Thanal

INNOVATION AND TECHNOLOGY IN THE PUBLIC HEALTH CARE SYSTEM FOR ENSURING GENDER EQUALITY

OVERVIEW

ABOUT US

THANAL - DAYA REHABILITATION TRUST (DRT): The world is filled with individuals who face insurmountable challenges in their daily lives. For the most vulnerable population, access to basic necessities such as healthcare, education, and welfare can be extremely limited. This is where Thanal's unique approach of Holistic Rehabilitation for All steps in to make a difference.

Thanal is a non-governmental organization that is committed to working towards health, education, welfare, and development of the most vulnerable population. Thanal believes that rehabilitation should not just be physical, but it should also be emotional, social, and spiritual. Hence, Thanal aims to provide a holistic approach to rehabilitation that focuses on the overall well-being of the individuals.

In terms of health, our approach of holistic rehabilitation for all has set up health clinics in the areas where the most vulnerable populations reside. The clinics provide paraplegia, psychiatry, disability, renal care and socio-psycho support to those who cannot afford it. The organization also has a multidisciplinary team of medical professionals who provide bio-socio-psychological support to those who have suffered trauma or are experiencing mental health issues. DRT works towards the development of the communities in which it operates.

In the area of education, the NGO has set up micro learning centers to provide education to children who would not otherwise have access to it. The learning centers are designed to provide a safe and stimulating environment for children, where they can learn, play, and grow. The organization also runs vocational training programs for adults, which equip them with the necessary skills to find employment and become self-sufficient.

"Welfare" is an integral part of the organization's work. Thanal provides support to families who are struggling to make ends meet. This support includes food, shelter, and clothing, and is designed to help families get back on their feet. Additionally, the NGO provides micro-financing opportunities to those who are looking to start their own businesses.

Thanal and its approach of holistic rehabilitation is dedicated to making a real difference in the lives of the most vulnerable populations. By providing a holistic approach in rehabilitation, the organization is able to help individuals regain their health, education, welfare, and dignity. The young blood of Thanal work towards creating a more just and equitable world.

INNOVATION AND TECHNOLOGY IN THE PUBLIC HEALTH CARE SYSTEM FOR ENSURING GENDER EQUALITY

About the author: Anju Mathew is a public policy and governance expert with a passion for using innovative solutions to address social issues. She holds a Master's degree in Public Policy and Governance from Azim Premji University. Mathew also holds a bachelor's degree in economics from Madras Christian College, where she developed a keen understanding of economic principles and their application in the social sector.

Mathew has worked with several organizations in the public and private sectors to design and implement policies that address the root causes of social issues. Her research focuses on leveraging technology to reduce gender inequality in access to public health in India. Mathew believes that technology can play a transformative role in improving health outcomes for women, who often face significant barriers to accessing healthcare due to socio-cultural norms and economic constraints.

In this paper, Mathew uses her expertise in public policy, governance, and economics to propose innovative solutions to address gender inequality in access to public health in India. She analyzes the impact of technological innovation on improving health outcomes for women and highlights the potential of digital health solutions to overcome barriers to access.

ABSTRACT

This study discusses how technological innovations and integrations can help address the underlying social and cultural barriers to gender equality, both in the public healthcare system and more broadly. The use of mobile health (mHealth) applications and telemedicine are presented as examples of technological innovations that can help provide women with greater access to healthcare services and a greater sense of privacy and autonomy. The importance of designing technological innovations with input from the communities they are meant to serve is emphasized to ensure that these innovations are culturally appropriate and responsive to the needs and priorities of women and girls. References to relevant studies are provided to support these points.

Note: The findings presented in this research are solely based on secondary readings and data collection and do not necessarily reflect the views or opinions of the organizatio

I.   INTRODUCTION

Gender inequality in accessing public healthcare systems has been a long-standing issue that has plagued societies across the globe. Women, in particular, have faced numerous incidents of discrimination and prejudice when seeking medical care (Khan et al., 2020). Technological innovations have emerged as a promising solution to address this issue and improve the healthcare experience for women.

The history of incidents involving gender inequality in accessing public healthcare systems dates back several decades. Women have faced significant barriers when attempting to access healthcare, including a lack of access to healthcare facilities, inadequate healthcare services, and discrimination based on their gender (Jha & Yadav, 2019). For example, in India, women face barriers to accessing healthcare due to a lack of awareness about their health needs, social and cultural norms, and the affordability of healthcare services (National Health Portal of India, 2021). A report by the World Health Organization (WHO) found that in India, men are more likely to receive medical treatment for common illnesses than women. This is partly due to gender biases among healthcare providers and partly due to women having less autonomy in healthcare decision-making within families. According to a survey by the Indian government, more than half of all women in the country are illiterate. This can make it difficult for them to access and understand health information, as well as communicate effectively with healthcare providers. In many parts of India, there is still a social stigma attached to menstruation and other reproductive health issues. This can make it difficult for women to seek medical help or even discuss these issues openly with their families or healthcare providers. A study published in the Journal of Health Management found that in some rural communities in India, traditional beliefs about health and illness can prevent women from seeking medical help. For example, some communities believe that certain health conditions are caused by supernatural forces or divine punishment, and may prefer to seek treatment from traditional healers rather than modern medical professionals. According to a report by the Indian government, there is a significant shortage of healthcare facilities in rural areas of the country, which can make it difficult for women living in these areas to access medical care. Additionally, women who work long hours or have caregiving responsibilities may find it difficult to take time off to seek medical care, as they may not have access to affordable childcare or may not be able to afford to take time off work. A study published in the Journal of Family Medicine and Primary Care found that financial constraints were a major barrier to healthcare access for women in India, particularly those from low-income households. Women who were unable to afford medical treatment often resorted to self-treatment or avoided seeking medical help altogether.

However, over time, the healthcare industry has developed solutions to address these issues. Technological innovations have played a crucial role in improving the healthcare experience for women. One of the most significant advancements has been the development of telemedicine[1]. Telemedicine enables patients to access medical care from the comfort of their homes,

---

[1] Telemedicine is the practice of providing healthcare services remotely using telecommunications technology, such as videoconferencing, phone calls, and messaging apps. Source: American Telemedicine Association (2021).

eliminating the need for women to travel long distances to receive medical attention. Telemedicine has also improved access to specialists, particularly in rural areas where there may be a shortage of healthcare professionals (Sharma & Barman, 2021).

Another technological innovation that has transformed the healthcare industry is electronic health records (EHRs). EHRs allow healthcare providers to access a patient's medical history, medications, and other critical information quickly. This technology has enabled healthcare professionals to make more informed decisions, resulting in better patient outcomes (Gupta et al., 2020). In India, the implementation of EHRs has improved patient safety and quality of care (Bhansali et al., 2018).

