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A Sustainable eHealth Program to Enhance the Healthcare Sector

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Abstract

This study aims to assess the efficiency of the eHealth program by conducting a comparative study between public and private healthcare settings in Bangladesh and Malaysia. A detailed literature review gathered from leading databases, articles, and case studies was conducted to achieve the study's objective. After evaluating the literature and utilizing reducing methods the factors were organized and categorized into the four SWOT groups. The study exhibits that the government of Bangladesh has taken multiple approaches to efficient usage of their resources and providing primary healthcare services at grassroots levels. However, compared to a developing country like Malaysia it is far lag and struggling with multiple challenges like inadequate ICT infrastructure interoperability issues, low adoption of services, privacy and trust issues inadequate data security lack of policies and regulations, and insufficient funding along with multiple threats like resistance to change, cultural influence, and native

environmental issues. Nonetheless, these challenges can be addressed through the development of adequate infrastructure, technology, financial support, and human resource capabilities. This will help to achieve the goal of universal health coverage and digital healthcare. This paper identified and explored numerous eHealth concerns and institutionalized favorable policy recommendations to establish an effective and successful eHealth system and boost the healthcare sectors of Bangladesh and similar emerging economies. Being the first to incorporate SWOT analysis and eHealthcare programs, the suggested approaches can have a significant positive impact on the implementation of an effective and sustainable eHealth system.

Keywords: EHealth, SWOT analysis, Healthcare, Sustainability

Introduction

The Healthcare system of a country is considered the most critical factor in deciding its performance. In modern civilization, the significance and role of healthcare services in raising the quality of life and social security has been widely accepted (Grigorieva & Sukhoveeva, 2020). Over the past decade, the healthcare system has undergone a significant transformation particularly due to the substantial development in the information and communication technology (ICT) industry. Recent research has suggested that eHealth is the blessing of ICT and it is arguably the most evident program that has a significant effect on the development of the healthcare industry in developed countries (Hoque et al., 2017). With the aid of eHealth, the majority of developing countries have now built a strong and reliable healthcare system. Even in developing countries like Bangladesh, the use of ICT for healthcare, especially eHealth, is increasingly evolving. Recently, owing to the current government's Digital Bangladesh campaign, which gives exceptional priority to the provision of healthcare to people through ICT, eHealth has been given special focus. As part of the current government's dedication to Digital Bangladesh, the Ministry of Health and Family Welfare has taken various measures to expand eHealth services (Ahmed, 2020).

Currently, there is an increasing consensus that eHealth is a key to providing affordable and quality healthcare support for the community. EHealth can increase access to health, quality of treatment, and the satisfaction of physicians and patients, and can connect rural and remote areas with remote care that decreases travel time and expense (LeBlanc et al., 2020). Consequently, in developing countries that have an extreme shortage of highly qualified health providers, poor infrastructure, and geographical locations, the demand for ICT-based health facilities has therefore heightened. A similar scenario has been observed in Bangladesh, where the country is struggling to provide safe and equitable healthcare to all people to meet sustainable development goals with scarce capital and a huge population. Bangladesh was reported as one of the 57 countries in the world with a serious shortage of health staff and hospital beds (Alam, 2018). Because of the lack of funding, the government

has begun a new era in the health sector by implementing ICT for the distribution of health services, in particular, supporting eHealth as a path to cost-effective, affordable, and reliable healthcare in Bangladesh (Rinty et al., 2022). Over the years, eHealth programs have transformed and extended their coverage areas. It is, therefore, necessary to evaluate the program to perceive its success and effectiveness.

The assessment of the success of the eHealth service, however, has never little attention and a lack of study has been carried out. In comparison, none of the analyses performed a SWOT analysis and comparative analysis of the national eHealth initiative to assess the program's effectiveness. Most previous studies have concentrated only on the implementation of eHealth in Bangladesh from the viewpoint of patients, obstacles, and service opportunities. Much of these findings are focused on telemedicine instead of the entire eHealth system (Hakim, 2016; Zobair et al., 2020). Therefore, the purpose of this study is to identify and evaluate the effectiveness of the eHealth program in Bangladesh. To get a better insight into the eHealth system, a comparative analysis was undertaken with the private healthcare environments as well as another developing country, Malaysia. The study also analyzes the strengths, weaknesses, opportunities, and threats through the conduct of SWOT analysis to distinguish the eHealth program environment along with identifying the strategies to take advantage of the strengths and opportunities and to overcome weaknesses and threats. The implications of this report will allow politicians to make effective decisions on eHealth programs. The study's findings will address all these aspects and introduce strategies to enhance the efficiency and sustainability of eHealth services.

