

Master of Science in Public Health



**Effect of Health Education Regarding Awareness of
Breast Cancer among School Going Adolescents in
Rawalpindi City; A Quasi Experimental Study**

By

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***(Effect Of Health Education Regarding Awareness Of
Breast Cancer Among School Going Adolescents In
Rawalpindi City; A Qusai Experimental Study)***

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Declaration

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I understand that plagiarism is the use or presentation of any work by others, whether published or not, and can include the work of other candidates. I also understand that any quotation from the published or unpublished works of other persons, including other candidates, must be clearly identified as such by being placed inside quotation marks and a full reference to their source must be provided in proper form.

This dissertation is the result of an independent investigation. Where my work is indebted to others, I have made acknowledgments.

I declare that this work has not been accepted in substance for any other degree, nor is it currently being submitted in candidature for any other degree.

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Dedicated to all those who have been a constant source of support and encouragement for me in my research work

I couldn't be able to accomplish this task without your support.....

ABSTRACT

Background: Breast cancer is a major type of cancer in women across the globe. One in every nine women in Pakistan has a lifetime risk of being diagnosed with breast cancer. Clinical breast examination and breast self-examination (BSE) are considered effective methods for early detection of breast cancer. Early detection can accelerate the process of cancer treatment, and improve women's overall quality of life.

Objectives: The primary objective of study was to determine the awareness levels about breast cancer and breast self-examination before the intervention among school going students of Rawalpindi city. The secondary objectives were to find difference between awareness levels about breast cancer and BSE pre and post educational intervention and to predict determinants that affect the awareness levels among students.

Methodology: A Quasi experimental study was conducted from March- August 2022 by using close ended, structured and validated tool to determine the awareness levels about breast cancer and BSE in school going children of Rawalpindi city. The tool was made of 4 scales measuring knowledge, attitudes and Champion's health belief model along with practices. Independent sample t-test and One-way ANOVA were used for determining associations between socio demographics and dependent variables.

Results: A significant difference was seen between the mean scores of study population pre and post intervention. The mean scores for attitude (14.07 ± 1.96 to 27.23 ± 2.136), knowledge (22.04 ± 3.213 to 27.86 ± 0.739), champion's health belief model (16.56 ± 2.520 to 26.74 ± 1.947) and practice (3.08 ± 0.526 to 6.99 ± 0.100) scores had increased post intervention. Variables significantly associated with attitude were family type (p value = 0.005) and educational level (p value=

0.012). Age (p value=0.0001), permanent address (p value=0.035), family type (p value=0.001), socioeconomic status (p value=0.009) and family history of breast cancer (p value=0.0001) were significantly associated with knowledge. Family type (p value=0.029), educational level (p value= 0.048) and family history of breast cancer (p value=0.000) were significantly associated with practices.

Conclusion: The results indicated that participants did not report adequate knowledge, attitudes and practices regarding breast cancer and breast self-examination before the intervention. The mean values of all the dependent variables of the study increased post health intervention. There is a need to improve the educational system and integrate information about breast cancer and its prevention in national health programs, to increase awareness in public about importance of BSE.

Keywords: Knowledge, attitudes and practices (KAP), Champions health belief model, breast cancer, breast self-examination, school going females, Rawalpindi

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LIST OF ABBEREVIATION

BC	Breast cancer
BSE	Breast self-examination
BMI	Body mass index
LMIC	Low middle income countries
SPSS	Statistical package for the Social Sciences, USA
IRB	Institutional review board
KAP	Knowledge, attitudes and practices

CHAPTER I: INTRODUCTION

The epidemiologic transition has put the non-communicable diseases as major source of morbidity and mortality. Of these non-communicable diseases, cancer is becoming an important issue worldwide. It is a disease in which some cells of the body grow at an abnormal rate and spread to the other parts of the body. Cancer is a dangerous and fatal disease and it is now becoming a public health challenge in most populations of the world. In 2012, over fourteen million new cases of cancer and 8.2 million cancer-related deaths occurred worldwide. Fifty-seven percent of the new cases and 65 % of the cancer-related deaths occurred in less developed countries (Didarloo et al., 2017).

Breast cancer is a major type of cancer in women. The etiology of breast cancer is not completely known, but some risk factors such as genetics, environmental, socio-biological and physiological factors are reported to affect the development of breast carcinoma (Zaheer et al., 2019). In 2020, 2.26 million new cases of female breast cancer were diagnosed globally leading to breast cancer being most common form of cancer in the world (Zhang & Lu, 2022).

The incidence of breast cancer in Asia is lower than that in Western countries, but the burden of breast cancer is growing rapidly in Asia. The risk of having breast cancer has increased in Pakistan over the past few years, whereby 1 in every 9 women in Pakistan has a lifetime risk of being diagnosed with breast cancer (Zaheer et al., 2019 ;Khan et al., 2021). The age-standardized incidence rate of breast cancer in Pakistan is one of the highest among Asian countries (Zaheer et al., 2019;Noreen et al., 2015).

Early detection of breast cancer can reduce its morbidity and mortality. Mammography, clinical breast examination and breast self-examination (BSE) are considered effective methods for early

detection of breast cancer(Akhtari-Zavare, Mehrnoosh, et al., 2015). Early detection can accelerate the process of cancer treatment, and improve women's overall quality of life. Some studies suggest that the early detection of breast cancer through screening tests can decrease mortality rates by 25– 30% (Didarloo et al., 2017). Since many women will discover a breast cancer symptom themselves, it is important that they have sufficient awareness regarding breast cancer i.e. have the knowledge, skills and confidence to detect breast changes and present promptly to a healthcare professional (Máirín O'Mahony et al., 2017).

Lack of public awareness regarding the breast cancer and cultural barriers often result in late diagnosis and poor treatment outcomes. Women who delay presentation of breast cancer symptoms have poor health outcomes and they develop advanced stages of cancer. This problem is common in older women, due to which their survival rates decrease (Kaushal et al., 2017). Disease free survival is affected by the stage of breast cancer at the time of the diagnosis and treatment. The 5 years disease free survival, when breast cancer is diagnosed at stage I and II is 85% , while it is only 10% at late stage diagnosis i.e. stage IV(Noreen et al., 2015). The cases of breast cancer are increasing day by day in Pakistan, but still there is no systemic and scientific approach which could be used to control the situation. The accurate occurrence, number of new cancer cases, death rates, and casualty rate annually for Pakistan are not documented. Moreover there are no comprehensive registries/database existing regarding any disease as well as breast cancer in Pakistan and the only data on hand is hospital based (Zaheer et al., 2019) .

The GLOBOCAN 2018 demonstrated that globally the incidence of breast cancer will increase from two million patients in 2018 to more than three million in 2046, showing a 46% increase. This will pose a significant burden on the patients as well as caregivers. This is an important public health issue which needs considerable attention (Pilevarzadeh et al., 2019).The current

demographic trends of breast cancer in our country also indicate that this disease will create a significant burden on our healthcare system in the coming years. As it is projected that the incidence of this disease will increase in coming years, so research should be conducted on it and effective strategies should be created and implemented. There is paucity of information about breast cancer in Pakistan (Qureshi et al., 2015).

Predictions have been used to advocate the allocation of adequate resources for diagnosis and treatment of disease, but there is little progress on the subject matter. There is a need to shift focus on the breast cancer research. Studies should be conducted to determine the incidence, mortality rates, risk factors and awareness of women about this disease. The information can then be used for creation of suitable policies to control the situation of breast cancer (Zaheer et al., 2019).

1.1. Rationale:

The current demographic trends indicate that breast cancer will pose an even greater public health concern in future for Pakistan. Additionally, there is a paucity of information regarding breast cancer awareness in Pakistan (Zaheer et al., 2019). Therefore, the current study will be carried out to determine the effectiveness of health education for raising the awareness regarding breast cancer. Through this study, researcher will be able to highlight the potential risk factors that can affect the awareness level of a woman regarding breast cancer. In this way, findings of the current study will help to develop future projections and further awareness sessions to improve the health status of females. It is important to use the approaches like primary prevention and early detection for controlling incidence rate of breast cancer.

1.2. Objectives:

1. To determine the awareness levels about breast cancer and breast self-examination before the intervention among school going adolescents of Rawalpindi city.
2. To find out the difference between awareness levels about breast cancer pre and post the intervention.
3. To find out the determinants that affects the awareness levels among students.

CHAPTER II: LITERATURE REVIEW

2.1. Context:

Breast cancer is the most common type of cancer among women and one of the most important causes of death in women. The registries for storing incidence and mortality rates for breast cancer started in 1990 and since then the overall rates of breast cancer have been increasing every year (Lima et al., 2021). According to 2019 statistics, breast cancer has an incidence of 11.6% among all types of cancer, accounting for 6.5% of mortalities worldwide (Pilevarzadeh et al., 2019).

The incidence, mortality, and survival rates of this disease vary considerably among different parts of the world (DeSantis et al., 2015). The prevalence of breast cancer is higher in developed countries as compared to developing countries but the mortality rates are higher in developing countries (Zendehdel et al., 2018). Breast cancer refers to cancers originating from breast tissue, most commonly from the inner lining of milk ducts or the lobules that supply the ducts with milk (Sharma et al., 2010). However, if breast cancer is diagnosed and treated in time, patients' quality of life and their disease prognosis can be improved (Brunault et al., 2016).

2.2. Breast Cancer:

Although, the incidence of breast cancer in Asia is lower than that in Western countries, but the global burden of breast cancer is growing rapidly in Asia. The risk of having breast cancer has increased in Pakistan, whereby one in every 9 women in Pakistan has a lifetime risk of being diagnosed with breast cancer. The mortality rates due to breast cancer are higher in our country. There are certain factors like late diagnosis, improper treatment and untimely referral to specialist doctors which lead to development of breast cancer to advanced stages. At advanced

stages the cancer has spread to which lead to development of breast cancer to advanced stages. At advanced stages it is difficult and costly to treat the cancer and it leads to higher mortality rate (Gulzar et al., 2019).