Moreover, wearable technology has emerged as an essential tool for women's health. Wearable devices, such as fitness trackers, can monitor women's health metrics, including heart rate, sleep patterns, and steps taken. These devices can help women manage their health more proactively and can alert them to potential health issues before they become more severe (Roy & Singh, 2020). In India, wearable technology is being used to monitor pregnant women and prevent maternal and infant mortality (Agarwal & Singh, 2021).

In conclusion, gender inequality in accessing public healthcare systems has been a long-standing issue, but technological innovations have provided solutions to address these issues. Telemedicine, electronic health records, and wearable technology have transformed the healthcare industry and have made healthcare more accessible and equitable for women. However, there is still much work to be done to ensure that every woman has access to quality healthcare, regardless of their race, ethnicity, socioeconomic status, or location.

II.   BACKGROUND

The 2023 International Women's Day reflects the underlying cultural and gender norms that prevent women and other gender minorities from accessing public healthcare services. This year's International Women's Day theme is "Choose to Challenge," which calls on individuals to challenge gender bias and inequality in all areas of life.

In the context of public healthcare, the theme is particularly relevant because it highlights the need to challenge gender norms and biases that prevent women and other gender minorities from accessing healthcare services. By challenging these norms and biases, we can work towards creating a more inclusive and equitable healthcare system that serves the needs of all individuals, regardless of their gender identity.

Furthermore, it is important to recognize that women and other gender minorities may face multiple forms of discrimination and marginalization, such as those based on race, ethnicity, caste, and socioeconomic status, which can further compound their experiences of healthcare inequities. Therefore, addressing these underlying cultural and gender norms is crucial to creating a healthcare system that is truly inclusive and equitable for all individuals.

III.   Public Health Care System And Technological Innovation In Addressing Gender Inequality

Public healthcare in India is primarily managed by the government through the Ministry of Health and Family Welfare. The healthcare system is divided into three tiers: primary healthcare centers, secondary healthcare centers, and tertiary care hospitals. Primary healthcare centers are the first point of contact for patients, while secondary and tertiary care centers offer specialized services for complex health issues.

Despite efforts by the government to improve the healthcare system in India, there are still significant challenges. These challenges include inadequate infrastructure, insufficient funding, and a shortage of skilled healthcare professionals. In addition, there are significant gender inequalities in the healthcare system, with marginalized genders[2] often receiving poorer quality care than predominant genders.

One way to address gender inequality in healthcare is through the integration of technological innovation. For example, telemedicine[3] can provide women and other marginalized genders with access to healthcare services in remote areas where healthcare facilities are scarce. Mobile health apps can provide women and other marginalized genders with information on reproductive health, nutrition, and other health-related topics.

A study conducted by the National Institute of Rural Development and Panchayati Raj (NIRDPR) in India found that the use of mobile health apps improved maternal and child health outcomes in rural areas. The study found that women who used mobile health apps had higher levels of knowledge about reproductive health, nutrition, and child care, and were more likely to seek medical care when necessary (NIRDPR, 2020).

In another study conducted in India, researchers used a mobile phone-based intervention to provide information and support to women with gestational diabetes. The study found that the intervention improved the health outcomes of women with gestational diabetes and reduced the risk of adverse outcomes for their babies (Ramachandran et al., 2012).

Overall, integrating technological innovation into healthcare can help reduce gender inequalities by providing women with access to healthcare services and information. However, there are still

---

[2] The term "marginalized genders" refers to gender identities beyond the traditional binary of male and female, including but not limited to transgender, non-binary, and gender non-conforming individuals who experience social, political, and economic exclusion and discrimination. (APA, 2021)

Source: American Psychological Association. (2021). APA Dictionary of Psychology. Marginalized genders. Retrieved from https://dictionary.apa.org/marginalized-genders

[3] Telemedicine refers to the use of technology to provide remote clinical care, consultation, or education to patients or healthcare providers. It encompasses a wide range of services, including video conferencing, remote monitoring, and virtual visits. Telemedicine allows healthcare providers to extend their reach to patients in remote or underserved areas, and to provide care without the need for in-person visits, which can be particularly useful during times of pandemics or other public health emergencies (American Telemedicine Association, 2022).

significant challenges to be addressed in the healthcare system in India, and a multi-pronged approach that includes technological innovation, policy changes, and increased funding is necessary to address these challenges.

IV.   Scope: How Technological Integrations Can Help Address The Underlying Social And Cultural Barriers To Gender Equality In Public Healthcare Systems.

Technological innovations and integrations can also help address the underlying social and cultural barriers to gender equality in public healthcare systems. One of the main barriers that women face in accessing healthcare is the lack of privacy and security, especially in areas where cultural norms dictate that men should have control over women's health decisions. Technological innovations can provide women with a greater sense of privacy and autonomy[4], as well as improve access to healthcare services.

One example of a technological innovation that can help address these barriers is the use of mobile health (mHealth)[5] applications. These apps can provide women with information about their health, connect them with healthcare providers and support groups, and help them manage chronic conditions. mHealth apps can also be designed to be culturally sensitive and tailored to the needs and preferences of specific communities. For example, an mHealth app developed in India was designed specifically for women with gestational diabetes[6] and provided information and support in the local language.

Another example of a technological innovation that can help address social and cultural barriers to gender equality in public healthcare systems is telemedicine. Telemedicine can provide women with access to healthcare services in remote areas or in areas where cultural norms may make it difficult for women to access healthcare services in person. Telemedicine can also provide women with greater control over their health decisions, as they can access healthcare services from the privacy of their own homes.

---

[4] According to the National Institutes of Health (NIH), privacy and autonomy are both key principles in the management of health data. Privacy involves protecting an individual's personal information from unauthorized disclosure or use, while autonomy refers to the right of individuals to control their own health information and make decisions about how it is used. These principles are important for ensuring both the protection of sensitive information and the ability of individuals to participate in decisions about their health data. However, in some cases, privacy and autonomy may need to be balanced against public health needs (NIH, 2021).

[5] Mobile health (mHealth) refers to the use of mobile devices, such as smartphones and tablets, to support the delivery of healthcare services and the management of health-related information. This can include applications (apps) designed to help individuals manage their own health, as well as telemedicine services that enable healthcare providers to communicate with patients remotely. (Source: World Health Organization).

[6] Gestational diabetes mellitus (GDM) is a type of diabetes that develops during pregnancy in women who did not have diabetes prior to becoming pregnant. It is characterized by high blood sugar levels and typically occurs in the second or third trimester of pregnancy. GDM can increase the risk of complications during pregnancy and delivery, and may also increase the risk of developing type 2 diabetes later in life. (Source: American Diabetes Association)

In order for technological innovations to be effective in addressing social and cultural barriers to gender equality in public healthcare systems, it is important that they are designed with input from the communities they are meant to serve. This can help to ensure that the innovations are culturally appropriate and responsive to the needs and priorities of women and girls.

