to attempt to make 62 out of the 64 target nutrition behavioral improvements from the initial survey. A total of 24 out of 40 caregivers who received a tailored message to improve a nutrition behavior set a goal based on that message during the MI session. The most commonly set nutrition goals involved increasing vegetable consumption (n=25/48), increasing lean protein consumption (n=8), and serving healthier snacks (n=8), which highlighted the target behaviors that the caregivers deemed most relevant. Of those who provided feedback on the MI sessions (n=41), most strongly agreed (scale from *strongly agree* to *strongly disagree*) that the MI session was easy and convenient to attend (n=33), and the UConn nutritionist made them feel comfortable to talk about their children's health (n=38), helped them think about why health changes may be important (n=32), and helped them set a goal for positive changes in their children's health (n=34).

Conclusions: Our results indicate the acceptability and usefulness of a web-based MI and goal-setting session, and that an initial survey with tailored messages informed the goal-setting session.

Conflicts of Interest: None declared.

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KEYWORDS

nutrition; oral health; motivational interview

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Abstract

Parent Preferences for Peer Connection in eHealth Programs

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Abstract

Background: Social support and connection with other parents are important factors associated with parental mental health and parenting practices. These social connections can be integrated in parental eHealth programs through forums or group therapy sessions, but parental needs and preferences regarding these eHealth features are unknown.

Objective: This study aims to examine parents' preferences for connecting with other parents in eHealth programs.

Methods: In total, 162 parents of 0-5–year-old children in the United States were recruited through Amazon Mechanical Turk (MTurk; mean age 32.7, range 22-61 years; 80.2% White; 59.9% men, 39.5% women, and 0.6% nonbinary; 93.8% biological parents). Participants filled out a one-time survey. Best practice recommendations for using MTurk were employed (through captcha verification and attention checks). Descriptive statistics were run in SPSS (version 27; IBM Corp) on MacOS.

Results: Parents were asked to rate how likely they would be to use a digital program with weekly opportunities to connect with other parents in the program (1=very unlikely to 5=very likely). Overall, 13.4% of parents indicated that they would be (very) unlikely to use a program with that feature and 59.8% of them indicated that they would be (very) likely to use it, with the remaining 27.8% of them being neutral. On being asked specifically about their preference, 85% of parents indicated that they would prefer connecting with other parents in the program, with 70% of those preferring to connect anonymously. On a forum, 67% of parents indicated that they would be comfortable connecting with all parents (as opposed to mothers or fathers only); regarding videoconferencing, that number was 61%.

Conclusions: Considering that studies have shown the positive impact of social support for parental mental health and parenting practices, integrating anonymous connection with other parents should be considered in developing parental eHealth programs and would be in line with the preferences of most parents.

Conflicts of Interest: None declared.

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KEYWORDS

telemedicine; mobile health; mental health; parents; family; social interaction; eHealth

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Abstract

Addiction and Mental Health Treatment Experiences in Veterans During the First Year of the COVID-19 Pandemic: Nationwide Cross-sectional Survey

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Abstract

Background: Addiction treatment evolved quickly during the first year of the COVID-19 pandemic in the United States, with changes likely increasing access to some forms of care (eg, medications for opioid use disorder) and reducing access to others (eg, inpatient treatments). Efforts to continue providing quality addiction treatment to veterans may have benefitted from the Veteran's Healthcare Administration's existing telehealth infrastructure. Veterans' experiences of care during this time are key to evaluating these efforts.

Objective: This study aimed to examine veterans' experiences of mental health and addiction treatment during the first year of the COVID-19 pandemic.

Methods: Cross-sectional self-report data were collected over 3 months starting in April 2021, using Qualtrics panels. Participants were 401 veterans who (1) endorsed one or more substance use–related problems and (2) reported attending one or more mental health or addiction treatment appointments since April 1, 2020. The survey included standardized assessments of the risk severity of substance use and treatment satisfaction, as well as study-specific questions assessing care in the past year, including the proportion of care received in person versus telehealth appointments and perceptions of treatment quality and access relative to before the pandemic.

Results: Overall, 22% of the participants were women and 67% were White and non-Hispanic, with an average age of 41.7 (SD 9.4) years. The majority were combat veterans (85%), and the army was the most commonly represented branch (61%). Most of them (98%) endorsed items consistent with a moderate to severe risk for one or more substance use disorders, with alcohol being the most common one (91%), and most (74%) met the risk criteria for 2 or more substances. One-fifth of participants (20%) reported that their past year appointments were evenly split between in-person and telehealth consultations, while 43% of them received care primarily via telehealth, and 37% of them attended mostly in person. The average satisfaction with mental health and addiction treatment was comparable with that reported in previous addiction treatment studies (mean 25.4, SD 4.1) and did not differ as a function of the proportion of care received via telehealth ($F_{2,398}$=2.77; P=.06). Most participants rated treatment as much better (27%), slightly better (38%), or the same (26%), and overall health care access as better (51%) or the same (30%) relative to before the pandemic. The distribution of satisfaction, quality, and access did not differ as a function of treatment modalities accessed in the past year (eg, medications and inpatient care).

Conclusions: Veterans rated their treatment satisfaction, perceived quality of care, and overall health care access as largely better or the same relative to prepandemic care. These data should be interpreted in the context of web-based administration of care and the cross-sectional study design. Nevertheless, our findings align with those of recent work suggesting that veterans with substance use disorders are particularly open to telehealth treatment options. These results also suggest that health care providers' efforts to continue providing care during the first year of the COVID-19 pandemic were well received.

Conflicts of Interest: None declared.

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KEYWORDS

substance use disorders; telehealth; veterans; COVID-19; pandemic

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Abstract

A Technology-Based Intervention to Help Health Care Provider Parents Manage Stress During the COVID-19 Pandemic: Findings From a Pilot Microrandomized Trial

Sun-Kyung Lee[1], PhD; Qiyue Cai[1], MA; Sydni Basha[1], BSc; Aditi Gupta[1], MA; Abigail Gewirtz[1], PhD

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Abstract

Background: The COVID-19 pandemic has increased the stress levels of parents, especially health care workers and other COVID-19 frontline workers. Nonetheless, little is known about stress management for this population.

Objective: This pilot study tested the impact of a mobile app *apt.mind* in reducing stress in health care provider parents by delivering a 30-day microrandomized intervention.

Methods: Participants included 102 parents who work in health care and their coparenting partners. They were given smartwatches and access to a mindfulness app. Each day, all parents were randomly assigned to (1) brief stress reduction messages, (2) meditation audio activities via the app, or (3) no intervention. Stress was evaluated using a self-reported COVID-19 Family Stressor Screener (10 items; 5-point Likert scale) to rate levels of stress regarding food security, job stability, family conflict, mental health, and social isolation. Dosage was measured by the percentage of parents who received any of the activities (app or messages; mean 66%, SD 9.8%), and parents were divided into 3 groups by dosage level: low (below 60%), middle (61%-70%), and high (above 71%).

Results: Using a pre-post test, this study assessed changes in mental health symptoms and parenting by individuals' dosage levels. Participants who received high levels of intervention reported significant decreases in COVID-19–related family stress (t=–2.50; P=.02) and a significant increase in parenting efficacy (t=2.39; P=.03), while those who received low or middle levels of the intervention did not show those changes.

Conclusions: This study supports the feasibility and efficacy of technology-based tools to reduce stress and the need to examine just-in-time interventions. Future studies can improve by focusing on microchanges in the parents' stress level on a daily basis and including physiological data such as heart rate variability to include objective stress data.

Conflicts of Interest: None declared.

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KEYWORDS

stress; parenting; meditation; microrandomized trial; smartwatches; mobile application; app; COVID-19

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Abstract

Evaluation of MyCOVIDRisk App Users: An Updated Risk Evaluation and Mitigation Tool for Public Use

Megan Ranney[1], MD, MPH; Elizabeth Goldberg[2], MD, ScM; Zahrie Ernst[1], BSc; Sudheesha Perera[2]; Arenal Haut[2]; Charlotte Bingaman[1], MEd, MArch

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Abstract

Background: The MyCOVIDRisk app is a free web-based tool for the public to quickly estimate the likelihood of COVID-19 infection based on individual behavior, environmental factors, and local case counts. User input of activities and mitigation measures impact the modifiable risk estimates. Originally launched in October 2020, an updated version was released in November 2021 to account for the transmission dynamics of delta and omicron variants and the protective effects of vaccination.

Objective: This study aims to assess trends in (1) user characteristics, (2) projected risk level, and (3) mitigation measures selected by users since the app's inception.

Methods: We tracked overall site usage with Google Analytics. To describe user inputs (preferred activities, gathering sizes, vaccination status, and other risk mitigation steps), we aggregated back-end app data logging at every run of the risk analysis algorithm. We calculated descriptive statistics.

Results: As of March 1, 2022, the MyCOVIDRisk app has been used 1,339,940 times (1,231,546 times in v1 and 108,394 times in v2). Multiple characteristics of activities changed across the 2 versions. For example, the top activity in v1 was "Visiting Friend's House" (22.6%, n=146,399); versus "Family Dinner" in v2 (21.3%, n=19,724). In v1, only 0.7% of users who were originally "high risk" and 10.8% of those who were originally "moderate risk" decreased their predicted risk to "low" using layered mitigation steps. In v2, in comparison, 24.4% of high-risk and 24.8% of moderate-risk activities were decreased to low risk. Self-reported mask use also changed across versions. In v1, 83.7% planned to wear a mask, versus only 68.8% in v2. Of those masking, more users reported use of N95s and surgical masks in v2 (50.5%) compared with v1 (18.1%). Vaccination status was not asked in v1. In v2, 97% (n=37,346) reported having received at least 1 dose of vaccine, and 81.7% had received 3 doses. Among those participating in indoor activities in v2, 75.7% (n=83,728) indicated that they were participating in indoor activities with people who had received at least 2 doses of Pfizer or Moderna or 1 dose of Johnson and Johnson vaccines.

Conclusions: The MyCOVIDRisk App allows individuals to assess in real time risk of being infected by SARS-CoV-2. Using app-directed mitigation steps, users were able to reduce their predicted risk of COVID-19 transmission during daily activities. Patterns of mask use and types of activities changed over time. In v2, users were more likely to report being vaccinated or boosted and wearing masks compared to what national statistics suggest. Future iterations of the app should assess actual change in behavior and should aim to reach those who are not currently vaccinated or masking.

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Conflicts of Interest: None declared.

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digital health; digital tools; COVID-19

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Abstract

Telehealth Technology Competency and Difficulties in the Therapeutic Process

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Abstract

Background: Telehealth therapy services increased during the COVID-19 pandemic and have the potential to shape service provision in the future. The growing body of research on telehealth services provides evidence of the efficacy of such services and the possibility for greater accessibility of counseling services for hard-to-reach clients. However, less is known regarding 2 unique processes of engaging in telehealth services, which are telehealth difficulties and perceived therapist telehealth competency.

Objective: This study examines the factor structure of the following 2 new measures: the Telehealth Difficulties Scale and the Therapist Telehealth Competency Scale.

Methods: Exploratory factor analyses were used with 223 participants who used telehealth services. Following this validation, these measures were tested with their association with the therapeutic alliance and therapy productiveness among clients of telehealth services using linear regressions.

Results: The study found that both measures had a one-factor structure and predicted therapeutic alliance scores. In addition, telehealth competency predicted therapy productiveness.

Conclusions: The implications for these results are discussed, and future directions are given.

Conflict of Interest: None declared.

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Abstract

Caregivers' Role in Supporting Occupational Therapy Video Telehealth: A Qualitative Study

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Abstract

Background: Video telehealth increases access to care for patients living in rural communities and those whose functional status makes attending brick-and-mortar health care visits difficult. This includes many older adults whose accumulated health risks, due to age and chronic illness, may result in higher rates of disability. Older adults underutilize video visits due to decreased digital literacy and age-related impairments. While caregiver assistance may ameliorate such barriers, little is known about the role of caregivers to support patient participation in video telehealth, particularly for more hands-on clinical services such as occupational therapy (OT).

Objective: This project seeks to explore the role of caregivers to facilitate video telehealth from the perspective of occupational therapy (OT) practitioners at Veterans Health Administration, the largest integrated health care system in the United States.

Methods: In early 2021, we conducted semistructured interviews with Veterans Health Administration occupational therapy practitioners (n=27) about their experiences using video telehealth to deliver OT services. During the interviews, we asked OT practitioners to describe caregiver involvement in video telehealth. We analyzed the responses related to caregiver participation to better understand the caregivers' support role in OT video telehealth sessions.

Results: Interview responses related to caregivers' participation in video telehealth led to the following three broad findings: (1) caregivers participate in video telehealth sessions to varying degrees and fill a variety of technical and clinical roles; (2) the presence of caregivers allows patients who might otherwise not be able to access telehealth to do so; and (3) there are benefits and barriers to caregiver participation. Related to caregivers' support roles, our findings revealed that caregivers assist with technical tasks such as logging onto the computer and operating the device to enable visualization during the sessions. The clinical tasks caregivers assist with include communicating with the clinician and taking measurements during home safety evaluations. Factors that appear to contribute to caregiver involvement include patients' low technical literacy and age- or health-related impairments, such as hearing and vision loss, decreased mobility, or cognitive changes. Perceived benefits included increased caregiver involvement in patient care, while barriers included lack of available caregivers to assist.

Conclusions: This study improves our understanding of the caregivers' role supporting patient participation in video telehealth. This foundational work suggests that more studies examining caregiver participation are needed, particularly larger studies and those from the perspectives of caregivers and patients. Elaborating caregiver participation in video telehealth should enable the identification of strategies to facilitate telehealth service delivery, particularly for patients who continue to face access challenges in a post–COVID-19 landscape.

Conflict of Interest: None declared.

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KEYWORDS

telemedicine; caregivers; occupational therapy

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Abstract

An International Core Capability Framework for Physiotherapists to Deliver Quality Care via Videoconferencing: A Delphi Study

Luke Davies[1*], BA, MA, DPT; Rana S Hinman[1*]; Trevor Russell[2*]; Belinda Lawford[1*]; Kim Bennell[1]; International Videoconferencing Steering Group[1*]

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Abstract

Background: The provision of physiotherapy care via telehealth is becoming increasingly common and, in some circumstances, is a necessity, as observed during the COVID-19 pandemic. Therefore, it is important to understand what are the core capabilities that physiotherapists need in order to deliver quality care via videoconferencing.