This paper is structured as follows; begins with a literature review to establish a foundation of understanding of eHealth and the comparison with other healthcare settings, followed by a methodology section detailing the research approach. The core of the manuscript consists of a SWOT analysis of eHealth. Strategies for enhancing the eHealth program are then proposed. The next section provides research implications, and future research directions and concludes with a summary of key findings.

Literature Review

EHealth System

The term eHealth is a generic umbrella term for the use of ICT in health-related services and processes. EHealth is traditionally the provision of health services with the help of multiple forms of communications systems, such as telemedicine, internet, electronic health records, mobile technology, and support for professional decision-making. It is a program that incorporates health information systems, computers, the internet, and related components to provide it (Da Fonseca et al., 2021). On the other hand, the World Health Organization denotes eHealth as a system of leveraging ICT to link clinicians, patients, and governments;

educating and informing healthcare practitioners, administrators, and customers; promoting creativity in the quality of treatment and management of the health system; and strengthening our healthcare system (World Health Organization, 2021).

Bangladesh eHealth Program

The large population, inaccessibility to health services, and below-standard healthcare infrastructure act as a limiting factor for providing quality healthcare services to the general people of developing countries like Bangladesh. To resolve these challenges and to provide optimum health coverage, the Bangladesh government has taken various measures to provide rural residents with ICT-based healthcare systems (Zishan et al., 2019). In 1998, when the Ministry of Health and Family Welfare (MOH&FW) undertook the Health and Community Sector Program (HPSP) to increase the quality of policy delivery, the eHealth project in Bangladesh began.

To promote eHealth services among vast numbers of people, the Directorate General of Health Services (DGHS) and the MOH&FW have made significant improvements (Sultana, 2019). More than 300 public hospitals are expected to be automated through a merger project between the Bangladesh MOH&FW and the World Bank. The government of Bangladesh has collaborated with local development agencies, private organizations, and NGOs to enhance the quality, efficacy, and protection of eHealth services (Alam, 2018). The Bangladesh Society for Telemedicine and eHealth (BSTeH) is another forum that promotes eHealth and telemedicine programs, monitors research work, and promotes the adoption of telemedicine and eHealth facilities for the people of Bangladesh.

Impact on the Community

Bangladesh is one of the few countries in the world where public hospitals provide individuals with free medical care at the national level. Like other resource-constrained developed and developing countries, Bangladesh is striving to provide its citizens with adequate and effective healthcare to meet sustainable development goals. A massive population resides in rural villages and remote areas that do not have adequate healthcare services (Rahman et al., 2024). Moreover, there is a continuing lack of health providers. On the other hand, owing to a shortage of services and a lower quality of life, prominent doctors are not also interested in settling in rural areas. As a result of the better treatment, they were compelled to visit the urban hospitals. Rural areas are poorly connected to rail and road transport and are prone to regular rainy days, flooding, and other natural disasters. As a result, it takes a great deal of effort to reach urban hospitals and get the proper medical attention that sometimes incurs the death of a patient (Shahen et al., 2020).

On the other hand, most majority of them are underprivileged and the expense of a modern hospital is a huge burden for them. Furthermore, most of these people are illiterate making the situation even worse as they have problems describing their medical records. The healthcare budget is also inadequate and private industries are just not that keen on investing as well (Shahen et al., 2020). As a result, in the past years, the government was unable to ensure the same medical services and care in rural areas that are accessible in urban areas (Zishan et al., 2019). Hence, the eHealth program allowed the Bangladesh government to provide rural and underprivileged citizens in the country with better and more flexible primary healthcare support.

The economically vulnerable and medically underserved communities are blessed with high-quality health service coverage at lower costs, providing them more comfort. Especially for primary healthcare, maternal and child healthcare services telemedicine and eHealth services prove to have a positive impact as the maternal and child mortality rate has reduced to a greater extent after the implementation of the services (MOH&FW, 2024). As a result, about 3,000 to 4,000 individuals and often about 5,000 take health-related advice and consultation from the state health call centre over the phone in a day, indicating its successful accomplishments (Amin, 2020).

