GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ)
ISSN (E): 2347-6915
Vol. 12, Issue 6 June (2024)

DIGITAL HEALTHCARE INNOVATIONS: THE BOONS AND BANES FOR WOMEN'S HEALTH

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ABSTRACT

AIM:

This review aims to explore the impact of digital healthcare innovations on women's health, investigating the advantages and disadvantages associated with the adoption of technology in the healthcare sector.

INTRODUCTION

The introduction provides an overview of the rapidly evolving landscape of digital healthcare and its implications for women's health. It highlights the increasing integration of technology. into healthcare services and the potential benefits and challenges this presents.

METHODOLOGY

This research employs a comprehensive literature review, and analysis of existing digital. health initiatives to assess the advantages and disadvantages experienced by women. Relevant data were collected from scholarly articles, reports, and healthcare technology. databases.

RESULTS

The results section presents a nuanced examination of the benefits of using femtech, including enhanced access to healthcare information, remote monitoring, and customised interventions, as well as the drawbacks, which include possible privacy issues, the digital divide, inaccurate digital services, and effects on doctor-patient relationships.

CONCLUSIONS

The conclusion summarises the overall effects of digital healthcare technologies on women based on the findings. The data examines the possibilities for enhancing healthcare and empowering women, and it also recognises that obstacles must be overcome to guarantee ethical and inclusive technology use in women's healthcare.

Keywords: Digital healthcare, women's health, technology adoption, femtech, healthcare outcomes, doctor-patient relationships.

INTRODUCTION

Digital health, or digital healthcare, is a broad, multidisciplinary concept that includes concepts from an intersection between technology and healthcare. Digital health applies digital transformation to the healthcare field, incorporating software, hardware and services. Under its umbrella, digital health includes mobile health (mHealth) apps, electronic health

records (EHRs), electronic medical records (EMRs), wearable devices, telehealth and telemedicine, as well as personalized medicine. Stakeholders in the digital health field include patients, practitioners, researchers, application developers, and medical device manufacturers and distributors. Digital healthcare plays an increasingly important role in healthcare today. Digital health has the potential to prevent disease and lower healthcare costs, while helping patients monitor and manage chronic conditions. It can also tailor medicine for individual patients. These innovations have the potential to revolutionize healthcare delivery, particularly in **the context of women's health**. However, it is essential to critically examine their advantages and disadvantages to ensure equitable and effective outcomes.

What is the need for this study?

Inspite of the slogan of diversity pinned on the flag of many tech companies the field is dominated by men. With the big bang theory or social network or the Silicon Valleyit's easy to imagine silicon valley as a bunch of guys in hoodies and flip flops, solving big problems with women as sidekicks rather than protagonists. Women hold only **11% of executive** positions at Silicon Valley companies and only **own 5% of the startups**, and it shows that majority of period tracker apps fail women miserably, fitness trackers and wearables are useless when it comes to pregnancy. Most of the apps were designed and developed without the input of their future consumers and it is not like there is no demand, in the health care category period tracking apps are reportedly the fourth most popular, yet it took years for Fitbit and apple watch to add it as a feature, and on the app side a recent study showed that **95% of menstrual cycle tracking apps are inaccurate for patients use** and almost none of them cite medical literature or health professional involvement. Women health is not only about period tracking and pregnancy. A lot less consideration is given to other female health problems ae well such as menopause, cancer detection, breastfeeding troubles, troubles around bladder control and a lot more. While digital heath companies already appeared in these areas their numbers are still quite low and they are usually struggling to get funded so Future developments in digital health must prioritize ethical considerations and strive for inclusivity to ensure that women of all backgrounds benefit from these innovations. Balancing the advantages and disadvantages is essential to harness the full potential of digital health care for improving women's well-being.

Advantages:

AI has significantly improved women's health and healthcare costs in the past decade, reducing medical errors and improving forecasting. It aids in early cancer detection and enhancing pregnancies by identifying conditions like gestational diabetes or birth defects.

FEMTECH:

- Femtech refers to diagnostic tools, products, services, wearables, and software used to address women's health issues. The market's growth is driven by increased awareness, technological advancements, investment, and demand for women's healthcare solutions.
- Femtech consists of devices, software, and services for women's health improvement. Devices include wearable devices and treatment products, while software focuses on female technological products. Services include medical services for women's healthcare. End-users

include D2C, hospitals, fertility clinics, and diagnostic centers. **FemTech India is India's first and only platform** for industry professionals in the female-led technology sector striving to make a positive impact on women's health by integrating the benefits of technology.