2.3. Health Education:

The diagnosis of breast cancer needs to be done timely so that treatment can be started soon. There are many factors in our country which leads to late diagnosis. Women lack knowledge about the etiology of breast cancer which is a major factor for late diagnosis. They think that breast cancer is a taboo disease and exposing their disease would bring shame to their families so many women hide their breast lumps from family members. A lot of women refer to religious peers and hakims for their treatment. Women from lower socioeconomic status cannot afford the treatment of breast cancer so they stay undiagnosed and don't get treatment. Lack of access to health care facilities further aggravates the situation. A study conducted in Pakistan reported that 40.7% women wasted their time by using alternative medicines, 17.1% ignored painless breast lumps and 10.6% considered breast as a secret organ and did not visited doctors for treatment (Khan et al., 2021).

There is lack of comprehensive database and registries of breast cancer in Pakistan. So the annual exact number of incident cases and death rates due to breast cancer are not recorded and there is lack of accurate data. Hospital based data is the source of data for breast cancer and concerned stake holders have to rely on it. There is a need to create proper database systems should be created for it. There is lack of information about breast cancer. Advocacy is used by various organizations to highlight the issue of allocation of proper resources for detection and treatment of breast cancer. But there is very little progress on this particular subject in recent

times. There is a need to conduct research in area of breast cancer to generate data about it (Zaheer et al., 2019)

The risk factors are factors which make a person prone to a certain disease or condition. A major cause of development of cancer is the improper functioning of immune system. Certain mutations in the DNA and RNA can lead to development of breast cancer. Certain factors like poor diet, unhealthy environment consisting of chemicals and radiations, aging and genetic predisposition to mutations lead to development of cancer. Family history is strongly associated with the development of this disease. Obesity is another factor which has been shown to have a correlation with breast cancer. Hormonal replacement therapy, pregnancy in early age, sedentary lifestyle, alcohol use and high dietary intake of fat can increase the risk of its development. Socioeconomic status is also associated with incidence rate of breast cancer. Women from higher social class have certain risk factors like older age at first child birth, paralysis and obesity, which can increase the incidence of this disease (Momenimovahed, 2019).

2.4. Need of awareness/ recommendations:

The knowledge about signs and symptoms play an important role in the early diagnosis of breast cancer. Early breast cancer is usually symptomless but there are some symptoms that develop as the cancer advances (Asuquo & Olajide, 2015). The most common symptom of breast cancer is presence of lump in armpit or breast. It is recommended that women should do monthly breast self-exam to determine the size, texture and skin condition of breasts. The other symptoms of BC are swelling or lump in armpit, pain in nipple, discharge from nipple, scaly skin on nipple, persistent tenderness of breast, pain in nipple and unusual breast pain. In advanced stages

complex symptoms such as bone pain, loss of appetite, shortness of breath and weight loss can occur(Sharma et al., 2010) .

Management of breast cancer includes various approaches like surgery, radiation therapy and chemotherapy. The surgery depends on the stage and type of tumor. It includes lumpectomy (removal of lump) or mastectomy (removal of entire breast). In radiation therapy high energy X rays or gamma rays are used to destroy a tumor or to target a post-surgery tumor site to destroy cancerous cells. In chemotherapy anti-cancer drugs are given to treat cancerous cells. The type of treatment given to patients depends on their age, medical history, overall health, stage and type of cancer and tolerance to certain medications(Sharma et al., 2010) .

For 30 years, CDCs, National Breast and Cervical Cancer Early Detection Programme (NBCCEDP) has provided women who have low incomes and uninsured and underserved access to timely breast and cervical cancer screening and diagnostic services. Champions health belief model scale (HBMS) was developed for research on breast cancer awareness and its screening. It is five point Likert scale with scores ranging from 1(strongly disagree) to 5 (strongly agree). The answers show the extent to which the participants agree with each item, with higher numbers, suggesting higher levels of agreement with that item. It has been reported that scale can be applied to women of all educational levels (Gözüm & Aydin, 2004).

Many studies have shown various ways to improve breast care awareness among adolescents. The three pillars toward achieving objectives regarding breast cancer awareness are:

- Health promotion for early detection.
- Timely diagnosis.
- Comprehensive breast cancer management.

Digital breast tomosynthesis, also known as 3D mammography, is becoming a best practice in women's health for breast cancer-detecting technology. It is the next evolution of digital mammography producing 3D images that allow breast tissue to be viewed in individual segments (Brunault et al., 2016).

2.5. Knowledge, attitude & practices regarding breast cancer: A worldwide view:

Breast cancer is an important global public health issue and several studies have been conducted on it to understand its incidence rate, risk factors awareness level. I will discuss some studies about importance of health education on awareness level of breast cancer. Awareness is very important for controlling a public health problem.

A study was conducted in Ghana to assess the impact of breast cancer education in adolescent high school girls. A pre-posttest quasi experimental study was conducted in two senior high schools. A self-administered pre educational questionnaire was used for data collection. Then an educational intervention was given by using Power point lecture, question answer session and distribution of breast cancer information leaflets. After duration of 3 months the same questionnaire was used for data collection to determine the impact of educational intervention. The results showed that general knowledge on breast cancer at pre-education was (29.1%) and it improved to 72.5% ($p < 0.001$). The knowledge on signs and symptoms improved from 33.1% to 55% ($p < 0.001$). Knowledge on risk factors improved from 55.3% to 79.2% ($p < 0.001$). The overall performance of the students improved from 17.2% to 59.4% ($p < 0.001$) after the educational intervention. The study showed that educational intervention improved the overall knowledge of students about breast cancer (Nsaful et al., 2022).

A study was conducted in Ethiopia to assess the impact of a planned teaching program about knowledge and practices regarding breast self-examination of midwifery students. 61 students were selected by systematic random sampling. Data was collected for pre-post educational intervention by using a structured questionnaire. Data was analyzed by using SPSS version 20 software. Paired t test was used to determine the pre- post intervention results. Before the intervention n=14(23%) of respondents had information and practiced breast self-examination, only n=8(13.1%) performed breast self -examination on a regular monthly basis. The number and percentage of the knowledgeable respondent's pre-post intervention is n=23(37.7%) and n=35(57.4%), respectively. Both the knowledge and practical competency scores showed highly significant increase after the intervention (Abera et al., 2017).

A study was conducted in Egypt to assess the effect of health intervention of breast self examination regarding knowledge, attitudes and practice among university students. A sample of 180 female students was selected from Zagazig University. A quasi- experimental study design was used. A self-administered questionnaire was used to collect data before and after intervention. The results before intervention depicted that study subjects have unsatisfactory knowledge, low perceptions and poor practice towards breast cancer. After giving intervention the results showed that student's knowledge, attitudes and practices had slightly improved. It was shown that the health intervention was a positive predictor of students' knowledge and practice scores (Gharieb Moustafa, 2015).

A quasi-experimental (pre-post) study design was conducted at Jahangirnagar University in Bangladesh. The study was conducted on 400 female students. A structured questionnaire was used to collect information about breast cancer and breast self-examination. Pre intervention information was recorded and then information about breast self-examination was given by using

images and detailed explanation. After 15 days' post intervention data was recorded. McNemar's tests and paired sampled t-tests were performed to investigate the differences between pre- and post-test stages. Significant changes were found in knowledge and awareness about breast cancer and BSE practices after the educational intervention. A significant percentage of change in BSE practices pretest and posttest was determined to be (21.3% vs. 33.8%; $p < 0.001$) (Sarker et al., 2022).

A study was conducted in Jordan to evaluate effectiveness of a behavior change educational program in promoting female university student's knowledge and attitudes towards BC and practices of breast self-examination (BSE). A pre- and post-test design was used. Data was collected from students by using a structured questionnaire. It was followed by an educational program with theoretical and practical educational sessions. Then participants were evaluated after educational program. A total of 110 participants were randomly divided into control group and intervention group. Analysis revealed that participants in both groups had relatively low level of knowledge, negative attitudes, and poor practice towards BC and BSE before attending the intervention. Analysis of the post test revealed that participants in the interventional group had significant improvement in knowledge, positive attitudes, and more practice of BSE compared to participants in the control group. The implementation of a BC awareness program had positive effects on the female university student's knowledge, attitudes, and practices regarding BC and BSE (Alsaraireh & Darawad, 2017).

A study was conducted in Malaysia to develop, implement and evaluate the effectiveness of Breast Health Awareness program based on health belief model on knowledge of breast cancer and breast-self-examination among female students in Malaysia. A single-blind randomized controlled trial was carried out among 370 female undergraduate students from January 2011 to

April 2012 in two selected public universities in Malaysia. Participants were randomized to either the intervention group or the control group. The educational program was delivered to the intervention group. The outcome measures were assessed at baseline, 6, and 12 months after implementing the health educational program. Chi-square, independent samples t-test and two-way repeated measures ANOVA (GLM) were conducted in the course of the data analyses. The results indicated that health belief model had a positive effect on knowledge of breast cancer and breast self-examination and practice of BSE among females in Malaysia (Akhtari-Zavare et al., 2016).

A study was conducted in Turkey to determine to effects of an educational program on the health beliefs and practices of breast self-examination. The study was conducted on nursing students. A semi experimental intervention study was conducted on a single group. Pre and post data was recorded from study participants. Post data was recorded 6 months after the health intervention. ANOVA was used for statistical analysis. Knowledge of study participants about breast cancer and BSE skills increased after the training. The percentage of students practicing regular BSE was determined as 14.6% before training, 45.8% after 6 months. The educational intervention improved the BSE practices in study subjects (Kissal & Kartal, 2019).

A cross-sectional study was conducted in Bangladesh on 567 female university students. A semi structured questionnaire was to collect knowledge about risk factors, early warning signs, screening and therapeutic approaches of breast cancer. Majority of students had good knowledge and attitudes towards breast cancer but only 37.95% of students had been practicing BSE. Statistical analysis determined age, advertisements (ad) promoting awareness about breast cancer, programs/campaign related to breast cancer, and personal breast problem history as predictors of awareness of breast cancer (Akter & Ullah, 2022).