Objective: The objective of our study was to develop a discipline-specific core capability framework for physiotherapists to deliver quality care via videoconferencing.

Methods: An international Delphi panel comprising a steering group and experts in the field, including physiotherapy researchers, physiotherapy clinicians, representatives of physiotherapy organizations, and consumers, was established by drawing on the research team's academic, research, and clinical networks as well as contacting international physiotherapy organizations. The draft framework was developed by the research team and steering group, based on relevant documents identified within the literature. The panel considered a draft framework of 73 specific capabilities mapped across 8 domains. Over 3 rounds, panelists rated their agreement (Likert or numerical rating scales) on whether each capability was essential (core) for physiotherapists to deliver quality care via videoconferencing. The capabilities that achieved consensus, defined as 75% of the panel ratings being ≥7 out of 10 in round 3, were retained.

Results: A total of 130 panelists from 32 countries participated in round 1, with retention rates of 65% and 60% in rounds 2 and 3, respectively. The final framework comprised 60 capabilities across the following seven domains: compliance (capabilities: n=7), patient privacy and confidentiality (capabilities: n=4), patient safety (capabilities: n=7), technology skills (capabilities: n=7), telehealth delivery (capabilities: n=16), assessment and diagnosis (capabilities: n=7), and care planning and management (capabilities: n=12).

Conclusions: This framework outlines the specific core capabilities that are required of physiotherapists to provide quality care via videoconferencing. The core capability framework provides guidance for physiotherapists to deliver care via videoconferencing and will help inform the future development of physiotherapy curricula and professional development initiatives in the delivery of telehealth.

Acknowledgments: The members of the International Videoconferencing Steering Group are Michael Billings, Carmen Cooper-Oguz, Karen Finnan, Sarah Gallagher, Daniel Kenneth Gilbertson, Lesley Holdsworth, Anne Holland, Jeremey McAlister, Dan Miles, and Robin Rots.

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Abstract

Mobile Technology Use and Acceptability of mHealth for HIV Prevention Among Men Who Have Sex With Men in Malaysia

Francesca Maviglia[1*]; Roman Shrestha[2*], MPH, PhD; Frederick L Altice[1], MD; Libby DiDomizio[1]; Antoine Khati[2]; Colleen Mistler[2]; Iskandar Azwa[3]; Adeeba Kamarulzaman[3]; Mohd Akbar Halim[3]; Jeffrey A Wickersham[1], PhD

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Abstract

Background: The growth in mobile technology access, utilization, and services holds great promise for facilitating HIV prevention efforts in Malaysia. Despite these promising trends, there is a dearth of evidence on the use of mobile health (mHealth) platforms to address the HIV prevention needs of Malaysian men who have sex with men (MSM).

Objective: The goal of this study was to gain insights into (1) the access and utilization of communication technology (eg, landline phone, internet, and cell phone), (2) the acceptability of mHealth-based interventions for HIV prevention services, and (3) preferences regarding the format and frequency of mHealth interventions among Malaysian MSM.

Methods: A cross-sectional survey of 376 Malaysian MSM was conducted between July 2018 and March 2020. Participants were recruited using respondent-driven sampling in the Greater Kuala Lumpur region, Malaysia. Participants completed a self-administered assessment of participant demographics, HIV risk-related behaviors, access to and frequency of the use of communication technology, and the acceptability of mHealth for HIV prevention.

Results: Almost all participants owned or had access to a smartphone with internet access (97.9%) and accessed the internet daily (99.2%), mainly on a smartphone (88.8%). Using a 5-point scale, participants on average used smartphones primarily for social networking (mean 4.5, SD 0.8), followed by sending or receiving emails (mean 4.0, SD 1.0) and searching for health-related information (mean 3.5, SD 0.9). Further, the results indicated the high acceptance of mHealth for HIV prevention, that is, receiving HIV prevention information (91.8%), receiving reminders to take medications (89.4%), tracking sexual activity (81.4%), tracking drug use (74.7%), and monitoring drug cravings (74.5%), with the most preferred method being the smartphone app for all activities.

Conclusions: The findings from this study provide support for developing and deploying mHealth strategies for HIV prevention in MSM by using a smartphone app, which are crucial for a key population with suboptimal engagement in HIV prevention and treatment.

Conflicts of Interest: None declared.

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KEYWORDS

HIV; mHealth; men who have sex with men; mobile phone; Malaysia

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Abstract

Telehealth and Intimate Partner Violence: A Systematic Review of Telehealth Interventions

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Abstract

Background: Intimate partner violence (IPV) is a global public health problem and often leads to deleterious outcomes. IPV is associated with elevated psychological distress, impaired physical health, and high rates of morbidity and mortality. Since the start of the COVID-19 pandemic in December 2019, there has been an exponential increase in the rates of IPV worldwide. The COVID-19 pandemic has also heralded an increased use of telehealth to deliver medical and psychological services. *Telehealth* is defined as the use of technology communication systems (ie, mobile apps, videoconferencing, etc) in the provision of health care. Given increases in access to Wi-Fi and computing technology, telehealth has become increasingly popular in all types of health care interventions, including those for IPV.

Objective: Reviewing and synthesizing information on telehealth intervention, screening, and prevention for IPV is essential for our knowledge of the efficacy and future of telehealth in IPV. Accordingly, this study conducted a systematic review of telehealth interventions for IPV, with a focus on screening and intervention for IPV victimization and perpetration.

Methods: This study applied the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to a literature search that identified research evaluating telehealth and telemedicine interventions for DV and IPV. Only 14 studies met the study inclusion criteria, with 3 articles focusing on telehealth screening for IPV and 11 articles studying telehealth interventions for IPV.

Results: The studies demonstrated heterogeneity in the (1) purpose of the intervention (screening, prevention, or treatment), (2) type of intervention delivered via telehealth (website vs telephone vs videoconferencing) and intervention dosage, and (3) outcomes assessed. Scientific rigor according to the Oxford Center for Evidence-Based Medicine was also variable. Studies predominantly focused on women. The results show promising evidence of the efficacy of telehealth screening (over face-to-face screening) for IPV victimization. Only specific types of telehealth interventions were shown to have promise for reducing psychological distress among IPV survivors. The results suggest that telehealth may be a viable option for the delivery of IPV screening and intervention programs, especially when face-to-face interaction is not feasible.

Conclusions: The present findings highlight the growing utilization of telehealth modalities for IPV screening and intervention. Further research is needed to enhance the evidence base for the telehealth screening, prevention, and intervention of IPV and to evaluate the effectiveness of the approaches for individuals involved in IPV.

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KEYWORDS

telehealth; IPV; DV; telemedicine

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Abstract

Effects of Novel, Whole-body Movement–Based Interventions on Locomotor Skills in Children With Autism Spectrum Disorder: Randomized Controlled Trial Comparing Face-to-face and Telehealth Modes of Intervention Delivery

Emily C Delepine[1], BS; Sruthi Takillapati[1], BS; Nidhi Amonkar[1], BS; Wan-Chun Su[2], PhD; Corina Cleffi[2], BS; Anjana Bhat[2], PhD; Sudha Srinivasan[1], PhD

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Abstract

Background: Autism spectrum disorder (ASD) is a neurodevelopmental disorder limiting a child's motor performance to a level half their chronological age. Due to COVID-19, there has been growing research on the use of telehealth-based interventions in the care of children with ASD.

Objective: Based on previous research from our lab, this study assessed the effects of 2 novel, whole-body movement interventions (creative movement and general movement) compared to a standard-of-care, seated play intervention using a randomized controlled trial design. Interventions were delivered either face-to-face (F2F) or via telehealth (TH) across all groups.

Methods: In total, 45 children with ASD (aged 5-14 years) participated in a 10-week study. Children were matched on age and level of functioning and then randomly assigned to the Play (creative movement), Move (general movement), or Standard-of-care control (seated play) group (n=15 per group) to receive 8 weeks of intervention F2F or via TH. The interventions were provided twice a week for 8 weeks, with each session lasting for around 1 to 1.5 hours. The locomotor subtest of the Test of Gross Motor Development was administered at pretest and posttest to assess the form and accuracy of locomotor skills (running, galloping, hopping, leaping, horizontal jump, sliding, and skipping).

Results: Improvements were seen in overall standard scores in the Play (pretest: mean 6.53, SE 0.97; posttest: mean 8.60, SE 0.97; $P<.05$) and Move groups (pretest: mean 6.07, SE 0.96; posttest: mean 8.07, SE 0.92; $P<.05$) but not in the Create group (pretest: mean 6.13, SE 0.88; posttest: mean 6.80, SE 0.87; $P.05$). Specifically, 75% of children seen via TH and 57.1% of children seen F2F improved in the Play group, and 89% of children seen via TH and 50% of children seen F2F improved in the Move group.

Conclusions: Our pilot data suggest that TH is a viable option for movement intervention delivery and can be used to promote locomotor skills in children with ASD. Broadly, movement-based interventions must be included in the plan of care for children with ASD, given their significant challenges with movement performance.

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KEYWORDS

autism spectrum disorder; children; locomotor skills

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Abstract

Innovation in the Treatment of Persistent Pain in Adults With NF1: Implementation of the iCanCope Mobile App

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Abstract

Background: Neurofibromatosis type 1 (NF1) is an autosomal dominant genetic condition affecting 1 in 2500 individuals. Over 50% of individuals with NF1 report significant pain and discomfort, which may be associated with benign and malignant tumors, but is often not localized to a structural lesion, thus presenting treatment challenges for patients and their medical caregivers. To date, there are very few treatments aside from surgical intervention to mitigate pain.

Objective: We developed the *iCanCope-NF* mobile app for pain self-management. *iCanCope-NF* is a customized self-monitoring and pain management mobile app designed to provide resources and support for those having chronic pain due to NF1. The app enables users to access daily pain monitoring and quality of life check-ins, allows them to plot interrelated variables on various timelines to observe trends in pain and interference across different areas of life (such as sleep, physical activity, and mood), and provides them with the option to set physiological and psychological goals as well as a robust library of written and video resources to help manage pain symptoms and to better cope with NF1.

Methods: This paper evaluated the *iCanCope-NF* to reduce pain severity and interference in adults with NF1. A total of 80 participants across 3 different groups (control, *iCanCope-NF* access condition, and *iCanCope-NF* contingency management condition where subjects were provided monetary incentives for engaging with the various features within the app [CM]) completed a randomized clinical trial in which evaluations were completed at intake (initial day of participation), discharge (2 months after intake), and 6 weeks after discharge.

Results: Preliminary data analysis demonstrated individuals randomized to the *iCanCope-NF* + CM had greater engagement with the mobile app than individuals who were randomized to *iCanCope-NF*. Additionally, individuals in the *iCanCope-NF* + CM consistently checked in more (SD 59.5/60 days) than individuals in the *iCanCope-NF* group (SD 51/60 days). Pain interference, as measured by the *Pain Interference Index* (PII), was significantly different across all 3 groups at discharge: control (M=6.3), *iCanCope* (M=5.7), *iCanCope* + CM (M=5.1), $P<.05$.

Conclusions: Qualitative interviews completed at discharge for individuals with access to the app indicated that the app was a "wonderful measuring tool" and "provided credibility of my pain symptoms," and that it was a dramatic and distinctive aide in the monitoring and tracking of their pain symptoms. We demonstrated preliminary acceptability and efficacy for *iCanCope-NF* as the first pain self-management tool for individuals with NF1. *iCanCope-NF* + CM was successful in increasing engagement and decreasing pain interference.

Trial Registration: ClinicalTrials.gov NCT04561765; https://clinicaltrials.gov/ct2/show/NCT04561765

Conflicts of Interest: None declared.

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KEYWORDS

neurofibromatosis type 1; mobile app; pain; pain management

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Abstract

A Sociotechnical Model for Managing Mental Health Distress Among College Students During and After a Pandemic: Development and Usability Study

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Abstract

Background: Mental distress affects people's health in many ways and at different levels. However, anxiety and depressive disorder have significantly increased since the outbreak of the COVID-19 pandemic. Controlling the spread of COVID-19 resulted in isolation protocols such as stay-at-home orders, social distancing, and quarantining. Though well intended, the protocols exacerbated the already increasing number of mental distress cases prior to the pandemic. During the rollout of these pandemic interventions to control the spread, there was a noticeable increase in technology use. For instance, to cope with their mental health concerns, several people, including students, turned to technology to sustain their connection to the society and to access mental health services. Although a plethora of technological tools exist for communication and socialization, it is unknown which types of technologies are effective in the management of anxiety and depression symptoms. Hence, there is a need for a sociotechnical model that can identify technologies effective in addressing an individual's mental health symptoms, specifically among college students.

Objective: The objective of this study is to identify the effectiveness of current technologies used in coping with a mental distress situation and to develop a model that college students can use to effectively handle their mental health distress during and after a pandemic.

Methods: The proposed model is built on the Stallman's Health Theory of Coping. The model expands the theory with 5 significant components, namely Mental Health Distress Situation, Level of Distress, Coping Strategy, Technology Used, and the Mental Health Distress Outcome. This paper describes the conceptualized functionality of each component. The model will be implemented as a prototype mobile app and evaluated using a case study with students from 2 colleges.

Results: The study is underway. However, the model will be evaluated using 2 categories of nonrandomized focus groups of college students to determine the usefulness and the effectiveness of the model. Each group will consist of 8 participants. Data collected from each group will be qualitatively evaluated to identify themes from the responses, which will be used to refine the model to meet the study objective.

Conclusions: Many people experienced an increase in mental distress due to the isolation requirements arising from the COVID-19 pandemic. With limited access to traditional coping strategies in public and large gatherings, people turned to technology to manage their stress, anxiety, and depression. However, there is no “one-size-fits-all” technology that can address every individual distress level and coping strategy. Thus, developing a model to identify effective technologies used as coping strategies will be helpful for an individual in alleviating their mental health distress symptoms during and after a pandemic.

Conflicts of Interest: None declared.