Relief for often ignored pain:

- Women often experience physical and psychological pain due to menstrual issues like endometriosis and PCOS. Despite 190 million cases globally, proper diagnosis takes 10 years. Femtech advancements provide education, virtual consultations, and specialized treatment options for these women, addressing their challenges.
- Additionally, **menopause** is a fact of life for aging women. Yet, healthcare for menopausal women is far from where it should be. Unfortunately, with men making up 84.6% of general practitioners in the U.S., this isn't too surprising. The good news is that femtech is innovating in this realm in a number of different, data-driven ways.
- **Embr Wave,** for example, offers a bracelet that delivers cooling sensations to a woman's wrist during a hot flash, helping course correct the brain's perception of the body's temperature. **IdentifyHer** is another company that offers a wearable worn on the chest that monitors and records menopause symptoms, which are then analysed to provide customized treatment advice and track the effectiveness of existing treatments.

Increased access to healthcare:

- Access to birth control has dramatically increased, thanks to a variety of apps and websites that make it possible to get birth control delivered directly to the home. **Carafem** helps women navigate abortions and use AI technology through its 24/7 virtual care assistant, Cara. Cara can help walk women through taking abortion pills at home, as well as answer any questions they might have.
- Digital health innovations enhance access to healthcare services, allowing women to receive medical advice and support remotely.
- **Telemedicine** platforms bridge geographical gaps, especially in rural areas where access to healthcare facilities may be limited.

Personalised healthcare:

- Technologies such as health apps and wearables enable women to monitor their health in real-time, promoting personalized and proactive healthcare.
- Tailored algorithms can provide personalized recommendations for nutrition, exercise, and reproductive health.

Enhanced communication:

- Digital platforms facilitate communication between healthcare providers and women, fostering a more collaborative and patient-centric approach.
- Women can seek advice, share information, and participate in virtual support communities.

- Telemedicine has been integrated into the care of the pregnant patient. As early as **1997, Nores *et al*** showed that the interpretation of first-trimester obstetric ultrasonography using a system of videotape review was equivalent to live video telemedicine. This practice has evolved and is commonly used at Ochsner Health, where many of the maternal fetal medicine ultrasounds are recorded by skilled technicians and evaluated later by the physician, allowing for increased efficiency without a decrease in quality.
  Ochsner Health uses TeleStork, a system for remote electronic fetal monitoring, to monitor a foetus's heart rate, aiming to reduce cerebral palsy, neonatal seizures, or intrapartum fetal death. Although subjective and difficult to standardize, it remains the most common method of intrapartum surveillance during labor.

Disadvantage:

FemTech is considered a thriving new market that can improve women's health outcomes and open new opportunities for companies within the ecosystem. However, the women's health industry has often experienced a lack of funding and faces other hurdles before it can take off. Some of the major challenges faced by these growing digital innovations are,

Lack of Investments

- Historically, the women's health tech industry has been overlooked and underfunded by investors. FemTech startups are still viewed as a niche investment opportunity and funding in this sector has a lot of catching up to do when compared to other healthcare fields.
- "When you look, for instance, at the issue of maternal healthcare crises, there is a huge problem, at least in the US, where this niche has experienced relatively poor investment compared to other sectors in the health tech industry" L. T.-VP at medical consultation platform.
- Despite the recent surge of interest and investment, overall funding for FemTech still lags behind other healthcare sectors. This can make it challenging for startups to gain traction and scale up. Implementing digital solutions in healthcare requires significant resources, which can slow down progress.

Insufficient R&D funds

- Being relatively young, the FemTech industry remains under-researched. Only **4% of healthcare research and development funding** is allocated to issues that directly affect women's health and wellness.
- The lack of representation in clinical trials has a negative impact on the understanding of female physiology, health conditions, drug efficacy, and the side-effects. FemTech companies face challenges regarding incomplete data on women's health and struggle to create effective products.
- Therefore, it is not surprising that **84% of women feel unheard** in healthcare settings, with their pain often being dismissed and their conditions often misdiagnosed.

