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Конфликт интересов. *Все авторы заявляют об отсутствии потенциального конфликта интересов, требующего раскрытия в данной статье.*
Вклад авторов. *Все авторы внесли равноценный вклад в разработку концепции, выполнение, обработку результатов и написание статьи.*
Авторами заявлено, что данный материал ранее не публиковался и не находится на рассмотрении в других издательствах.
Финансирование. *Отсутствует.*

Статья поступила: *10.10.2023.*
Принята к публикации: *11.12.2023.*

УДК 616-01 **DOI: 10.24412/2790-1289-2023-4-73-80**
МРНТИ: 76.29.45

UNVEILING CHALLENGES AND OPPORTUNITIES: EXAMINING COVID-19'S EFFECTS ON DIGITAL HEALTH RESEARCH INITIATIVES IN SOUTH ASIA

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Abstract

The purpose of this study was to assess and contrast the volume and viability of digital health initiatives in the South Asia region both before the onset of the COVID-19 pandemic and during its course.

Materials and methods. To achieve this objective, a two-fold methodology was employed. Firstly, a descriptive analysis was conducted on digital health research articles published from 2016 to 2021 in South Asia. This analysis involved stratifying research articles based on the diseases and conditions they addressed, the geographical areas of focus, and the tasks for which the initiatives were applied. Secondly, the study introduced a straightforward and replicable tool, developed by the authors, to evaluate the sustainability of digital health initiatives. This tool utilized experimental or observational study designs for assessment.

The findings from the descriptive analysis revealed significant insights, including a 40 % increase in the number of studies reported in 2020 compared to 2019. Noteworthy areas of focus included Health Systems Strengthening, Ophthalmic Disorders, and COVID-19. Additionally, the top three commonly developed tools were identified as Remote Consultation, Health Information Delivery, and Clinical Decision Support Systems.

The inter-rater operability of the sustainability assessment tool was meticulously developed and estimated, resulting in a Kappa value of 0.806 (±0.088).

In conclusion, our study indicates a positive impact of the COVID-19 pandemic on digital health research. This is evidenced by an upswing in the number of digital health initiatives and an enhancement in the sustainability score of studies published during the COVID-19 period.

Keywords: *Digital healthcare, South Asia, COVID-19, Descriptive analysis, Sustainability assessment, Health Systems Strengthening, Kappa value.*

Introduction

The Global Digital Health Strategy 2020-25, as defined by the World Health Organization (WHO), lays the foundation for a transformative approach to healthcare through the effective integration of digital technologies. According to the WHO, digital health is a comprehensive field dedicated to the development and deployment of digital tools and technologies to augment and improve health outcomes [1; 2].

A pivotal framework in understanding the diverse facets of digital health initiatives is the FITT framework proposed by Ammenwerth et al. This framework categorizes digital health endeavors into three overarching tasks: Health Information Exchange, Data Science, and Surveillance [3; 4]. These tasks collectively contribute to the evolution of healthcare systems by enhancing information sharing, leveraging data for insights, and bolstering surveillance capabilities.

The WHO's vision, as articulated in its Global Digital Health Strategy, underscores the commitment to advancing global health by accelerating the adoption of person-centric, accessible, affordable, scalable, and sustainable digital health solutions. This visionary document delineates strategic objectives that include the institutionalization of digital health practices, the formulation of an integrated strategy for success, promotion of judicious technology utilization, and targeted efforts to overcome challenges faced by the least developed countries in embracing digital health innovations.

One of the fundamental pillars of the WHO's strategy is the institutionalization of digital health, emphasizing the need for incorporating digital solutions seamlessly into existing healthcare structures. This involves not only the deployment of technologies but also the establishment of policies, standards, and frameworks that facilitate the harmonious integration of digital health into routine healthcare practices.

An integrated strategy for success is another key aspect highlighted in the Global Digital Health Strategy. Recognizing the interconnected nature of healthcare systems, the WHO emphasizes the importance of cohesive and collaborative efforts among stakeholders. This integration spans across sectors, encompassing governments, healthcare providers, technology developers, and communities, with the goal of creating a holistic and interoperable digital health ecosystem.