Comparison with Other Healthcare Settings

Comparison with Private Setting

Bangladesh's private hospitals tend to be more advanced in developing facilities and using eHealth instruments following international norms. The market-oriented operation of private hospitals is the guiding force behind decisions and proactive conduct in the everyday use of technologies, which is not the case with the public health system (Alam, 2018). The private hospital is complete with ICT equipment and has a separate facility. IT department of trained personnel and the eHealth technologies have already been developed, introduced, and used (Khan et al., 2019). Moreover, studies suggest that doctors at private hospitals are fortunate to use ICT. The consistency of the services rendered is high and interoperability is in force between the agencies. All significant healthcare-related arrangements are greatly strengthened and are directed at being outstanding. It has also reduced the burden of paperwork for both patients and healthcare professionals. The private hospital doctors agreed that they could operate better because the hospital's ICT department provided the desired guidance and instructions. Although, the current government has taken multiple initiatives to strengthen their eHealth program, disparity still exists due to lack of funding human resources, and infrastructural issues (Bhuiyan & Ferdous, 2023; Hoque et al., 2017).

Another achievement of the private eHealth service is the launch of several mobile health apps. Currently, more than 180 eHealth apps are offering various categories of healthcare

resources including healthcare records, health and medical institutes, body fitness, doctors' information, mother, maternity and child, diseases specific, and nutrition (Karim et al., 2016). It has not only improved accessibility to healthcare services but also improved the compliance of patients. A randomized control trial study investigating the effects of a mobile health system intervention on self-management patients in Bangladesh revealed a substantial improvement in glycaemic regulation after six months (Banu et al., 2023).

Comparison with Malaysia's eHealth System

The total Malaysian population in 2023 was 34.3 million while urbanization is 78.7%. Only 23.3% of people live in rural areas (Statita, 2024). The healthcare sector is therefore largely geared to the needs of urban populations. On the other hand, the improvement of the welfare of 'disadvantaged' rural populations, especially the rural poor, mothers, infants, children, and the disabled, has become a major concern for the major healthcare providers (Hisham et al., 2018). The Ministry of Health (MOH) is the primary healthcare provider for rural citizens in Malaysia. There are a growing number of rural health clinics, community clinics, committed general practitioners, and Mobile teams that provide residents in rural areas access to modern healthcare, as well as adequate referral services. By using universal health status metrics, remarkable gains have been made in the health status of needy rural residents (Wahab et al., 2023). Its world-class healthcare services and sophisticated infrastructure facilitated Malaysia to score 95 out of 100 rankings the first place as the 'Best Healthcare' in the 'World' category of the 2019 International Living Global Retirement Index (The Daily Star, 2019). In contrast to Bangladesh, Malaysia's healthcare sector is therefore highly well organized and sustained.

However, there is a major gap between urban and rural residents in terms of health status despite these substantial changes. In response, the Telemedicine Project in Malaysia is identified as a way of achieving wellness for all rural residents. The Telemedicine Blueprint of Malaysia was established in July 1997. Since then, the effort to use an eHealth system has been promoted by Malaysia. The Multimedia Super Corridor (MSC), a Flagship project of Telehealth System was introduced by the Government of Malaysia. The long-term objective of Malaysia, Vision 2020, has been reinforced by the Multimedia Development Flagship Application which has 7 flagship Applications of the MSC group (Wahab et al., 2023). Moreover, a sub-unit under MOH was formed to conduct this Flagship telehealth initiative. Under this flagship program, four pilot projects are being developed. These projects were reconstructed over time with the change in telehealth layout. Finally, in 2007, the Integrated Health Enterprise (IHE) framework was introduced which includes Lifetime Health Record (LHR), Health Online, Teleconsultation (TC), and Continuing Professional Development (CPD) (Zishan et al., 2019).

The Malaysia MOH has always mentioned the importance and effectiveness of the integration of eHealth in the healthcare system. Malaysia plans to leverage the potential of

information and multimedia technology to change healthcare delivery and enhance health quality, in line with Vision 2020 (Wong et al., 2024). The emphasis was given more on transparent access to diagnostic and logistical patient records, high-quality control of patient health data, active engagement of patients in healthcare processes, enhancement of the quality of existing business processes in healthcare, and the protection and confidentiality of medical data (Awang et al., 2023). Similarly, in the Strategic Plan 2016-2020, special emphasis was given to the eHealth integration (KKM, 2021). While separate initiatives to introduce eHealth systems have been taken by both Bangladesh and Malaysia and many of them have already been introduced, both countries face various challenges to the implementation, promotion, and efficacy of the eHealth system (Ahmed, 2020). Both countries have problems with insufficient ICT infrastructure services, lack of human capital, lack of eHealth awareness among patients and healthcare personnel, opposition to reform, concerns related to regulation and regulations, as well as problems with system integration (Zishan et al., 2019).

