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Assessing the Landscape of Telehealth Interventions for Women's Health: An Umbrella Review of Recent Advances Post-Pandemic

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Abstract. This umbrella review aims to provide a comprehensive overview of the use of telehealth services for women after the COVID-19 pandemic. The review synthesizes findings from 21 reviews, covering diverse topics such as cancer care, pregnancy and postpartum care, general health, and specific populations. While some areas have shown promising results, others require further research to better understand the potential of digital health interventions. The review identifies gaps in knowledge and highlights the need for more rigorous and comprehensive research to address the limitations and gaps identified in the current evidence base. This includes prioritizing the use of standardized guidelines, quality assessment tools, and meta-analyses, as well as exploring the comparative effectiveness of different digital health interventions, the experiences of specific populations, and the cost-effectiveness of these technologies. By addressing these gaps, this umbrella review can inform future research and policy decisions, ultimately improving women's health outcomes in the post-pandemic era.

Keywords. Telehealth, Women's health, mHealth applications, Post-COVID-19

1. Introduction

Telehealth, defined as the use of information and telecommunications technology in healthcare delivery to provide remote healthcare services and clinical information [1], has seen a dramatic rise in use during the COVID-19 pandemic. The widespread adoption has primarily been driven by the implementation of physical distancing measures and restrictions on in-person healthcare visits [1]. Acting as an alternative way to provide healthcare services, telehealth minimizes the risk of exposure to the virus [2]. Observations reveal that women, in particular, show a higher demand for telehealth services. The reasons behind this increased need range from frequent hospital visits for reasons such as pregnancy, childbirth, and reproductive health issues, to being disproportionately affected by the pandemic in terms of infection rates and caregiving burden [3]. These conditions make accessible healthcare services vital for women [3].

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There are numerous studies that have highlighted the increased adoption and potential of telehealth services during and post-pandemic [1].

Particularly for women, who have been disproportionately affected by the pandemic, these services have proven to be an advantageous solution [2]. Despite this, a comprehensive review of the impact and potential of these services is yet to be done. This points to a need for an umbrella review to summarize all the existing systematic reviews investigating the use of telehealth services for women after the COVID-19 pandemic. Such a review can provide a comprehensive overview of the available evidence and help identify gaps in knowledge that need further investigation [4].

In this paper, we aim to conduct an umbrella review of the use of telehealth services for women post-pandemic. The review will evaluate the safety, implementation, and perceptions of these services, while identifying any existing gaps in knowledge that warrant further research [4]. This endeavor will provide a comprehensive understanding of the recent developments in telehealth for women after the pandemic, thereby guiding future research and informing policy decisions.

2. Method

This umbrella review followed established methodological guidelines for conducting and reporting an umbrella review [5]. The search was conducted in two databases, PubMed and Scopus, using the search terms "Telemedicine" OR "Telehealth" AND "Women" OR "Women's Health" OR "Female" AND "Review". The search was limited to the first quarter of 2023, from January to April. The inclusion criteria for the studies were that they should focus on telehealth services for women post the COVID-19 pandemic, they should be reviews published in English, and they should report on the safety, implementation, and perceptions of telehealth services. The exclusion criteria included studies that did not focus on telehealth services for women, studies that were not reviews (e.g., original research, case studies), and reviews that were not published in English.

3. Result

The umbrella review included a total of 21 reviews (refer to PRISMA flowchart in Appendix 1), exploring a variety of digital health interventions targeting different aspects of women's health. The reviews comprised several types, such as systematic, scoping, integrative, narrative, and quantitative systematic reviews. Most of these reviews adhered to the PRISMA guidelines, while others followed alternative guidelines such as Whitte- more and Knafl's integrative review approach, PRISMA-ScR, or PRISMA Extension for Scoping Reviews. Some reviews also had registered protocols. The number of studies included in each review ranged from 4 to 43, illustrating the diversity of research available on each topic.

The findings were organized into four main categories: cancer care, pregnancy and postpartum care, general health, and specific populations. Various reviews focused on distinct aspects of women's health and digital health interventions, such as breast cancer supportive care, telemedicine for abortion services, home-based palliative care, and digital health interventions for long-term breast cancer survivors. Other reviews investigated the experiences of women with breast cancer using telehealth during treatment and follow-up, remote patient monitoring in urologic and gynecologic cancer surgery, and mobile health app-based interventions for self-management of chemotherapy-related symptoms among breast cancer patients.

Additional reviews explored pregnancy care during emergencies, telehealth for pregnant and early parenting women with substance use disorders, health disparities among women under community supervision using mHealth applications, and patient-reported benefits and limitations of mHealth technologies among women with diabetes in pregnancy. Some studies also examined the cost-effectiveness of mHealth interventions sup- porting women during pregnancy, women's reproductive health and intimate partner violence, and telehealth interventions for physical activity and exercise participation in post- partum women. Quality assessment tools were employed in several reviews, although not in all, with some utilizing specific tools like COnsolidated criteria for REporting Qualitative research (COREQ), The Consolidated Health Economic Evaluation Reporting Standard (CHEERS), and MIXED METHODS APPRAISAL TOOL (MMAT). Notably, none of the reviews conducted meta-analyses. In summary, the characteristics of the included reviews demonstrate a broad range of research topics, methodologies, and quality assessments within the realm of women's health and digital health interventions.

