

Programme: MSc Public Health and Social Care in Practice

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Blog 1- Critically discuss the impact of an existing digital technology currently used for a digital health promotion intervention

Cancer is continuously plaguing our modern society and among all types of cancer breast cancer has become one of the most common types of cancer that occurs in women regardless of their age worldwide. Different factors like genetics, environment, and lifestyle have contributed to the rise of breast cancer among women. Many lives are lost due to breast cancer and it also impacts the mental and physical health of women. Therefore, it is required to treat or diagnose as early as possible.

Mammography is one of the common and popular methods of screening breast cancer and it helps to obtain high-resolution images. Currently, full-field digital mammography is used for addressing breast Cancer. Digital mammography systems have both input and output formats input is about the raw images and output is about the post-processing. Digital mammography and artificial intelligence-supported screening help to analyze the images for detecting mass segmentation, breast masses, and density of the breast (Dileep & Gyani, 2022). Artificial intelligence also helps to assess the cancer risk by finding breast masses in breast cancer patients and it is identified as computer-aided diagnosis. Artificial intelligence enhances observation cause doctors can view full-size images of tissue specimens that help to view subvisual morphometric phenotypes and enhance patient care.

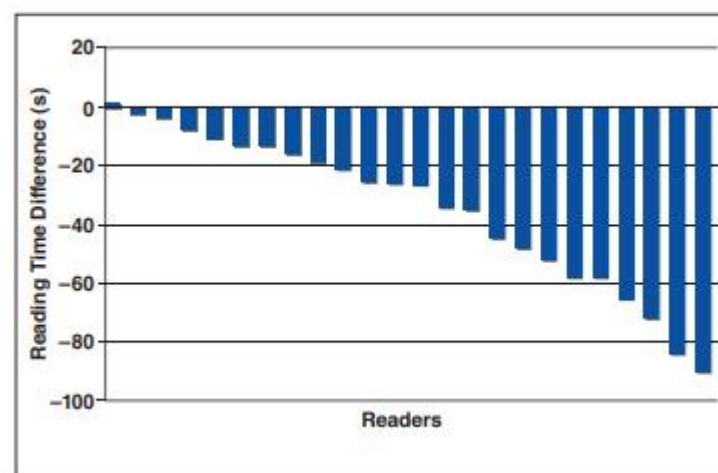


Figure 1: Difference between mammographic reading time and AI reading

(Source: Lamb et al., 2022)

The above bar chart shows the difference between mammographic reading time with an AI-supported reader study of 24 radiologists. Reading time improved with the help of the artificial intelligence assistant and it decreased by 35 seconds. Each bar is considered as an individual reader only one reader at the leftmost bar has enhanced the reading time with the help of artificial intelligence which is 1.4 seconds (Lamb et al., 2022). Therefore it can be

stated that artificial intelligence enables the radiologist to enhance reading time and accuracy and help to enhance the care of patients. In breast cancer, it is very important to identify the problem as fast as possible to cure it by lowering its impact on the patient's physical and mental well-being.

Digital mammography and AI-assisted screening are helpful for reducing the time of diagnosis as they help to identify the issues in less time compared to traditional pathological mammography. AI-assisted screening reviews AI algorithms for screening mammography with the help of full-size images. It helps to identify the breast mass and density of the breast and also helps to detect mass segmentation in less time which helps to assess the risk of cancer (Romero-Martín et al., 2022). Although there are a large number of advantages to using artificial intelligence, screening, and digital mammography to detect breast cancer among women, intelligence is not always correct.

According to CNN health research has been conducted in Sweden with 80000 women. it was identified that one group of women with two radiologists read the mammographs without the help of AI detected 20% less cancer whereas the other group read the mammography with the help of AI and it detected 20% more cancer patients (AI-supported mammogram screening increases breast cancer detection by 20%, study finds | CNN). According to the researchers, AI is too sensitive and it did not enhance the number of false positives but when it diagnoses a minimum abnormality, it is taken as cancer even though no cancer is present. This shortfall can be addressed by recruiting experienced radiologists who will have the potential to use AI efficiently (Yoon et al., 2023).