The MOH has established this MyHealth platform under the Multimedia Super Corridor (MSC) Telehealth Flagship Application. Via this portal, the public will be able to easily view existing health statistics and health tips through the Internet. MyHEALTH portal covers certain health-related issues such as children's well-being; teenagers; prime years; golden years; nutrition; medicine and you; oral health alert; often asked questions (FAQ) and a health page. This portal is gaining popularity every day with multiple visits from the general population (KKM, 2021). On the other hand, MyHDW is a trusted source of comprehensive healthcare data structured for query and predictive analysis purposes. It provides security, privacy, and confidentiality of patient data, and information governance. It is a sustainable, cost-effective, and patented local technology. The MOH is committed to making sure that the electronic medical record (EMR) system will be enforced in all hospitals and clinics nationally within three to five years. The government of Malaysia is unceasingly developing and trying to manage the standards with international benchmarking (Attipoe-Dorcoo et al., 2020). In contrast, due to a lack of funding and support, Bangladesh is still lagging in its digital health journey to some extent. Although they have formulated the national data warehouse and eHealth Portal ‘Shosthobatayon’, its integration of these portals is still in process.

Methodology

To ensure the reliability, authenticity, and conciseness of the information, several well-known scholarly databases including Emerald, JStor, Scopus ScienceDirect, Reaxys, SpringerLink Journal, and Online Library were utilized for data collection. To evaluate and obtain articles relating to the concerning issue, the funneling technique was utilized (Wahab et al., 2023). To identify the most appropriate articles, a three-stage screening procedure was implemented. Initially, this study used a systematic analysis of the eHealth system associated with Bangladesh and Malaysian concerns from prior literature published between 2016 and 2024.

To ensure that all articles related to the eHealth system are included, this study performed a citation chain for additional studies for each retrieved article. The primary reason for picking this period is to collect data and information on the present situation, anticipating that the majority of published articles in this field have risen.

Previous research within the last eight years is thought to give greater insight than research from previous years. A total of 76 papers were chosen after careful evaluation of the abstracts. In the second step, articles were segregated based on certain inclusion criteria. These papers should be written in the English language. Journal articles and grey literature relevant to the field of interest, such as conference proceedings, reports, and news stories (Wahab & Sahak, 2023). The literature review yielded 28 useful pieces of literature ranging from journal articles to various reports. These articles were double-screened based on the exclusion criteria. Opinion pieces, incomplete articles, studies in other languages with no English translation, and duplicates were eliminated. At the end of the process, 6 papers were excluded, and 22 articles were reviewed following the SWOT analysis.

The SWOT analysis is an analysis of the strengths and weaknesses that occur currently within the enterprise, combined with the opportunities and threats that the organization faces externally (Wahab et al., 2023). It is an outstanding instrument that offers a forum for defining the desired potential position, defining challenges, and helping leaders to better understand how to transform vulnerability into strengths by exploiting opportunities and discovering how obstacles will become opportunities by the use of strengths. Therefore SWOT analysis has been applied to get a better understanding of the eHealth system environment.