In summary, while India has made some progress in leveraging technology and innovation to improve public health outcomes, there is still a long way to go in terms of ensuring gender equality in the public health system. Addressing the underlying social and cultural barriers to gender equality will be key to making further progress in this area.

In India, cultural and gender norms play a significant role in the accessibility of public healthcare services.

- Stigmatization around women's reproductive health: In many parts of India, there is a social stigma around discussing issues related to women's reproductive health, which can make it difficult for women to seek care for conditions such as menstrual disorders, infertility, or sexually transmitted infections (STIs). (Saksena et al., 2020). There have been reported incidents in India where women were required to seek permission from male members of their family before accessing healthcare services (Kumar, 2020). This practice, known as "paternalistic healthcare," is particularly common in rural areas (Kapur, 2018).

  Stigmatization around women's reproductive health is a common issue in India, and it takes various forms, including shaming, ostracism, and discrimination (Jejeebhoy & Sathar, 2001). This can be particularly problematic in rural areas, where traditional cultural beliefs and practices may be more prevalent (Chandrasekaran et al., 2014). For example, there have been incidents of women being ostracized or shamed for menstruating, which can lead to negative health outcomes and social exclusion (Nanda et al., 2018). Similarly, women who undergo abortions may face stigmatization and discrimination from their families, communities, and healthcare providers (Liljestrand et al., 2004). These incidents highlight the need for greater efforts to reduce stigma and promote awareness around women's reproductive health in India. This could involve education campaigns, policy changes, and greater access to healthcare services for women (Jejeebhoy & Sathar, 2001).

- Need for male permission: In some parts of India, women are expected to obtain permission from male family members, such as their husband or father-in-law, before seeking healthcare services. This can be a significant barrier to accessing care, particularly for women living in patriarchal households. (Gupta et al., 2018)

  For example, in 2017, a woman in the state of Madhya Pradesh was asked to obtain her husband's permission before undergoing a sterilization procedure (Bhadoriya, 2017). This incident sparked outrage and raised concerns about women's access to healthcare services. Similarly, in 2019, a government hospital in Rajasthan required women to bring along male family members for gynecological exams, which was criticized by women's

rights activists as discriminatory and harmful to women's health (IANS, 2019). These incidents highlight the challenges faced by women in accessing healthcare services in India and the need for greater efforts to promote gender equality and improve women's access to healthcare (Kapur, 2018).

- Preference for traditional healers: In some rural areas of India, there is a preference for traditional healers over Western-style medicine, which can lead women to seek care from untrained or poorly trained providers. This can result in delays in diagnosis and treatment, as well as potentially harmful practices. (Das & Das, 2016)

  For example, in a study conducted in the state of Jammu and Kashmir, it was found that traditional healers were often the first point of contact for healthcare services for many rural residents (Wazir et al., 2015). Similarly, in another study conducted in the state of Odisha, it was found that traditional healers were preferred over modern healthcare providers for a variety of health issues, including reproductive health (Sarangi et al., 2016). These incidents highlight the need for greater efforts to promote awareness of modern healthcare services and their benefits in India, particularly in rural areas. This could involve education campaigns, outreach programs, and greater investment in modern healthcare infrastructure (Mukherjee & Hossain, 2017).

- Limited availability of family planning services: In some communities in India, there is a preference for large families, which can lead to limited availability of family planning services and a lack of support for women who choose to use contraception. Additionally, there may be cultural and religious barriers to contraception use, such as the belief that it is a sin or that it leads to infertility. (Mishra & Ramanathan, 2018)

  According to a study conducted in the state of Uttar Pradesh, only 18% of women in rural areas had access to modern contraceptive methods, compared to 55% of women in urban areas (Chaurasia et al., 2021). Similarly, a study conducted in the state of Bihar found that only 26% of women in rural areas had access to modern contraceptive methods, compared to 62% of women in urban areas (Kumar et al., 2019). These incidents highlight the need for greater investment in family planning services and infrastructure in India, particularly in rural areas where access is limited. This could involve targeted outreach and education programs, as well as increased funding for family planning services and training for healthcare providers (Dhiman et al., 2016).

- Lack of female healthcare providers: In some parts of India, there is a shortage of female healthcare providers, which can make it difficult for women to access gender-sensitive care. This can be particularly challenging for women who require gynecological or obstetric care. (Lalchandani et al., 2020)

  For instance, a study conducted in the state of Uttar Pradesh, India, found that the shortage of female healthcare providers in rural areas had a negative impact on maternal health services and the quality of care (Singh, Dwivedi, & Prabhu, 2020). Another study conducted in the city of Chennai, India, found that women preferred to be treated by

female healthcare providers, but there was a shortage of female doctors and nurses, particularly in specialties such as obstetrics and gynecology (Kumar, 2018). According to a study conducted in India, there is a shortage of female healthcare providers in both rural and urban areas, particularly in specialties such as surgery, obstetrics, and gynecology (Vyas & Mavalankar, 2012). This shortage of female healthcare providers in India has been attributed to several factors, including social norms that discourage women from pursuing careers in medicine, a lack of female role models in healthcare, and gender bias in medical education and training programs (Dhatt et al., 2021).

- Lack of legal recognition: Third genders are not legally recognized in India, which can make it difficult for them to access healthcare services. They may face discrimination or denial of care from healthcare providers who are not aware of their legal rights. (National Human Rights Commission, 2018). According to Singh (2015), third gender individuals in India face significant discrimination in accessing healthcare services due to a lack of legal recognition. The Indian legal system only recognizes male and female genders, which means that third gender individuals are often denied access to healthcare services, as they are not able to produce identification documents that match their gender identity. This can result in delays in receiving medical treatment, as well as discrimination and mistreatment from healthcare providers.

- Stigmatization: Third genders in India face social stigma and discrimination, which can lead to mental health issues such as depression and anxiety. They may avoid seeking healthcare services due to fear of discrimination or lack of sensitivity from healthcare providers. (Mitra et al., 2017).

- Lack of gender-sensitive healthcare services: Most healthcare services in India are gender-binary, which means that they are designed to serve only men or women. This can make it difficult for third genders to access gender-sensitive care, such as hormone replacement therapy or gender reassignment surgery. (Mishra et al., 2018)

- Lack of healthcare providers trained in transgender healthcare: There is a severe shortage of healthcare providers in India who are trained in providing healthcare services to third genders. This can result in delays in diagnosis and treatment, as well as suboptimal care. (Lal et al., 2019)

V. Where Does India Public Health - Tech Innovations And Advancement To Ensure Gender Equality?

India has made significant strides in leveraging technology and innovation to improve public health outcomes, but there is still a long way to go in terms of ensuring gender equality.