Blog 2- Critically discuss the impact of a digital technology you designed for a digitalhealth promotion intervention

Obesity has become one of the major health issues across the world and it is considered an epidemic. Appropriate weight management is required to deal with obesity, as overweight is the main reason that is increasing across the global population over the past few decades and enhances the risk of obesity. Therefore it is very important to deal with this health issue as soon as possible with digital intervention.

In order to reduce weight or help the obesity patient to manage their weight the mobile application for weight Management has been modified so that the patients with obesity can manage their weight to lower the impact of obesity. Electronic health has been defined by the World health Organisation there for information and communication

technology used for health and responsible for digitalise medical record and transmission information within healthcare practitioners for improve the care environment. Mobile health application is the potential for varying degrees of specificity of the patients and the target audiences to focus on the objective for adding patients from complex diseases. Simply the mobile application helps the adults to maintain a balanced lifestyle by giving advice and m health products and encouraging the patients to lead a healthy lifestyle(Ghelani et al., 2020). The mobile application also helps obesity patients to reflect and monitor on their own health behaviors on a daily basis.

An unhealthy lifestyle and eating behavioris one of the major reasons of obesity therefore the mobile application of weight management will be helpful for the patients because it helps them to self-monitor their eating behavior and physical activity. Patience can set goals specified with time frames, the mobile application will give reminders to the patients to input data within the application so it can give in-app reminders or text messages to the patient for encourage them towards a healthy lifestyle and healthy eating behavior. With potential encouragement and motivation towards healthy eating, they can reduce weight or manage their weight that will be helpful for them to reduce the impact of obesity on physical and mental well-being(Islam et al., 2020).

The mobile application of weight management is self-monetary that is related to better weight loss outcomes. It is convenient and motivates the patients towards a healthy lifestyle. It also provides educational content related to weight management, physical activity and nutrition that will be helpful for the patient for a lifetime. It is not always accurate related to gallery count steps and metrics that sometimes lead to inaccuracies(Laranjo et al., 2020). While using the mobile health applications users have to provide personal information that can be the reason for privacy concerns. Potential antivirus software can we helpful for reducing the risk of data theft.

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4. Expected outcome

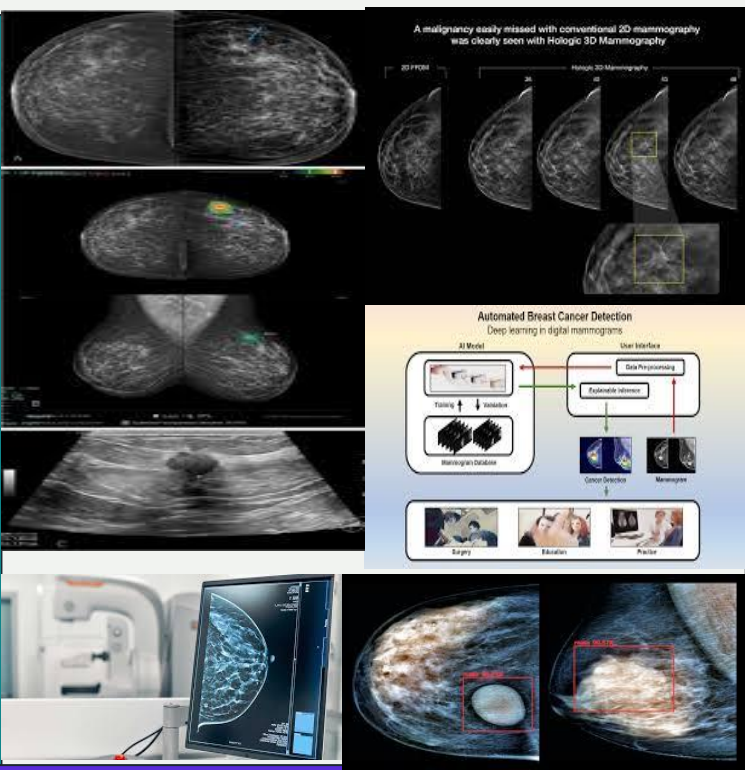
Outcome of the result using behavioral change theory of Health belief model