Promoting appropriate technology use is a strategic imperative in the WHO's vision, acknowledging that the success of digital health initiatives depends on the judicious selection and application of technologies. This involves considering the context-specific needs of diverse populations, ensuring that digital solutions align with the cultural, social, and economic landscapes of the communities they aim to serve.

Addressing obstacles faced by least developed countries is a crucial element of the WHO's strategy, reflecting a commitment to global inclusivity. Recognizing that digital health advancements should not exacerbate existing disparities, the strategy outlines measures to support less economically developed nations in overcoming challenges such as infrastructure limitations, resource constraints, and workforce capacity issues.

In essence, the Global Digital Health Strategy 2020-25 by the World Health Organization provides a comprehensive roadmap for leveraging digital technologies to enhance healthcare on a global scale. By prioritizing person-centric, accessible, affordable, scalable, and sustainable solutions, and addressing challenges faced by diverse nations, this strategy envisions a future where digital health plays a pivotal role in advancing the well-being of populations worldwide.

The COVID-19 pandemic profoundly disrupted global healthcare systems, diverting resources towards controlling the outbreak and impacting routine healthcare services [5; 6]. Amidst this disruption, digital health initiatives played a crucial role, evident in a significant increase in research papers indexed in PubMed – 264 in 2020 compared to 82 in 2019 from the South Asia region. This three-fold rise indicates growing interest from medical practitioners, researchers, and academicians in countries like India, Bangladesh, Vietnam, Thailand, Sri Lanka, and Indonesia.

While the increase in quantity aligns with the global digital health vision, the proposed situational analysis delves into two critical aspects often explored to a limited extent: the quality of research and key steps taken in the development phase to ensure sustainability [6; 7].

This research paper systematically analyzes the change in digital health research patterns in South Asian countries, home to about a quarter of

the world's population. The objective is to evaluate and compare the quantity and sustainability of digital health initiatives in the South Asia region before and during the COVID-19 pandemic. Through a comprehensive review of published literature, this study aims to shed light on evolving trends in digital health research, providing valuable insights into the impact of the pandemic on the region's healthcare landscape [8-12].

Materials and Methods

• Comprehensive review of digital health research articles from 2016 to 2021 in South Asia.

• Stratification of the articles based on diseases, geographical areas, and tasks, employing quantitative and content analysis

Results and Discussion

A) Descriptive Analysis:

• Research trends: The number of research articles published on digital health has steadily increased from 2016 to 2020, with a 40 % increase in 2020 compared to 2019, likely due to the COVID-19 pandemic.

• Study design: Review articles and guidelines dominated the research landscape, followed by letter to editors and correspondence, with experimental studies and cohort studies increasing in number.

• Targeted diseases and conditions: Health systems strengthening, ophthalmic disorders, and COVID-19 were the top three areas where digital health initiatives were focused.

• Digital tools: Health information exchange (HIE) was the most common tool used across all conditions, while data science and surveillance tools were more prevalent for specific conditions.

B) Assessment of Sustainability:

• Validation of the sustainability assessment tool: The tool demonstrated good inter-rater reliability, indicating its consistency and replicability.

• Overall sustainability: Experimental and cohort studies had higher average sustainability scores compared to cross-sectional and diagnostic studies.

• Factors contributing to sustainability: Multisectoral teams, stakeholder engagement, adherence to standards, feedback collection, and gap analysis were identified as key factors contributing to sustainability.

• Impact of COVID-19: Studies conducted during the pandemic generally showed better sustainability compared to those conducted pre-pandemic. This was particularly evident in cross-sectional studies.

Additional key points:

• The study used the FITT framework to classify digital tools based on their tasks (e.g., health information exchange, data science, surveillance).

• The authors highlight the importance of considering sustainability when developing and implementing digital health initiatives.