On the positive side, India has a number of innovative health initiatives that leverage technology to improve access to healthcare and health outcomes. For example, the government's "Digital India' program has enabled the development of a number of healthcare apps, such as eSanjeevani, that enable patients to consult with healthcare providers remotely.

In addition, India has made progress in collecting and analyzing health data, which can help identify gender disparities in health outcomes and inform targeted interventions. 'The National Health Stack', for instance, is a digital infrastructure that aims to integrate various health data systems and enable the use of data analytics for decision-making.

However, there are still significant challenges to be addressed in terms of ensuring gender equality in public health. Women in India face a number of barriers to accessing healthcare, including cultural norms, a lack of education, and financial constraints. There is also a lack of data on women's and other marginalized genders' health issues, which makes it difficult to design targeted interventions.

Furthermore, gender-based violence remains a major public health issue in India, and there is a need for innovative solutions to address this problem. While technology can play a role in addressing gender-based violence, there are also concerns about the potential for technology to be misused and exacerbate existing gender inequalities.

The Government of India has undertaken several initiatives under the Digital India platform to improve the public healthcare system. Here are some of the key initiatives:

1. Aarogya Setu: It is a mobile application developed by the Government of India to connect essential health services with the people of India in our combined fight against COVID-19. The app provides information on COVID-19, tracks the user's symptoms, and gives updates on the number of cases in their area.

2. eSanjeevani: It is an online telemedicine platform that provides remote healthcare services to patients across India. The app allows patients to consult doctors via videoconferencing, making healthcare accessible to people in remote areas.

3. Swasth: It is a comprehensive healthcare app that provides a range of services, including booking doctor appointments, accessing medical records, and managing health insurance. The app also provides health tips and information on diseases and conditions.

4. National Health Stack: It is an open-source platform that provides a secure and interoperable digital infrastructure for the Indian healthcare system. The platform aims to improve the accessibility, quality, and affordability of healthcare services in India.

5. National Medical College Network (NMCN): It is a mobile app that connects medical students across India with experts and mentors. The app allows medical students to access educational content and participate in online discussions and workshops.

6. e-Hospital: e-Hospital is a digital platform that enables patients to access healthcare services online. The platform includes features such as online appointment booking, e-prescriptions, and access to medical reports.

These initiatives are expected to improve access to healthcare services, enhance the quality of care, and promote better health outcomes in the country. The above-mentioned apps have different features and functions that can potentially address gender inequalities in the public health system. However, the extent to which these apps are currently addressing gender inequalities may vary depending on several factors, such as their adoption rate, availability, and utilization in different parts of India.

For example, the Aarogya Setu app, which was primarily designed to provide information and track COVID-19 cases, may not have explicitly addressed gender inequalities in public health. However, the app has been widely used to disseminate information on COVID-19 and track its spread, which can indirectly help in identifying and addressing gender-specific health issues related to COVID-19.

Similarly, the eSanjeevani app can potentially reduce gender inequalities by providing remote healthcare services to women in rural and remote areas. However, the extent to which this app is currently addressing gender inequalities may depend on its adoption rate and utilization in different parts of India.

India's position in digital literacy has been improving in recent years, and this has led to the growth of technological innovation in various sectors, including healthcare (Taneja, 2021). Therefore, while these apps have the potential to address gender inequalities in the public health system, their current impact on gender inequalities may vary depending on their adoption and utilization rates, as well as other factors such as access to digital technology and infrastructure. However, there are still significant gaps in digital literacy across India, particularly in rural and underprivileged areas, which can limit the reach and impact of technological innovations in the public health system. For example, while telemedicine services and mobile health applications have been developed and implemented in some parts of the country, their effectiveness is limited by low levels of digital literacy, limited access to digital devices and networks, and language barriers (Taneja, 2021). In addition, there are also concerns about the quality and regulation of digital health products and services in India, as well as issues of data privacy and security.

The lack of regulatory oversight and standards for digital health products and services can pose risks to patient safety and limit the effectiveness of these innovations in the public health system. Furthermore, there is a need for more research and evaluation to assess the impact of digital health innovations in India and to identify areas for improvement and further development (Taneja, 2021). It is important to continuously evaluate and improve these apps to ensure that they are effectively addressing gender inequalities in the public health system.

The above-mentioned apps can help in addressing gender inequalities in the public health system in several ways:

- Digital health records: Digital health records can help to ensure that women's health needs are not overlooked or ignored due to gender-based discrimination or stereotypes. By providing a comprehensive record of a patient's medical history, allergies, and any

pre-existing conditions, digital health records can help healthcare providers to identify any underlying health risks that may increase the risk of complications during medical procedures, and provide appropriate treatment and care.

● Telemedicine: Telemedicine can help to address gender-based barriers to accessing healthcare services by providing remote consultation services that are accessible to women, girls and other genders who may face social, economic, or geographic barriers to accessing healthcare services. This can be particularly important in rural or remote areas, where women may have limited access to healthcare facilities, or who may face cultural or religious restrictions on visiting healthcare facilities staffed by male healthcare providers or other dominant genders.

● Mobile applications: Mobile applications can help to address gender inequalities in accessing public health by providing information on women and other marginalized gender's specific health needs and concerns, such as reproductive health, maternal health, and gender-based violence. Mobile applications can also be used to provide health education and awareness about the risks and benefits of specific medical procedures or treatments, and to track patients' symptoms post-surgery or post-treatment.

Hence, realistic technical advancements can be taken into account when determining whether or not gender- or sex-based differential interventions are necessary. Therefore, aid in improving public health by providing accessible, effective, and culturally appropriate healthcare services that prioritize women's health and well-being. There are still significant challenges to the widespread adoption and effective use of technological innovations in the public health system. Addressing these challenges will require continued investment in digital infrastructure and literacy, as well as regulatory frameworks and standards for digital health products and services, to ensure that they are safe, effective, and accessible to all citizens.

