Designing a virtual breast cancer prevention program for Iranian women: A study protocol

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Abstract:

BACKGROUND: The growing number of breast cancer patients in Iran, following the lower referrals of women to screening centers after the outbreak of the COVID-19, suggests the need for designing virtual educational interventions to teach self-care methods to women. The aim of this study is to design a virtual training program for the prevention of breast cancer in women based on the steps of the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) educational design model.

MATERIALS AND METHODS: This developmental study will be conducted based on the steps of the ADDIE model. In the first step (analysis), a qualitative study, literature review, and a panel of experts will be conducted to analyze the situation (learners, content, platforms, and media for the electronic presentation of the program). In the design step, the learning objectives, educational strategies, and the way of program's implementation and evaluation will be specified. In the third step, not only are the content, storyboard, and educational program developed, but the pilot study is also conducted and formative assessment is performed. In the fourth step, the program will be provided to the audience and will be implemented as a preliminary program. In the final step, the final virtual education program for the prevention of breast cancer in women will be presented based on the results of the evaluation.

CONCLUSIONS: Using a comprehensive and systematic educational design model can be a step toward making changes and encouraging innovations in breast cancer prevention education programs in women based on virtual education. Given the existing needs and conditions, this program can promote cancer preventive behaviors as much as possible, reduce the costs imposed on the family and healthcare systems, and lower the complications and mortality rate caused by the delayed diagnosis of the disease.

Keywords:

Breast neoplasms, primary prevention, program, virtual education

Introduction

Breast cancer is the most prevalent cancer and the leading cause of cancer-related deaths among women all around the world.[1] In recent years, an increasing trend has been reported in Iran in the incidence of this disease and the mortalities caused by it, and the peak age of this type of cancer among Iranian women is a decade lower than global statistics.[2] Based on several studies, most women with breast cancer (50–80%) in low- and middle-income countries usually go to treatment centers in advanced stages of cancer, and this is affected by factors such as insufficient knowledge about breast cancer and the influence of cultural and social factors.[3] Therefore, the death rate caused by this type of cancer has increased in these societies, and hence, its impact on women, their families, and the economy of these societies is significantly remarkable. In this regard, the prevention and early diagnosis of breast cancer can play a substantial role in reducing mortality and complications

caused by it.[4] Nevertheless, based on the results of many studies, there are numerous individual, psychological, cultural, and social obstacles to performing breast cancer prevention methods for women.[5-10] Additionally, the gap in breast cancer screening which was caused by the outbreak of the COVID-19, the decreased visits of women to screening centers, and the lack of medical staff who can train women in this regard have led to delayed diagnosis of the disease and a further increase in the number of patients with advanced cancer.[11]

In this regard, the arrival of wide communication networks, such as the Internet, along with advanced educational tools and facilities, has caused a revolution in educational methods and covered a wide range of students in different far and near places. Thus, with methods different from traditional methods and without participating in in-person classes, scientific and specialized training can be provided.[12] Undoubtedly, the greatest impact of the arrival of information and communication technology in the form of advanced facilities such as computers, high-speed Internet, and comprehensive information resources in educational settings has been the creation of virtual education and learning environments.[13] The growth of information technology together with new developments in education has led to new ways of education. Therefore, designing an educational program based on modern virtual education methods and tools is the most important and effective strategy to educate women with regard to the prevention of breast cancer, especially in countries with limited health resources.

Despite the fact that this issue is a significant one, studies for the design of virtual education program are mostly limited to developed countries.[14-20] Few related studies have also been conducted in Iran, which have been generally limited to the preparation of educational electronic content.[21] However, no study has hitherto been conducted regarding the design of a comprehensive virtual program based on the needs of women that, while having appropriate educational content, provide these women with motivational discussions to improve their behaviors with regard to the prevention and early diagnosis of breast cancer and guide them gradually and effectively. Accordingly, the need to educate women about breast cancer prevention at younger ages and in more advanced stages of the disease, the public interest in virtual education platforms in current conditions, the development of new communication technologies and the availability of various virtual education facilities and platforms, and the lack of resources and manpower in health centers for providing the necessary education related to breast cancer prevention prompted the researchers to design a self-directed program based on modern virtual education methods and the culture and needs of women in Iranian society to prevent breast

cancer in them. Based on this, the use of a comprehensive and systematic educational design model can be a step toward implementing change, and innovation in women's education programs based on the needs and existing conditions to promote as much as possible the preventive behaviors of breast cancer reduce the costs imposed on the family and healthcare systems and reducing complications and mortality caused by the late diagnosis of the disease. Thus, the aim of this study is to design a virtual breast cancer prevention program for Iranian women based on the educational method of ADDIE.