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KEYWORDS

technology; socialization; COVID-19; pandemic; mental health; college students

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Abstract

Experiences of Older Veterans Who Participated in a Multicomponent Telehealth Program: Qualitative Program Evaluation

Michelle R Rauzi[1], DPT, ATC; Meredith L Mealer[2,3], RN, PMHNP, PhD; Kathryn A Nearing[4,5], PhD, MA; Elizabeth K Magnan[1], BA; Lauren M Abbate[5], MD, PhD; Jennifer E Stevens-Lapsley[1,5], PT, PhD, FAPTA

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Abstract

Background: Older veterans have greater medical complexity, lower physical function, and less daily physical activity compared to age-matched civilians. Telehealth programs offer promising approaches to address these complex needs and improve access for diverse patient populations.

Objective: The purpose of this program evaluation was to understand veterans' experiences of the telehealth program's quality, feasibility, safety, and effectiveness.

Methods: Interviews were conducted by a provider and external evaluator who had expertise in qualitative methods; veterans were interviewed following completion of the 12-week program. Questions were designed to explore both positive and negative experiences of the program and its 4 components, which were physical therapy, biobehavioral intervention (coaching), social support, and technology. Interviews were audio recorded and transcribed verbatim. Team-based–directed content analysis, using deductive and inductive thematic analysis, was conducted to identify themes; analysis was supported by structured debriefs following each interview and using Dedoose software.

Results: Twenty-one veterans enrolled in the program (n=14 completed). All 14 completers and 1 withdrawer completed the interviews (mean 60.4, SD 8.2 minutes); interviewees were mostly male (73.3%), White (60.0%), and non-Hispanic (86.7%). The following 6 domains were identified (subthemes to follow): (1) technology, (2) social network, (3) therapeutic relationship, (4) access, (5) feasibility, and (6) patient characteristics. Technology—although veterans noted varying levels of technology competency and satisfaction, most felt encouraged and held accountable to being active by the technology. Social Network—this domain highlighted themes surrounding veterans' social support both within and outside of the program, which reportedly enhanced motivation and commitment to regular exercise. Therapeutic Relationship—interviewees shared specific ways that providers significantly contributed to their overall experience and their progress. Access—older veterans described the pros and cons of telehealth and noted the program made it possible to begin physical therapy sooner than they would have in person. Telehealth also made it easier for them to fit physical therapy sessions into their workdays, and for some, it provided a solution to overcome mental and physical health issues precluding in-person care. Feasibility—themes of preparedness, fit with daily routine, manageability, and outcomes of the program emerged. Patient Characteristics—motivation, self-efficacy, attitudes and beliefs, and expectations influenced the perceived benefits, overall experience, and therapeutic relationship experienced by the veterans.

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Finally, many veterans provided constructive feedback to improve the program (eg, organizing group sessions based on functional ability and further integrating technology and wearable data).

Conclusions: This program evaluation identified impactful aspects of the telehealth program and mechanisms of how those aspects contributed to participants' satisfaction and outcomes. Veterans offered suggestions to inform ongoing quality and operational improvements, with implications for staffing, training, and patient engagement. Qualitative feedback from the program evaluation identified additional questions to explore through rigorous qualitative research.

Conflicts of Interest: None declared.

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KEYWORDS

telehealth; older adult; veteran; physical therapy

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Abstract

Adaptation of a Theory-Based, Clinic-Affiliated Smartphone App to Improve HIV Testing and Pre-exposure Prophylaxis Uptake Among Gay, Bisexual, and Other Men Who Have Sex With Men in Malaysia

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Abstract

Background: In Malaysia, HIV disproportionately affects gay, bisexual, and other men who have sex with men (GBMSM). Homosexuality and substance use are criminalized in Malaysia, making GBMSM bear multilevels of social stigma and discrimination, including in health care. Mobile health (mHealth), particularly smartphone apps, is a promising and cost-effective strategy for reaching stigmatized and hard-to-reach populations like GBMSM and linking them to HIV prevention services (eg, HIV testing and pre-exposure prophylaxis [PrEP]), particularly in the context of COVID-19.

Objective: This study aimed to adapt the HealthMindr app (Emory University), which was developed with GBMSM in the United States, to improve HIV testing and PrEP uptake for GBMSM in Malaysia.

Methods: We conducted online focus group discussions (FGDs) between August and September 2021 with 20 GBMSM and 16 community stakeholders (eg, doctors, nurses, pharmacists, and nongovernmental organization staff). Participants were asked questions regarding their preferences for functions and features in mHealth apps among GBMSM and suggestions for adapting the HealthMindr app to the Malaysian context. Each session was digitally recorded and transcribed. Transcripts were inductively coded using Dedoose software (University of California, Los Angeles) and analyzed to identify and interpret emerging themes.

Results: The FGDs with GBMSM revealed preferences for interfacing with apps to access HIV testing, PrEP, and counseling services. Stakeholders showed strong interest in using the app-based platform to deliver integrated care (eg, HIV and mental health). The key themes mostly focused on adaptation and refinement for the Malaysian context and were related to cultural and stylistic preferences (design and user interface), engagement strategies (reward systems, marketing campaigns, and reminders), and recommendations for new functions (enhanced communication options via chat and discussion forums) in a one-stop hub for all HIV prevention needs (HIV self-testing, PrEP, and postexposure prophylaxis) that minimize privacy and confidentiality risks.

Conclusions: Our data suggest that a tailored HIV-prevention app would be acceptable for GBMSM in Malaysia. The findings provided detailed recommendations for the successful adaptation and refinement of the existing platform for optimal use in the Malaysian context.

Conflicts of Interest: None declared.

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KEYWORDS

HIV; HIV prevention; pre-exposure prophylaxis; PrEP; HIV test; men who have sex with men; MSM; mHealth; eHealth; Malaysia; focus groups

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Abstract

Feasibility and Acceptability of Recruitment and Retention in a Remote Trial of Gatekeeper Training for Military Veterans

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Abstract

Background: SAVE (Signs; Ask; Validate; Encourage) is a brief gatekeeper training designed to teach lay individuals how to identify and assist military veterans at risk for suicide. SAVE can be delivered asynchronously using a web-based video format, but no studies of the effectiveness of SAVE exist.

Objective: The aim of this project was to determine the feasibility and acceptability of recruitment and retention in a remote trial of SAVE.

Methods: We conducted a social media campaign using sponsored Facebook posts (ads) to recruit veterans, including those outside the Veterans Affairs network of care, and their loved ones. Participants (N=214) were randomized to SAVE or a sham video training unrelated to suicide prevention and followed for 6 months. We also conducted qualitative interviews with a subgroup (n=15) and used a mixed methods framework to integrate findings.

Results: At baseline, most participants were a family member or friend of a veteran (146/214, 68.2%), and 47.7% (102/214) knew at least one veteran or service member who had died by suicide. Across both study arms, 73.8% (158/214) responded to at least 3 of 6 follow-up surveys and 72.4% (155/214) completed follow-up at 6 months. Themes from interviews indicated the following three barriers to study participation: generic posts, copy (ad text) referring to “research,” and Facebook as a platform. There were 5 facilitators to participation: audience segmentation focused on veterans’ family members and friends, an urgent call to action to help a veteran, prior exposure to suicide, emphasizing the benefits of receiving training, and using a university as the campaign messenger.

Conclusions: A social media campaign was a feasible and acceptable approach to recruiting and retaining participants—especially the loved ones of veterans with prior exposure to suicide—for a fully remote trial of SAVE gatekeeper training. Several campaign strategies may be applied to further promote remote study participation in this population.

Trial Registration: ClinicalTrials.gov NCT04565951; https://clinicaltrials.gov/ct2/show/NCT04565951

Conflicts of Interest: None declared.

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KEYWORDS

suicide; social media; virtual; pilot; veterans; caregiver

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Abstract

Identifying Feasible and Impactful Approaches to Implementing Telehealth in Rural Washington Communities: Group Concept Mapping Study

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Abstract

Background: The expansion of telehealth use during the COVID-19 pandemic increased access to health care services for many US residents. This is particularly true for provider-to-patient telehealth communication. In rural communities, telehealth can increase access to health care services that would otherwise be limited due to geographic and distance barriers. The adoption of telehealth in rural communities, however, has been hindered by technology barriers, lack of community awareness, and lack of provider buy-in. The purpose of this study was to explore community-identified approaches to improving telehealth access in rural North Central Washington.

Objective: The aim of this study was to identify, group, and rate approaches to expanding and integrating telehealth in rural communities in North Central Washington.

Methods: We used group concept mapping, a participant-engaged, mixed method approach, to explore participant perspectives and preferences. Purposively sampled participants were community leaders and stakeholders in rural North Central Washington. Participants brainstormed strategies for implementing and expanding community telehealth access in their community and sorted them into conceptually similar groups. Strategies were then rated by participants in terms of potential impact, feasibility, and the cost of implementation. Quantitative analyses included multidimensional scaling and hierarchical cluster analysis to produce a cluster map and pattern match graph for interpreting the community members' ideas and preferences.

Results: Participant brainstorming yielded 70 strategies for implementing telehealth in rural North Central Washington. Strategies were individually sorted into groups (point map stress value 0.21), producing a 6-cluster solution. The clusters were "Community infrastructure," "Ensuring access to telehealth technology," "Technology infrastructure for telehealth," "Training/awareness of telehealth," "State- and policy-level considerations," and "Health care systems engagement and delivery." Participants rated "Training/awareness of telehealth" and "Health care systems engagement and delivery" to be highly impactful and feasible approaches. The "Training/awareness of telehealth" cluster included strategies such as educating community members that telehealth is an easy, reliable, convenient, and private way to access health care and providing community training on how to access health care remotely. The latter cluster, "Health care systems engagement and delivery," included approaches that were ranked as highly feasible and impactful, such as engaging with clinics and providers on overcoming barriers to implementing telehealth services or ensuring that local health clinic staff is on board with telehealth as an alternative platform to provide services.

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Conclusions: Strategies identified and rated by participants incorporate the importance of community engagement in telehealth implementation, including educating community members about telehealth and engaging with community health clinics to facilitate use by providers. Community partners in North Central Washington will use these findings, along with additional community survey data, broadband speed test data, and provider input, to increase access to telehealth in their rural and remote communities.

Conflicts of Interest: None declared.

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KEYWORDS

telehealth; group concept mapping; community engagement; rural

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Abstract

Comparing Pre- to Post-COVID-19 Health Disparities Between Black and White Female Connecticut Medicaid Beneficiaries in Behavioral Health Utilization

Emil Coman[1], PhD, PStat; Thomas Agresta[2], MD, MBI; Willie Frazier[2], MPH; Wizdom Powell[2], MPH, PhD

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Abstract

Background: Broad health disparities (HDs) persist in Connecticut and the United States between minority and White patients, especially in access to and the utilization of behavioral telehealth services.

Objective: We aimed to determine the geographic distribution of HDs in Connecticut between Black female and White female adults in Medicaid behavioral telehealth utilization in 2019 and 2020.

Methods: We used the following spatial Connecticut data: (1) behavioral health utilization from Medicaid claims, from the Connecticut Department of Social Services, for the third quarters of 2019 and 2020; (2) mental health and drug and alcohol treatment facilities and ZCTA (ZIP Code Tabulation Area)-level descriptors from PolicyMap; and (3) Connecticut ZIP-to-ZCTA crosswalk data. Data were joined spatially, merged, and analyzed using spatial autoregressive models in Stata 17 (with outcome, predictors, and errors spatial lags). We computed ZCTA-level HDs comparing Black and White adult female Medicaid beneficiaries' rates of face-to-face and telehealth behavioral services utilization. Spatial regressions were used to test spatial effects, which are extensions of classic regressions, that add neighbors' effects to covariates.

Results: Distances to nearest treatment facility vary quite widely in Connecticut by ZCTAs, from 0.06 mile to 13.4 miles—3.5 miles on average. The overall White female versus Black female HDs in behavioral health care utilization were impacted by the distance to the nearest facility, such that ZCTAs farther away from the nearest facility display larger Black versus White HDs—nearly statistically significant effect in 2019 and significant effect in 2020. In 2020, in ZCTAs situated farther away from treatment facilities, both White female and Black female Medicaid patients had higher telebehavioral health utilization (spatial effects +1.3% points and +2.0% points, respectively, for 1 more mile farther away). The differential Black versus White female HDs in telebehavioral health care utilization were not impacted by distance to nearest facility, according to the total effect (direct and indirect through neighboring ZCTAs; P=.26).

Conclusions: Quantitative analyses indicate broad differences in Medicaid enrollment and the utilization of behavioral health services among Black and White female Medicaid recipients in Connecticut and that these differences were rather stable between 2019 and 2020. It appears that the expansion of telebehavioral health services in 2020 enhanced the access to treatment among residents who were located furthest away from providing facilities.

Conflicts of Interest: None declared.

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KEYWORDS

health disparities; medicaid utilization; behavioral health; mental health

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Abstract

Effectiveness and Implementation of a Text Messaging Intervention to Reduce Depression and Anxiety Symptoms Among Latinx and White Adults During the COVID-19 Pandemic

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Abstract

Background: SMS text messaging interventions are increasingly being used to help people manage mental health symptoms due to the COVID-19 pandemic. Despite the widespread adoption of SMS text messaging interventions, little is known about racial and ethnic differences in effectiveness, feasibility, and implementation factors.

Objective: A hybrid type 1 mixed-methods study was conducted to compare the effectiveness and implementation of the StayWell intervention for Latinx and non-Latinx White (White) adults using elements of the RE-AIM framework.

Methods: Adults using the StayWell intervention received daily mood inquiries and skills–based text messages for 60 days and reported symptoms via online surveys and the HealthySMS portal. Reach was assessed by the share of adults reached via distinct recruitment methods, and effectiveness was evaluated using the Personal Health Questionnaire (PHQ-8) depression scale and General Anxiety Disorder (GAD-7) scale. Adoption was assessed with user engagement, defined as the share of responses to the (60) daily mood inquiries. Implementation was evaluated based on user feedback on the number/timing of messages, the difficulty of using the program, and the System Usability Scale. Maintenance was assessed with user reports of the likelihood of continuing and recommending the program. Quantitative RE-AIM indicators were assessed using a *t* test for continuous outcomes and a chi-square test for categorical outcomes. Mixed-effects linear regressions examined heterogeneity among Latinx and White users in the outcomes' (ie, PHQ-8 and GAD-7) changes over time. A thematic text analysis of responses to an open-ended question about participant experiences of the program was conducted to help contextualize differences in the effectiveness and implementation of StayWell between Latinx and White users.