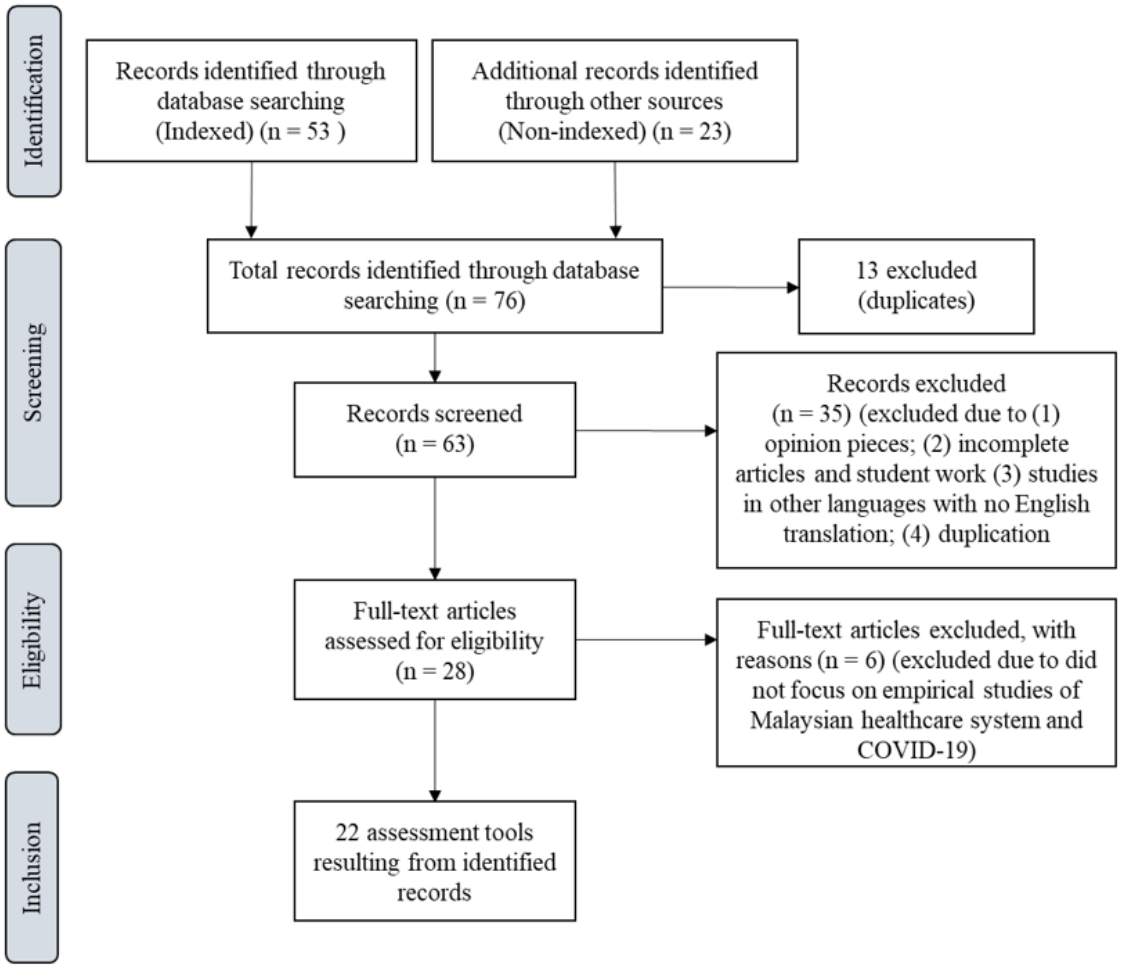

Figure 1. The Flow of the Article Selection Process (Source: Authors)

Results

Strength

The introduction of the smartphone and 4G facilities in Bangladesh has made the use of eHealth services more user-friendly. As of November 2023, Bangladesh's mobile users reach 190.36 million of the total population (UNB, 2023). Consequently, mHealth and eHealth have emerged as an effective method of access to information related to wellness. Approximately four-fifths of households also have at least one mobile phone collection in rural areas. According to the Bangladesh Telecommunications Regulatory Commission, there are approximately 90 million active Internet connections in the region, suggesting that Internet penetration exceeds 50% (Bayes, 2019). With the support of eHealth systems, patients living in isolated areas and distant places are now provided with health coverage. Today, without attempting to travel to the doctor's place or location, patients can obtain treatment from a specialist doctor (Paul et al., 2016).

Moreover, the District Health Information System 2 (DHIS2) become the national public sector health data warehouse in Bangladesh. The rich data-mining functions of the framework allow credible and accurate data to be generated for evidence-based decision-making and planning and tracking of health interventions (Khan et al., 2019). Similarly, through the integration of big data and artificial intelligence in eHealth, eHealth service has contributed to a huge volume of data being stored at the Directorate General of Health Services (DGHS) central data repository (Khan et al., 2019). With the majority of healthcare professionals having a favorable attitude towards the adoption of the eHealth system, it become a successful functioning, use, and sustainability of eHealth services (Sheekha et al., 2019).