Materials and Methods

This developmental study aims to design a self-directed program based on virtual education and the steps of the ADDIE model. As a valid and well-known model in educational design with a systematic approach, this model is also used to design electronic courses. The use of this model in this research will result in better organization of the designed program. This model includes the steps of analysis, design, development, implementation, and evaluation based on which the stages of the research will proceed [Figure 1].

Study aims and objective
The aim of this study is to design a virtual breast cancer prevention program for Iranian women. The objectives of the study are to
- Identify the virtual education needs of women in preventing breast cancer
- Identify virtual education strategies for breast cancer prevention program among women
- Develop appropriate electronic content for breast cancer prevention education
- Evaluate the virtual education program for the prevention of breast cancer among women.

Study design and setting
To interview with women in the Isfahan metropolis, the researchers will refer to health centers, offices, cultural centers, mosques, parks, recreation centers, and clubs. Also, to interview the experts, the researchers will refer to the offices of the experts and specialists in hospitals, universities, Isfahan health center, and sonography and mammography units. This makes it possible for the researchers to access the participants (with maximum diversity at the cultural, economic, and social level).

Study participants
Inclusion criteria for participants are 1) women with Iranian nationality and the ability to understand and speak Persian, 2) healthy women aged 20 to 59 years and at different levels of education, 3) women with a history of breast cancer (with the aim of creating maximum diversity in sampling), 4) experts in the field of breast
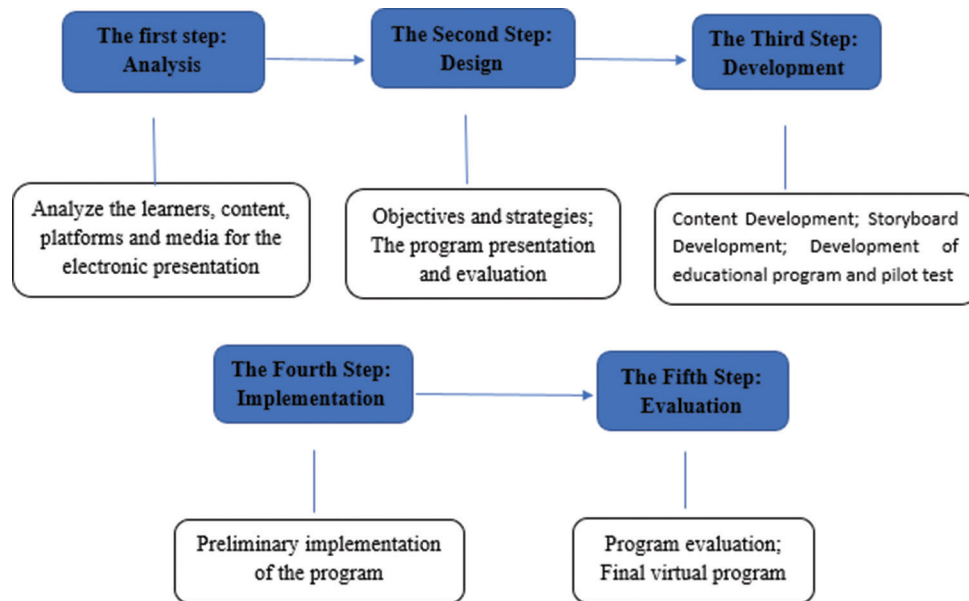
Figure 1: Key steps of designing a virtual breast cancer prevention program based on the ADDIE model

cancer and its prevention methods, 5) information technology experts, 6) health policymakers in the field of cancer prevention, 7) breast cancer screening service providers (nurses, midwives, doctors, and staff of health centers, screening, and mammography), and 8) having a desire to participate in the study and consent to conduct an interview.

Study processes

The first step: analysis
In this step, a qualitative study, literature review, and a panel of experts will be conducted to analyze the situation (learners, content, platforms, and media for the electronic presentation of the program).