Results: Among 398 users, 262 (65.8%) responded to the postintervention assessment. Upon completion, depressive (–1.48; *P*=.001) and anxiety (–1.38; *P*=.001) symptoms decreased among all users. Compared to White adults, Latinx adults reported an additional –1.45 (*P*<.05) decline in PHQ-8 scores, adjusting for demographics, recruitment sample, and engagement. Among Latinx adults, StayWell resulted in a greater improvement of depression symptoms (25.8% vs 13.8% reduction; *P*=.02) but not in anxiety symptoms (21.2% vs 15.9% reduction; *P*=.23). Despite Latinx adults reporting lower usability (76.8 vs 83.9; *P*=.001) than White adults, they were more likely to report interest in continuing the program (7.5 vs 6.2; *P*=.001) and recommend StayWell to a family member or friend (7.8 vs 7.0; *P*=.013). Repetitive content was a critical barrier to engaging Latinx adults in StayWell; among Latinx adults, support groups and bidirectional messages were considered important program modifications.

Conclusions: Although anxiety and depressive symptoms decreased among all StayWell users after receiving 2 messages daily for 60 days, Latinx users experienced greater reductions in depression symptoms compared to White users. Bidirectional text messaging using contextual information and ecological momentary analysis of mood data are promising adaptations to enable the tailoring of messages and improved usability of StayWell, which may be especially effective in improving Latinx user engagement.

Trial Registration: ClinicalTrials.gov NCT04473599; https://clinicaltrials.gov/ct2/show/NCT04473599

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Conflicts of Interest: None declared.

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KEYWORDS

hybrid design; mental health; text messaging intervention; depression; anxiety; effectiveness; implementation

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Abstract

Telepsychiatry in the Postpandemic Future: Results From Patient and Clinician Survey

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Abstract

Background: Telepsychiatry has become much more widely established due to the public health emergency posed by the COVID-19 pandemic.

Objective: This study aimed to discuss the telepsychiatry model adopted at UConn Health and explore the success of this model.

Methods: We conducted anonymous surveys of both psychiatry clinicians as well as patients, collecting information on their satisfaction with telepsychiatry visits.

Results: We found that telepsychiatry visits were widely accepted by both clinicians and patients, including older adults.

Conclusions: Telepsychiatry is a valuable way to increase access to care and is widely accepted by both clinicians and patients.

Conflicts of Interest: None declared.

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KEYWORDS

telepsychiatry; survey; clinician experience; patient experience

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Abstract

The Prediction of Suicidal Ideation as a Function of Daily Mood and Anxiety Scores Collected Using mHealth Technology in Patients Undergoing Treatment for Depression

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Abstract

Background: Suicide is one of the most common causes of death in the United States. The rates of suicide have increased by 33% in the period 1999-2019. In 2019, suicide was responsible for one death every 11 minutes. Clinically, a previous history of suicide attempts is the main risk factor, as well as the presence of comorbid conditions like depression and anxiety. Accurate and real-time prediction of suicidal thoughts may lead to improved management of patients with depression. Prediction of suicidality is difficult due to its day-to-day variability in relation to mood and anxiety symptoms. This can be overcome with the advent of mobile health (mHealth) technology that can capture granular data scores at a higher frequency than conventional therapeutic visitations.

Objective: The aim of this study is to predict suicidal ideation using self-reported mood and anxiety in patients undergoing treatment for depression.

Methods: This study will use data from the DepWatch study, an mHealth study that uses the DepWatch app developed by our research group. The objective of this longitudinal study is to develop an mHealth-based, personalized diagnostic prediction system for patients undergoing treatment for depression. Patients are followed over 12 weeks using electronic assessments conducted via the DepWatch app installed on their smartphones. The electronic assessments include the Quick Inventory of Depression Symptomatology-Self Report (QIDS-SR), conducted on a weekly basis, and weekly medication adherence and medication safety and tolerability questionnaires. The assessments include brief mood and anxiety assessments conducted on a daily basis. Generalized estimating equation modeling for a binary outcome (the presence or absence of suicidal thought), clustered by individual subjects, will be used. The key explanatory variables are the daily mood and anxiety levels (time variant). The outcome variable is suicidal ideation as determined by the self-reported subject response to question 12 (about suicidality) on the QIDS-SR scale. Variables that show significance at *P* values <.1 are subsequently used in the multivariate model, in addition to mood and anxiety.

Results: A total of 34 subjects are in the interim analysis set. The median age is 26 years, 85.3% are female, and 64.7% are White. In addition, 38.2% either have a college degree or graduate education, while 23.5% are unemployed and 41.1% are full-time employed. About half of participants (52.9%) earn less than $50,000 annually and 61% have never smoked. Univariate analysis shows statistical significance of gender, race, aggregate anxiety, and employment status at .1 significance level. In the multivariate model, only gender and employment status are significant at .05. Race is marginally insignificant (*P*=.068).

Conclusions: Suicidality and completed suicides are significant public health problems, especially in patients with depression. The mHealth technology and statistical modelling that captures daily variability in anxiety leading up to suicidal ideation can help predict suicidality.

Conflicts of Interest: None declared.

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KEYWORDS

mHealth; suicide; mood; anxiety

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Abstract

Using a Digital Approach to Improving Mental Health in Adults With Self-reported Psoriasis: An Analysis of Real-world User Data

Eliane Boucher[1], PhD; Ryan Honomichl[1], PhD; Murray Zucker[1], MD

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Abstract

Background: Visible scales and perceived stigma often lead to feelings of embarrassment, shame, low self-esteem, and self-consciousness among people with psoriasis. Beyond the negative effects of this distress on mental health, some researchers also argue that the inflammatory response caused by psoriasis predisposes patients with psoriasis to mental health conditions like depression. Given that anxiety and depression are linked to higher disease activity and pain in patients with psoriasis, researchers have argued that an important component of any psoriasis management plan should include addressing mental health. However, a shortage of mental health professionals, particularly in low income and rural areas, makes access to mental health care more challenging than many other common referrals—a problem that has been exacerbated in light of the COVID-19 pandemic.

Objective: This study aims to explore the feasibility of using a digital mental health intervention to help improve subjective well-being and anxiety among adults with self-reported psoriasis.

Methods: Real-world users who signed up for the digital wellness program, Happify, between January 1, 2017, and June 10, 2021, and who reported having psoriasis during onboarding were included in this analysis. To qualify, users had to complete at least two in-app assessments (which include a proprietary measure of subjective well-being, the Happify Scale, and the Generalized Anxiety Disorder 2 scale to measure anxiety), complete at least 1 Happify activity, complete no more than 3 activities before taking their first assessment, and had to have at least 42 days between their first and last assessment. We examined changes in well-being and anxiety among these participants based on Happify use (recommended vs less than recommended).

Results: Users who engaged with the program at the recommended level experienced significantly greater improvements in both well-being (P<.001) and anxiety (P=.01). More specifically, users who completed the recommended number of activities improved their well-being scores by 26.8%, whereas users who completed fewer activities improved their well-being scores by only 4.11%. Similarly, users who completed the recommended number of activities improved their anxiety scores by 26.64%, compared to 8.15% among those who engaged below the recommended level.

Conclusions: These data suggest that a digital mental health intervention can effectively improve both subjective well-being and anxiety among patients with psoriasis when used at the recommended level. Although future research is required to better understand whether this subsequently impacts disease-specific outcomes, such as disease activity and pain, our data suggest that a digital approach may be one method of providing greater access to mental health support for patients with psoriasis, increasing the likelihood that it can be incorporated into their treatment plan.

Conflicts of Interest: None declared.

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KEYWORDS

psoriasis; mental health; digital mental health interventions

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Abstract

Feasibility and Usefulness of Evidence-Based Gaming to Deliver Health Messages to Tweens in a Classroom Setting

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Abstract

Background: Our interdisciplinary team developed a publicly available online game—*Eat and Move as I Like* (EAMAIL)—for tweens based on the MyPlate evidence-based representation of the Dietary Guidelines.

Objective: We aimed to test the feasibility of using EAMAIL in a classroom setting to promote engagement and self-awareness and motivate healthier diet behaviors in tweens.

Methods: Teachers in one middle school offered EAMAIL on school Chromebooks (institutional review board–approved). The researcher introduced EAMAIL's login instructions, including nonidentifiable usernames, basic demographics, and home zip codes. Children were instructed to enter EAMAIL's *Story Mode*, which had 5 MyPlate-food group levels; children caught healthy foods in color-matching buckets and avoided sweets. Each level delivers informational and motivational messages, asking users to report liking or disliking food groups and making dietary improvements on 7-point facial hedonic scales (from *Love it* to *It's okay* to *Hate it*). At game completion, children rated the game based on whether it made them want to eat better and play again. Aligned with the Design, Play, and Experience Framework, the researcher made observations to assess child engagement, feelings about the game and the messages, and the motivation to make dietary improvements. Children were encouraged to complete the *Story Mode* before advancing to *Free Play Mode*, which had greater game challenges and 15-second interruptions every 2 to 3 minutes to deliver physical activity and health messages. Finally, each child completed a 13-item online survey to assess game-playing experiences, the desire to play again, new knowledge learning, and whether the game motivated healthier behaviors.

Results: EAMAIL was administered to five 30-minute classes involving 54 children (age: mean 11.6 years; female: 75%; White: 58%) and 105 users, and 1187 games were played. By the highest user level reached in *Story Mode*, 10% of users completed level 1 (*Grains*), 14% completed level 2 (*Vegetables*), 11% completed level 3 (*Healthier Protein*), 17% completed level 4 (*Fruits*), 15% completed level 5 (*Dairy*), and 31% completed all levels. Across users' highest levels, *Healthier Protein*, on average, was the most liked, and *Vegetables* was the least liked. Most reported at least *Like it* to eating more fruits and vegetables (82%), vegetables (73%), healthier protein (79%), fruits (84%), and dairy (80%). All users responded to end-game questions; 64% reported at least *Like it* to "The game made me want to eat better" and "I would like to play the game again." These responses were unchanged for most users who completed *Story Mode* and entered *Free Play Mode* (n=24); 6 reported *worse* and 3 reported *better*. From the postgame online survey, *somewhat agreed* to *strongly agreed* was reported by 76% of children with regard to learning about healthy eating and by 50% with regard to the game being fun, the game having positive attributes (pace, challenge, and flow), and whether they would share their game experiences. Researcher observations were consistent with children's online responses.

Conclusions: EAMAIL appears feasible for teaching tweens in classroom settings about MyPlate, encouraging self-reflection, and motivating healthier eating, with *Story Mode* maximizing health promotion messages and engagement.

Conflicts of Interest: None declared.

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KEYWORDS

digital gaming; nutrition education; adolescents; motivation; health promotion; school-based; healthy eating

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Abstract

Development and Implementation of Ontario Critical Care Clinical Practice Rounds

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Abstract

Background: The COVID-19 pandemic brought unprecedented challenges to health care systems across the world. Health care professionals were burdened with time constraints as they balanced care for a large number of patients while managing crippling resource shortages. In the pandemic's early stages, it was challenging for health care providers to provide evidence-based therapies due to the novel nature of COVID-19. There were also pressures to adopt unproven, yet highly touted treatments based on media reports and social media postings. These challenges were identified by Critical Care Services Ontario (CCSO), a provincial health organization that ensures the integration of the critical care system in Ontario, Canada. Since traditional methods of knowledge translation were inaccessible during the pandemic, CCSO created a webinar series titled Ontario Critical Care Clinical Practice Rounds (OC3PR) to share evidence-based practices with critical care professionals.

Objective: We sought to develop and implement a webinar series to connect critical care professionals with the best available evidence and clinical expertise during the COVID-19 pandemic. We were also interested in gathering attendee perceptions of OC3PR as an educational tool.

Methods: CCSO collaborated with 5 regional critical care leaders in Ontario to develop and implement OC3PR. This committee identified presentation topics based on perceived urgency and demand and selected presenters with expertise on their respective discussion topic. To promote accessibility, OC3PR was facilitated on the Zoom platform, live simulcasted on Youtube, and subsequently posted on Youtube for asynchronous viewing. Attendees also had the opportunity to share inquiries in live questions-and-answers sessions facilitated by the presenters. Finally, to gather the perceptions of and experiences with OC3PR, we invited attendees to partake in a web-based questionnaire at the end of each session.

Results: In total, 19 webinars were presented from November 26, 2020, to December 2, 2021, with 1481 registered unique attendees from within Canada and internationally and 17,533 Youtube visits. OC3PR presentation topics centered on resource rationing, patient therapies, staffing challenges, infection control, and vaccination. In addition, 22 follow-up questionnaires yielded 408 responses from attendees, which were composed of physicians (32%), registered nurses (15%), and other health care professionals. Our survey results suggest that OC3PR is beneficial to professionals as the majority of the respondents strongly agreed that it was of acceptable quality, enhanced their knowledge, relevant to their practice, and allotted appropriate timing for interactive components. Most (98%) respondents also reported that they would attend another OC3PR session.

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Conclusions: The success of OC3PR as an accessible educational tool made it evident to CCSO that it would continue this forum in a postpandemic context. Although the webinar series was created for critical care professionals, it can be adapted by other health organizations to improve the integration of their health networks and enhance the support they provide for their workers.

Conflicts of Interest: None declared.

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KEYWORDS

webinar series; COVID-19; critical care support; health care best practices; critical care integration; teaching and learning; education; knowledge translation

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Abstract

Impact of COVID-19–related Isolation on Individuals in Treatment for Substance Use

Ashlin Ripley Ondrusek[1], BA; Emily Townsend[2], BS; Charles Warnock[2], BS, MPH; Sarah Lowe[1], PhD; Jessica Muilenburg[2], PhD; Trace Kershaw[1], PhD

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Abstract

Background: For individuals in treatment for substance use, supportive social networks are essential to protect against a return to use.

Objective: This study aimed to explore the impact of the swift and severe isolation brought on by the COVID-19 pandemic, specifically for individuals in treatment for substance use disorder, by exploring the relationships amongst social connectedness and isolation to treatment accessibility, mental health, and substance use.