Weaknesses

Bangladesh does not have adequate infrastructure such as computers, the Internet network, printers, and electricity to support eHealth. The weakness of applications with growing workloads, lack, and incomplete electronic health reports are some other technological operational issues due to old infrastructure (Alam et al., 2018). Although the MOH&FW has developed a draft guideline for the eHealth services, there are no unified protocols for the existing and future database systems interoperability due to a lack of device interoperability and standardization (Alam, 2018). At the current state, most of the Bangladesh population has little knowledge about the process of accessing the eHealth service. Particularly women in rural areas have shown little interest in the adoption of eHealth services due to inadequate functional literacy (Zobair et al., 2020). Accordingly, due to a lack of training, there is a shortage of qualified staff which may lead to inaccurate details as well as delays in the eHealth implementation phase (Ahmed, 2020).

Not to mention that privacy is a topic of growing concern in the healthcare industry. Studies revealed the positive effect of trust on the willingness of patients in Bangladesh to use eHealth services. Moreover, trust and privacy concerns often serve as a barrier to embracing eHealth assistance, especially among female patients of Bangladesh (Hoque et al., 2017). Additionally, the lack of a privacy act or regulation in Bangladesh to promote the protection of patient data or user rights leads to the problem of poor patient data security, leading to poor acceptance of eHealth services (Hoque et al., 2017). Currently no standard on eHealth or mHealth operating systems in the region. Hence, comparable well-being gains are very difficult to measure due to a lack of regulatory and ethical eHealth systems related to personal health records, internet security, and equity (Hakim, 2016). Furthermore, the procurement, implementation, and use of eHealth systems are costly. Most of the time, local governments have to rely on developed countries, foreign investors, or the World Bank to carry out large-scale projects. This situation further lags behind its implementation (Alam, 2018).

Opportunities

The success of the mTika software implementation for children living in difficult-to-reach rural areas and urban streets indicates that there is an opportunity for eHealth services implementation (Uddin et al., 2016). The pre-and post-intervention of mTika software data represents the possibility of the acceptance of eHealth among difficult-to-reach rural areas. Moreover, eHealth should also be seen as a critical method for responding to a post-disaster emergency to counter human loss (Zaman et al., 2017). Furthermore, by offering quality health services to underserved populations in remote locations, the country will be able to achieve the goal of universal health coverage (Ara et al., 2020). The author further strengthened that, with the effective implementation and integration of eHealth service with the traditional healthcare system, the government will be able to fulfil its dream of establishing a Digital Care System under the Goal Digital Bangladesh.

Threats

Resistance to change among elderly people remains the main concern. This group of people are still accustomed to and relaxed using conventional and physical channels for healthcare services and is not very exposed or adapted to smartphones and internet technologies (Nisha et al., 2019). Studies have found that cultural dimensions, such as power distance, dominance, and conventional values, have had major impacts on the purpose and usage of eHealth and also contribute to lower acceptance of services (Hakim, 2016). Additionally, the problem of the native environment is the deployment of the eHealth program in remote coastal areas since the surface contact between these regions and the mainland is not strong (Ahmed, 2020).