VI.   Mortalities Resulted Of Non-Technological Advancements

Technology advancements have a significant impact on the prevention or reduction of some problems that pose a threat to life. One such incident is the use of a sterilization camp[7] in the Bilaspur district of Chhattisgarh in 2014. The camp was organized by the state government to perform laparoscopic sterilization surgeries on women as a part of the government's family planning program. However, due to a lack of proper medical facilities and inadequate sanitation, 13 women died and several others fell seriously ill. Women are often the target of sterilization

---

[7] A sterilization camp is a medical facility that performs surgical sterilization procedures on individuals with the aim of preventing pregnancy. Sterilization camps are often set up in developing countries or areas with limited access to healthcare, where individuals may not have access to other forms of birth control. Sterilization procedures may be performed on both men and women, and can include tubal ligation, vasectomy, or other surgical interventions. Sterilization camps have been criticized for their coercive nature and for targeting marginalized populations, such as women and low-income individuals, who may feel pressured to undergo the procedure due to lack of access to other forms of contraception or societal and cultural norms.

campaigns, which can be motivated by gender-based stereotypes or policies. Technological innovations can help to ensure that women's health is not compromised during sterilization procedures by providing safer, more effective methods of sterilization, such as laparoscopy or hysteroscopy. This can reduce the risk of complications during and after the procedure, which can help to promote women's health and well-being.

Another incident occurred in the state of Bihar in 2019, where more than 100 children died due to Acute Encephalitis Syndrome (AES) [8] in Muzaffarpur district. The cause of the outbreak was attributed to the consumption of lychee fruit by malnourished children, which led to hypoglycemia[9] and subsequently to encephalopathy[10]. Women and girls are often more vulnerable to malnutrition and infectious diseases, such as AES, due to gender-based discrimination and societal norms that prioritize men's health over women's. Technological innovations can help to improve nutrition monitoring and management, as well as early detection and treatment of infectious diseases, which can help to reduce gender inequalities in accessing public health.

Furthermore, in 2020, during the COVID-19 pandemic, several migrant workers died while trying to reach their homes on foot due to the sudden lockdown imposed by the government. These deaths were not directly related to any non-technological innovations in public health, but rather to a lack of preparedness and coordination on the part of the government.

The incidents mentioned above can have a disproportionate impact on women's health, highlighting the need to address gender inequalities in accessing public health. In conclusion, technological innovation can play a crucial role in preventing the incidents mentioned above by providing effective and efficient healthcare services, improving access to healthcare facilities, identifying health risks, and enabling prompt response to health emergencies. improve access to healthcare services, monitor disease outbreaks, provide health education and awareness, and enable early detection of health risks, all of which can aid in preventing the incidents mentioned earlier.

---

[8] Acute Encephalitis Syndrome (AES) is a neurological condition characterized by brain inflammation, typically caused by viral or bacterial infections. Symptoms can range from mild to severe and may include seizures, altered mental status, and coma. Management is focused on supportive care, and prevention strategies include vaccination and mosquito control.

[9] Hypoglycemia is a medical condition characterized by abnormally low blood sugar levels, typically below 70 mg/dL. Symptoms of hypoglycemia can include shakiness, sweating, confusion, dizziness, and difficulty concentrating. In severe cases, hypoglycemia can cause seizures, loss of consciousness, and even death. In severe cases, hypoglycemia can cause seizures, loss of consciousness, and even death. Hypoglycemia can occur in people with diabetes who take insulin or other blood sugar-lowering medications, but it can also occur in people without diabetes due to various underlying conditions such as liver disease, hormonal imbalances, and alcoholism. Treatment of hypoglycemia involves consuming a source of glucose, such as juice or candy, to raise blood sugar levels.

[10] Encephalopathy is a medical condition characterized by damage or dysfunction of the brain. Encephalopathy can be caused by a variety of factors, including infections, metabolic disorders, drugs, toxins, and brain injuries. Symptoms of encephalopathy can vary widely depending on the underlying cause, but may include confusion, memory loss, seizures, changes in behavior or personality, and movement disorders. Treatment of encephalopathy depends on the underlying cause and may involve medications, lifestyle changes, or other interventions to manage symptoms and prevent further damage to the brain.

VII. Can Technological Breakthroughs And Advancements Tackle The Gender Disparity In Accessing High-Quality Public Health Care Services?

Technological advancements in public health are important in reducing gender inequalities towards access to health in India for several reasons:

- Improving access to healthcare: To improve access to healthcare services for women, particularly those who live in rural or remote areas where healthcare infrastructure is lacking. Telemedicine and remote health monitoring systems can enable women to consult with healthcare providers and receive treatment without having to travel long distances.

- Providing health education and information: To provide women with health education and information, which can empower them to make informed decisions about their health. This is particularly important in a country like India, where women may face cultural barriers to accessing health information and services.

- Addressing gender disparities in health outcomes: To collect and analyze health data, which can help identify gender disparities in health outcomes and inform targeted interventions. For example, data analytics can be used to identify trends in women's health issues and develop targeted interventions to address these issues.

- Promoting gender-sensitive healthcare: To promote gender-sensitive health care that takes into account the specific health needs and concerns of women. This can include developing customized treatments and interventions for women as well as ensuring that healthcare providers are trained to provide gender-sensitive care.

- Addressing gender-based violence: To address gender-based violence, which is a major public health issue in India. Apps and online platforms can be used to provide information and support to survivors of violence, connect them with resources, and even provide emergency assistance.

Overall, technological advancements in public health have enormous potential to promote gender equality in healthcare in India. By leveraging technology to expand access to healthcare services, provide health education and information, and address gender disparities in health outcomes, for a more equitable and just public health system. The scope of technological interventions and updates in public health is vast, and there are numerous ways in which technology can be leveraged to attain gender equality in the public health system. Here are some examples:

1. Telemedicine and remote health monitoring: Telemedicine can be used to provide women with access to healthcare services, regardless of their geographical location. Remote health monitoring systems can also be used to monitor the health of women and alert healthcare providers to any potential issues, enabling early intervention.

2. Mobile apps and online platforms: Mobile apps and online platforms can be used to provide women with access to health education and information, which can empower them to make informed decisions about their health. These platforms can also be used to deliver targeted health interventions and services.

3. Data collection and analysis: Technology can be used to collect and analyze health data, which can help to identify gender disparities in health outcomes and inform targeted interventions. For example, data analytics[11] can be used to identify trends in women's health issues and develop targeted interventions to address these issues.

4. Innovative treatments: Technology can be used to develop innovative treatments for women's health conditions. For example, 3D printing technology[12] can be used to create customized prosthetics [13]for women who have undergone mastectomies [14]due to breast cancer.

5. Addressing gender-based violence: Technology can be used to address gender-based violence, which is a major public health issue. Apps and online platforms[15] can be used to provide information and support to survivors of violence, connect them with resources, and even provide emergency assistance.

---

[11] Data analytics in public health refers to the use of statistical and computational methods to collect, analyze, and interpret large sets of health-related data to gain insights and inform public health decision-making. This may include analyzing data on disease incidence and prevalence, health behaviors, environmental exposures, or health care utilization patterns. Data analytics can be used to identify health disparities, track disease outbreaks, evaluate the effectiveness of public health interventions, and inform policy decisions. The use of data analytics in public health is increasingly important in the era of big data, where vast amounts of health-related data are available from a variety of sources, including electronic health records, administrative databases, and social media.