Methods: A total of 24 semistructured interviews were conducted from May 2020 to August 2020 with participants engaged in substance use treatment asking about the impact of the pandemic on social networks, substance use, access to treatment, and mental health. Interviews were coded and analyzed using grounded theory.

Results: Results centered around two main themes: (1) access to support (eg, formal and informal networks) and (2) individual outcomes regarding substance use and worsened mental health.

Conclusions: This research suggests that the COVID-19 pandemic has greatly disrupted access to resources for individuals in treatment for substance use, and calls for treatment centers and governing bodies to put more resources into telehealth and alternative treatment plans in the event of major disruptions, such as national disasters and global pandemics.

Conflicts of Interest: None declared.

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substance use; COVID-19; treatment accessibility

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Abstract

Comparison of the Effects of Movement-Based Interventions Delivered Face-to-face Versus Via Telehealth on Restricted and Repetitive Behaviors of Children With Autism Spectrum Disorder

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Abstract

Background: Autism spectrum disorder (ASD) is the most common pediatric neurodevelopmental disorder with a prevalence of 1 in every 44 children. Children with ASD exhibit social communication and behavioral impairments including poor verbal and nonverbal communication and heightened frequencies of repetitive and maladaptive behaviors (RBs).

Objective: Our randomized controlled trial compares face-to-face (F2F) versus telehealth-based intervention delivery for three types of interventions: two whole-body gross motor interventions and a conventional seated play (SP) intervention on RBs in children with ASD.

Methods: A total of 45 children with a confirmed diagnosis of ASD (aged 5-14 years) were recruited, matched on age bands and level of functioning, and randomly assigned to 1 of the 3 intervention groups, creative movement (CM), general movement (GM), or SP. Sessions were 1 to 1.5 hours long and were conducted with the child twice a week over 8 weeks by an expert clinician, adult confederate, and the caregiver. We coded videos of early and late training sessions for 3 types of RBs: sensory, stereotyped, and negative. Frequencies per standard time were calculated for RBs across early and late sessions.

Results: Data from a subset of 39 children suggest that there was a significant reduction in total RBs from an early to a late session in the CM group (early: mean 34.8, SE 5.0; late: mean 24.7, SE 3.9; *P*=.01) but not in the GM (early: mean 34.8, SE 5.0; late: mean 24.7, SE 3.9; *P*=.01) and SP groups (early: mean 14.6, SE 3.1; late: mean 15.2, SE 4.0; *P*=.79). The reduction in total RBs in the CM group did not differ significantly between children seen F2F (mean 14.2, SE 4.4) versus via telehealth (mean 5.3, SE 3.8; *P*=.20). The CM group specifically reduced frequencies of sensory (early: mean 10.7, SE 1.8; late: mean 6.2, SE 1.9; *P*=.03) and negative (early: mean 10.7, SE 2.6; late: mean 7.4, SE 2.3; *P*=.01) behaviors. Similar to the trends reported above, the reductions were not significantly different for children seen F2F and via telehealth (sensory F2F: mean 5.1, SE 1.8; sensory telehealth: mean 4.7, SE 3.7; *P*=.92; negative F2F: mean 2.6, SE 1.3; negative telehealth mean 3.7, SE 2.1; *P*=.66).

Conclusions: CM activities involving music and movement are novel contexts and lead to higher frequencies of RBs at baseline compared to conventional SP activities in children with ASD. However, training children reduced the frequencies of RBs, especially negative and sensory behaviors. No improvements were found in the GM or SP groups. Although our sample size was limited, preliminary data suggests similar trends for improvement in children seen F2F versus via telehealth. Telehealth-based training seems to be a viable mode of intervention delivery for families with difficulties accessing in-person care.

Conflicts of Interest: None declared.

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KEYWORDS

autism spectrum disorder; movement intervention; repetitive behaviors

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Abbreviations

ASD: autism spectrum disorder
CM: creative movement
F2F: face to face
GM: general movement
RB: repetitive and maladaptive behavior
SP: seated play

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Abstract

Perspectives on Ethical Issues Around the Use of Smartphone Apps for HIV Prevention in Malaysia: Focus Group Study With Men Who Have Sex With Men

Antoine Khati[1], BSc, MD; Roman Shrestha[1], MPH, PhD; Aviana Rosen[1], MS; Jeffrey Luces[2], MS; Jeffrey Wickersham[3], PhD; Iskandar Azwa[4], MD; Mohd Akbar Ab Halim[4], BS

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Abstract

Background: The use of smartphone apps can improve the HIV prevention cascade for key populations such as men who have sex with men (MSM). In Malaysia, where stigma and discrimination toward MSM are high, app-based strategies have the potential to open new frontiers for HIV prevention efforts. However, little guidance is available to inform researchers about ethical concerns unique to the development and implementation of app-based HIV prevention programs.

Objective: This study aims to understand and characterize the attitudes and concerns of Malaysian MSM regarding HIV prevention mobile apps, particularly focusing on ethical aspects surrounding their use.

Methods: We conducted online focus group discussions with 23 MSM between August and September 2021. Using in-depth semistructured interviews, participants were asked about their perceived risks, benefits, and ethical issues associated with using mobile apps for HIV prevention. Each session was digitally recorded and transcribed. Transcripts were inductively coded using Dedoose software and analyzed to identify and interpret emerging themes.

Results: Overall, participants indicated a preference for using app-based strategies for HIV prevention efforts. Emerging themes on benefits related to app use for HIV prevention included convenience, anonymity (ability to remain anonymous while seeking care), less stigmatizing access to services (ability to avoid the burden and stigma of visiting an HIV clinic in person), readily accessible multimedia resources (eg, text, graphics, videos), and self-management portals (eg, medication adherence, appointment reminders). Prominent concerns raised by participants included privacy and confidentiality concerns, issues around personal health data storage and management, and fear of the Malaysian government accessing data.

Conclusions: The findings from this study indicate that app-based strategies for HIV prevention efforts are acceptable among Malaysian MSM. The results further highlighted the role of ethical concerns and the associated risks and benefits related to the use of app-based HIV prevention programs. Given the ever-evolving nature of such technological platforms and the complex ethical and legal landscape, such platforms must be safe and secure to ensure widespread public trust and uptake.

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KEYWORDS

HIV; mHealth; mobile app; HIV prevention; MSM; privacy; confidentiality

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Abstract

Development and Usability Testing of a Chatbot to Promote Mental Health Services Use Among Individuals With Eating Disorders Following Screening

Jilllian Shah[1], BS; Bianca DePietro[1], BA; Laura D'Adamo[1], BA; Marie-Laure Firebaugh[1], LMSW; Olivia Laing[1], MSW; Lauren A Fowler[1], PhD; Lauren Smolar[2], MA; Shiri Sadeh-Sharvit[3], PhD; Craig Barr Taylor[4], MD; Denise E Wilfley[1], PhD; Ellen E Fitzsimmons-Craft[1], PhD

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Abstract

Background: Eating disorders (EDs) are complex mental illnesses with debilitating, pervasive psychological and physiological consequences when left untreated. Unfortunately, patients may face barriers to receiving treatment, such as stereotypes surrounding EDs, denial of illness severity, lack of motivation for treatment, and lack of knowledge about treatment resources. Barriers such as these result in a large treatment gap: only 20% of those with EDs will ever receive treatment. Digital tools like chatbots show potential to disseminate mental health–related interventions to large populations while offering a user-friendly, cost-effective, accessible, and anonymous means of tackling patient concerns.

Objective: This study developed and evaluated the usability of a chatbot designed for pairing with online ED screening. The tool aimed to promote mental health service utilization by improving motivation for treatment and self-efficacy among individuals with EDs.

Methods: A chatbot prototype, Alex, was designed using decision trees and theoretically informed components: psychoeducation, motivational interviewing, personalized recommendations, and repeated administration. Usability testing was conducted over 4 iterative cycles, with user feedback informing refinements to the next iteration. Postintervention, participants (N=21) completed the System Usability Scale (SUS), the Usefulness, Satisfaction, and Ease of Use Questionnaire (USE), and a semistructured interview. This process aimed to create an optimized chatbot by the final cycle for use in a randomized trial.

Results: Interview feedback detailed chatbot aspects participants enjoyed and aspects necessitating improvement. Feedback converged on four themes: user experience, chatbot qualities, chatbot content, and ease of use. Following refinements, users described Alex as humanlike, supportive, and encouraging. Content was perceived as novel and personally relevant. USE scores across domains were generally above average (~5 out of 7), and SUS scores indicated “good” to “excellent” usability across cycles, with the final iteration receiving the highest average SUS score.

Conclusions: Overall, participants responded well in interactions with Alex, including the initial version. Refinements between cycles further improved user experiences. This study provides preliminary evidence of the feasibility and acceptance of a chatbot designed to promote motivation for and use of services among individuals with EDs. Alex is the first chatbot designed for pairing with an ED or other mental health–related online screen, with the goal of ultimately increasing service utilization.

Acknowledgments: This research was supported by K08 MH120341 from the National Institute of Mental Health.

Availability of Data, Materials, and Code: The data will be made available by reasonable request to the corresponding author.

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Authors' Contributions: EEFC conceptualized and designed the study. OL and BD conducted the investigation process. BD and JS assisted with data curation and conducted formal thematic analyses. JS conducted formal statistical analyses. JS wrote the original manuscript, with contribution from BD. EEFC, CBT, DEW, and SSS designed the data collection instruments, and coordinated and supervised data collection, in addition to reviewing and editing the manuscript with LS, LMF, LAF, and LD.

Conflicts of Interest: None declared.

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KEYWORDS

eating disorder; chatbot; mental health treatment; digital intervention; health screening; conversational agent; chatbot design; chatbot development; mHealth

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Abstract

Using a Private Facebook Group to Engage Low-Income Families With Young Children With Evidence-Based Nutrition and Dental Health Information

Rama Kattan[1], MS; Kate Killion[1], MPH, RD; Valerie Duffy[1], PhD, RD; Molly E Waring[1], PhD

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Abstract

Background: Low-income children in the United States have high rates of obesity and dental caries. Social media may be an efficient and accessible tool to engage individuals in relevant evidence-based nutrition and dental information and motivate healthier behaviors. Previous research on social media–delivered behavioral interventions suggests that engagement may vary by post type.

Objective: The aim of this study is to assess (1) engagement with moderator posts in a private Facebook group for caregivers of children aged 1-6 years from low-income communities by type of post, and (2) the proportion of caregivers who engaged with moderator posts within a sample 2-week period.

Methods: We enrolled 67 low-income caregivers of children aged 1-6 years from Connecticut in a private Facebook group. A moderator posted 5 posts per week that included evidence-based information to promote healthy diet and dental health in young children. Posts were polls, informational posts, healthy recipes, and open-ended questions. Informational posts focused on responsive feeding, healthier snacks, sugar-sweetened beverages, teeth brushing, and flossing. Polls solicited caregivers' interest in particular topics, which was used to guide future posts, and were intended to engage caregivers. Information provided was consistent with the 2020 Dietary Guidelines for Americans and post format was informed by the Information Motivation Behavior model. Facebook analytics provided interactions (replies, reactions, poll votes) and impressions on moderator posts from September 2021 to February 2022. We calculated the proportion of caregivers who engaged with moderator posts over a sample 2-week period (February 21 to March 4, 2022).

Results: Over 5 months, the moderator posted 110 posts. Polls (n=27) attracted the most engagement, with a median of 5 interactions (IQR 3-7, range 0-13) and a median of 24 impressions (IQR 22-27, range 20-41) per post. Informational posts (n=38) received a median of 1.5 interactions (IQR 1-3, range 0-5) and a median of 22 impressions (IQR 20-25, range 10-42) per post. Posts sharing recipes (n=28) had similar engagement with a median of 1 interaction (IQR 1-2, range 0-6) and a median of 21 impressions (IQR 18-24, range 11-32) per post. Posts with open-ended questions (n=17) had the lowest level of engagement with a median of 0.5 interactions (IQR 0-0.5, range 0-6) and a median of 19 impressions (IQR 17.5-24, range 16-27) per post. During the 2-week sampling period (n=10 posts), 58% of caregivers interacted with at least one moderator post.

Conclusions: Nearly 6 in 10 caregivers engaged in the group, and nonengaging caregivers may have benefited from involvement despite lack of visible engagement. Polls may be a more effective strategy to engage caregivers around child nutrition and dental health than informational posts or posts that ask caregivers open-ended questions about their experiences. Future research should use feedback from caregivers on posts with low engagement to revise posts to better engage caregivers.

Conflicts of Interest: None declared.

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Abstract

Effects of Movement-Based Interventions on Imitation and Praxis Skills in Children With Autism Spectrum Disorder: A Comparison of Face-to-Face Versus Telehealth Modes of Delivery

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Abstract

Background: Children with autism spectrum disorder (ASD) exhibit poor imitation, movement planning, and praxis skills that in turn compound their core social communication and behavioral difficulties.

Objective: Our randomized controlled trial compares the effects of 2 whole-body movement interventions (creative movement ["Play"] and general exercise ["Move"]) to those of a seated play standard-of-care intervention ("Create") on imitation and praxis skills in children with ASD. As part of this clinical trial, we also compare face-to-face (F2F) versus telehealth (TH) modes of intervention delivery in each of the three groups.

Methods: A total of 44 children with ASD aged between 5 and 14 years participated in this 10-week study. Children were matched at baseline and assigned to the Play, Move, or Create groups (n=14-15/group). Approximately half of the children in each group were seen F2F, while the other half were seen via TH. Training was provided 2 times/week (60-90 minutes/session) for 8 weeks. We administered the Bilateral Motor Coordination (BMC) and Postural Praxis (PP) subtests of the Sensory Integration and Praxis Test (SIPT) at pretest and posttest and assessed spatial and temporal errors in movement execution during both tests. We calculated the percent total imitation error score for both subtests.