Qualitative study
In this qualitative study which is conducted using the conventional content analysis method, the researcher will use purposive sampling method with maximum diversity. To explain the needs of women and the strategies for the implementation of the virtual education program related to breast cancer prevention, in-depth semi-structured interviews will be conducted with women and experts active in the issues of women and information technology field. Then, the data will be analyzed by using Graneheim and Lundman inductive approach. To ensure the trustworthiness of the research findings, the four criteria of credibility, dependability, transferability, and confirmability will be used which have been proposed by Lincoln and Guba (1985) for the rigor and trustworthiness of the qualitative studies.[22]

Literature Review
To search in the existing information databases, keywords

are determined based on Mesh and considering the title of the study, and, then, the texts will be reviewed by combining the existing keywords. To this end, using keywords such as "breast cancer," "breast neoplasms," "screening," "early detection," "prevention," "virtual education," "online education," and "electronic education," virtual strategies for providing education in the area of breast cancer prevention in women and the best available technologies for providing virtual content were searched in the guidelines of G-I-N, NGC, NICE, SIGN, GAC, New Zealand, NHMRC, WHO, Breast Cancer Screening Guidelines, American Cancer Society, American Cancer Society Prevention and Early Guidelines as well as the information databases of PUBMED/MEDLINE, CINHAL, COCHRANE, SCOPUS, ProQuest IranMedex, Science Direct, Embase, Proquest, CINAHL, Eric, ISI Web of Sciences, Magiran, SID, and IranDoc from 2000 to 2022.

Panel of experts
To integrate the data obtained from the qualitative stage and literature review, prioritize the needs and strategies for the implementation of virtual education for breast cancer prevention in women, and transform the strategies into appropriate platforms or tools for virtual education, the opinions of experts will be used in the focused group (expert panel). For this purpose, RAM modified Delphi technique will be used. The members of the panel of experts will be selected from among the experts of women, health education, and health information technology by using purposive sampling method. Accordingly, the results will be discussed during two stages so that a consensus (80%) can be reached on them by the members of the panel.[23]

The Second Step: Design
In this step, the educational objectives will be developed based on the main categories of women's needs obtained from the previous step. The sequence of the objectives will be determined based on the priority of achieving them. Then, different educational and media strategies will be determined in accordance with the available conditions and facilities so that the educational objectives can be achieved. Finally, according to the proposed strategies, the methods and formats of the program presentation and evaluation are determined for each section. The draft of the breast cancer prevention virtual education program will be provided to experts (e.g., medical education, health education, women, and information technology experts) to confirm its authenticity; and after collecting opinions and suggestions, necessary modifications will be made.

The Third Step: Development
The design of the program is followed by the stage of developing the breast cancer prevention virtual education program, which is considered one of the most important and time-consuming stages. In this step, the electronic education content of the program is produced. For the development of multimedia interactive content of the program, three main stages will be used which are as follows: content development, storyboard development, and educational program development; development of media and interactive components, and course production in different formats or presentation of the program on the web and integration of content elements in a learning platform to which the learners can have access.[24]

Content Development
To choose appropriate media and electronic learning activities, the educational content architecture matrix for breast cancer prevention is developed based on the educational objectives formulated in the previous stage and the type of content for each chapter. This matrix is a three-dimensional table. Learning objectives are placed in the first dimension. Different types of cognitive content (facts, concepts, principles, processes, and trends) are placed in the second dimension. Then, based on the type of required content, cognitive learning objectives are placed in the appropriate place at different levels; and in the third dimension of the table, the panel of experts determines appropriate learning activities according to the position of each objective in the table. Learning activities in fully electronic courses are the chosen media type for content development. However, in choosing the right educational media, in addition to the two mentioned dimensions, educational designers also consider factors such as learners' preferences, instructor's skills, accessibility, ease of use, learning platform, time, and cost. Content creation software will be used to prepare multimedia content.

Storyboard Development
The integration of educational methods (all educational elements needed to support the learning process) and media elements is performed by preparing a storyboard, that is, a document describing all components of the final interactive products such as images, text, interactions, and evaluation tests.