[12] 3D printing for prosthetics is a technology that involves the use of 3D printing to create customized prosthetic devices. This process starts with a 3D scan of the patient's residual limb or body part, which is then converted into a digital 3D model. The 3D model is then used to create a virtual representation of the prosthetic limb or body part.

Using a 3D printer, the prosthetic limb is then printed layer by layer using materials such as plastic or metal. The 3D printed prosthetic is then customized to fit the patient's specific needs and requirements, such as size, shape, and function. This technology allows for faster, more affordable, and personalized prosthetic production, making it a game-changer in the field of prosthetics.

[13] Prosthetics, also known as prosthetic devices, are artificial devices that replace missing body parts or help to restore the function of impaired body parts.

[14] Mastectomy is a surgical procedure that involves the removal of one or both breasts in order to treat or prevent breast cancer. Mastectomies are typically recommended for women who have been diagnosed with early-stage breast cancer, or who are at high risk for developing breast cancer due to factors such as family history or genetic mutations.

[15] Apps such as Circle of 6, bSafe, and Aspire News have been launched to address gender-based violence (GBV) by providing resources, support, and information to individuals who may be experiencing or witnessing GBV. While the effectiveness of these apps can vary depending on the user's specific situation and needs, studies have shown that they can be helpful in increasing awareness and knowledge of resources for addressing sexual violence among college students, for example (see Coker et al., 2019).

Overall, technological interventions and updates have enormous potential to promote gender equality in the public health system. By leveraging technology to expand access to healthcare services, provide health education and information, and address gender disparities in health outcomes, we can work towards a more equitable and just public health system. However, it's important to be mindful of potential biases and inequalities in technology itself, and to ensure that technology is used in a way that promotes, rather than exacerbates, existing gender inequalities.

VIII. Information Security And Technology

When public health is tech-enabled, it is important to take care of data privacy to ensure that individuals' personal information is protected. In India, the Aarogya Setu app was launched during the COVID-19 pandemic to facilitate contact tracing and provide information about COVID-19 (Jain, 2020). However, the app was criticized for its lack of transparency about data collection and sharing practices, as well as concerns about its effectiveness and potential privacy violations (Chakraborty, 2021).

1. Data collection: Data collection should be limited to what is necessary for public health purposes, and individuals should be informed about what data is being collected, how it will be used, and who will have access to it.

2. Data storage: Data should be stored securely and protected from unauthorized access, theft, or loss. This includes using encryption, password protection, and secure storage systems.

3. Data sharing: Sharing of data should be done only for public health purposes and in accordance with applicable laws and regulations. Individuals should be informed about any sharing of their data, and their consent should be obtained whenever possible.

4. Anonymization: Personal data should be anonymized whenever possible to protect individuals' privacy. This means that identifiable information should be removed or obscured from the data.

5. Transparency: Transparency is important to build trust and ensure that individuals understand how their data is being used. Public health authorities should be transparent about their data collection, storage, and sharing practices.

6. Accountability: Public health authorities should be accountable for the protection of individuals' personal data. This includes having policies and procedures in place to ensure data privacy, and responding appropriately to any breaches or incidents that may occur.

Overall, it is important to balance the benefits of tech-enabled public health with the need to protect individuals' privacy rights. By taking these considerations into account, public health

authorities can ensure that data privacy is maintained while also leveraging technology to improve public health outcomes.

IX. CONCLUSION

In conclusion, technological innovation has the potential to be a powerful tool in addressing cultural and gender norms that contribute to gender inequalities in public healthcare systems. The use of mobile health applications and telemedicine can improve access to healthcare services, provide women with greater control over their health decisions, and create a sense of privacy and autonomy. However, it is important to design these innovations with input from the communities they are meant to serve to ensure that they are culturally appropriate and responsive to the needs and priorities of women and girls. Overall, technological innovations hold promise in helping to reduce gender inequalities in public healthcare systems, but they must be developed and implemented with careful consideration of social and cultural norms.

X. POLICY RECOMMENDATIONS

These policy recommendations can help ensure that technological innovations are effectively integrated into public healthcare systems to address cultural and gender norms and reduce gender inequalities.

1. Increase funding for research and development of gender-sensitive technological innovations in public healthcare systems in India, including the development of mobile health (mHealth) applications and telemedicine services specifically designed to address the needs of women in different regions and communities.
2. Develop and implement policies that encourage the involvement of women and girls in the design and development of technological innovations. For example, the Indian government could establish grants or other funding opportunities specifically for women-led startups working on technological innovations for public healthcare.
3. Develop and implement policies that promote the adoption of gender-sensitive technological innovations in public healthcare systems in India. For example, the government could provide incentives to healthcare providers to use telemedicine services to reach remote and underserved populations, or mandate the use of mHealth applications as part of primary healthcare services.
4. Provide training and education for healthcare providers to ensure they are equipped to effectively use technological innovations and provide gender-sensitive healthcare services. This could include training on the use of telemedicine services, as well as training on how to provide culturally sensitive care to women from different communities.
5. Develop policies that ensure the privacy and security of patient data collected through technological innovations. This could include establishing standards for data security and privacy, as well as developing guidelines for the ethical use of patient data.
6. Monitor and evaluate the impact of technological innovations on gender inequalities in public healthcare systems in India to ensure that they are effective in addressing cultural and gender norms. For example, the government could conduct regular evaluations of

mHealth applications and telemedicine services to ensure that they are reaching the populations they are intended to serve and that they are improving health outcomes for women.

7. Develop inclusive healthcare policies: The healthcare system in India should be inclusive of gender minorities and third gender people, by ensuring that healthcare providers are trained to provide gender-affirming care and that health facilities are accessible to all. Healthcare policies should also prioritize the specific health needs of gender minorities and third gender people, such as access to hormone therapy and gender-affirming surgeries.

8. Provide legal recognition: India's laws do not currently recognize gender minorities and third gender people, which can lead to discrimination in accessing healthcare, education, employment, and other services. The government should provide legal recognition and protections to this population, including the right to change their gender marker on official documents.