A study conducted in Nigeria to determine the role of health education in creating and investigating the level of breast cancer awareness among female undergraduates in University of Calabar. A validated questionnaire about Awareness and Breast Cancer Disease reduction was used for data collection. The study was conducted on 152 female university students. Data was analysed by chi square test of statistical analysis. The results showed that breast cancer awareness significantly affect individual's knowledge of the symptoms and risk factors of breast cancer, as well as their practice of breast self-examination. The result showed that Health Education has a positive significant role in the reduction of breast cancer (Asuquo & Olajide, 2015).

A cross sectional study was conducted in Malaysia to identify the knowledge and BSE practice among undergraduate female students at four public universities in Klang Valley, Malaysia. The study was conducted among 820 undergraduate female students using a self-administered questionnaire covering socio-demographic data, knowledge of breast cancer and BSE practice. The study showed low level of knowledge on breast cancer and breast self-examination among participants. Only 19.6% participants were performing BSE regularly. Knowledge of breast self-examination was significantly associated with BSE practice ($p=0.001$). BSE showed significant associations with age, marital status and being trained by a doctor for doing BSE ($p<0.05$) (Akhtari-Zavare, Latiff, et al., 2015).

A cross sectional study was conducted in Ghana to understand predictors and awareness of breast examination of female undergraduate students. A validated questionnaire was used to collect data and SPSS version 13.1 was used for data analysis. Chi-square and binary logistic regression statistical tests were used in research. Results revealed that 73% of the students were aware of breast cancer, with social media being the most important source of information (64.4%). The

prevalence of breast cancer risk factors varied from 1% of having a personal history of breast cancer to 14.3% for positive family history of breast cancer. The study demonstrated that a gap is present between the awareness and practice of breast cancer screening. Awareness campaigns and education should be intensified in the University to bridge this gap (Osei-afriyie et al., 2021).

2.6. Importance of Research

It is reported that the global incidence of breast cancer will increase from two million patients in 2018 to more than three million in 2046, showing a 46% increase (Pilevarzadeh et al., 2019). The current demographic trends of breast cancer in our country also indicate that this disease will create a significant burden on our healthcare system in the coming years. As it is projected that the incidence of this disease will increase in coming years, so research should be conducted on it and effective strategies should be created and implemented for tackling this situation in coming years. There is paucity of information about breast cancer in Pakistan (Qureshi et al., 2015). It is very important to assess the impact of educational intervention regarding breast cancer in females. This study will help us in determining that either health education have a direct impact on female school going students or has no impact. According to our information a health education interventional study regarding breast cancer awareness on school going students in Rawalpindi have not been conducted. So it is important to conduct this study, as it will reveal the baseline awareness of school going students in pretest examination. And posttest examination will determine that either the health intervention had a positive impact on awareness of study subjects about breast cancer.

2.7. Conceptual framework

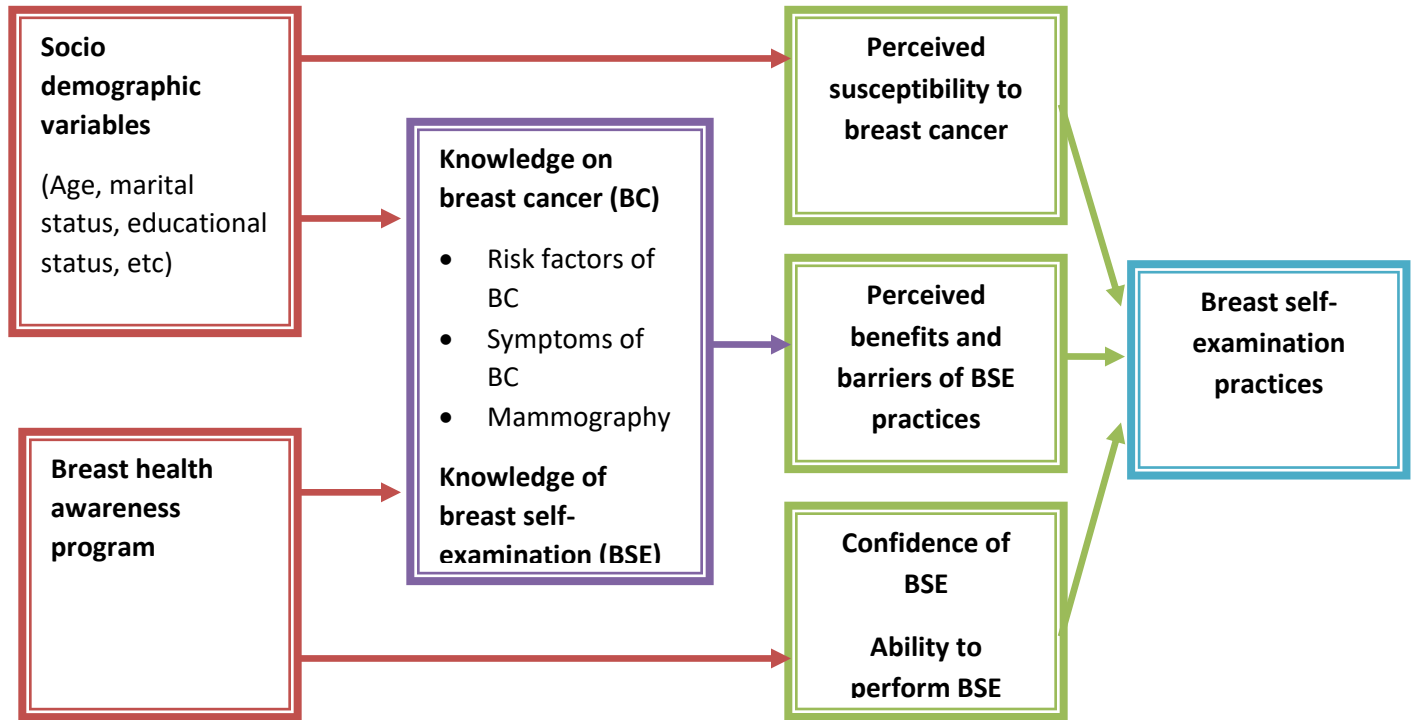


Figure 1: Conceptual framework for Effect Of Health Education Regarding Awareness Of Breast Cancer Among School Going Adolescents

2.8. Similar studies done locally:

A cross-sectional study was carried out in Pakistan to assess the awareness of female university students about breast cancer's risk factors, signs and symptoms, and breast cancer examination. A total of 774 participants completed the survey and recorded their responses on an online pre-tested self-administered questionnaire. Only 29.8% of the participants had identified breast cancer history in their first-degree relatives as a risk factor. Moreover, 14.1% of the participant considered that the use of oral contraceptives for more than 5 years can increase the risk of developing breast cancer Overall, the university female students of Pakistan were poorly aware

of breast cancer's risk factors, signs and symptoms, and breast examination. The study highlighted the need for initiation of aggressive strategies regarding breast cancer awareness in both the literate and illiterate female population of Pakistan (Id et al., 2022).

Another cross-sectional study was conducted in Karachi, Pakistan. The purpose of study was to determine the knowledge, attitudes and practices of urban women regarding breast cancer and its available screening modalities. Females visiting a tertiary care hospital were used for data collection. A total of (n=373) women participated in study. A self-administered questionnaire was used for data collection. About 182 (48.8%) had heard about Breast Self-Examination and 142 (38%) knew how to perform it. However, only 97 (25.9%) regularly performed such an exam. Almost all 362 (97%) women wanted more media awareness campaigns regarding the issue. Factors significantly associated with higher awareness score were age > 40 years, education level, income and employment status. There is a real need for comprehensive health education programs focusing on breast cancer awareness in Pakistan (Sobani & Saeed, 2012).

Another cross sectional study was conducted in Karachi, Pakistan. The purpose of study was to assess the knowledge, attitude, and practice of BSE among female college students of Karachi, Pakistan. The study was conducted on 1000 students from June to December 2016. Data were collected using a pre-piloted questionnaire, and SPSS (version 20) was used for data analysis. Chi-square test was used to determine the significance of the difference in knowledge and attitude among participants who had performed BSE and those who had not. 71.4% of the women knew what BSE was; only 33.1% had performed it. Majority of the participants considered that BSE is important in the early detection of breast cancer. A medical background was found to be a significant predictor for adequate knowledge and a positive attitude toward BSE. Educational interventions are required in Pakistan to encourage young women to perform

BSE regularly so that breast abnormalities can be detected early on and mortalities can be minimized(Ahmed et al., 2018).

2.9. Operational Definitions

2.9.1. Health Education: will be given to study subjects by conducting a workshop. A 2-hour workshop will be delivered to create awareness in female school going students about breast cancer and breast self-examination. Its contents will include information about normal breast, breast health awareness, breast cancer, and screening methods. Participants will be trained on how to practice breast self-examination (BSE) on a silicon breast model with multiple implanted lumps.

2.9.2. Knowledge: means the awareness of female school students about breast cancer and breast self-examination. It will be assessed through 10 questions. Three questions of this scale are dichotomous in nature, while remaining seven questions have more than 2 close ended options.

2.9.3. Attitude: means the certain way in female school students think and behave towards breast cancer and its self-examination. It will be assessed through 10 questions. It is a 3 point Likert scale, with 1 score for disagree and 3 score for agree.

2.9.4. Practice: means how female school students practice the information given to them about breast cancer and breast self-examination. It will be assessed through 3 questions. The questions have various options, from which the student will select any one option.

2.9.5. Champion's health belief model: it is a scale developed for conducting research breast cancer awareness and screening. In this study it will consist of 7 items. It is a 5 point Likert scale with options from strongly disagrees to strongly agree.

CHAPTER III: METHODOLOGY

3.1. Research Design

As the current study was aimed to determine the effect of health education on awareness regarding breast cancer, a Quasi experimental study design was used for carrying out this study.

3.2. Research Duration

Study period for the current research was six months from March- August 2022.

3.3. Study Setting

The study was conducted in public and private schools of Rawalpindi city. Four schools were selected for the purpose of the study; two public and two private.

3.4. Research Participants

The research participants were female students of class ninth and ten, who were present in school during the research sessions and those who met the inclusion and exclusion criteria.