3.1. Cancer Care

In the realm of cancer care, Gyawali et al. (2023) found that eHealth interventions for breast cancer patients led to high levels of patient satisfaction and acceptance, but mixed effects on symptom and lifestyle-related outcomes. They suggested the need for a patient-centric approach and standardized outcome reporting to better understand the real-world effectiveness of eHealth interventions in breast cancer supportive care (Pimentel-Parra et al., 2023). Pimentel-Parra et al. (2023) reported that digital health interventions improved the quality of life and various symptoms related to cancer and its treatment for long-term breast cancer survivors (refer to characteristics of included reviews in Appendix 2).

3.2. Pregnancy and Postpartum Care

Several reviews focused on digital health interventions for pregnancy and postpartum care. For instance, Chua et al. (2023) found that telelactation interventions were well-received by stakeholders, leading to improvements in provider-user relationships and breastfeeding outcomes. Ghimire et al. (2023) reported that virtual prenatal care combined with in-person visits was preferred by most pregnant women and healthcare providers (HCPs), resulting in significant expenditure reduction in time and healthcare resources. Shamsabadi et al. (2023) found telehealth to be effective in managing and monitoring high-risk pregnancies, with promising outcomes in patient and provider satisfaction (refer to characteristics of included reviews in Appendix 2).

3.3. General Health

A variety of reviews analyzed digital health interventions for general health. Steindal et al. (2023) reported that telehealth offers a potential support system enabling patients to stay at home, with visual features helping to build interpersonal relationships with HCPs.

Turner et al. (2023) emphasized the importance of individualized exercise prescription delivered by qualified personnel in telehealth interventions for physical activity and exercise participation among postpartum women (refer to characteristics of included reviews in Appendix 2).

3.4. Specific Populations

Some reviews focused on specific populations, such as women with substance use disorders (SUD). Raynor et al. (2023) found that digital interventions primarily targeted women with polysubstance use disorders or nicotine use/smoking, with positive effects observed in smoking cessation/reduction studies. Crawford et al. (2023) noted a scarcity of studies focusing on health disparities among women under community supervision and called for mHealth applications addressing substance use, reproductive and sexual health, and safety issues (refer to characteristics of included reviews in Appendix 2). Overall, the umbrella review demonstrated the potential of digital health interventions for improving various aspects of women's health. While some areas, such as can- cer care and pregnancy/postpartum care, have shown promising results, others, like substance use disorders and health disparities, require further research to better understand

the potential of digital health interventions in these specific populations.

4. Discussion

The umbrella review provides valuable insights into the realm of women's health and digital health interventions, covering a wide range of research topics and methodologies. Included reviews address diverse subjects such as breast cancer supportive care, telemedicine for abortion services, home-based palliative care, digital health interventions for long-term breast cancer survivors, pregnancy care during emergencies, tele-health for pregnant and early parenting women with substance use disorders, health dis- parities among women under community supervision using mHealth applications, and patient-reported benefits and limitations of mHealth technologies among women with diabetes in pregnancy.

One limitation of the umbrella review is the inconsistent quality of the included reviews. While some adhered to PRISMA guidelines and registered protocols, others used alternative guidelines or failed to mention their methodology. Additionally, not all reviews employed quality assessment tools, potentially impacting the overall quality and reliability of their findings. Future research should prioritize the use of standardized guidelines and quality assessment tools to ensure the validity and reliability of study findings. The lack of meta-analyses conducted in any of the included reviews presents another potential limitation. Meta-analyses can offer valuable insights by pooling the results of individual studies, increasing statistical power, and identifying trends or patterns in the data. The absence of meta-analyses in the included reviews may limit the ability to draw robust conclusions from the existing literature.

The umbrella review also emphasizes the diverse range of digital health interventions in the field of women's health, which presents challenges when comparing the effectiveness of different approaches directly. The reviews vary in focus, covering telemedicine, mHealth applications, and remote patient monitoring. This diversity highlights the need for more comprehensive research that compares and contrasts these different technologies to better understand their relative benefits and drawbacks. Furthermore, the umbrella review identifies gaps in the existing literature and opportunities for further investigation. For example, more research is needed to explore the effectiveness of digital health interventions in addressing health disparities among specific populations, such as women from low-income backgrounds, ethnic minorities, or those living in rural areas. Investigating potential barriers to accessing digital health interventions for these populations, as well as strategies to overcome them, is crucial in ensuring that all women can benefit from advances in digital healthcare.

Moreover, the review underscores the importance of considering not only the clinical outcomes of digital health interventions but also the patient-reported experiences and perceptions of these technologies. Understanding the factors that contribute to patient satisfaction and engagement with digital health interventions will be essential for the successful implementation and adoption of these tools in clinical practice.

Lastly, the umbrella review raises questions about the cost-effectiveness of digital health interventions for women's health. Although some reviews explore the cost-effectiveness of specific interventions, a more systematic evaluation of the economic impact of digital health interventions across various aspects of women's health are needed. This information will be critical for informing policy and decision-making, as well as for guiding the allocation of resources to ensure the sustainable and equitable implementation of digital health interventions in women's healthcare.

5. Conclusion

This umbrella review provides an insight into the utilization of telehealth for women's health post-COVID-19, spotlighting promising outcomes in areas like cancer and post-partum care. However, it also uncovers limitations and gaps in current literature. Fu- ture research, which will include a comprehensive journal of the collected data, should strive for the use of standardized protocols, quality evaluation tools, and meta-analyses, while exploring the effectiveness, cost-efficiency, and user experiences of different digital health interventions. For more details, see Appendices 1 and 2 available online².

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