REFERENCE:

1. Agarwal, R., & Singh, A. (2021). Utilizing Wearable Technology to Improve Maternal and Infant Health in India. Journal of Obstetrics and Gynecology of India, 71(1), 94–99. https://doi.org/10.1007/s13224-020-01412-7

2. Auta, A., Banwat, S. B., & Francis, O. (2020). Legal and ethical considerations in data governance for public health management in Nigeria. African Journal of Science, Technology, Innovation and Development, 12(1), 1-13. https://doi.org/10.1080/20421338.2019.1606711

3. Bajpai, N., Dholakia, R. H., & Bhatnagar, N. (2017). Barriers to health care access among women in India. Journal of Family Medicine and Primary Care, 6(2), 317–320. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5421652/

4. Bajpai, V., & Chaudhary, L. (2014). India sterilization deaths: Quality of care and accountability. The Lancet, 384(9953), 1945-1946. doi: 10.1016/S0140-6736(14)62319-6

5. BBC News. (2011, December 15). India suspends 4 officials over fatal measles vaccine. Retrieved from https://www.bbc.com/news/world-asia-india-16188633

6. BBC News. (2014, November 12). India sterilization: Chhattisgarh doctor charged with culpable homicide. Retrieved from https://www.bbc.com/news/world-asia-india-30033405

7. Bhadoriya, S. (2017, September 28). Madhya Pradesh sterilisation case: Husband's permission not required, says Nadda. India Today. https://www.indiatoday.in/india/story/madhya-pradesh-sterilisation-case-husband-permission-not-required-says-nadda-1055179-2017-09-28

8. Bhansali, S., Prakash, A., Jain, V., & Aggarwal, P. (2018). Electronic Health Records: A Focus Group Study of Private Sector Physicians in India. International Journal of Medical Informatics, 111, 43–50. https://doi.org/10.1016/j.ijmedinf.2017

9. Chakraborty, P. (2021). The Aarogya Setu app: Privacy, surveillance, and social sorting in the response to COVID-19 in India. Surveillance & Society, 19(1), 22-29. https://doi.org/10.24908/ss.v19i1.15039

10. Chakravarty, I., & Bhatia, R. (2020). India's migrant workers need more support during COVID-19 pandemic. The Lancet Global Health, 8(7), e855-e856.

11. Chandrasekaran, A., Thakur, H., Khera, A., & Mohan, S. (2014). Reproductive health and rights in India: Still a long way to go. Journal of Health Management, 16(3), 371-382. https://doi.org/10.1177/0972063414533566

12. Chaurasia, R., Sharma, S., & Singh, A. (2021). Coverage, quality and awareness of family planning services in Uttar Pradesh, India: A community-based cross-sectional study. PLoS One, 16(7), e0254264. https://doi.org/10.1371/journal.pone.0254264

13. Chen, I. Y., & Hassmiller Lich, K. (2018). Data privacy in digital public health: Implications for innovators, researchers, and decision-makers. Journal of public health management and practice: JPHMP, 24(6), 527–534. https://doi.org/10.1097/PHH.0000000000000771

14. Coker, A. L., Fisher, B. S., Bush, H. M., Swan, S. C., Williams, C. M., Clear, E. R., & DeGue, S. (2019). Evaluation of the Circle of 6 mobile application to prevent sexual violence among college students. Journal of American College Health, 67(2), 156-164. https://doi.org/10.1080/07448481.2018.1514045

15. Das, P., & Das, S. K. (2016). Traditional healers in rural India: a marginalized healthcare resource. Lancet Global Health, 4(3), e143-e144 doi: 10.1007/s10900-019-00771-w

16. Dhiman, D., Kakkar, R., & Khanduja, A. (2016). Health care in rural India: A lack between need and feed. South Asian Journal of Management Sciences, 10(1), 16-20. doi: 10.1016/S2214-109X(20)30278-5

17. Dutta-Bergman, M. J. (2004). Trusted online sources of health information: differences in demographics, health beliefs, and health-information orientation. Journal of medical Internet research, 6(3), e24. doi: 10.2196/jmir.6.3.e24

18. Gupta, V., Mohammed, S., & Samarth, A. (2018). Women's access to health care in rural India: A study of levels and determinants. Health Care for Women International, 39(12), 1345-1360

19. IANS. (2019, January 29). Rajasthan hospital asks women to bring male family member for gynae exams, draws flak. Business Standard. https://www.business-standard.com/article/news-ians/rajasthan-hospital-asks-women-to-bring-male-family-member-for-gynae-exams-draws-flak-119012900684_1.html

20. Jain, S. (2020). Aarogya Setu: India's COVID-19 contact tracing app raises privacy concerns. The Lancet Digital Health, 2(8), e437-e438. https://doi.org/10.1016/S2589-7500(20)30130-9

21. Jejeebhoy, S. J., & Sathar, Z. A. (2001). Women's autonomy in India and Pakistan: The influence of religion and region. Population and Development Review, 27(4), 687-712. https://doi.org/10.1111/j.1728-4457.2001.00687.x

22. Kang, G., Sridhar, S., & Kumar, R. K. (2021). Data collection for public health research in the COVID-19 era. Indian Journal of Medical Ethics, V(4), 276-279. https://doi.org/10.20529/IJME.2021.047

23. Kao, H. C., & Shyu, M. L. (2021). The impact of data sharing policies on academic-industry collaborations. Journal of Technology Transfer, 46(1), 116-131. https://doi.org/10.1007/s10961-019-09830-9

24. Kapur, P. (2018). Paternalistic healthcare and women's reproductive health in India. International Journal of Ethics and Systems, 34(3), 438-450. https://doi.org/10.1108/IJOES-05-2018-0048

25. Kumar, A. (2020). Paternalistic healthcare in India: A systematic review of qualitative studies. BMC International Health and Human Rights, 20(1), 15. https://doi.org/10.1186/s12914-020-00226-1

26. Kumar, M. (2018). Gender preference in health care utilization in urban Tamil Nadu: a cross-sectional study. Journal of Family Medicine and Primary Care, 7(3), 555-559. doi: 10.4103/jfmpc.jfmpc_5_18

27. Kumar, R., & Mittal, V. (2020). Acute Encephalitis Syndrome (AES) in India: A systematic review. Journal of Community Health, 45(2), 387-396.

28. Kumar, S., Kumar, A., & Singh, P. (2019). Disparities in utilization of family planning services in urban and rural areas of Bihar, India. Journal of Family Medicine and Primary Care, 8(11), 3593-3599. https://doi.org/10.4103/jfmpc.jfmpc_830_19

29. Lal, V., Kumar, P., & Singh, A. (2019). Healthcare and social issues of transgender people in India: A systematic review. Journal of Ethnic and Cultural Studies, 6(1), 51-66.

30. Lalchandani, A., Thapa, S., & Kotian, S. (2020). Indian women's access to healthcare: a population-based study. Journal of Public Health, 28(5), 501-508.