3.4.1. Inclusion Criteria

1. Students who were willing to participate in the study.
2. Only Female students were included in study.
3. Students of class 9 and 10 were included.

3.4.2. Exclusion Criteria

1. Students who did not agree for follow up.
2. Students who had a family history of breast cancer.

3.5. Sample Size Calculation

The sample size was calculated by using Open-Epi Menu software, by adding 80% power to detect a group difference of 12.5 % and two-sided 5 % significance level. The desired sample size for the current study was 100 for each group (Sarker et al., 2022).

3.6. Sampling Strategy

Desired sample was collected using non-probability consecutive sampling strategy.

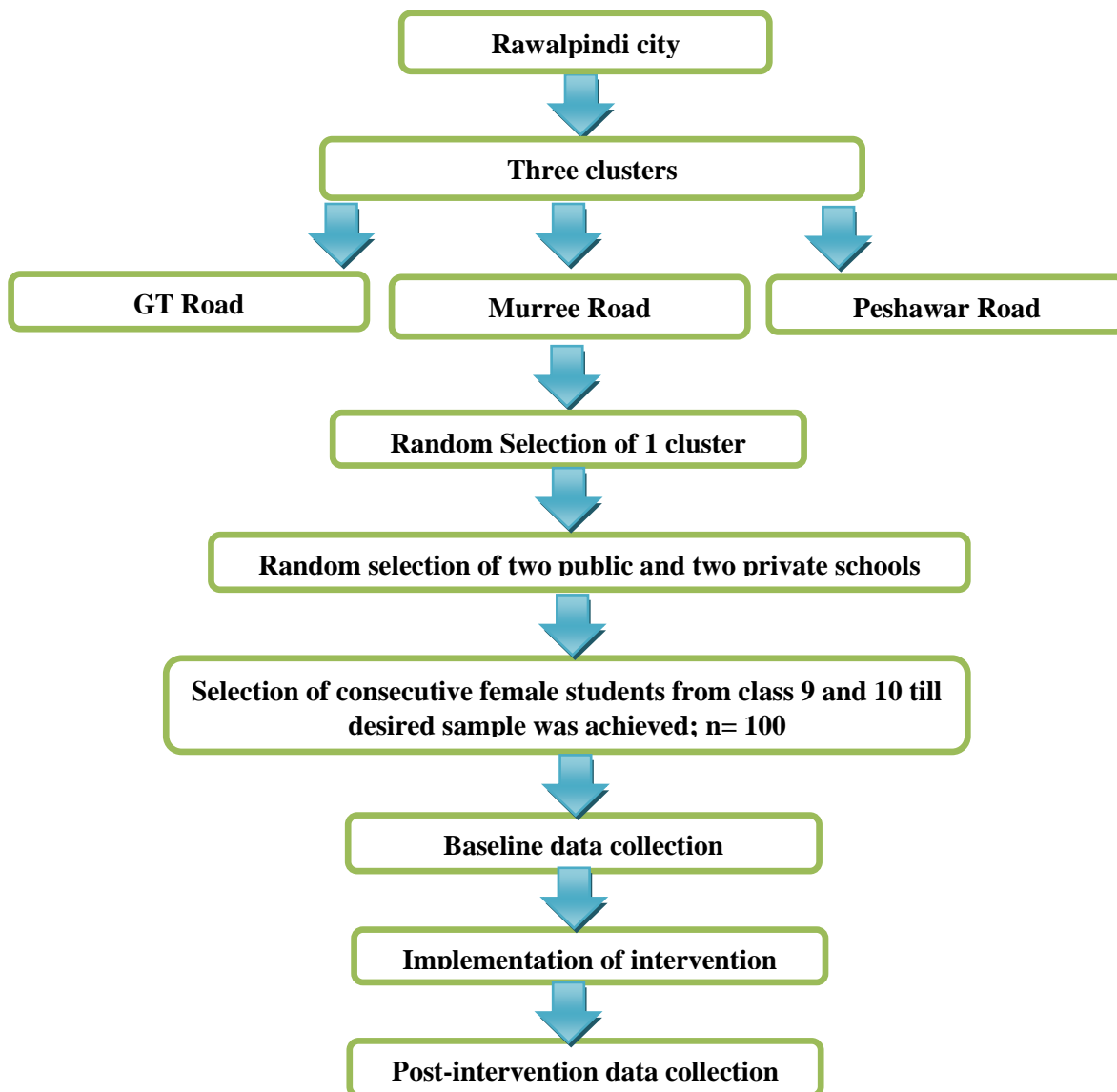


Figure 2: Non probability consecutive sampling strategy

3.7. Development of Intervention

The educational module on breast health awareness was developed based on the Clinical Guidelines of Pakistan for breast cancer screening and American Cancer Society. The content of the education module included the normal breast, breast health awareness, breast cancer, and other screening methods. In addition to this information, participants were trained on how to practice breast self-examination (BSE) on a silicon breast model with multiple implanted lumps. The study subjects received a total of three 1 hours' workshops once a week. Data were collected at the baseline and end of the intervention from study subjects.

3.8. Intervention

The intervention was carried out in four sessions. In 1st session, students were told about the purpose of the research and consent form was given to them to take permission from their mothers. In second session, students were asked to fill the questionnaire regarding awareness of breast cancer. After this, a workshop regarding awareness of breast cancer was carried out that comprised 60 minutes. Information related to breast cancer, its causes, risk factors and treatment was provided to the students. They were also told about the early detection of the breast cancer. During 3rd session, awareness regarding breast self-examination (BSE) was provided. Importance of BSE was demonstrated for early detection of breast cancer. Students were explained proper steps of BSE using models. The session lasted for 60 minutes. In fourth session, students were given the same questionnaire to evaluate their awareness regarding breast cancer post intervention (figure 3).

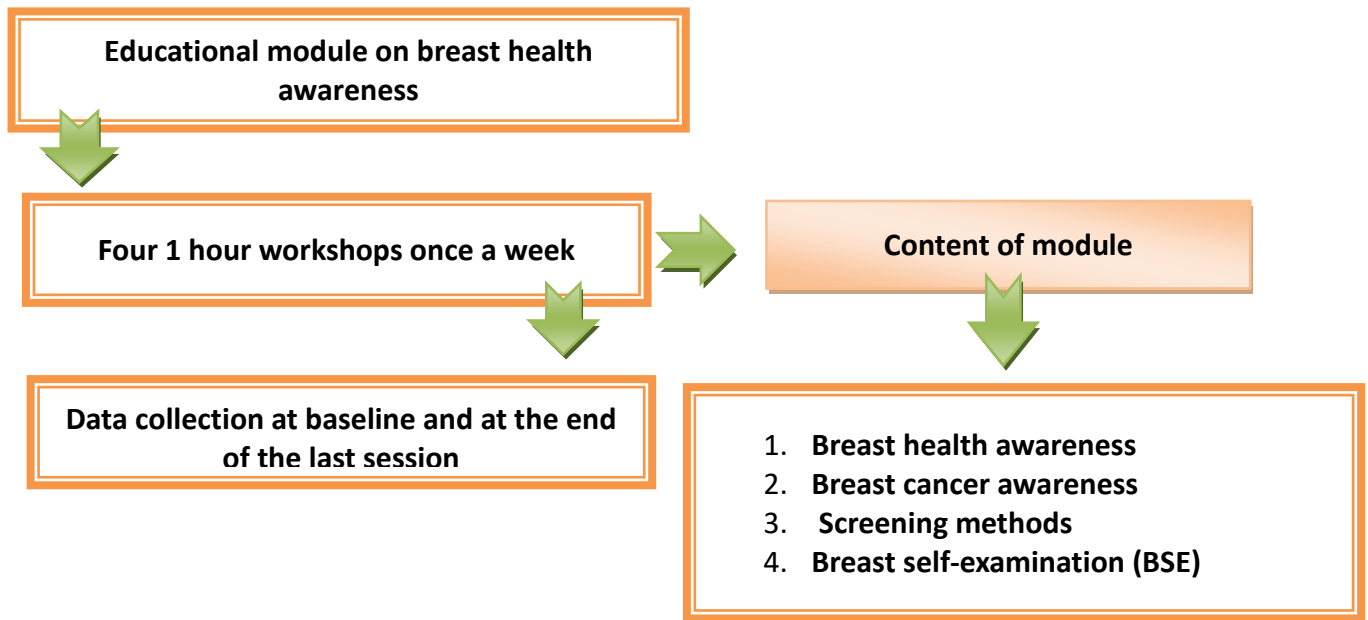


Figure 3: Health Education Intervention on Awareness regarding Breast Cancer

3.9. Data Collection Instrument

3.9.1. Questionnaire Design

Data were collected using a self-administered questionnaire in which the study subjects filled the questionnaire and recorded their responses. A validated structured questionnaire (Heena et al., 2019)(Akhtari-Zavare, Mehrnoosh, et al., 2015) was adapted, pilot tested and used for data collection. The questionnaire consisted close ended questions. The questionnaire consisted four main sections.

- **First section:** This section was socio demographics section. It included questions regarding age, marital status, family type, education and family history of breast cancer.
- **Second section:** This section included questions regarding knowledge and attitude towards breast cancer, screening and self-examination. Knowledge regarding breast cancer was assessed by 10 questions. Different options were given for each question, from which the respondent can tick any option. The attitudes towards breast self-examination were assessed

by using 10 questions. The responses for the questions regarding attitudes were in the form of 3 point Likert scale.

- **Third section:** It included Champion's Health Belief Model Scale to evaluate the health beliefs of the participants. This scale had 7 questions and it was a 5 point Likert scale.
- **Forth section:** It included questions related to Breast self-examination practice and frequency. It had 4 questions and various options were given for each question.

3.9.2. Study Variables

3.9.2.1. Outcome Variable

The major construct of the questionnaire was to assess the knowledge and attitudes towards breast cancer, screening and self-examination. The outcome variables were knowledge, attitude, Champion's Health Belief Model Scale and practice of breast self-examination, which were measured by using a validated questionnaire. The outcome variables were divided into categories on the basis of median score.

