



Proceedings of IHOPE Conference

## Can digitization be leveraged for correcting gender distortions in healthcare?

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Received : 25 October 2022  
Accepted : 16 December 2022  
Published : 17 January 2023

DOI  
10.25259/IHOPEJO\_28\_2022

Quick Response Code:



Digitization has been a toolkit for generating welfare in multiple spheres. Digital health technologies, mobile applications, and wearable health devices are steadily growing in popularity among the population, to monitor, and track their health. There is increasing consensus that patient experience can be improved by making information on health and related services accessible online. Moreover, through the digitization of medical records, doctors can easily access patients' medical histories and provide diagnoses. As pointed out by Dr. Deepshikha Batheja<sup>1</sup> during the panel discussion on "Health Economics-Gender, Digitalization Global Health" at the Indian Health Outcomes Public Health and Economics Research Center (IHOPE) Research to Policy Conference 2022, despite the multiple advantages of health-care digitization, the health sector invests <10% on information and communication technology.<sup>[1]</sup> In addition, digital leveraging fails to operate in the absence of a strong health-care infrastructure that could facilitate efficient access.<sup>[2,3]</sup> Another major concern relates to social inequities in access to digital healthcare. This means that certain groups of society who need health information are least likely to have access to the new health technologies. For instance, in India, applications such as Practo, Netmeds, or wearable devices are generally launched in metropolitan cities and largely cater to urban educated groups. Adding to the issue, limited internet penetration in rural areas, and low levels of digital literacy among women, the elderly and the disabled prevent independent access to a digital medium.

This article specifically focuses on gender distortions, that is, differences between men and women in health-care access. It is a global phenomenon that systemic gender inequality produces health inequalities.<sup>2</sup> In developed countries, prior studies indicate that, although women tend to live longer, they report higher rates of diseases and poorer health than men.<sup>[4,3]</sup> Globally, women had higher instances of respiratory disorders, chronic morbidity, and mental health issues such as depression anxiety and hypertension.<sup>[6,4]</sup> Such problems remain central with the older cohort of females in low- and middle-income countries. Roy and Chaudhuri<sup>[7]</sup> report that older women(60 years and above), compared to men, are more likely to report poorer self-rated health and higher rates of disabilities in India. The higher morbidity rates among women have recently drawn significant attention from researchers and policymakers.

While there exists some evidence on finding ways to increase access to healthcare in developed nations across the gender groups (i.e., disparity between men and women),<sup>[8,9]</sup> the empirical evidence on gender distortions in developing countries in healthcare still remains under-explored.<sup>[7]</sup> In

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low- and middle-income countries where patriarchal societies are generally the norm, gender differentials in socioeconomic status and lack of financial empowerment deteriorate the issue of health inequalities.<sup>[10]</sup> During the panel discussion, Prof. Tanika Chakraborty<sup>5</sup> talked about strong parental preference for boys over girls within families in developing countries such as India. She highlighted the findings from Oster<sup>[11]</sup> research which illustrates the gender disparities in access to vaccinations during COVID-19 in rural India. Despite vaccinations being provided free of cost, parents generally prefer to take their sons over daughters to vaccination camps due to high travel costs. Studies also highlight that India has about 43 million missing women due to sex-selective abortions and neglect of girl children during the early neonatal period.<sup>[12]</sup> The aim of this article is to expand the understanding of potential ways through which gender distortions arise in access to healthcare. And to discuss, whether digitization of healthcare can be an effective mechanism to reduce gender distortions in access to healthcare.

This article has been divided into three sections. It begins by discussing the broad implications of gender distortions in access to healthcare in Section 1. Section 2 examines whether technological advancements can subvert gender distortions in healthcare and the related challenges associated with its adoption. The last section concludes the article by suggesting the way forward through policy implications.

*Gender distortions in access to healthcare:* The gender distortions in access to healthcare can be highlighted through three broad and highly relevant ideas. First, as per global estimates, females are 26.5% less likely to participate in the global labor force than males.<sup>[4]</sup> Due to low or no earnings, women cannot contribute to the household decision-making process. In low-income and middle-income countries (LMICs), women often lack financial autonomy, hindering their ability to access healthcare as they have to rely on men within households to meet their transport and treatment costs. Consequently, women then depend on informal health-care providers and low-cost medicines, even knowing it can be less effective.<sup>[13]</sup> On the other hand, studies have shown the importance of women's increased decision-making power and access to financial resources with their improved utilization of health-care services. According to a study in Pakistan, a 1% increase in women's decision-making power can lead to a 10% increase in access to maternal healthcare.<sup>[14]</sup>