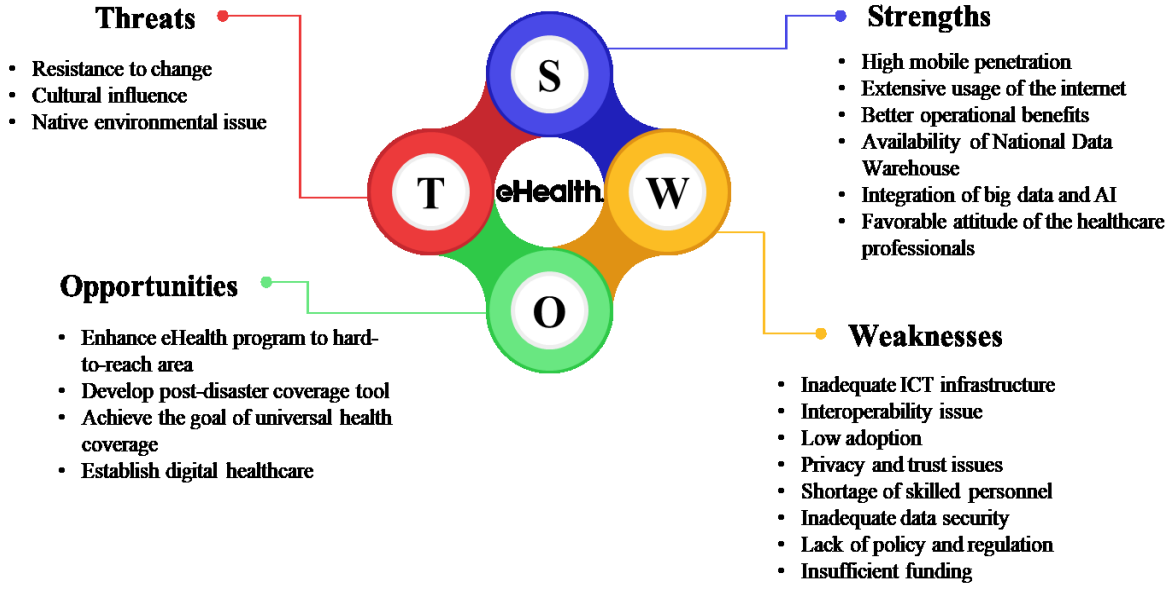

Figure 2. SWOT Analysis Summary of the eHealth Program (Source: Authors)

Strategies for enhancing the ehealth Program

From the SWOT analysis summarised in Figure 4, it has become evident that over these years the eHealth program of Bangladesh can secure multiple strengths. Despite this success, the system holds multiple weaknesses. These multifaceted challenges act as a barrier for the program to serve quality healthcare services. Moreover, the threat can hinder the progress of eHealth services. The analysis also exhibits the growing opportunities that denote that appropriate implementation of eHealth services will enhance the effectiveness of the eHealth program. Therefore, based on the situational analysis SWOT Matrix has been performed and several strategies were constructed for the successful implementation of the eHealth program as summarized in Table 1.

Table 1. SWOT Matrix

	Strength (S)	Weakness (W)
	1. High mobile penetration 2. Extensive usage of the internet 3. Better operational benefits 4. Availability of National Data Warehouse 5. Integration of big data and AI 6. Favorable attitude of the healthcare professionals	1. Inadequate ICT infrastructure 2. Interoperability issue 3. Low adoption 4. Privacy and trust issues 5. Shortage of skilled personnel 6. Inadequate data security 7. Lack of policy and regulation 8. Insufficient funding
Opportunities (O)	SO Strategies	WO Strategies
1. Enhance eHealth program to hard-to-reach area 2. Develop post-disaster coverage tool 3. Achieve the goal of universal health coverage 4. Establish digital healthcare	1. Introducing chatbots and robots 2. Full digitalization of HIS 3. Proceed, reinforce, and introduce eHealth programs 4. Formulation of comprehensible national eHealth policy 5. Massive campaign	1. Continued investment 2. Periodic performance evaluation 3. Continuous upgrading and updating of ICT infrastructure 4. Establish public-private partnership 5. Offer eHealth training program 6. Strengthening governance and technology regulation 7. Increase the funding allocation 8. Establish functional metrics
Threats (T)	ST Strategies	WT Strategies
1. Resistance to change 2. Cultural influence 3. Native environmental issue	1. Customized user-friendly interface 2. Introducing a portable patient monitoring system 3. Crowdsourcing medical emergency IoT 4. Development of an integrated mobile health app for women	1. Ensure privacy and confidentiality 2. Promote video-based consultation 3. Special internet package and IT centre in rural areas

SO Strategies

Bangladesh public sector health facilities are working with severe human capital constraints and a heavy workload, hence, introducing chatbots and robots, will assist in better understanding patient requests and improve the entire communication system (Khan et al., 2019). Moreover, through full digitalization of the Healthcare Information System (HIS), enables to establishment of a strong evidence-based decision-making system. There is a need to establish a suitable database, framework, and tailored applications, evaluating factors such as cost, implementation capacity, scalability, interoperability, protection, and user-friendliness where and when necessary. The government is also required to proceed, reinforce, and introduce eHealth programs, particularly in remote areas. The awareness of the formulation of a comprehensible national eHealth policy should be done through a massive campaign to develop trust and assurance in the eHealth service (Hossain et al., 2019). Furthermore, successful cases should be shared in the form of testimonials that meet both the external and internal outlets of data search in order to create confidence (Nisha et al., 2019).