Results: For the SIPT-PP, we found a reduction in percent total errors from pretest to posttest in the Play (pretest: mean 15.8%, SE 1.1%; posttest: mean 12.9%, SE 1.1%; $P \leq .05$), Move (pretest: mean 17.1%, SE 1.4%; posttest: mean 14.8%, SE 1.2%; $P \leq .05$), and Create groups (pretest: mean 16.5%, SE 1.5%; posttest: mean 12.7%, SE 1.7%; $P \leq .05$). There were no statistically significant differences in the percent reduction in total errors among children seen F2F versus via TH in the Play (F2F: mean 3.4%, SE 1.5%; TH: mean 2.4%, SE 2.1%; $P=.72$), Move (F2F: mean 2.6%, SE 1.6%; TH: mean 2.1%, SE 1.5%; $P=.84$), and Create groups (F2F: mean 6.1%, SE 1.2%; TH: mean 3.4%, SE 1.8%; $P=.22$). For the SIPT-BMC, children significantly reduced their percent total error scores from pretest to posttest in the Play group (pretest: mean 8.6%, SE 2.4%; posttest: mean 3.9%, SE 0.7%; $P \leq .05$) but not in the Move and Create groups. Specifically, children in the Play group improved on spatial errors (pretest: mean 9.1%, SE 1.9%; posttest: mean 5.4%, SE 1.2%; $P \leq .05$) and also showed a nonsignificant trend for improvement in temporal errors (pretest: mean 9.2%, SE 3.3%; posttest: mean 3.1%, SE 0.6%; $P=.06$). Similar to the SIPT-PP, we found no significant differences in the percent reduction in total errors among children seen F2F versus via TH (F2F: mean 2.0%, SE 1.5%; TH: mean 7.3%, SE 3.8%; $P=.23$).

Conclusions: Our pilot data suggest that imitation-based gross and fine motor training activities led to improved postural imitation skills in children with ASD across all 3 groups. However, only the Play group that received rhythmic movement practice improved on the BMC subtest of the SIPT. Our findings suggest that improvements in imitation and praxis skills are highly training-specific in children with ASD. The lack of significant differences between the F2F and TH modes across all groups suggests that TH could be a successful method of intervention delivery for promoting imitation and praxis skills in children with ASD.

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KEYWORDS

autism spectrum disorder; children; movement interventions; imitation; praxis

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Abstract

Effects of a Whole-Body General Movement Intervention on Motor Performance, Agility, and Locomotor Skills of Children With Autism Spectrum Disorder: Results From a Comparison Between Face-to-face and Telehealth-Based Intervention Delivery

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Abstract

Background: Children with autism spectrum disorder (ASD) demonstrate significant motor impairments in visuomotor and body coordination, agility, and strength. Around 87% of children with ASD are at risk for motor impairments. However, only about 31% of these children receive rehabilitation services to address their motor needs.

Objective: Our randomized clinical trial assessed the effects of a general movement (GM) intervention compared to a standard-of-care seated play (SP) intervention delivered to children via face-to-face (F2F) and telehealth (TH)–based modes of intervention delivery on motor performance, agility, and locomotor skills in children with ASD.

Methods: Thirty 5- to 14-year-old children were matched on age, gender, and level of functioning and randomly assigned to the GM or SP groups. Children participated in the study for 10 weeks with pretests and posttests conducted during the first and last weeks and training in the interim 8 weeks with 2 sessions conducted per week. The strength and running speed and agility subtests of Bruininks-Oseretsky Test of Motor Proficiency (BOT-2) and the locomotor subtest of the Test of Gross-motor development (TGMD) were administered at pretest and posttest. In addition, in the GM group, task-specific games involving locomotor skills were assessed during early and late training sessions for changes in movement form or accuracy and the amount of prompting required to complete the actions.

Results: We found significant improvements in standard scores of the TGMD from pretest to posttest in the GM group (pretest mean 6.1, SE 1.0; posttest mean 8.1, SE 0.9; $P<.001$) but not the SP group. Within the GM group, there were no significant differences in the rates of improvement for children seen F2F versus via TH (F2F mean 1.8, SE 0.8; TH mean 2.0, SE 1.7; $P=.87$). On the BOT-2, the GM (pretest mean 36.1, SE 2.6; posttest mean 40.9, SE 3.1; $P<.001$) but not SP group showed improvements in standard scores on the strength and agility composite. Similar to the trends reported above, there were no differences in the magnitude of improvement for children seen F2F versus via TH (F2F mean 3.7, SD 1.3; TH mean 5.6, SD 1.5; $P=.37$). On the training-specific test of locomotor skills, children in the GM group improved their movement accuracy (pretest mean 74.4, SE 6.2; posttest mean 86.5, SE 4.7; $P<.001$) and reduced prompting (pretest mean 22.5, SE 3.5; posttest mean 16.9, SE 4.2; $P=.02$) required to complete the movements. Both children seen F2F as well as via TH showed similar trends, with no significant differences between the intervention delivery modes.

Conclusions: Our data suggest that TH is an effective mode of delivery of gross motor interventions and can be used to promote agility and motor coordination in children with ASD.

Conflicts of Interest: None declared.

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KEYWORDS

autism spectrum disorder; children; motor skills; movement interventions; agility; locomotor skills; endurance; exercise

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Abstract

Development of a Digital Game Intervention Targeting Suicide Prevention in Adolescents Who Misuse Opioids

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Abstract

Background: Suicide is the second leading cause of death in adolescents aged 14-18 years. Adolescents who misused prescription opioids are more likely to experience suicidal thoughts and behaviors than adolescents who did not. Compelling evidence shows "serious games" (ie, games for a purpose other than solely entertainment) can promote healthy behaviors, reduce risk factors, enhance protective factors through skill-building, and target prevention.

Objective: Our primary objective was to design and develop a digital game intervention that models the process of a safety planning intervention. We explored peer and student perceptions around potential warning signs, coping strategies, and seeking help among youth who may be at greater risk of suicide due to misuse of opioids.

Methods: We conducted 8 focus groups with a total of 30 participants, including 9 high school–aged adolescents (aged 16-18 years), 8 college-aged youth (aged 18-21 years), and 13 providers, as well as 5 interviews with adults who had experience with opioids in their youth (aged 40-47 years) to inform the content of the digital game intervention. Focus groups and interviews were conducted via Zoom between February 2022 and April 2022. A semistructured focus group/interview guide was developed, pilot tested, and used in focus groups and interviews. The guides align constructs from the intersectional ecological model to better identify how to help students cope with social and cultural stressors and how to strengthen individual and community assets. Using this lens, questions were related to potential warning signs of emotional distress, coping strategies, and seeking help to prevent suicidal thoughts and behaviors among youth who misuse opioids. Focus groups and interviews were approximately 60-90 minutes. Debrief summaries were completed after each one. Participants received a $25 gift card and additional mental health and opioid misuse resources following the session. Focus groups and interviews were audiotaped and then transcribed.

Results: Findings will inform the development of a digital game intervention to prevent suicide among adolescents who misuse opioids. Salient themes were extracted from the focus groups and interviews. They include themes related to previous substance misuse, later diagnosis of a mental health disorder, grief, bullying, stigma, family dynamics, and the role of identity. Potential story lines will focus on improving one's self-esteem, managing conflict at home, navigating peer influence, addressing concerns about seeking help, and increasing access to resources for seeking help based on identity. Gameplay will incorporate techniques that enhance mindfulness, emotion regulation, interpersonal effectiveness, and distress tolerance from dialectical behavioral therapy for adolescents.

Conclusions: Digital game interventions may play a critical role in preventing suicide among youth who misuse opioids. Next steps include a pilot randomized controlled trial to evaluate the user experience, acceptability, and feasibility of the intervention in fall 2022.

Conflicts of Interest: None declared.

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KEYWORDS

suicide prevention; opioid misuse; digital game interventions

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Abstract

Can Gross Motor Skills Be Trained Through Telehealth-Based Training? Insights From a Randomized Controlled Trial of Creative Movement and Play-Based Interventions in Children With Autism Spectrum Disorder

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Abstract

Background: The motor trajectories of children with autism spectrum disorder (ASD) are often compromised, leading to difficulties in gross motor performance and locomotor skills by late childhood. Our past work has suggested that whole-body movement interventions using rhythmic contexts can facilitate gross motor skills in children with ASD.

Objective: This study compares the effects of whole-body movement interventions delivered face-to-face (F2F) versus via telehealth (TH) and compares these effects to those of a standard-of-care, seated play (SP) intervention on the gross motor performance of children with ASD.

Methods: A total of 45 children with ASD aged between 5 and 14 years were seen for 10 weeks, with pretests and posttests conducted during the first and 10th weeks. Children were matched based on age, gender, and level of functioning and then randomly assigned to the general movement (GM), creative movement (CM), or SP groups. An equal number of children in each group received the training via F2F and TH modes. Training was provided in 2 sessions per week for 8 weeks, with sessions lasting from 1 to 1.15 hours. The CM and GM groups received whole-body movement training, whereas the SP group engaged in tabletop activities. The gross and fine motor subtests (fine motor precision, fine motor integration, balance, bilateral coordination, running speed and agility, and strength) of the Bruininks-Oseretsky Test of Motor Proficiency were administered at pre- and posttest. We reported standard scores on body coordination, strength and agility, and fine manual control composites.

Results: The CM and GM groups showed significant improvements on the body coordination composite (CM group's scores—pretest: mean 35.3, SE 2.1; posttest: mean 40.5, SE 2.7; $P<.005$; GM group's scores—pretest: mean 38.1, SE 3.2; posttest: mean 44.7, SE 3.3; $P<.005$). The GM group's scores (pretest: mean 36.1, SE 2.6; posttest: mean 40.9, SE 3.1; $P<.001$) also improved on the strength and agility composite, and a trend for similar improvements was observed in the CM group's scores (pretest: mean 32.5, SE 2.4; posttest: mean 34.5, SE 2.7; $P=.09$). The SP group did not show any improvements on the gross motor composites. The SP group's scores instead showed significant improvements on the fine manual control composite (pretest: mean 36.4, SE 2.3; posttest: mean 41.6, SE 2.5; $P<.005$). Fine motor skills remained unchanged in the CM and GM groups. In each of the 3 groups, there were no significant differences in the amount of improvements (posttest − pretest) observed for children seen F2F versus via TH for the body coordination (CM group—F2F: mean 4.1, SE 2.6; TH: mean 5.4, SE 1.6; $P=.70$; GM group—F2F: mean 6.5, SE 2.7; TH: mean 5.6, SE 2.5; $P=.80$), strength and agility (CM group—F2F: mean 1.3, SE 1.4; TH: mean 2, SE 1.1; $P=.70$; GM group—F2F: mean 3.7, SE 1.3; TH: mean 5.6, SE 1.5; $P=.40$), and fine manual control composite standard scores (SP group—F2F: mean 2.2, SE 2.8; TH: mean 1.9, SE 1.2; $P=.80$).

Conclusions: The findings of our pilot study emphasize the importance of training gross and fine motor skills in children with ASD and suggest that virtual modes of intervention delivery can be used by movement clinicians to train these skills.

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Conflicts of Interest: None declared.

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KEYWORDS

autism spectrum disorder; motor performance; movement interventions; telehealth; gross motor skills; fine motor skills

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Abstract

Effects of a Whole-body General Movement Intervention on Functional Muscle Strength of Children With Autism Spectrum Disorder: Results From a Comparison of Face-to-face Versus Telehealth-Based Intervention Delivery

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Abstract

Background: Children with autism spectrum disorder (ASD) demonstrate impairments in postural strength and control, both of which are important for activities of daily living. With the onset of the COVID-19 pandemic, more focus has been placed on telehealth interventions.

Objective: Our randomized controlled trial assessed the effects of a general movement (GM) intervention compared to a standard-of-care seated play (SP) intervention delivered via face-to-face (F2F) and telehealth (TH)-based modes of intervention delivery in children with ASD.

Methods: Thirty 5- to 14-year-old children were matched at baseline and randomly assigned to the GM or SP groups. Children participated in a 10-week study with pretests and posttests conducted during the first and last weeks and training in the intermediate 8 weeks (2 sessions/week at 1.5 hours/session). The strength subtest of the Bruininks-Oseretsky Test of Motor Proficiency (BOT-2) and a custom-developed functional strength test were administered at pretest and posttest. In addition, we assessed functional strength using 15 upper and lower body exercises that were administered during early and late training sessions. All strength tests were coded for errors in movement form and movement quality during execution.

Results: On the BOT-2, the GM group (pretest: mean 8.3, SE 1.1; posttest: mean 10.31, SE 1.3; *P*=.007) but not the SP group showed improvements in scaled scores on the strength subtest. There were no differences in the amount of change for children seen F2F versus TH in the GM group (F2F: mean 2.3, SE 0.8; TH: mean 1.8, SE 0.9; *P*=.70). In the GM group, 77% of participants showed improvement in front raises and 50% improved on both sumo squats and donkey kicks. Of the 15 upper and lower body functional strength exercises performed, 7 provided significant results at a significance level of *P*=.05. For the upper body, these included back row (early: mean 81.3, SE 4.6; late: mean 57.0, SE 7.8; *P*=.01), spread your wings (early: mean 55.5, SE 6.0; late: mean 32.1, SE 5.4; *P*=.008), press ups (early: mean 72.1, SE 5.3; late: mean 46.8, SE 8.0; *P*=.01), and superman reach (early: mean 74.4, SE 2.8; late: mean 58.9, SE 6.8; *P*=.009). For the lower body, these included donkey kicks (early: mean 69.2, SE 2.9; late: mean 40.2, SE 6.0; *P*<.001), do-a-dot (early: mean 77.4, SE 3.3; late: mean 56.3, SE 6.3; *P*=.008), and superman kick (early: mean 71.9, SE 2.9; late: mean 49.8, SE 6.8; *P*=.008). Across all 7 moves, a comparable or higher proportion of children seen via TH showed improvement in movement performance scores compared to children seen F2F. For 6 of 7 movements, the mean reduction in percent movement performance errors (early vs late) was greater for children seen via TH compared to children seen via F2F. In addition, for superman kick (sk), donkey kick (dk), press ups (pu), and superman reach (sr) exercises, a higher proportion of children seen via TH compared to F2F improved movement performance error scores with training (sk: 80% TH vs 50% F2F; dk: 90% TH vs 60% F2F; pu: 100% TH vs 50% F2F; sr: 90% TH vs 25% F2F).

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Conclusions: Although preliminary, our data suggest that TH is an effective mode of delivery of gross motor interventions and can be used to promote functional upper and lower body muscle strength in children with ASD.