Another reason for women's inability to access health-care treatment is the prevalence of stigma in societies, especially

around unmarried women, HIV-positive women, and sex workers, which restricts women from seeking quality health-care services to avoid judgment and discrimination. Women often report differential treatment by health workers and feeling discriminated against due to their ethnicity, lower socioeconomic status, positive HIV status, and age during their access to maternal care.<sup>[15]</sup> Gendered cultural and religious norms are often significant barriers for women to access health-care services. For instance, social and cultural taboos around women's health make it difficult for women to seek medical care from male health providers; this further limits women's access to medical care, especially in rural regions where there is already a shortage of female health professionals.<sup>[16]</sup> Prior studies have already documented a strong parental preference for boys over girls within families in developing countries, which is a significant source of gender-biased sex-selective abortions among women resulting in skewed child sex ratios.<sup>[17]</sup>

Third, women are also likely to be highly engaged in the invisible care sector, estimated to be 1.5 trillion USD. As discussed by Prof. Dimitra Petrakaki<sup>6</sup> at the conference that within households, women often spend more time than men caring for their children, the elderly, and other household members who are sick. This negatively impacts women's own physical and mental well-being, especially when caring for family members affected by chronic medical conditions.<sup>[18]</sup> Domestic work, including care for other household members, must be acknowledged as work, and parental leave policies must ensure that men share equal household responsibilities with women. It is essential to tackle social biases that lead to gendered disparities in health.

*Is digitization a catalysts for access to healthcare for women:* In his keynote lecture for the panel discussion, Prof. Anil B. Deolalikar<sup>7</sup> mentioned the differences in digital determinants of health for different groups. While the discovery of mRNA vaccines helped combat the spread of COVID-19, these technological advances become insignificant if they cannot be made accessible to all sections of the population, especially vulnerable groups. This is often evident in India, where the health outcomes are still low as compared to other LMICs such as Thailand, China and sub-Saharan Africa.<sup>[19]</sup> Thus, it is imminent to understand whether technological advancements can contribute to subverting gender distortions in healthcare.

While it has been argued that a female's financial autonomy deprivation leads to unequal health-care access, digital solutions can become an effective mechanism for women to access low-cost health-care treatment and information. The online platforms can create safe spaces for a one-to-one consultation with doctors as per women's requirements,

2. Going ahead, by gender distortions we mean differences between men and women in access to healthcare or technologies.

3. The empirical evidence from research studies suggests the pattern of longer life expectancy among women than men.<sup>[5]</sup>

4. This is more likely to be the case in a developing country like India which suffers through the double burden of diseases.

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making healthcare more accessible for otherwise a non-vocal group. It can allow a woman to choose the professional that she wants to consult, barring any stigma or cultural bias. With platforms such as Netmeds and MediBuddy, women can easily purchase medicines for maternal care, menstrual pain, and contraceptives without relying on a third party. With its ubiquitous nature, digitization can even bridge the vast rural-urban divide between women dispersed across geography.

Moreover, adopting digital tools can enable the diffusion of information for those seeking information and those providing healthcare services. On the demand side, healthcare applications, websites, and mass media can be used for informing and increasing literacy on issues related to maternal healthcare and other diseases for women. The learnings from a randomized controlled trial called mass media meet motherhood in Burkina Faso highlighted the increase in uptake of contraceptive pills (by 20%) by women who listened to a radio in their household compared to the households that did not listen to radio.<sup>[20]</sup> While one success story encourages gendered digital literacy, policymakers and service providers still need to be careful about digital exclusion. The exclusion is often caused by the content, the nature of the information, and the language in which the information is circulated. The existing platforms have content primarily available in English, which may not be the native language of the targeted group. It is often embedded in western culture as opposed to the family-oriented culture of the south-eastern countries.<sup>[21,22]</sup> This calls for the information to be locally relevant and meaningful for the women accessing it.

On the supply side, digital channels can enable the diffusion of knowledge among clinicians and doctors. COVID-19 proved to be an example of when practitioners across the globe could transfer knowledge on diagnosis and improve patient outcomes through WhatsApp groups, Twitter, and other social media platforms. These online telecommunication mediums also enabled the doctors to engage with the patients directly while ensuring constant monitoring and surveillance. More recently, digital platforms are being seen as catalysts for reskilling/upskilling clinicians. Chamakiotis *et al.*<sup>[23]</sup> studied MedicineAfrica, a digital platform that brought together UK-based clinical tutors and medical doctors to students based in the post-conflict state of Somaliland to educate them on COVID-19.