• Overall, the study provides valuable insights into the current state of research on digital health and highlights the importance of sustainability in ensuring long-term success of digital health initiatives.

Conclusions

In the aftermath of the COVID-19 pandemic, our research findings posit a compelling narrative that suggests a silver lining amidst the myriad challenges faced globally. Specifically, we observe a notable surge in digital health research initiatives originating from South Asia, signaling a region-wide response to the evolving healthcare landscape. What distinguishes this surge is not only its quantitative increase but also the emergence of a profound, long-term vision among researchers for the continued advancement of digital health endeavors [12-15].

Crucially, as we celebrate this surge in digital health research, it becomes imperative to deliberate on strategies for sustaining the momentum and interest cultivated during the pandemic, extending its influence into the post-pandemic era. Our sustainability analysis underscores the optimistic outlook, expressing confidence in researchers' capacity to nurture and propel the envisioned longevity of these initiatives well beyond the immediate crisis [15-21].

However, the realization of this optimistic vision is contingent upon various extrinsic factors that exert significant influence. Among these factors, the availability of skilled manpower stands out as a key determinant. The cultivation and retention of a workforce well-versed in digital health technologies are pivotal for driving sustained progress in this field. Equally crucial is the establishment of a supportive policy environment that encourages innovation, facilitates collaboration, and provides a regulatory framework conducive to the growth of digital health initiatives.

Moreover, the accessibility of the internet and hardware among the target population emerges as another critical factor in determining the trajectory of digital health research post-pandemic. Bridging the digital divide and ensuring that digital health solutions are inclusive and accessible to diverse communities is paramount for achieving meaningful and equitable outcomes.

As we navigate the evolving landscape of post-pandemic digital health research, it becomes increasingly evident that the lasting impact of the pandemic on this field is contingent upon a multifaceted interplay of these external elements. Collaborative efforts from governments, research institutions, and the private sector will be instrumental in addressing these challenges and fostering an environment where digital health can thrive as a transformative force in global healthcare.

In conclusion, the COVID-19 pandemic, despite its adversities, has catalyzed a positive influence on digital health research. The surge in initiatives, coupled with a newfound long-term vision among researchers, presents an opportunity to reshape and enhance healthcare delivery. Nurturing this momentum into the post-pandemic era requires concerted efforts to address challenges such as skilled manpower, supportive policies, and digital accessibility, ultimately ensuring that the digital health revolution becomes a sustained and inclusive reality.

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РАСКРЫТИЕ ПРОБЛЕМ И ВОЗМОЖНОСТЕЙ: АНАЛИЗ ВОЗДЕЙСТВИЯ COVID-19 НА ИССЛЕДОВАТЕЛЬСКИЕ ИНИЦИАТИВЫ В ОБЛАСТИ ЦИФРОВОГО ЗДРАВООХРАНЕНИЯ В ЮЖНОЙ АЗИИ

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Аннотация

Целью данного исследования было оценить объем и жизнеспособность инициатив в области цифрового здравоохранения в регионе Южной Азии как до начала пандемии COVID-19, так и в ходе ее развития.

Материалы и методы. Для достижения этой цели была использована двухэтапная методология. Во-первых, был проведен описательный анализ научных статей по цифровому здравоохранению, опубликованных в Южной Азии с 2016 по 2021 год. Этот анализ включал стратификацию научных статей по заболеваниям и состояниям, которые они рассматривали, географическим областям фокуса и задачам, для которых применялись инициативы. Во-вторых, в рамках исследования был представлен простой и повторяемый инструмент, разработанный авторами, для оценки устойчивости инициатив в области цифрового здравоохранения. Данный инструмент использовал экспериментальные или наблюдательные методы оценки.

Результаты. Результаты описательного анализа выявили значительные инсайты, включая увеличение на 40% числа исследований в 2020 году по сравнению с 2019 годом. Заметные области фокуса включали укрепление систем здравоохранения, офтальмологические расстройства и COVID-19.