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KEYWORDS

autism spectrum disorder; functional strength; gross motor interventions

Multimedia Appendix 1
Outline of this study and figures of the results.
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Abstract

Keeping Telehealth an Equalizer in the Age of COVID-19

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Abstract

Background: Telehealth has historically been used to increase access to care for marginalized populations living in rural and underserved communities and those who require frequent medical care. Video visits have been used to address distance barriers for routine and specialty care, and remote patient monitoring has been used to help those with chronic medical conditions. However, following the COVID-19 pandemic, telehealth has become standard and is less likely to be used by the populations who could benefit most from its use.

Objective: This review aimed to evaluate whether telemedicine use is lower among patients without insurance, racial/ethnic minority individuals, and non–English-speaking patients.

Methods: From reviews of the literature and US data, comparisons of telehealth use between different populations were conducted. Utilization rates were compared between racial/ethnic groups (Black, Asian, and White; Hispanic and non-Hispanic) and among different telehealth use cases: on-demand, direct-to-consumer care; scheduled ambulatory video visits; and remote patient monitoring applications.

Results: Among telehealth users in the United States, the highest share of visits that used video services occurred among young adults aged 18-24 years (72.5%), those earning at least US $100,000 (68.8%), those with private insurance (65.9%), and White individuals (61.9%). Video telehealth rates were lowest among those without a high school diploma (38.1%); adults aged ≥65 years (43.5%); and Hispanic (50.7%), Asian (51.3%), and Black individuals (53.6%).

Conclusions: Telehealth use increased dramatically during the COVID-19 pandemic, but research suggests that access to telehealth was not equitable across different population subgroups. Following the pandemic, the use of telehealth has gone from a tool that was used to primarily address barriers in access among minority populations to a model of care that serves those who are better insured, English-speaking, and White. Interventions to address inequities involve payment policies, ambulatory operations, and investments in making telehealth more accessible by underserved populations.

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KEYWORDS

telehealth; equity

Conflicts of Interest

None declared.

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Abstract

Evaluation of a Tailored Digital Literacy Intervention in Affordable Older-Adult Housing: Case Study

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Abstract

Background: Older age, low socioeconomic status, living alone, and low English proficiency are independent factors associated with low information communication technology (ICT) use. Evidence-based interventions are needed to increase digital access and literacy among underrepresented groups.

Objective: This study aimed to increase the understanding of factors influencing ICT adoption and sustainable resources for training and support in affordable older-adult housing.

Methods: Broadband, tablet computers, training, and support were offered at 1 affordable older-adult housing community. Three 60-minute classes covered device basics, Google Translate, YouTube, and Zoom; in-language user guides were provided. Resident Ambassadors offered weekly in-language tech support. Mixed methods evaluation included surveys at entry, 30 days, and 90 days and key informant interviews.

Results: Overall, 72% (N=76) of residents participated. The average age was 78 (SD 8) years, and the participants were primarily Asian (62%), lived alone (68%), and had low English proficiency (65%). About half (49%) of the participants had less than a high school degree. Reasons to decline initial participation included: already owned another device, visual or cognitive challenges, or unwillingness to complete surveys. Of the participants, 89% attended at least 1 class and 37% attended all 3 classes. Over 90% of participants found the classes helpful, 87% found the user guide helpful, and 49% received help from a neighbor. At 30 and 90 days, 82% of the participants reported using their tablet at least twice per week for various activities. However, over half of participants reported the tablet was difficult to learn, and from 30 to 90 days, confusion and the fear of making mistakes when using the tablet slightly increased.

Conclusions: Overall, participants reported high satisfaction with the devices and tech support, although the decreasing comfort with technology over time indicates a need for additional training and ongoing support. This case study provides a model to increase ICT use among older adults in affordable older-adult housing communities.

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KEYWORDS

technology acceptance; digital literacy; digital divide; low-income; gerontology; gerontechnology; aged; emigrants and immigrants; poverty; computer literacy; evaluation; low English proficiency; information communication technologies; ICT use

Conflicts of Interest

None declared.

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Abstract

Technology-Based Innovative Health Care Solutions for Improving Maternal and Child Health Outcomes in Low- and Middle-Income Countries: Systematic Review and Network Meta-analysis

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Abstract

Background: Technology-based health care interventions (TBIs) are being considered as a promising solution to effectively strengthen maternal and child health (MCH) service uptake in resource-limited settings.

Objective: This study aimed to identify the most effective TBIs that could achieve the best functional MCH outcomes in low- and middle-income countries (LMICs).

Methods: A comprehensive search was performed in January 2021. In all, 2 independent researchers identified randomized controlled trials (RCTs) implemented in LMICs using the Population, Intervention, Comparison, Outcomes framework: Population: healthy pregnant women; Intervention: TBIs; Comparison: usual care or non-TBIs; and Outcomes: MCH outcomes. We estimated the direct, indirect, and relative effects, with their certainty based on the Grading of Recommendations, Assessments, Development, and Evaluations approach, for a wide range of MCH outcomes.

Results: In total, 30 trials with 70,807 participants were included, and 80% had low risk of bias. Our network meta-analysis (NMA) estimates indicated that TBIs, particularly SMS text messaging or phone call with mobile voucher interventions, were likely to be effective in improving MCH outcomes. The 1-way communication intervention was likely to be the most effective for the uptake of ≥4 antenatal care visits (relative risk [RR] 1.81, 95% CI 1.33-2.45; moderate certainty), facility delivery (RR 1.45, 95% CI 1.10-1.91; moderate certainty), early breastfeeding initiation (RR 1.18, 95% CI 1.02-1.37; moderate certainty), and caesarean delivery (RR 0.87, 95% CI 0.84-0.91; low certainty) outcomes; however, 2-way communication intervention was likely to be the most effective for the skilled birth attendance (RR 1.36, 95% CI 1.14-1.63; low certainty), maternal (RR 2.04, 95% CI 1.05-3.96; very low certainty) and infant's postnatal care use (RR 1.55, 95% CI 1.19-2.04; low certainty), exclusive breastfeeding practice (RR 1.53, 95% CI 1.14-2.05; moderate certainty), and perinatal death (RR 0.51, 95% CI 0.32-0.83; low certainty) outcomes. There was no substantial inconsistency between direct and indirect evidence, but small study effects were detected in the NMA.

Conclusions: Different forms of TBIs have a possibility to improve MCH outcomes in LMICs and can be integrated into the existing health systems based on their priorities. This study suggests the implementation of large-scale, well-designed RCTs in low-income countries due to the limited number of RCTs in the NMA.

Trial Registration: PROSPERO CRD42021239185; https://tinyurl.com/yuvmp35x

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KEYWORDS

technology-based interventions; mobile health; digital health; telehealth; eHealth; maternal and child health; systematic review; network meta-analysis; low- and middle-income countries

Conflicts of Interest

None declared.

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Abstract

Systematic Approaches for Telemedicine and Data Coordination for COVID-19 in Baja California, Mexico

Cristian Castillo Olea Jr[1], PhD; Carlos Vera Hernandez Sr[1], MSc, PhD; Amellaly Mendias Alarcon[1], MSc, PhD; Roberto Conte Galvan Sr[2], PhD

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Abstract

Background: In 2019, the State of Baja California had a total population of 3,682,063 inhabitants; in the city of Tijuana, there were only 13 Red Cross ambulances and 1 fire department ambulance to attend to the prehospital emergencies of almost 2 million inhabitants.

Objective: This study aimed to provide information to the public; evaluate COVID-19 in real time; and track regional, municipal, and state-wide data in real time that inform supply chains and resource allocation with the anticipation of a surge in COVID-19 cases.

Methods: Our model is based on human-centric design factors and cross-disciplinary collaborations for the scalable, data-driven enablement of smartphone teleconsultation technologies to link hospitals, clinics, and emergency medical services for point-of-care assessments of COVID-19 testing and subsequent treatment and quarantine decisions.

Results: The Telehealth System handled 28,964 telephone calls in the period from April 1, 2020, to January 30, 2022, and accumulated 20,287 working hours. In total, 13,721 follow-up calls were made to quarantined patients, providing medical and psychological counseling, and 12,643 calls were received and transferred from the 911 system, of which 4964 calls from patients with respiratory symptoms required urgent ambulance dispatch.

Conclusions: Telehealth offers capabilities for remote detection, care, and treatment to help with supervision, surveillance, discovery, and prevention, as well as to mitigate the effects of health care indirectly related to COVID-19.

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KEYWORDS

telemedicine; COVID-19; systems design; digital health

Conflicts of Interest

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Abstract

Digital Health for Vulnerable Populations: From Co-design to Scaling and Replication

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Abstract

Background: The COVID-19 pandemic has made it clear that technology access, digital literacy, and telehealth access have become more crucial than ever before. At the Center for Information Technology Research in the Interest of Society (CITRIS) at the University of California, 2 projects are focused on communities have the least access to quality health care services, including low-income workers in rural areas as well as low-income older adults in their community.

Objective: Co-designed technology innovation is a core competency of CITRIS Health. This presentation will focus on 2 of CITRIS Health's co-designed signature programs: ACTIVATE and Lighthouse. Co-designed innovations have the intended outcomes of improving access to technology, increasing technology literacy, and ultimately improving health outcomes.

Methods: Co-design refers to a participatory approach to designing solutions, in which community members are treated as equal collaborators in the design process—they give feedback, and they try out devices. It is part of an innovation process. Key components of a co-design process involve the following: intentionally involving users in designing solutions, postponing design decisions until after gathering feedback, synthesizing feedback from participants into insights, and developing solutions based on feedback.

Results: Both projects have undergone formal evaluations to assess the process of implementation as well as outcomes. Additionally, each project has a systematic process for monitoring its own implementation and key metrics. Common near-term outcomes include positive feedback from co-designers about the inclusivity of the design progress and optimism that technology selections, training, and interventions will lead to the intended outcomes.

Conclusions: Ultimately, the intention of these co-designed innovations is to create models that are feasible and sustainable. They will provide a roadmap for both public and private partners, setting a gold standard in California and across the nation.

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KEYWORDS

telehealth; co-design; health outcomes

Conflicts of Interest

None declared.

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Abstract

Telehealth Frontiers: Social Telerobots in Developmental and Behavioral Pediatrics

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Abstract

Background: COVID-19 has severely impacted health in vulnerable demographics. As communities transition back to in-person work, learning, and social activities, pediatric patients who are restricted to their homes due to medical conditions face unprecedented isolation. Prior to the pandemic, it was estimated that each year, over 2.5 million US children remained at home due to medical conditions. Confronting gaps in health and technical resources is central to addressing the challenges faced by children who remain at home. Having children use mobile telemedicine units (telerobots) to interact with their outside environment (eg, school and play, etc) is increasingly recognized for its potential to support children's development. Additionally, social telerobots are emerging as a novel form of telehealth. A social telerobot is a tele-operated unit with a mobile base, 2-way audio/video capabilities, and some semiautonomous features.

Objective: In this paper, we aimed to provide a critical review of studies focused on the use of social telerobots for pediatric populations.

Methods: To examine the evidence on telerobots as a telehealth intervention, we conducted electronic and full-text searches of private and public databases in June 2010. We included studies with the pediatric personal use of interactive telehealth technologies and telerobot studies that explored effects on child development. We excluded telehealth and telerobot studies with adult (aged >18 years) participants.

Results: In addition to telehealth and telerobot advantages, evidence from the literature suggests 3 promising robot-mediated supports that contribute to optimal child development—belonging, competence, and autonomy. These robot-mediated supports may be leveraged for improved pediatric patient socioemotional development, well-being, and quality-of-life activities that transfer traditional developmental and behavioral experiences from organic local environments to the remote child.

Conclusions: This review contributes to the creation of the first pediatric telehealth taxonomy of care that includes the personal use of telehealth technologies as a compelling form of telehealth care.

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KEYWORDS

telehealth; social robots; technology; human development; health equity

Conflicts of Interest

None declared.

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Abstract

Design and Development of an e-Learning Patient Education Program for Self-management Support in Patients With Rheumatoid Arthritis

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Abstract

Background: Patient education is integral to the treatment and care of patients with rheumatoid arthritis. Furthermore, change is taking place in the organization of health care systems because of a demographic shift toward aging populations and advancements in digital technologies, allowing for new interventions. However, evidence on how to provide web-based patient education within arthritis is limited.

Objective: This study aimed to develop an e-learning education program targeting patients with rheumatoid arthritis.

Methods: The development involved content specification and creative design with contributions from the investigators, patient research partners, and experts in communication, digital design, and e-learning. It was theoretically framed within theories of self-management and behavior change, multimedia learning, and entertainment education and empirically based on the evidence of patient education in rheumatoid arthritis and focus group discussions with patients, nurses, and rheumatologists. Finally, we conducted a feasibility test among 10 patients to assess the acceptability and usability of the program to identify areas to be adjusted.

Results: The 5 following themes for educational needs were found in focus group discussions: “Knowledge of rheumatoid arthritis,” “The disease course and prognosis,” “Medical treatment,” “A new life situation,” and “Daily life with rheumatoid arthritis.” Based on these themes, a didactic and entertaining e-learning program with a simple user interface was created. It consists of 3 modules covering the disease course, examinations, treatment, and daily life with rheumatoid arthritis. It combines animations, videos, podcasts, text, speech, and tests. The patients who tested the program found it to be feasible—that is, clear in content and easy to understand with a suitable pace and coherence between graphics, speech, and text.

Conclusions: This e-learning program is based on solid theoretical knowledge that meets users’ needs and is easy to use. Our study describes possible elements integrated in the development of web-based educational tools that can guide future development processes.

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KEYWORDS

rheumatoid arthritis; web-based patient education; e-learning; digital health tools; self-management

Conflicts of Interest

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Abstract

Digital Communication Between Patients and Health Care Professionals Across Disciplines and Sectors After Hospital Discharge: Facilitators, Barriers, and Effects

Lili Worre Høpfner Jensen[1,2], BSc, MSc; Birthe Dinesen[2], MSc, PhD; Søren Kold[1], MD, PhD; Ole Rahbek[1], MD, PhD

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Abstract

Background: Over the past decade, hospital admissions for patients undergoing orthopedic surgery have been shortened, and the time for informing and educating patients prior to discharge has been compromised. The transition of care from hospital to home poses a substantial risk of adverse events. Patients have difficulty remembering information and struggle to assess the severity of symptoms after discharge, leading to unplanned telephone contacts and clinic visits. These inquiries are frequent and pose a substantial burden on the health care system and patients. The COVID-19 pandemic showed an emerging need to implement new communication technologies. Asynchronous digital communication (DC) may provide easy access to health care and seamless communication across sectors.