While the developed world has significantly leveraged digital tools in its healthcare infrastructure,<sup>[24]</sup> the medical system in developing countries is moving toward cost-effective mechanisms and streamlining payment services through digital platforms.<sup>8</sup> This makes the process of utilization of health-care services easy for the service seeker and

efficient for the service provider. In addition, with the big data revolution and technical advancement touching the shores of LMICs, the hospitals are shifting their structures to provide increased access to digital electronic medical records to clinicians and medical practitioners.<sup>9</sup> This is done to mend the gaps in solving complex medical issues efficiently through big data analysis and predictions using a patient's history (e.g., The data revolution of electronic medical records coming through Ayushman Bharat Health Account<sup>10</sup>). For instance, India launched the National Digital Health Mission (NDHM) in 2020, to build a universal health ecosystem that is efficient, accessible, inclusive, affordable, timely, and safe.<sup>11</sup> The digital infrastructure envisioned by NDHM would generate a unique health id for identification of medical history of a person, and build a repository of doctors and health facilities including relevant information on their services, qualification, and specialization.

*The Way Forward:* The digital platforms and the technical revolution in the health-care industry are bringing new opportunities and innovative solutions to the world. However, its role in bridging the gender gap has been limited and remains to be exploited.

While the medical records data and artificial intelligence techniques are making strides, the population of the data by male records makes it a biased estimator and inaccurate predictor of women's medical problems. This calls for a need to improve the data collection procedure, which should capture gender-disaggregated information at diagnosis, disease, and prescription levels for accurate predictions, which, at times, can be a costly affair. Another critical factor that requires consideration revolves around the development of sound regulations and guidelines on data privacy in the health-care system. While medical records are digitized, the system needs to strengthen confidence and trust among patients for sharing information. There have been numerous instances of insurance fraud and extortion in the name of tests which lead to hesitance among patients when asked about medical information. Thus, there needs to be an increase in both financial support and security for health systems to remain strengthened and adequately resourced.

Although the digital tools such as mobile applications, wearable devices, and other assisted living digital products are becoming readily available, there remains a big question about their accessibility across gender groups. The tech products and applications are designed predominantly by men who often fail to take into account the issues that women

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8. For example: Bharat Interface for Money (BHIM) has been developed to facilitate easy online bank transactions in India

9. LV Prasad Eye Institute and other hospitals such as Max Healthcare, Apollo, Fortis, etc. have their in-house electronic medical record systems

10. <https://healthid.ndhm.gov.in>

11. <https://www.makeinindia.com/national-digital-health-mission>

may go through. Thus, they fare worse in terms of efficacy and ease of use for women. Therefore, it becomes crucial for academic institutions and research centers to promote inclusiveness by eliminating gender differentials in access to advanced medical training. Moreover, policies must be formulated to advance women's careers in the health sector and STEM education streams. In the short run, such an intervention can bridge the digital divide through increased literacy between men and women. Moreover, in the long run, such a step will lead to the formulation of inclusive policies and transform the way technologies are designed.

To improve gender distortions in access and affordability of healthcare, there is a need to increase women's financial autonomy. Policymakers need to formulate and implement policies that encourage women's labor force participation. Organizations need to deploy employment policies that provide equal pay and flexible work opportunities. More equitable parental leave policies in the workplace will allow women not only to reduce the burden of mental stress and physical well-being but also to return to work easily. There is an urgent need to recognize women's contributions to health care and the health sector, which are often undervalued or unpaid.

The existing empirical evidence has shown that investing in girls and women through education, health, or nutrition leads to higher economic and social returns for any country. It, thus, becomes essential to include women in every aspect of India's growth, development, and health strategies to be called an inclusive society in the years to come.

### Acknowledgment

This article has benefited from the comments of Dr. Chirantan Chatterjee. The authors acknowledge funding from Wellcome Trust/DBT India Alliance grants Indian Health Outcomes, Public Health and Economics Research Center (IHOPE). This article covers the conference proceedings from the panel discussion on Gender, Digitization, and Healthcare at the Research to Policy Conference 2022.

### Declaration of patient consent

Patient's consent not required as there are no patients in this study.

### Financial support and sponsorship

The authors acknowledge funding from Wellcome Trust/DBT India Alliance grants Indian Health Outcomes, Public Health and Economics Research Centre (IHOPE).

### Conflicts of interest

There are no conflicts of interest.

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**How to cite this article:** Agrawal S, Manchanda P. Can digitization be leveraged for correcting gender distortions in healthcare? *IHOPE J Ophthalmol* 2023;2:20-4.