3.9.2.2. Independent Variable

Data on independent variables was collected through a structured Performa which was constructed after international and national literature review. The Performa included socio demographic variables such as age, education level, marital status, place of residence, socioeconomic status, family type and family history of breast cancer.

3.10. Data Collection Process

Data was collected using a self-administered questionnaire that included 4 sections: section 1 included general information regarding socio demographic factors such as age, marital status, family type, education and family history of breast cancer. Section 2 included questions

regarding knowledge and attitude towards breast cancer, screening and self-examination (Heena et al., 2019). Section 3 included Champion’s Health Belief Model Scale to evaluate the health beliefs of the participants. The last section included questions related to BSE practice and frequency (Akhtari-Zavare, Mehrnoosh, et al., 2015).

3.10.1. Pilot Testing

Pilot testing was performed before starting the formal data collection procedure by including 10% of the actual sample size. Questionnaire was tested for any future changes. After pilot study, no changes were made in the questionnaire. Data from pilot testing was not included in final analysis. Reliability of the scales were determined through Cronbach alpha’s values. The value of Cronbach alpha for attitude scale was 0.688, for knowledge items, it was 0.668, for HBM model, the value of Cronbach alpha was 0.656 and for practices, it was 0.679.

Reliability Statistics	
Cronbachs Alpha	N of Items
.688	10

Figure 4: Reliability of Attitude scale

Reliability Statistics	
Cronbachs Alpha	N of Items
.668	10

Figure 5: Reliability of Knowledge scale

Reliability Statistics	
Cronbachs Alpha	N of Items
.656	7

Figure 6: Reliability of HBM model

Reliability Statistics	
Cronbachs Alpha	N of Items
.679	4

Figure 7: Reliability of Practices scale

3.10.2. Formal Data Collection

Data were collected by the researcher herself and no data collectors were hired. All the students of selected schools were approached for data collection. Written consent forms were signed by parents of those students who were taking part in research study. Data collection was approximately completed in one month. All filled questionnaires were kept protected in plastic files and no one had access to it other than researcher.

3.11. Data Analysis Procedure

Code book was developed and data was entered in Statistical Package for Social Sciences (SPSS) version 26. After careful data entry, data was checked for any error before proceeding to the further analysis. After data cleaning, data transformation was carried out for certain variables. Data analysis was done in two phases; descriptive analysis and inferential analysis.

3.10.1. Data Cleaning

After careful data entry, data was checked for any missing values and any error that could possibly affect the further analysis. Double entries were eliminated before continuing the further analysis.

3.10.2. Data Transformation

The data was entered into SPSS and after that the total scores for knowledge, attitude, champion's health belief model and practices were computed. After computation the variables were subjected to analysis. Age was further categorized to proceed the analysis.

3.10.3. Descriptive Analysis

Descriptive statistics were generated for socio demographic characteristics. For categorical variables, data was summarized in the form of frequencies and percentages and presented in table form, Bar chart and Pie chart. For continuous variables, mean and standard deviation were calculated.

3.10.4. Inferential Analysis

Paired t-test was used to determine the effect of intervention on the awareness of breast cancer. Independent sample t-test and One-way ANOVA were used to determine association of knowledge, attitude and practices of breast cancer with socio demographic variables. P values <0.05 were considered as statistically significant.

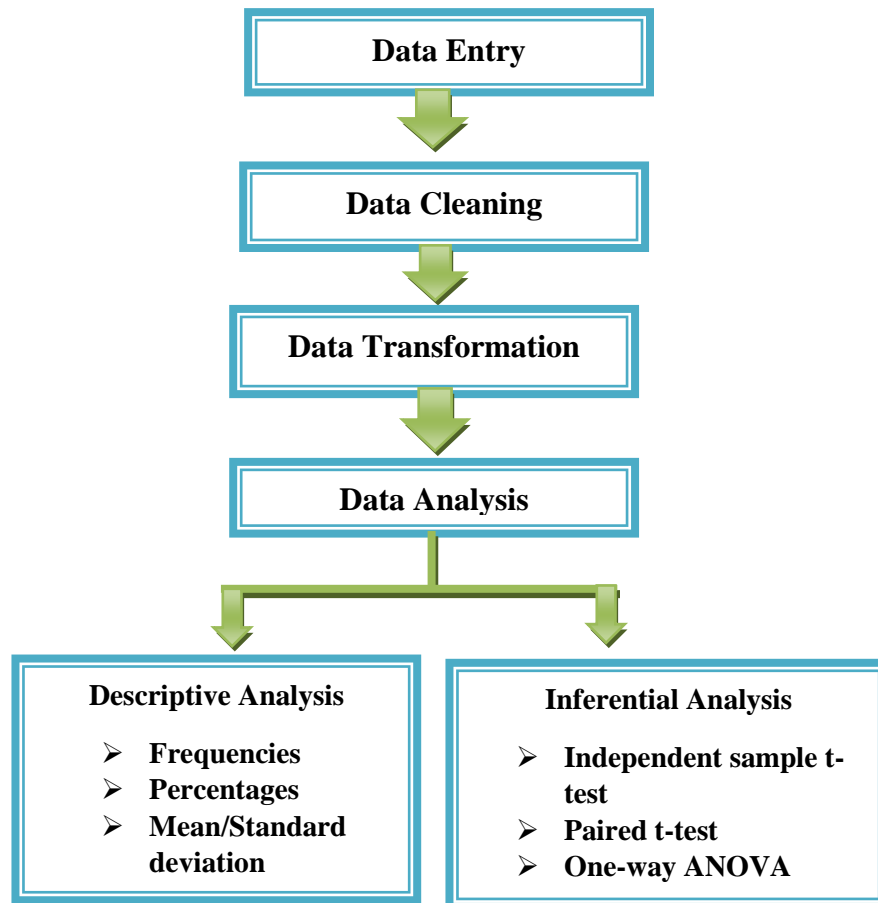


Figure 8: Data analysis plan

3.11. Ethical Considerations

Before starting formal data collection, approval from Institutional Review Board (IRB) of Al-Shifa School of Public Health Rawalpindi, Pakistan was taken. Permission letter from the Head of Department of Al-Shifa School of Public Health was obtained regarding access to public and private schools. Permission was also taken from the public and private sector schools of Rawalpindi city for conducting research. Students were explained the purpose of the research and written consent was taken from each participant's parent. Participants were assured for the confidentiality of their data. Data collected from the respondents was kept anonymous and was not shared with anyone. Data was entered in SPSS anonymously. After data entry, hard copies of collected were kept at a safe place.

CHAPTER IV: RESULTS

4.1. Descriptive summary of Socio demographic Variables

A total of 100 female students participated in the study. Majority of participants, (n=56; 56%) were less than 15 years. Majority of participants (n= 67; 67%) were permanently settled in city. (n=51; 51%) subjects were students of class 9 while (n=49; 49%) were students of class 10. Only (n=14; 14%) study subjects had a family history of breast cancer. Socio demographics of study subjects are shown in table 1.

Table 1: Socio demographics characteristics of study participants

S. No.	Variable	Category	Frequency (n)	Percentage (%)
1.	Age	Under 15 years	56	56
		More than 15 years	44	44
2	Permanent address	Village	33	33
		City	67	67
3	Family type	Nuclear	46	46
		Compound	54	54
4	Education	Class 9	51	51
		Class 10	49	49
5	Family history of breast cancer	Yes	14	14
		No	86	86

4.2. Descriptive summary of respondents regarding breast cancer, screening and self-examination

In this study knowledge, attitudes, Champion's health belief model and practice scales were used for collecting data about breast cancers, its screening and self-examination. The data were collected at two intervals. Data collected at the start of research was called pre intervention data.

The data collected after giving the intervention to respondents was referred as post intervention data. For this study the data about breast cancer was recorded using a validated structured questionnaire.

4.2.1. Knowledge regarding Breast Self-examination Before and After Intervention:

It can be seen that pre intervention all respondents had poor knowledge about breast self-examination. Out of total 100 respondents, 98 (98%) had not heard about breast self-examination. All of study subjects (n=100; 100%) did not know that breast self-examination is a useful tool for early detection of breast cancer. None of subjects (n=100; 100%) had been taught about breast self-examination. After health intervention all respondents had adequate knowledge about breast self-examination. Out of total 100 respondents, 99 (99%) had respondents that they heard about breast self-examination. Almost all study subjects (n=99; 99%) reported that they knew that BSE is a useful tool for early detection of breast cancer. Ninety-seven (97%) study subjects reported that they had been taught about breast self-examination. All study respondents (n= 100; 100%) reported that BSE should be done by the individual herself. A detailed summary of respondents' knowledge regarding breast self-examination is given in table 2.

Table 2: Knowledge regarding breast self-examination Pre and Post Intervention

S. No.	Knowledge regarding breast self-examination	Pre-intervention n (%)	Post-intervention n (%)
1	Heard of breast self-examination(BSE)		
	Yes	2 (2)	99 (99)
	No	98 (98)	1 (1)
2	BSE is tool for early detection		
	Yes	0 (0)	99 (99)

	No	100 (100)	1 (1)
3	Taught about Breast self-examination		
	Yes	0 (0)	97 (97)
	No	100 (100)	3 (3)
4	Age to start Breast self-examination		
	From birth	3 (3)	0 (0)
	From puberty	2 (2)	0 (0)
	From 20 years	3 (3)	97 (97)
	From 30 years	30 (30)	3 (3)
	After menopause	48 (48)	0 (0)
	Not sure	14 (14)	0 (0)
5	Breast self-examination should be done by		
	Doctor	100 (100)	0 (0)
	Trained Nurse	0 (0)	0 (0)
	The individual	0 (0)	100 (100)
6	Benefits of Breast self-examination		
	To be familiar with the breast texture	49 (49)	0 (0)
	Detection of any abnormal changes in the breast	2 (2)	100 (100)
	A good breast exercise	3 (3)	0 (0)
	Combinations of the above	5 (5)	0 (0)
	Not Sure	41 (41)	0 (0)

4.2.2. Attitude towards breast cancer, screening and self-examination Before and After Intervention:

It was seen in table 3 that before giving intervention majority of students were unaware of risk factors of breast cancer. Many students disagreed (n=78; 78%) that any woman is at risk of breast cancer. Many students (n=83; 83%) did not know that early diagnosis of breast cancer can lead to prolonged life. It was seen that after giving intervention majority of students (n=90; 90%)

agreed that any woman is at risk of breast cancer. (n=98; 98%) students agreed that if they knew benefits of breast self-examination, they would do it. Many students agreed (n=87; 87%) that breast cancer can be prevented. Many students (n=98; 98%) knew that early diagnosis of breast cancer can lead to prolonged life. A detailed summary of attitude of respondents towards breast cancer, screening and self-examination before and after the intervention is given in table 3.