- Personal variables such as age, gender, and ethnicity influence individual judgments of vulnerability, severity, self-efficacy, and benefits/barriers among breast cancer patients
- Perceived vulnerability and the nature of a health issue among breast cancer patients may have combined to form the term "perceived threat."
- Perceived advantages operate to lower the perceived hazard associated with a health practice. Perceived obstructions inhibit health-related practices. Benefits minus obstructions promote health behavior change (Xiang et al., 2020).
- Self-efficacy increases perceived danger (probability and severity) and perceived benefits minus perceived obstacles, which supports in the implementation of improvements in health behaviors among breast cancer patients.
- Cues in the environment prompt behavior and modify human thoughts, such as perceived rewards and susceptibility.

For example, professionals may be interested in learning about the general public's opinions of cancer treatments. Identifying solution ssuch as individual's opinion about the risk of developing cancer, the benefits of using AI for screening cancer, and the barriers to AI can assist healthcare practitioners devise techniques to motivate the individuals. The technique may also be used to support public health activities in a range of settings, including educational programs to help women understand health, illegal drug use, physical activity, food patterns, and self security concerns. Such programs are usually Based on the Health Belief Model and seek to educate, provide skill training, remove barriers, and enhance self-efficacy..

5. Conclusion of the implication of this digital technology intervention on policies, education and research.

Teachers will use technologies to run the classrooms they teach with greater efficacy and effectiveness. Administrative activities will be automated using digital technologies, allowing educators to focus on generating meaningful student-teacher associations and creative teaching approaches. It enables students to access digital material and course content effectively and efficiently, supports centered around students and self-directed learning, and fosters the establishment of a stimulating educational atmosphere that provides more opportunities for intellectual inquiry. Overall, digitization provides benefits such as better living circumstances, greater participation from the public, cleaner governance, increased safety, a smaller carbon impact, and stronger economic growth (Jiang et al., 2022). However, the effect of modern technology on research goes much beyond these mechanics. Technology, especially the availability of previously unthinkable amounts of data, is enabling radically different methods of study. For example, data visualization has grown into a more crucial component of many research efforts. It is also noted that thousands of removed from-identification mammograms were used to train the AI system. Using Google's artificial intelligence technology, the computer learns the precise properties of the mammogram, which are thought to signify malignancy. As a result, the system may be able to detect cancer symptoms that other healthcare providers overlook.



2. Health promotion values and principles
Health promotion values and principles

People who actively engage in the process of decision-making have been known to come apart when participative. The word holistic: taking into account every aspect that influences healthcare, as well as how they interplay (Sechopoulos, Teuwen, & Mann, 2021). Equitable refers to ensuring that service prospects obtain fair outcomes. The term "intersectoral" refers to collaboration with other relevant governments or organizations. The main ideas are The five underlying concepts are as follows: (1) a broad and positive view of health; (2) involvement and engagement; (3) implementation and execution capability; (4) an environmental perspective; and (5) equity in terms of wellbeing. Digital health technology intervention for developing health promotion values and principles The initial measures in breast cancer prevention are to adopt healthy behaviors such as drinking less alcohol and leading an active lifestyle. Finding out how to reduce the risk of breast cancer. A person may question what steps she might take to avoid breast cancer if she expressed concern about developing the disease. T Several development prospects in digital medicine hWearable technologies like as telemedicine, mobile applications and instruments, artificial intelligence (AI), and smartwatches have the potential to improve the traditional framework of clinical history, investigation, diagnosis of numerous illnesses, and treatment. Digital health technology aids individuals in directing their health conditions by routinely monitoring and documenting symptoms (Ritchie, Van den Broucke and Van Hal, 2021).Even more importantly, it is an instrument for identifying significant changes in a patient's illness course early on, before the patient's breast health is seriously deteriorating. By allowing effective and economical care delivery, motivating patients with the ability to take charge of their health, and enhancing access to healthcare services in rural regions, online medical care has the possibility of completely altering the treatment of breast cancer.