Development of educational program
Program development involves the development of media and interactive components, various forms of course production and presentation of the program on the web, as well as the integration of content elements into a learning platform to which learners have access. The media for presenting the program will be determined with the help of experts of information technology, and based on each of these designed media, the learner's guide and ways of evaluation of the media will be determined. Additionally, at this stage, a pilot study will also be conducted based on which a formative revisions will be made.

At the end of the program's third step, the accuracy of the educational materials and media as well as the content of the breast cancer prevention program will be qualitatively evaluated by the related experts, and their corrective opinions will be applied.

The Fourth Step: Implementation
In this step, the designed educational program is delivered to women; that is, it is installed on the server and becomes accessible to them. In this step, given the time and budget limitations, parts of the program will be implemented for a number of women based on the capabilities of the research team and applicable details according to the existing conditions. Thus, the prepared virtual cancer prevention program is provided to them. The implementation of the program will also be explained to women in this step.

The Fifth Step: Evaluation
In the final step of the program design, evaluation is performed in two parts as follows.

Evaluation of the program by the experts
Program evaluation includes checking the program in terms of having the details of a virtual education program. To this end, the experts will use the checklist proposed by the California State University for the evaluation of virtual education programs.[25] This checklist evaluates the virtual education program in terms of six categories of learner support and resources, online organization and design, educational design and presentation, audience learning evaluation, and creative education with the help of technology. The content validity of the checklist will be qualitatively evaluated by five–seven information

technology experts. Finally, the program will be modified based on this stage, and the final virtual program for prevention of breast cancer in women will be presented.

Evaluation of the program by the participants

In this section, a descriptive and analytical study is conducted to examine the perspective of the participants about the virtual program for breast cancer prevention. The research setting will be the virtual education platform designed for offering the breast cancer prevention program, and the study population consists of all women living in Isfahan city who will be selected by purposive sampling method. The minimum number of samples for the study will be 30 subjects. In this study, data collection will be done through completing an online self-assessment questionnaire, which will evaluate the strengths and weaknesses of the program and the level of satisfaction of the participants with participating in the program. Moreover, the program will be modified, and the final virtual program will be presented considering the results of the pilot study and receiving the opinions of the target group.

Ethical considerations

The researcher starts study after obtaining approval from the ethics committee of Isfahan University of Medical Sciences (IR.MUI.RESEARCH. REC.1400.174). The researcher will introduce herself to the participants and research units, explains the purpose of the research to them, and oral and informed consent will be obtained before entering the study. Participants will be assured of the confidentiality of the information collected and the anonymity of the participants' names. Participants are also reminded that they can withdraw from the study at any stage of the study.

Discussion

This study will be conducted to design a program for preventing virtual breast cancer program among Iranian women. As recent evidence shows, the use of the Internet and virtual education programs has increased significantly in developed and even developing societies to help users obtain information related to the prevention, control, and treatment of oncological diseases, such breast cancer.[26-29] Several studies have recently been conducted all over the world to educate women with regard to prevention and early detection of breast cancer. Given the global development of new communication technologies in recent years, the focus has been more on the use of virtual methods in the implementation of educational strategies for the breast cancer prevention.[26,30-34] Although several studies have investigated breast cancer prevention in Iran,[35-40] no study has hitherto been conducted to design a program for the prevention of breast cancer based on a virtual education program. The design of such a program should be based on the needs of women and strategies of virtual education and consider the perspective of Iranian women and experts. Moreover, cultural, social, and even religious factors can affect the type and content of the program and its implementation as well. Accordingly, it is necessary to conduct a study which can address these issues. Additionally, given the social and economic conditions of Iran, especially the lack of resources and staff to provide women with in-person education in health centers, it is necessary to design a self-directed program for the prevention and early detection of breast cancer among women based on virtual education. As such, the use of a comprehensive and systematic educational design model can be a step toward making changes and encouraging innovations in women's education programs based on the needs and existing conditions to promote the preventive behaviors of breast cancer as much as possible, reduce the costs imposed on the family and healthcare systems, and lower the complications and mortality rate caused by the late diagnosis of the disease. This program can also be presented to the authorities of the health department of the Ministry of Health so that they can improve the health of women with regard to breast cancer prevention. The program can also be offered to foreign societies with similar cultural, social, and economic structures.

List of abbreviations

ADDIE: Analysis, Design, Development, Implementation, Evaluation.

Conflicts of interest

There are no conflicts of interest.

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