Objective: This study aimed to investigate how DC can facilitate easy communication between patients and health care professionals (HCPs) across sectors and the effects of DC on patient-initiated telephone contacts after discharge.

Methods: The overall theoretical approach was inspired by Continuity of Care and the Consolidated Framework for Implementation Research. Substudy I was a scoping review on DC between patients and HCPs after hospital discharge. Substudy II explored DC in an orthopedic surgery setting and through a triangulation of qualitative data collection techniques. Substudy III investigated the effect of DC on patient-initiated telephone contacts after discharge.

Results: Preliminary findings from substudy I show that DC is increasingly used to support patient-provider communication after discharge. In substudy II, preliminary findings show that DC is feasible in a real-life setting, providing patients with easy access to HCPs, who accept and adapt DC to existing cross-sectoral workflows. However, barriers exist related to the technological integration between systems and individuals' hesitation to use DC. In substudy III, DC is to be tested in a randomized controlled trial.

Conclusions: This study generates new knowledge of asynchronous DC that may guide future implementations across the health care system.

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KEYWORDS

text messaging; communication; postoperative care; continuity of patient care

Conflicts of Interest

None declared.

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Abstract

Identifying Parental Needs When Caring for a Child or Adolescent With Cancer: Participatory Design Study

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Abstract

Background: Survival possibilities among children and adolescents (referred to as “children”) with cancer have increased, resulting in more children and parents living with sequelae and psychological distress, respectively. Childhood cancer treatment is intensive and long term and affects the everyday life and functioning of the whole family, including daily and social life restrictions and hospitalizations, which force the parents to split up between the hospital and home to care for both the ill child and siblings and manage their jobs and homelife routines. Adequate parental coping strategies are essential for family adjustment and the child’s coping ability. Parenting a child with cancer, however, is challenging and stressful.

Objective: This study aimed to identify parental needs when caring for a child with cancer.

Methods: Using a participatory design approach, we generated data through field studies and semistructured interviews with parents of children receiving treatment at Odense or Aarhus University Hospital and focus group interviews with parents of children who have completed treatment within the past 2 years.

Results: The parents felt trapped in an endless, emotional roller-coaster ride of fear, hope, grief, and mental and emotional exhaustion and had very limited resources for self-care. The presence of support from peers, health care providers, and relatives was a facilitator of successfully coping with the illness. In contrast, full-time isolation in the hospital, due to COVID-19 restrictions, was a barrier and linked with feelings of loneliness. Loneliness was also experienced as navigating difficult emotions when responding differently from the spouse or not feeling understood by relatives.

Conclusions: Parents of children with cancer face many stressors that may become a psychological burden. New innovative approaches to provide psychosocial support, taking into account that the families are periodically isolated, are needed. For this goal, technological solutions may be useful and should be the focal point of this study’s experimental design phase.

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KEYWORDS

pediatric cancer; parental caregiving; participatory design

Conflicts of Interest

None declared.

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Abstract

Integrating Psychosocial Aspects in Digital Solutions

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Abstract

Background: The design and development of digital health platforms do not routinely incorporate psychosocial aspects and theory that may increase engagement and motivation for using the digital solution. However, emerging evidence suggests that when integrating both theory and psychosocial aspects in the design process, the resulting digital health platforms may be superior in engaging and motivating patients to use them.

Objective: The objective of our study was to give an overview of how and why integrating psychosocial aspects in digital solutions may be essential to engaging and motivating patients to use digital solutions.

Methods: We conducted a brief narrative review of studies integrating psychosocial aspects and theory in the design and development of digital solutions for telerehabilitation.

Results: In the studies identified, self-determination theory, incorporating the patient's perspective, and using behavioral or psychological interventions on digital platforms are among some of the theoretical and psychosocial aspects that have already been used to design and develop digital solutions for telerehabilitation.

Conclusions: Based on the literature, it is argued that integrating psychosocial aspects and theory in the design and development of digital solutions for telerehabilitation may result in platforms of increased value to both health providers and patients.

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KEYWORDS

digital health; psychology; psychosocial; digital solutions

Conflicts of Interest

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Abstract

The Heart Game: A New Tool for Digital Patient Education for Patients With Heart Failure

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Abstract

Background: The COVID-19 pandemic has shown the need for new ways to perform remote patient education. Patients with heart failure are associated with a high readmission rate. Rehabilitation can prevent hospital readmissions, but there is poor participation in rehabilitation of patients with heart failure. Based on user-driven innovation in the Future Patient research project, we have developed the prototype of the digital Heart Game. The Heart Game is a new approach to digital patient education, where patients can access a digital board game via an app; through the board game, they can be presented with quizzes, activities, and reflection questions, all related to heart failure.

Objective: The objective of our study was to assess the usability of the Heart Game prototype app.

Methods: A total of 6 patients with heart failure were recruited. Think-aloud test, where participants were observed during play and sound and iPad screens were recorded, was conducted, followed by a questionnaire immediately after playing. Finally, an interview (n=6) was carried out. Qualitative data were analyzed in NVivo software (version 12.0).

Results: In total, 6 patients with heart failure (83% male; mean age 66 years) participated in the think-aloud tests. One participant did not complete the game. The game duration was from 9 minutes and 14 seconds to 16 minutes and 13 seconds. Findings from the think-aloud tests were shown in themes: digital games are a new world; practice makes perfect; the Heart Game is illogical; tasks are not generalizable, in understandable formulations, or entertaining; and the Heart Game is relevant, fun, and entertaining to play.

Conclusions: The usability of the Heart Game shows opportunities for digital patient education. However, there are some challenges in the prototype with illogical game structures in the board game. Further test and development of the prototype needs to be performed.

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KEYWORDS

telehealth; digital patient education; heart failure; game prototype

Conflicts of Interest

None declared.

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Abstract

Measuring Client Satisfaction With Digital Services: Validity and Reliability of a Short-Form Digital Tool

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Abstract

Background: Because of the COVID-19 pandemic's preventive measures, mental health care services were forced to reorganize and develop remote telehealth services. This led to newer modes of receiving treatment, both internet-based and video-based therapies, to meet patients' need for help, while at the same time keeping the COVID-19 pandemic under control. This shift calls for an evaluation of the patient experience during times of increased use of novel approaches of receiving treatment. Brief evaluation forms are ideal for this purpose.

Objective: As there are no validated brief measurement tools to evaluate patient-reported experiences in Norwegian mental health settings, we aimed to explore the internal consistency and factor validity of the 4-item self-administrated Client Satisfaction Questionnaire (CSQ-4).

Methods: We examined the internal consistency and factor structure of a brief digitally administrated patient satisfaction measure in a sample of 145 outpatients in Norwegian mental health settings during the COVID-19 pandemic.

Results: The internal consistency of a digital Norwegian CSQ-4 was high, with a Cronbach α of .92. A clear unidimensional structure (eigenvalue=3.22), which explained 80.4% of the variance, emerged from our data. A Mann-Whitney *U* test found a nonsignificant difference in satisfaction between genders (U=2546.5; P=.17). A Spearman rank correlation between satisfaction and age in our data was not statistically significant (r_{144}=.110, P=.19).

Conclusions: A measurement tool such as the CSQ-4 would be a valuable resource to improve the development and application of digital mental health services. Our results may support the use of the Norwegian CSQ-4 as a valid and reliable measure of satisfaction with mental health care services. In addition, as the CSQ-4 is a short-form and generic tool, it can be implemented in a wide range of routine evaluations of patient-reported satisfaction with telehealth services.

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KEYWORDS

digital mental health services; patient satisfaction; telehealth; reliability; validity; patient-reported experience; digital health care; scale development

Conflicts of Interest

None declared.

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Abstract

Future Patient: Telerehabilitation of Patients With Heart Failure Empower Patients

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Abstract

Background: Heart failure is one of the most common cardiovascular diseases that causes mortality, and patients' participation in rehabilitation programs is often low. During the COVID-19 pandemic, the Future Patient Telerehabilitation Program developed for patients with heart failure offered a new approach. The aim of the Future Patient program has been to increase the quality of life and educate patients to monitor any worsening of their symptoms. Patients used self-tracking devices for monitoring their physical activity, blood pressure, sleep, respiration, and pulse, with their data transmitted to a shared web platform (called the Heart Portal), which could be accessed by patients, their relatives, and health care professionals across sectors.

Objective: The aim of this paper is to determine whether the Future Patient Telerehabilitation Program has increased the quality of life of patients with heart failure and to empower them to manage their own disease.

Methods: A randomized controlled trial (n=140) was conducted. Data from the intervention group (n=70, 50%) on patient-reported outcomes were collected and analyzed using the Kansas City Cardiomyopathy Questionnaire and Spiegel Sleep Questionnaire. Semistructured interviews with 12 patients (n=6, 50% men and n=6, 50% women) were conducted and analyzed.

Results: The patients participating in the Future Patient program experienced a significant increase in clinical and social well-being as well as in quality of life. The patients participating in the program articulated their experiences in terms of the following themes: a sense of security and an increased sense of empowerment in managing their disease using the Heart Portal. The Heart Portal proved to be a valuable tool for remote monitoring and better communication with health care professionals across sectors.

Conclusions: Telerehabilitation of patients with heart failure can improve their quality of life and empower them to manage their own disease remotely.

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KEYWORDS

telerehabilitation; heart failure; cardiovascular disease

Conflicts of Interest

None declared.

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Abstract

Video Consultations in General Practice: Tendencies and Lessons Learned From the First COVID-19 Lockdown Period

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Abstract

Background: Video consultation was urgently introduced in general practice in connection with the COVID-19 pandemic, where a rapid implementation ensured patients' continued access to their general practitioner (GP). With the Danish lockdown in March 2020, the use of video consultations in general practice increased drastically and then declined significantly shortly after as society gradually reopened. Today, only a small proportion of the total number of consultations in general practice is made up of video consultations, and there is great variation in the scope and use of video consultation among GPs and practice staff.

Objective: The aim of this paper is to present research findings from a qualitative, interdisciplinary project, investigating GP and patient experiences with video consultations during the first lockdown period in 2020, which might help explain the abovementioned tendencies in relation to scope and implementation variances.

Methods: The data corpus includes data generated through semistructured interviews with 27 patients and 15 GPs, as well as 8 video recordings of video consultations between GP and patient.

Results: The patients reported positive experiences with consulting their GP through video, valuing increased convenience and spatial flexibility and wishing for future use of video consultation as either a supplement or an alternative to physical consultation. Video consultation furthermore presented a new communicative context in which both patients and GPs enacted distinct forms of technologically facilitated participation.

Conclusions: To further the best use of video consultation in future general practice, organizational and individual factors such as renumeration, task delegation, time pressure, and professional identity need to be considered.

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KEYWORDS

video consultation; general practice; Denmark; COVID-19; qualitative research

Conflicts of Interest

None declared.

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Abstract

Impact of Digital Literacy Levels of Health Care Professionals on Perceived Quality of Care

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Abstract

Background: Multiple digital technologies were used during and after the COVID-19 pandemic with an intent to improve quality of patient care. It has been seen that the perception of patients toward the use of digital solutions in clinical care varies significantly. This has also been attributed to varying levels of digital literacy among the health care professionals (HCP) involved in patient care.

Objective: Our paper aims to study the impact of digital literacy levels of HCPs, including hospital attendants and support staff who were involved in a clinical care team of COVID-19 patients, so that barriers toward the implementation of digital health solutions could be identified.

Methods: A standardized survey using responses based on Likert scale was developed, which measured the confidence levels of HCPs and their attitudes toward digital technologies. The survey consisted of questions from the Technology Acceptance Model as well as the unified theory of acceptancy and use of technology to assess the attitude of HCPs. A total of 100 Hospital attendants directly employed in patient care were enrolled in the study. They were also asked to respond to feedback received from patients on the perceived quality of care.

Results: Around 60% of the HCPs showed high digital literacy levels. Most respondents showed confidence in the use of technology. Moreover, around 20% of HCPs showed apprehension toward using digital solutions for direct patient care. A significant difference was found between study population with high digital literacy and perceived quality of care.

Conclusions: Our study found that poor digital literacy in HCPs adversely affects the safety and quality of patient care. It is important that institutions provide targeted education and training to not only doctors and nursing staff but also other support staff with low digital literacy levels and to boost their confidence in providing clinical care.

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KEYWORDS

digital health literacy; technology acceptance model; quality of care

Conflicts of Interest

None declared.

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Abstract

Sundhed.dk and MyHealth During the Corona Storm

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Abstract

Background: The Danish eHealth portal, sundhed.dk, pioneers open access to medical records since 2003 and is, in this regard, unique worldwide. As part of the Danish health care sector, sundhed.dk supports transparency and patient empowerment and provides health professionals with the possibility to access patient health data outside of local systems and across sectors and boundaries. Sundhed.dk and the MyHealth app have played a crucial role during the COVID-19 pandemic in Denmark, not least due to the development of the corona passport.

Objective: The overall purpose during the COVID-19 pandemic has been to assist the health authorities handling the pandemic and to support patient empowerment. Sundhed.dk provided new digital services to support monitoring the spread of the virus and telemedicine solutions to support the Danish citizens both during isolation and as the society was gradually reopening.

Methods: By exploiting sundhed.dk's known and widespread position in the society and the already existing digital building blocks, sundhed.dk and MyHealth managed to provide fast and easy access to COVID-19 laboratory responses and, on top of that, to develop the corona passport, which was the result of accelerated IT development and fast scaling of the required server with the users.

Results: The many digital services accessible through sundhed.dk or MyHealth made it possible for Danish citizens to continue to see their doctor or physiotherapist during lockdown. Moreover, the corona passport made the safe and efficient reopening of Denmark possible.

Conclusions: The story of sundhed.dk during the COVID-19 pandemic is a story of success, a result of its close interdisciplinary and cross-sectoral cooperation with Danish health authorities and private IT vendors. It illustrates what can be achieved when there is a unified blueprint and overall purpose to overcome barriers in order to ensure development and progress for both the individual and the society. This has also drawn global attention, as reflected in a report by the World Health Organization.

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KEYWORDS

e-learning; eHealth; medical records

Conflicts of Interest

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