1. Background

Scale of the public health problem and why an intervention is necessary.

Breast cancer can be defined as the most common form of malignant cancer among the woman. Global estimates demonstrate substantial variances in the worldwide incidence of breast cancer caused by human progress. For example, among every 12 women 1 women may be diagnosed with breast cancer at some point in their lives, and 1 in 71 may die from the illness in countries with exceptionally high Human Development Indexes. Surgery to remove the malignancy is frequently the very first step in the medical management of breast cancer. After surgery, the majority of patients with tumors in their breasts will have further therapies such as hormone therapy, chemotherapy, and radiation. Before surgery, some patients could get hormonal therapies or chemotherapy.

Examples of public health interventions (digital and non-digital technology intervention)

By increasing exposure and participation among those who would not otherwise have access to in-person interventions in rural regions, among those with caregiving duties or transportation challenges, and among those in non-traditional jobs, initiatives related to digital health reduce inequities. Biosensors, smart thermometers, linked inhalers, smart watches, FitBits fitness trackers, ECG monitors, and blood pressure monitors are a few applications. Among the (Trapani et al., 2022). non-digital technologies are thermometers and administering medicine, among others.

Digital Mammography and AI Assisted Screening

Many thousands of de-identified mammograms have been employed to train the AI system. The algorithm learns the mammogram's intricate characteristics that presumably indicate cancer using Google's artificial intelligence technologies. Because of this, the system could identify indications of cancer that some professionals would miss. The X-ray wavelength is used by both forms of mammography equipment to create a picture of the breast. The most important difference is that, although modern digital mammography systems see and save digital pictures on a computer, older mammography systems rely on film. Additionally, it is simpler to peer into and work with digital mammograms (Shah et al., 2022).

3. Behavior change theory
Health Belief Model

According to the Healthy Behavior Model, an individual's appraisal of their own risk of developing a medical ailment, together with their assessment of the positive impacts of specified wellness behaviors, can predict their likelihood of engaging in the recommended activities. The health belief framework has six components. They include signals to action, perceived hurdles, perceived benefits of significance, perceived vulnerability, and self-assurance. Nurses can use the health belief model as a beneficial instrument to assist patients avoid serious illnesses or, in the case in which they already exist, to enhance their quality of life (Lau et al., 2020).

Impact of Health Belief Model to deliver the digital technology intervention that promotes health

There are four main concepts: the first two speak regarding particular diseases, while the latter two speak of possible actions that might lessen the chances or frequency of such diseases. Perceived susceptibility, also known as perceived vulnerability, refers to a particular individual's belief in the likelihood of creating the illness if they adhere to their remaining protocol. The term "perceived severity" describes the way seriously a person takes the condition and its effects. While searching about digital intervention perceived benefits, we mean the advantages that one perceives from taking a different course of action, such as how much the illness is prevented and just how severe the repercussions are when it comes to digital breast cancer treatments. It is still one of the most popular and well-tested paradigms for understanding and predicting health-associated behaviors (Vahedian-Shahroodi et al., 2021). Furthermore, tactics based on the health perception framework can operate as call to action, reminding and motivating people to engage in health-promoting activities. Interventions may also attempt to boost self-efficacy by teaching specific health-promoting habits, particularly for difficult lifestyle changes such as changing one's diet or increasing physical activity, or adhering to a complex authorization regimen.

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