ST Strategies

To attract users, the eHealth services should be designed and customized according to the requirements of patients. The user-friendly interface will make users feel more connected when eHealth services eventually increase their acceptance (Shareef et al., 2017). Similarly, the implementation of a portable patient monitoring system with a very small portable device and inexpensive will ensure the availability of eHealth services to people living in remote and difficult access regions (Paul et al., 2016). Furthermore, the use of the crowdsourcing medical emergency system using the Internet of Things (IoT) in the case of an emergency medical incident is cost-effective and more suitable for the economic situation of a developing country like Bangladesh. Integration of these approaches along with eHealth service can enhance emergency health response as well as help to overcome the shortage of human resources (Yesmin & Hasan, 2018). It is also important to note that the development of an integrated mobile health app will improve the efficacy of the eHealth network and encourage programs focused on improving the health, population, and nutrition services in rural Bangladesh. It will therefore aim to reduce the rate of mortality and morbidity to meet the SDG objectives (Uddin et al., 2017).

WO Strategies

Continued investment is paramount to encourage the capacity for the preservation, growth, promotion, and extension of the use of DHIS2, as well as to ensure the integration of eHealth stakeholders and programs towards an integrated structure. Periodic performance evaluation of the eHealth program emphasizing the importance of commitment in assessing well-being more efficiently and quality of services. The government also should continuously upgrade

and update ICT Infrastructure to keep up with the pace of technological advancement and the increasing number of patients (Bhuiyan & Ferdous, 2023). It is also important to establish public-private partnerships for the demand-facilitation organization. The eHealth training program should also be considered to improve skills in eHealth, particularly for healthcare professionals (Sheekha et al., 2019). Accordingly, strengthening governance and technology regulation and increasing the funding allocation for the operations of eHealth will further expand its implementation growth. Furthermore, to monitor its applicability and acceptance, there is a need to establish functional metrics in assessing and ensuring the consistency of eHealth services (Khan et al., 2019).

WT Strategies

To ensure the privacy and confidentiality of patients' data, the government should take a few important steps including formulating adequate privacy policies and legislations, introducing health software accreditation for customers' face recognition, and the authentication of user verification through the use of national identification number to access the medical record of the patient with audit logs and by encryption algorithm to share medical records (Khan et al., 2019). Likewise, promoting the use of video conferencing for fast and economical instant contact, remote control, internet workshops, science and clinical seminars, distance learning, and teaching instruction will benefit both user and provider. For rural communities, a special internet package and IT centre should be provided. There should also be at least one IT centre in each village from which rural citizens can access the Internet and the eHealth system (Uddin et al., 2017).

Conclusion

With the rapid growth of eHealth in developed countries, there is a significant need for concrete evidence of its effects to justify and track the investment of capital in such methods. The eHealth program in Bangladesh is a flagship program of the present government for the unique extension of primary healthcare services to the doorsteps of rural people. From this study, it becomes evident that the Ministry of Health, supported by the Government of Bangladesh, has taken a range of measures to ensure optimal use of existing resources and efficiently run the eHealth program. But it still falls behind the private sector, as well as other developing countries like Malaysia. The SWOT analysis further shows a variety of flaws in the eHealth software. As a result, there is an urgent need for the government to improve this service structure and ensure its sustainability, otherwise it will fail to meet its target. Suggested interventions can support the program to ensure its effectiveness and sustainability.

Research Implications

This research is the first of its kind to combine SWOT Analysis and the eHealth system to evaluate the effectiveness of the eHealth system implementation in Bangladesh. Therefore, this study would add importance to ongoing SWOT-based academic work. Moreover, comparative analysis between Bangladesh and Malaysia's eHealth system heightened the awareness about the effect of diversification of cultures, patterns of thinking, and acting on the eHealth system as well as enable to identification of the areas of improvement. Besides, it would reduce the knowledge gap and enhance the perception of the eHealth system, not just in Bangladesh but also internationally. Moreover, this study would act as a roadmap to greater comprehension of the market leaders and their operating climate. The effective implementation of the proposed methods would increase the successful implementation and efficiency of eHealth operations. This study can impact social transformation by helping the healthcare system by ensuring the provision of essential healthcare services to patients at the time they need them which is the ultimate goal of universal healthcare.

Limitation and Future Research

Although the current analysis of the eHealth system in Bangladesh is extremely comprehensive, there are some limitations in this paper. This study is conducted primarily on the eHealth system, hospital information system (HIS), and electronic medical record (EMR) EMR systems which were not broadly discussed in our study reach. Comparable, the management of the eHealth system is a dynamic process, and the strategies differ from one nation to another. The evaluation for this study was contained in Bangladesh and Malaysia and the comparison among the neighboring and other Asian countries was exempt from the study reach. Therefore, future studies can be carried out with the comparison among other Asian countries utilizing the same criteria.

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Conflict of interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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