Кроме того, выявлены три наиболее часто разрабатываемых инструмента: удаленная консультация, доставка здравоохранительной информации и системы поддержки клинических решений. Межоценочная операбельность инструмента оценки устойчивости была тщательно разработана и оценена, что привело к значению Каппа 0,806 (±0,088).

Заключение. Наше исследование указывает на положительное воздействие пандемии COVID-19 на исследования в области цифрового здравоохранения. Это подтверждается ростом числа инициатив в области цифрового здравоохранения и улучшением показателей устойчивости исследований, опубликованных в период COVID-19.

Ключевые слова: *цифровое здравоохранение, Южная Азия, COVID-19, описательный анализ, оценка устойчивости, укрепление систем здравоохранения, значение Каппа.*

ҚИЫНДЫҚТАР МЕН МҮМКІНДІКТЕРДІ АШУ: ОҢТҮСТІК АЗИЯДАҒЫ ЦИФРЛЫҚ ДЕНСАУЛЫҚТЫ ЗЕРТТЕУ БАСТАМАЛАРЫНА COVID-19 ӘСЕРІН ТАЛДАУ

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Аңдатпа

Бұл зерттеудің мақсаты – COVID-19 пандемиясы басталғанға дейін де, оның дамуы барысында да Оңтүстік Азия аймағындағы цифрлық денсаулық сақтау саласындағы бастамалардың көлемі мен өміршеңдігін бағалау болды.

Материалдар және әдістері. Бұл мақсатқа жету үшін екі кезеңді әдістеме қолданылды. Біріншіден, 2016 жылдан 2021 жылға дейін Оңтүстік Азияда жарияланған цифрлық денсаулық сақтау саласындағы ғылыми мақалаларға сипаттамалық талдау жасалды. Бұл талдауға олар қарастырған аурулар мен жағдайлар, фокустың географиялық аймақтары және бастамалар қолданылатын міндеттер туралы ғылыми мақалалардың стратификациясы кірді. Екіншіден, зерттеу цифрлық денсаулық бастамаларының тұрақтылығын бағалау үшін авторлар әзірлеген қарапайым және қайталанатын құралды ұсынды. Бұл құрал эксперименттік немесе бақылаушы бағалау әдістерін қолданды.

Нәтижесі. Сипаттамалық талдау нәтижелері айтарлықтай инсайттарды, соның ішінде 2019 жылмен салыстырғанда 2020 жылы зерттеулер санының 40 %-ға өсуі. Фокустың көрнекті аймақтарына Денсаулық сақтау жүйесін нығайту, офтальмологиялық бұзылулар және COVID-19 кірді.

Сонымен қатар, ең жиі әзірленетін үш құрал анықталды: қашықтықтан кеңес беру, денсаулық сақтау туралы ақпаратты жеткізу және клиникалық шешімдерді қолдау жүйелері. Тұрақтылықты бағалау құралының бағалауаралық жұмыс қабілеттілігі мұқият әзірленді және бағаланды, нәтижесінде Каппа мәні 0,806 (± 0,088) болды.

Қорытынды. Біздің зерттеуіміз COVID-19 пандемиясының цифрлық денсаулық сақтау саласындағы зерттеулерге оң әсерін көрсетеді. Бұл цифрлық денсаулық сақтау бастамаларының өсуімен және COVID-19 кезеңінде жарияланған зерттеулердің тұрақтылық көрсеткіштерінің жақсаруымен расталады.

Түйін сөздер: *сандық денсаулық сақтау, Оңтүстік Азия, COVID-19, сипаттамалық талдау, тұрақтылықты бағалау, Денсаулық сақтау жүйесін нығайту, Каппа маңызы.*

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Conflict of interest. *All authors declare that there is no potential conflict of interest requiring disclosure in this article.*
Contribution of the authors. *All authors have made an equal contribution to the development of the concept, implementation, processing of results and writing of the article. Authors are declared that this material has not been published before and is not under consideration by other publishers.*
Financing. *None.*

Article submitted: *10.10.2023.*
Accepted for publication: *11.12.2023.*