Table 3: Attitude towards breast cancer, screening and self-examination Pre and Post Intervention

S. No.	Attitude towards breast cancer, screening and self-examination	Pre-Intervention			Post-Intervention		
		Disagree N (%)	Neutral N (%)	Agree N (%)	Disagree N(%)	Neutral N(%)	Agree N (%)
1	Any woman is at risk of breast cancer	78 (78)	18 (18)	4 (4)	9 (9)	1 (1)	90 (90)
2	Breast cancer can be prevented	72 (72)	19 (19)	9 (9)	10 (10)	3 (3)	87 (87)
3	If I examine my breast myself, I cannot detect abnormalities in my breast	80 (80)	13 (13)	7 (7)	17 (17)	0 (0)	83 (83)
4	There is no reason to examine my breast	80 (80)	14 (14)	6 (6)	8 (8)	0 (0)	92 (92)
5	If I knew the benefits of BSE, I would have done it by now	5 (5)	44 (44)	51 (51)	0 (0)	2 (2)	98 (98)
6	Women prefer female doctors for breast examination	99 (99)	1 (1)	0 (0)	27 (27)	3 (3)	70 (70)
7	If there is no problem in my breast, periodic breast examination by a physician is not required	82 (82)	12 (12)	6 (6)	27 (27)	4 (4)	69 (69)
8	Early methods of detection have no	75 (75)	6 (6)	19 (19)	10 (10)	3 (3)	87 (87)

	effect on treatment						
9	Personal hygiene decreases the breast cancer risk	55 (55)	35 (35)	10 (10)	17 (17)	8 (8)	75 (75)
10	Early diagnosis of breast cancer will lead to prolonged life	83 (83)	13 (13)	4 (4)	1 (1)	1 (1)	98 (98)

4.2.3. Champion's health belief model:

It was found that most students (n=68; 68%) disagree that they will get breast cancer in future. None of students (n=0; 0%) agreed that they will get breast cancer at any time in their life. Very few (n=3; 3%) students agree that mammogram is best way to find small lumps in breast. It was found that after giving health intervention most students (n=85; 85%) agreed that they will get breast cancer in future. (n=88; 88%) students agreed that mammogram is best way to find small lumps in breast. A comparison of before and after intervention score of Champion's health belief model is given in table 4.

Table 4: Champion's HBM score Pre and Post Intervention

S.No.	Champion's health belief model	Pre-Intervention					Post-Intervention				
		SD	D	N	A	SA	SD	D	N	A	SA
1	I will get breast cancer	4 (4)	68 (68)	24 (24)	4 (4)	0 (0)	0 (0)	7 (7)	8 (8)	85 (85)	0 (0)
2	Great chances of breast cancer in next few years	35 (35)	54 (54)	11 (11)	0 (0)	0 (0)	7 (7)	5 (5)	5 (5)	69 (69)	14 (14)
3	Get breast cancer sometime during my life	5 (5)	63 (63)	32 (32)	0 (0)	0 (0)	2 (2)	14 (14)	11 (11)	71 (71)	2 (2)
4	Mammogram help in early detection of	41 (41)	33 (33)	22 (22)	4 (4)	0 (0)	4 (4)	4 (4)	1 (1)	88 (88)	3 (3)

	breast lumps										
5	Mammogram finds very small lumps	52 (52)	22 (22)	22 (22)	3 (3)	1 (1)	0 (0)	0 (0)	0 (0)	71 (71)	29 (29)
6	Afraid to have a mammogram	11 (11)	49 (49)	13 (13)	27 (27)	0 (0)	0 (0)	84 (84)	5 (5)	11 (11)	0 (0)
7	Afraid about results of mammogram	7 (7)	45 (45)	4 (4)	42 (42)	2 (2)	0 (0)	88 (88)	1 (1)	11 (11)	0 (0)

SD= Strongly disagree, D= Disagree, N= Neutral, A= Agree, SD= Strongly agree

4.2.4. Practices regarding BSE Before and After Intervention:

Before giving intervention, only (n=4; 4%) students said that they had ever performed breast self-examination. While after the health intervention (n=99; 99%) students said that they have performed breast self-examination as shown in figure 9.

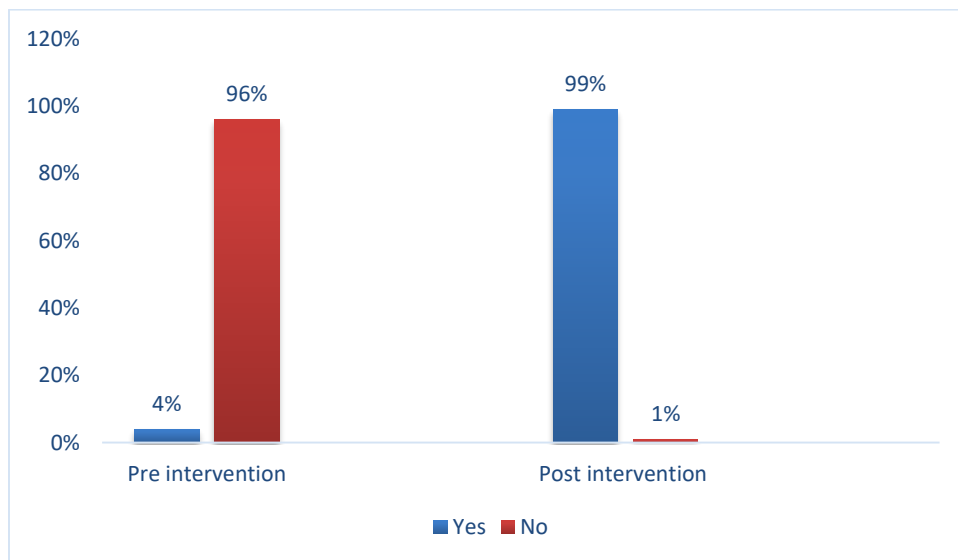


Figure 9: Percentage of respondents performing Breast self-examination pre and post health intervention

Before health intervention majority of students (n=94; 94%) said that there is no specific time to perform breast self-examination. But after it happened (n=100; 100%) students said that the correct time for breast self-examination is 2nd -3rd day after menses as given in figure 10.

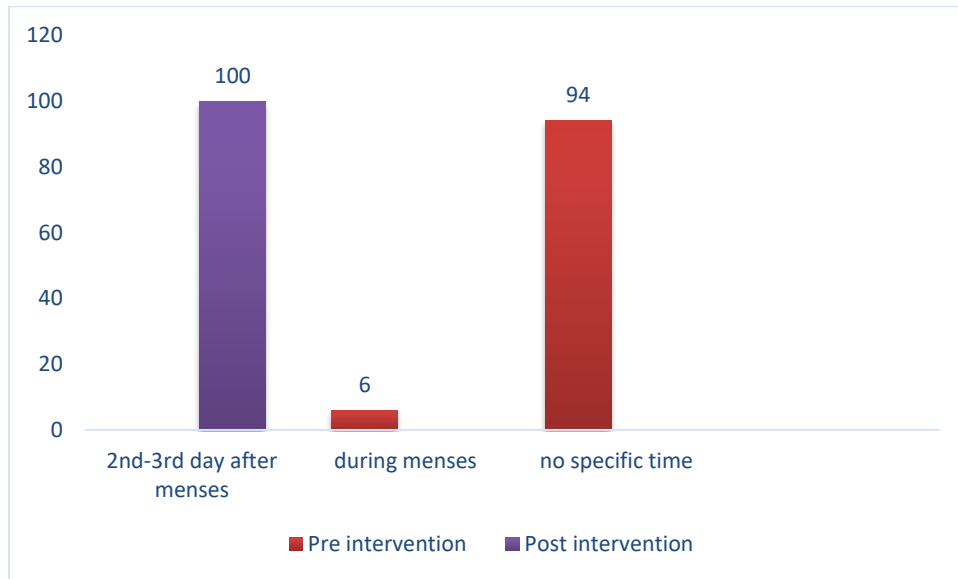


Figure 10: Time at which respondents perform breast self-examination pre and post health intervention

It was found that all students (n=100; 100%) said that they find it embarrassing to do breast self-examination (figure 11).