Privacy and security concerns:

- The digitalization of health information raises concerns about the privacy and security of sensitive data, especially related to women's reproductive health. Unauthorized access and data breaches pose significant risks.
- Five key characteristics of the digital health footprint were associated with health privacy policy challenges: **invisibility** (people are unaware of how their data are tracked), **inaccuracy** (data in the digital health footprint can be inaccurate), **immortality** (data have no expiration date and are aggregated over time), **marketability** (data have immense commercial value and are frequently bought and sold), and **identifiability** (individuals can be readily reidentified and anonymity is nearly impossible to achieve). There are virtually no regulatory structures in the US to protect health privacy in the context of the digital health footprint.
- According to the **"Health Policy and Privacy Challenges Associated with Digital Technology"** article published on June 2020 has identified 3 key findings. *First*, there are no clear distinctions between data that are health related and are not health related. *Second*, the digital health footprint is associated with enduring health privacy challenges that transcend specific technologies or applications. *Third*, the digital health footprint is largely unregulated. These findings may have implications for health privacy and policy.

Socioeconomic disparities:

- Not all women have equal access to digital health technologies, leading to potential disparities in healthcare outcomes.
- The **digital divide** refers to the gap between those with and without access to information communication technology (ICT). According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), approximately **45.2** percent of the world's households do not have access to the internet.
- The digital divide is most apparent among other intersections of inequality, especially race, gender, and class. According to UNESCO's report, women around the world are **23 percent less likely to make use of mobile internet** than their male counterparts. In Asia, Africa, and South America, women are 30–50 percent less likely to use the internet at all.
- Unconnected households in rural areas lack broadband infrastructure, leading to low-income students and digital redlining. Affordability issues and limited investment in infrastructure contribute to internet access issues. Such Socioeconomic factors may limit access to smartphones, high-speed internet, or other essential tools.

Reliability and accuracy:

- The accuracy and reliability of health apps and wearable devices may vary, leading to potential misinformation and mismanagement of health conditions.
- Overreliance on technology without professional guidance can have adverse effects.
- As the femtech market expands, low regulatory hurdles and race-to-market strategies have made it easy for some femtech companies to **develop inaccurate and untested** products with the potential to harm consumers.

- Given that many femtech devices are not actively regulated by the FDA and are not required to satisfy any threshold accuracy standards, it is no surprise that these devices vary widely in terms of accuracy and usability. Repeated studies have found that most untested and unverified femtech applications do not live up to their promises and are inaccurate to the point of being medically unreliable.

The Organization for the Review of Care and Health Apps (ORCHA) found over 85% of femtech apps inaccurate, with clinical assurance concerns. Columbia University Medical Centre's 2016 study found 95% of free smartphone menstrual cycle apps inaccurate, and Current Research and Opinion's 2018 study found none could accurately predict ovulation.

Inaccurate femtech devices can have unexpected impacts on clinicians, with over 7 out of 10 clinicians admitting to having access to more data than they can handle and analyze. They are unsure how to incorporate this data into patient records and care plans, leading to a lack of trust in femtech data.

RESULTS

- Femtech devices, while useful as consumer tracking tools, have limited relevance in women's healthcare due to clinical accuracy issues. Digital health care innovations, such as AI and robotics, offer personalized healthcare and improved prenatal care. Telemedicine and augmented reality are promising for more comprehensive healthcare solutions. However, resource-limited countries face challenges such as privacy concerns and socioeconomic disparities, which need to be addressed to ensure the continued advancement of women's healthcare.
- Sam Doyle, a Business Researcher, identified several barriers to women's digital health technology, including lack of trust, privacy concerns, poor design, irrelevant content, dry and unengaging content, and low levels of female-specific general health information. These barriers can be addressed by digital health innovators to enhance their offerings and improve women's health outcomes.

CONCLUSION

While we marvel at the spectacular advancements AI and robotics bring to women's healthcare, we must remain grounded. The real triumph will not lie in the sophistication of the technology but in ensuring its benefits reach every corner of the globe, eventually helping attain universal health coverage, a goal we are too far from achieving. The journey ahead is difficult, but the potential benefits are too great to ignore. The aspiration is to establish a network of healthcare where technology serves as a bridge connecting women globally, facilitating a canvas of health and well-being that is both inclusive and expansive. The challenge is set; the question remains: **Can we rise to meet it?**

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