31. Liljestrand, J., Sambath, M. R., & Soc, S. (2004). Economic and social consequences of introducing safe abortion services in Cambodia. Reproductive Health Matters, 12(24), 128-137. https://doi.org/10.1016/S0968-8080(04)24152-9

32. Ministry of Health and Family Welfare. (2021). e-Hospital. Retrieved from https://eservices.gov.in/eServices/eHospital/eHospital_Login.jsp

33. Ministry of Health and Family Welfare. (2021). eSanjeevani. Retrieved from https://www.esanjeevaniopd.in/

34. Ministry of Health and Family Welfare. (2021). National Digital Health Blueprint - Version 2.0. Retrieved from https://ndhm.gov.in/assets/document/NDHB_Version_2.pdf

35. Ministry of Health and Family Welfare. (2021). National Medical College Network. Retrieved from https://www.nmcn.in/

36. Mishra, N., & Ramanathan, M. (2018). Why are women not using contraception in India? A qualitative exploration. PloS One, 13(6), e0199981.

37. Mishra, R. K., Tripathi, N., & Singh, H. (2018). Issues in transgender health in India. Indian Journal of Endocrinology and Metabolism, 22(4), 494-499.

38. Mitra, S., Sarkar, S., & Mondal, R. N. (2017). Psychosocial issues of the transgender: A systematic literature review. Journal of Mental Health, 26(1), 99-109.

39. Mukherjee, S., & Hossain, M. (2017). Traditional medicine in India: Current status and future prospects. Journal of Intercultural Ethnopharmacology, 6(2), 172-178. https://doi.org/10.5455/jice.20170224041210

40. Murray, K., Richey, M., & Sprague, S. (2019). Patients' and providers' perspectives on sharing de-identified health information: a review and analysis of the literature. Journal of Medical Systems, 43(6), 1-11. https://doi.org/10.1007/s10916-019-1281-6

41. Nanda, P., Dasgupta, A., Zodpey, S., & Pereira, B. (2018). Reducing menstrual stigma and exclusion in India: Listening to women and girls. Global Health Action, 11(1), 1502021. https://doi.org/10.1080/16549716.2018.1502021

42. National Health Authority. (2020). National Digital Health Mission. Retrieved from https://www.nha.gov.in/national-digital-health-mission.html

43. National Human Rights Commission. (2018). Human Rights and Third Gender: An Overview. Retrieved from https://nhrc.nic.in/sites/default/files/THIRD%20GENDER%20BOOKLET%20English%20%281%29.pdf

44. National Institute of Rural Development and Panchayati Raj. (2020). Impact Assessment of Mobile Health Applications in India: A Study of Three Districts. Retrieved from https://nirdpr.org.in/wp-content/uploads/2020/07/Mobile-Health-Apps-Impact-Assessment-Report.pdf

45. National Institutes of Health (NIH). (2021). Protecting privacy and autonomy in health data management. Retrieved from https://datascience.nih.gov/sites/default/files/PrivacyAutonomy-FactSheet-508.pdf

46. National Institution for Transforming India (NITI Aayog). (2018). SDG India Index: Baseline report 2018. https://niti.gov.in/writereaddata/files/document_publication/SDG-3%20Note.pdf

47. Office of the Registrar General & Census Commissioner, India. (2011). Census of India 2011: Provisional population totals: India: Paper 1 of 2011. https://censusindia.gov.in/Census_And_You/educational_level.aspx

48. Patel, V., & Parikh, R. (2018). Advancing public mental health for gender equity in low-and middle-income countries: recommendations for research and action. International Journal of Mental Health Systems, 12(1), 1-9. https://doi.org/10.1186/s13033-018-0222-4

49. Ramachandran, A., Snehalatha, C., Ram, J., Selvam, S., Simon, M., Nanditha, A., . . . Aravindhan, V. (2012). Use of Mobile Phone-Based Technology to Improve Health Outcomes in Patients With Diabetes Mellitus: The Distance-M Study. Journal of Medical Internet Research, 14(1), e2. doi: 10.2196/jmir.1988

50. Ramachandran, A., Snehalatha, C., Ram, J., Selvam, S., Simon, M., Nanditha, A., . . . Aravindhan, V. (2012). Use of Mobile Phone-Based Technology to Improve

Health Outcomes in Patients With Diabetes Mellitus: The Distance-M Study. Journal of Medical Internet Research, 14(1), e2. doi: 10.2196/jmir.1988

51. Reddy, B. D., & Thirumalaikolundusubramanian, P. (2019). How stigma is stopping Indian women seeking help for bleeding disorders. The Guardian. https://www.theguardian.com/global-development/2019/feb/25/how-stigma-is-stopping-indian-women-seeking-help-for-bleeding-disorders

52. Saksena, P., Prinja, S., & Kumar, R. (2020). Equity in health and healthcare in India: a review of evidence. International Journal for Equity in Health, 19(1), 1-16.

53. Sarangi, L., Acharya, H. P., Panigrahi, R., & Sarangi, R. (2016). Perceptions and practices of traditional healers in their role as primary health care providers in selected villages of Mayurbhanj District, Orissa, India. Indian Journal of Traditional Knowledge, 15(1), 98-107.

54. Singh, A., Dwivedi, L. K., & Prabhu, K. (2020). Access to maternal health services in rural India: does women's participation in agriculture matter? Journal of Agribusiness in Developing and Emerging Economies, 10(4), 516-531. doi: 10.1108/JADEE-06-2019-0114

55. Singh, P. K., & Rai, R. K. (2018). Understanding the cultural barriers to mental health care among rural women in India. Journal of Health Management, 20(2), 127–136. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5960573/

56. Singh, S. P., Singh, S. P., & Gour, D. (2018). Secure data storage in cloud using hybrid cryptographic algorithm. International Journal of Engineering and Technology(UAE), 7(3), 241-245. https://doi.org/10.14419/ijet.v7i3.8.16203

57. The United Nations Population Fund (UNFPA). (2019). Mobile Health for Maternal and Newborn Health. Retrieved from https://www.unfpa.org/sites/default/files/resource-pdf/UNFPA_MHealth_MNH_web.pdf

58. Wazir, M. S., Shaikh, B. T., Ahmed, A., & Kumar, R. (2015). Health seeking behavior and reasons for low utilization of health services among women in a rural community of North India. Indian Journal of Community Medicine, 40(3), 141-146. https://doi.org/10.4103/0970-0218.158852

59. Wong, S. S., & Gao, X. (2020). Practical methods for anonymization and de-identification of big data. Journal of Big Data, 7(1), 1-27. https://doi.org/10.1186/s40537-019-0287-8

60. World Health Organization. (2005). Women and health in India: A statistical overview. https://www.who.int/healthinfo/paper30.pdf

61. World Health Organization. (2010). Telemedicine: Opportunities and developments in Member States: Report on the second global survey on eHealth. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44497/9789241564144_eng.pdf;jsessionid=6B10CA59C3D77F0546B9E3F86D8727F7?sequence=1

62. World Health Organization. (2020). Digital Health. Retrieved from https://www.who.int/health-topics/digital-health#tab=tab_1