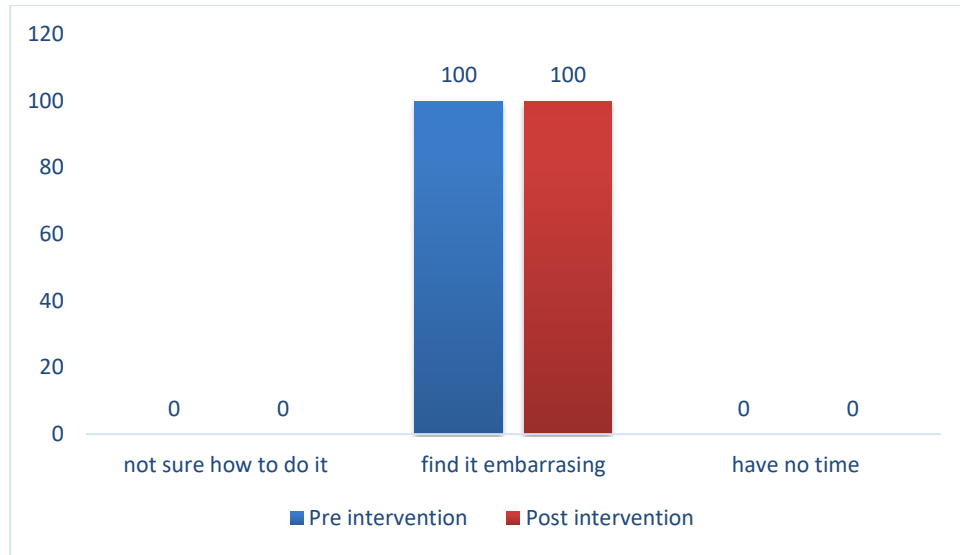


Figure 11: Reasons for not doing breast self-examination pre and post health intervention

4.3. Comparison of Mean Difference Before and After Intervention:

In present study, mean difference of knowledge, attitude and practices before and after the intervention was determined by paired t-test. Results revealed that there was a significant difference between the mean scores of study population pre and post intervention. The mean attitude score before intervention was 14.07 ± 1.96 and after intervention was 27.23 ± 2.136 . The mean score for knowledge scale before intervention was 22.04 ± 3.213 and after intervention was 27.86 ± 0.739 . The mean score for champion's health belief model was 16.56 ± 2.520 before intervention and 26.74 ± 1.947 after intervention. The mean score for practice was 3.08 ± 0.526 before intervention and 6.99 ± 0.100 after intervention. The summary of pre and post intervention mean score difference is given in 5.

Table 5: Difference in Mean value before and after Intervention

S. No.	Variables	Mean \pm S.D		Mean difference	t-test (df)	P value
		Pre-Intervention	Post-Intervention			
1	Knowledge about BSE	22.04 \pm 3.213	27.86 \pm 0.739	5.82 \pm 3.38	17.21 (99)	0.0001**
2	Attitude regarding breast cancer, screening and self-examination	14.07 \pm 1.96	27.23 \pm 2.136	13.16 \pm 2.41	54.36 (99)	0.0001**
3	Champion's health believe model	16.56 \pm 2.520	26.74 \pm 1.947	10.18 \pm 2.52	40.46 (99)	0.0001**
4	Practices regarding BSE	3.08 \pm 0.526	6.99 \pm 0.100	3.91 \pm 0.51	76.02 (99)	0.0001**

Significant at *p value<0.05, **p value<0.001, C.I.= 95%

4.3. Association between Socio demographic and Awareness regarding breast cancer

In current study, associations between socio demographic characteristics and knowledge and attitudes towards breast cancer, screening and self-examination were calculated using Independent Sample t test and One Way ANOVA. Table 6 shows that knowledge regarding BSE was relatively higher among less than 15 years' students as compared to more than 15 years' students. Adolescents living in compound families reported relatively higher mean score of knowledge as compared to those who were living in nuclear families. Results showed that age of the respondents (p value=0.0001), permanent residence (p value=0.035), family type (p value=0.001), family history of breast cancer (p value=0.0001) were significantly associated with knowledge. A detailed summary of association of socio demographics with BSE knowledge is given in table 6.

Table 6: Association between Knowledge of students after intervention and Socio demographic characteristics

S. No.	Socio demographic variables	N	Mean ± S.D.	t test(df)	P value
1	Age				
	<15 years	56	27.98±.301	1.889(98)	0.0001**
	>15 years	44	27.70±1.047		
2	Permanent address				
	Village	33	27.97±.305	1.042(98)	0.035*
	City	67	27.81±.875		
3	Family type				
	Compound	54	27.96±.272	1.520(98)	0.001*
	Nuclear	46	27.74±1.042		
4	Education level				
	Class 9	51	27.92±.627	.849(98)	0.174
	Class 10	49	27.80±.841		
5	Family history of breast cancer				
	No	86	27.93±.527	2.413(98)	0.0001**
	Yes	14	27.43±.1.453		

Significant at *p value<0.05, **p value<0.001, C.I.= 95%

Results indicated that family type (p value =0 .005) and educational level (p value=0.012) were associated with attitudes regarding breast cancer, screening and self-examination. A detailed of results regarding attitude of respondents with respect to their socio demographic characters is given in table 7.

Table 7: Association between Attitudes of adolescents after intervention and Socio demographic characteristics

S. No.	Socio demographic variables	N	Mean ± S.D.	t-test(df)	P value
1	Age				
	>15 years	44	27.30±1.912	0.270(98)	0.217
<15 years	56	27.18±2.313			
2	Permanent address				
	City	67	27.34±2.206	0.754(98)	0.453
Village	33	27.00±2.000			
3	Family type				
	Nuclear	46	27.57±1.759	1.457(98)	0.005*
Compound	54	26.94±2.390			
4	Education level				
	Class 9	51	26.55±2.248	3.424(98)	0.012*
Class 10	49	27.94±1.773			
5	Family history of breast cancer				
	Yes	14	27.64±2.061	0.778(98)	0.815
No	86	27.16±2.152			

Significant at *p value<0.05, **p value<0.001, C.I.= 95%

Results indicated that family type (p value=0.029), educational level (p value= 0.048) and family history of breast cancer (p value=0.0001) were significantly associated with practices regarding BSE.

Table 8: Association between Practice of students after intervention and Socio demographic characteristics

S. No.	Socio demographic variables	N	Mean ± S.D.	t test(df)	P value
1	Age				
	<15 years	56	6.98±0.134	0.885(98)	0.074

	>15 years	44	7.00±0.0001		
2	Permanent address				
	Village	33	7.00±0.0001	0.700(98)	0.158
	City	67	6.99±0.122		
3	Family type				
	Compound	54	7.00±0.0001	1.084(98)	0.029*
	Nuclear	46	6.98±0.147		
4	Education level				
	Class 10	49	7.00±0.0001	0.980(98)	0.048*
	Class 9	51	6.98±0.140		
5	Family history of breast cancer				
	No	86	7.00±0.0001	2.546(98)	0.0001**
	Yes	14	6.93±0.267		

Significant at *p value<0.05, **p value<0.001, C.I.= 95%

It was found that believes of adolescents as determined by Champion's health believe model were not significantly associated with any socio demographic characteristic (p value>0.05).

CHAPTER V: DISCUSSION

This study was conducted on 100 female students studying at public and private schools of Rawalpindi city. The primary purpose of the study was to assess the awareness levels about breast cancer before and after the health intervention among school going adolescents of Rawalpindi city. Furthermore, the study was also intended to find out the association of socio demographic variables with awareness levels about breast cancer among adolescents. Data was collected at start of study by using a self-administered questionnaire. Then an awareness session about breast cancer was given to students. After that data was again collected by using self-administered validated questionnaires.

This study determined significant change in level of knowledge of breast cancer and breast self-examination practices following an educational intervention among female school going students in Rawalpindi. A significant difference was seen between the mean scores of study population pre and post intervention. The mean attitude score before intervention was 14.07 ± 1.96 and after intervention was 27.23 ± 2.136 . The mean score for knowledge scale before intervention was 22.04 ± 3.213 and after intervention was $27.86 \pm .739$. The mean score for champion's health belief model was 16.56 ± 2.520 before intervention and 26.74 ± 1.947 after intervention. The mean score for practice was $3.08 \pm .526$ before intervention and $6.99 \pm .100$ after intervention.

Associations between socio demographic characteristics and effect of health education regarding awareness of breast cancer among school going students were calculated using Independent Sample t test and One Way ANOVA. Inferential analysis indicated that family type (p value = .005) and educational level (p value= .012) were associated with attitude. Age (p value=.000), permanent address (p value=.035), family type (p value=.001), socioeconomic status (p value=.009) and family history of breast cancer (p value=.000) were significantly associated with

knowledge. None of the significant variables were significantly associated with Champion's health belief model. Independent sample t test determined that family type (p value=.029), educational level (p value= .048) and family history of breast cancer (p value=.000) were significantly associated with practice.

The data was collected before and after educational intervention. After 1 week of educational intervention, post intervention data was collected. Correct answers were given by almost all of study participants about each question in posttest session. These results are consistent with several studies conducted in Bangladesh (Sarker et al., 2022), Iran (Rezaeian et al., 2014), Izmir (Ceber et al., 2010) and Sivas (Yilmaz et al., 2017). In all these studies the knowledge level on symptoms, risk factors, prevention, screening methods and practice of BSE were increased after educational session among study participants. In our study mean knowledge score for correct answers had increased from 22.04 ± 3.213 to $27.86 \pm .739$. Our results are consistent with studies conducted by (Sarker et al., 2022; Rezaeian et al., 2014; Ceber et al., 2010; Yilmaz et al., 2017).

Current study indicated that there was an increase in mean attitude score from 14.07 ± 1.96 to 27.23 ± 2.136 after giving health intervention. In the study (n=72; 72%) girls disagreed that breast cancer can have prevented. Our results are slightly different from a study conducted on female university students of Jordan (Suleiman, 2014). The mean score for champion's health belief model was increased from 16.56 ± 2.520 to 26.74 ± 1.947 after health intervention. Similar results were reported by studies conducted on females (Akhtari-Zavare et al., 2013; Moodi et al., 2011; Kissal & Kartal, 2019). Before health intervention 52% students disagreed that mammogram finds small lumps in breast. Post intervention only 29% students disagreed that mammogram finds small lumps. These results are almost similar to another study conducted on nursing students (Kissal & Kartal, 2019).

Our results indicate that there was an increase in mean practice score. The mean score increased from $3.08 \pm .526$ to $6.99 \pm .100$ after intervention. Only 4% students had practiced breast self-examination before the health education, but after it 99% students had practiced it. A study reported increase in practice of BSE after post intervention (Prusty et al., 2021). Our results are different from a study conducted on pharmacy students in Malaysia where 24% students had performed BSE before the health intervention (Ali et al., 2019). The health intervention about awareness of breast cancer had played a role in improving the practices of students towards prevention of breast cancer.

Age (p value=0.0001), permanent address (p value=0.035), family type (p value=0.001), socioeconomic status (p value=0.009) and family history of breast cancer (p value=0.0001) were significantly associated with knowledge. Age, family type and socioeconomic status were reported to be significantly associated with knowledge in other studies conducted on women (Shalini et al., 2011; Arulmohi et al., 2017).

In this study none of the independent variables were significantly associated with Champion's health belief model scale. Our results differ from a study conducted in Turkey where education was associated with champion's health belief model. This difference may be due to the reason that the study population is different in both studies. The study in turkey was conducted on nursing students, while our study is conducted on school students (Kissal & Kartal, 2019).

5.1. Strengths

1. This study was conducted by using a validated questionnaire, which makes the results of this research reliable.
2. As per researcher's knowledge, it was determined that study regarding awareness of breast cancer and breast self-examination on school going female adolescents was not conducted in Pakistan, so the findings of the study tried to cover this literature gap.

3. Adolescents were given adequate knowledge regarding breast cancer and self-examination and their awareness was determined before and after intervention. It was indicated that after intervention, a significant difference was observed in the study population.

5.2. Limitations

1. The questionnaire was composed of close ended questions so it can be difficult to explain the underlying reason for a specific outcome by using it.
2. Another limitation is that as the sample was only restricted to schools of Rawalpindi so findings cannot be generalized to general population.
3. Sample size was limited so inferences cannot be generated about the whole population. Further research is required before generalizing research findings on whole population of Pakistan.
4. Time restrictions also influenced the results.

Chapter VI: CONCLUSION

The study was conducted to determine effect of health education regarding awareness of breast cancer among school going adolescents. The results indicated that participants did not have adequate knowledge, attitudes and practices regarding breast cancer and breast self-examination before the intervention. It was found that mean values of knowledge, attitude, Champion's health belief model and practices were significantly higher after the health intervention. Certain socio demographic factors were found to be associated with knowledge, attitude and practices of respondents which included age, permanent residence, family history of breast cancer and socioeconomic status. Awareness sessions regarding breast cancer should be carried out at educational institutes in order to spread awareness and promote self-examination practices among young females to early detect the symptoms of breast cancer.

6.1. Recommendations

Based on the current findings, following recommendations are put forward for the health authorities and future researchers to address this untapped public health issue:

6.1.1. Policy level:

1. There should be proper health policies regarding breast cancer screening to early diagnose the disease.
2. There should be guidelines regarding awareness of breast cancer among school going female students so that they can get maximum awareness regarding breast cancer in early life.
3. Television, social media and newspapers can be used for dispersing information regarding this issue.

4. Breast cancer screening facilities should be made economical so that every person can afford them.

6.1.2. Health system level:

1. Awareness programs for the whole population and not only for female school adolescents should be held, starting from school education up to higher education.
2. Greater efforts should be done to implement a screening protocol for those females who are at risk of breast cancer, hoping to slow down the rising incidence of breast cancer and build up a healthy society.
3. Females should be encouraged to adopt healthy practices like breast self-examination which are essential for early detection of breast cancer.
4. There should be screening facilities available at health facilities for breast cancer.

6.1.3. Healthcare professional level:

1. Health professionals should be trained enough to effectively communicate and treat such patients so that patient satisfaction level can be improved.
2. Patients should be advised to take healthy diet and maintain a normal body weight.
3. Females are encouraged to do breast self-examination and consult doctor in case of any abnormality.

6.1.4. Individual level:

1. All females should perform BSE at home to detect any abnormality in the beginning of the disease.
2. Healthy diet and regular walk should be adopted in daily life.

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ANNEXURE 1

Data Collection Tool

Please read all questions carefully and tick the most appropriate answer. You are requested to fill all information accurately so that appropriate results can be derived. All information will be kept confidential.

SECTION-A

Demographics

1. Age _____ Years
2. Marital Status:
 - Single
 - Married
 - Separated/Widow
3. Permanent residence:
 - Village
 - City
4. Family type:
 - Nuclear
 - Compound
5. Education: _____ (Class)
6. Family history of breast cancer:
 - Yes
 - No

SECTION-B

Knowledge and Attitude towards breast cancer, screening and self-examination

Questions Attitude towards breast cancer, screening and self-examination	Disagree 1	Neutral 2	Agree 3
1) Any woman is at risk for breast cancer			
2) Breast cancer can be prevented			
3) If I examine my breast myself, I cannot detect abnormalities in my breast			
4) There is no reason to examine my breasts			
5) If I knew the benefit of breast self-examination, I would have done it by now			
6) Women prefer female doctor for breast examination			
7) If there is no problem in the breasts, periodic breast examinations by a physician are not required			
8) Early detection methods have no effect on treatment			
9) Personal hygiene decrease breast cancer risk			
10) By early diagnosis of breast cancer, the person will have prolonged life			

Questions/statements for assessing knowledge of BSE:

1. I heard of Breast Self-Examination:

- Yes
- No

2. BSE is a useful tool for early detection of breast cancer:

- Yes
- No

3. I have been taught about Breast Self-Examination:

- Yes
- No

4. Age at which BSE should be started:

- From birth
- From puberty
- From 20 years
- From 30 years
- After Menopause
- Not sure

5. Time for Breast Self-Examination:

- Daily
- Weekly
- Monthly
- Yearly
- Not sure

6. What is the best time to do Breast Self-Examination?

- During menstrual flow
- A week after period
- During Pregnancy
- During breastfeeding
- Not sure

7. BSE should be done by:

- Doctor
- Trained Nurse
- The Individual
- Combination of the above
- Others
- Not sure

8. BSE is done by:

- Inspecting the breast in the mirror
- Feeling the breast with the hand
- Feeling the armpit with the hand
- Doing Ultrasound of the breast
- Mammography
- Any combination of the above

- Not sure
- Other

9. Action upon abnormality in Breast on Self-Examination:

- Leave it to God and pray
- Do some lab tests
- See a doctor
- Combinations of the above three
- Do nothing
- Others
- Not Sure

10. Benefits of Breast Self-Examination:

- To be familiar with the breast texture
- Early detection of breast cancer
- Detection of any abnormal changes in the breast
- A good breast exercise
- Combinations of the above
- Not Sure

SECTION-C

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Champion’s Health Belief Model Scale	1	2	3	4	5
It is likely that I will get breast cancer.					
My chances of getting breast cancer in next few years are great.					
I feel I will get breast cancer sometime during my life.					
Having a mammogram will help me to find breast lumps early.					
Having a mammogram is the best way for me to find a very small lump.					
I am afraid to have a mammogram because I might find out something wrong.					

I am afraid to have a mammogram because I do not know what will be done.					
--	--	--	--	--	--

SECTION-D

BSE practice and frequency

- 1. Have you ever performed breast self-examination?**
 - Yes
 - No
- 2. At what time do you perform breast self-examination?**
 - 2nd-3rd day after menses
 - 2nd-3rd day before menses
 - During menses
 - During ovulation
 - No specific time
- 3. If you don't, what are your reasons for not doing it?**
 - Not confident on how to do it
 - Not sure of ability to detect breast changes
 - Find it difficult to remember
 - Find it embarrassing
 - Has no time
 - Has no family history of breast cancer and do not see the need for it

Thank you for participation!

ANNEXURE 2

Informed Consent Form

I Dr. Warda Wazir am student of MSPH- Final Semester, at Alshifa School of Public Health, Rawalpindi. I am doing research on Effect of Health Education Regarding Awareness of Breast Cancer among School going adolescents in Rawalpindi City.

PURPOSE OF THE RESEARCH

The purpose of this study is to assess the effectiveness of health education for raising the awareness regarding breast cancer. Through this study, researcher will be able to highlight the potential risk factors that can affect the awareness level of a woman regarding breast cancer.

PARTICIPATION

I do not anticipate that taking this study will contain any risk or inconvenience to you. Your participation is strictly voluntary and you may withdraw your participation at any time without penalty. I request you to answer the questions as honestly as possible. It will take no longer than 20 minutes to complete a questionnaire. All information collected will be used only for research purpose and will be kept highly confidential. Your identity and your responses will not be identifiable; all data will be stored anonymously. As this is solely a student project no incentive will be provided. Once study is completed, I would be happy to share the results with you if you desire.

Thank you for agreeing to participate in this study. Your feedback is important.

Consent

I have read and understand the information sheet and agree to take part in the study.

Signature _____ **Date** _____

ANNEXURE 3

IRB Letter



**AL-SHIFA SCHOOL OF PUBLIC HEALTH
PAKISTAN INSTITUTE OF OPHTHALMOLOGY
AL-SHIFA TRUST, RAWALPINDI**

No. MSPH-IRB/13-37
24th March, 2022

TO WHOM IT MAY CONCERN

This is to certify that **Warda Wazir** D/O **Wazir Ul Hassan** is a student of Master of Science in Public Health (MSPH) final semester at Al-Shifa School of Public Health, PIO, Al-Shifa Trust Rawalpindi. He/she has to conduct a research project as part of curriculum & compulsory requirement for the award of degree by the Quaid-i-Azam University, Islamabad. His/her research topic which has already been approved by the Institutional Review Board (IRB) is **"Effect of health education regarding awareness of breast cancer in school going students of Rawalpindi city"**.

Please provide his/her necessary help and support in completion of the research project. Thank you.

Sincerely,

Dr. Ayesha Babar Kawish
Head
School of Public Health, PIO
Al-Shifa Trust, Rawalpindi

ANNEXURE 4

Gantt Chart

Activities	March 2022	April 2022	May 2022	June 2022	July 2022	August 2022
Literature search						
Synopsis writing and IRB approval						
Pilot testing						
Data collection and entry						
Data analysis						
Write up						
Thesis submission						

ANNEXURE 5

Budget

Budget item	Transport	Stationery and internet	Printing	Publishing
Pilot testing	500 Rs/-	5000Rs/-	5000Rs/-	-
Data collection	10,000Rs/-	7,000Rs/-	-	-
Thesis write-up	1,000Rs/-	5,000Rs/-	8,000Rs/-	25,000 Rs/-
Total expenditure	16,000Rs/-	17,000Rs/-	13,000Rs/-	25.000 Rs/-
Grand total	71,000 Rs/-			