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**KNOWLEDGE, ATTITUDES AND PRACTICES
REGARDING BREAST CANCER AMONG COLLEGE
STUDENTS IN NEPAL**

A Descriptive Study



ABSTRACT

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Knowledge, attitudes and practices regarding breast cancer among college students in Nepal.

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The purpose of this thesis was to find out the knowledge, attitudes and practices of breast cancer among college students in Nepal. The aim of this study was the student benefits from the awareness programme that was provided during the thesis process and to improve their knowledge of breast cancer.

The quantitative research methodology was used in this thesis. Survey questionnaires were used as a research instrument. There were altogether 86 female students and 29 male students participated in data collection process. Thirty-one closed ended questions along with demographic profile were formulated to gather data. The questions were divided into 5 subtypes: knowledge regarding breast cancer, screening practices of breast cancer, seeking behaviour, sources of breast cancer information and attitude regarding breast cancer. A survey questionnaire was distributed to the students and data were collected. An awareness programme was conducted and post data were collected to evaluate the difference in knowledge level of students. Data were analysed quantitatively using SPSS software. Data were analysed in terms of frequencies, percentages, Pearson's correlation test and T-test analysis for different categorical variables.

The knowledge level of female participants regarding breast cancer in pre data was found to be poor level which increased to very good level after awareness programme. Similarly, screening practices were found to be poor level in pre-test results and after the awareness programme, it was increased to excellent level. Only 9% participants were performing breast self-examination for the reason that the participants did not know exactly how to perform it. The Ttest, $p=0.0001$ denotes there was significant increase in knowledge level post awareness programme. The knowledge level of male participant was at good level. All male participants responded that they supports women with breast cancer and almost all responded that breast cancer patients should be cared and support by the family and community.

The students had poor knowledge level regarding breast cancer. Only few students knew about breast self-examination and were performing correctly. This shows that the people in Nepal are still lacking knowledge regarding breast cancer, hence high mortality rate from breast cancer compared to developed countries. The simple steps of educating women about awareness regarding breast cancer can help them detect breast cancer early and have optimal survival rates with cancer treatment.

Keywords: Breast cancer, Awareness, Knowledge, Attitudes, Practices

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List of Abbreviations and Symbols

WHO	World Health Organization
BSE	Breast Self-Examination
Ed	Edition
SPSS	Statistical Package For The Social Sciences
CSN	Cancer Society Nepal
RFN	Rose Foundation Nepal
NCRS	Nepal Cancer Relief Society
CBE	Clinical Breast Examination
BC	Breast Cancer
WPR	World Population Review
FB	Facebook
IBM	International Business Machines Corporation
CDC	Centres for Disease Control and Prevention

1 INTRODUCTION

Breast cancer is a leading cause of death and disability among young women in resource constrained countries. The incidence of breast cancer in low income country continues to be lower than in most high-income countries. However, the mortality rate from breast cancer is very high. This high mortality rate is likely due to a lack of awareness about breast cancer detection and treatment, inadequate facilities for detection and diagnosis, as well as poor access to treatment. In many developing countries, the incidence of breast cancer is now rising sharply due to changes in reproductive factors, increase urbanization, adoption of western lifestyle, and increased life expectancy. (Lawrence et al, 2010.)

There are 2.1 million new cases every year, and the mortality rate from breast cancer is 627,000 deaths among women which is approximately 15% of all cancer deaths. Breast cancers were more common in developed countries previously, however it is estimated that breast cancer rates are inflating in nearly every area worldwide. The negative outcomes of breast cancer can be reduced by using preventative measures. They can also, be reduced if it is detected at an early stage. However, in developing countries, due to the incidence of breast cancer that is diagnosed at late stage; these strategies cannot eliminate the majority of breast cancers or improve the outcome. Therefore, early detection of breast cancer is the cornerstone of breast cancer control in order to improve breast cancer outcomes and survival chances. By participating in awareness programmes that teach women how to recognize the early signs and symptoms, breast cancer diagnosis can be made at earlier stages; which can result in faster treatment. (WHO, 2018.)

According to WHO 2017, deaths due to breast Cancer in Nepal remained 1,054 which is 0.65% of all deaths. The age adjusted Death Rate is 9.21 per 100,000 population. Nepal ranks 163th position in the world in breast cancer mortality rate incidence. Statistical data collected from Globocan 2018, shows there were 2068 new breast cancer cases diagnosed in Nepal in 2018. This is 13% new cases per 100,000

women and resulting in 1018 (5.2%) mortalities. The graph below compares the data with other countries, including: India, Bangladesh, Pakistan, UK and USA.

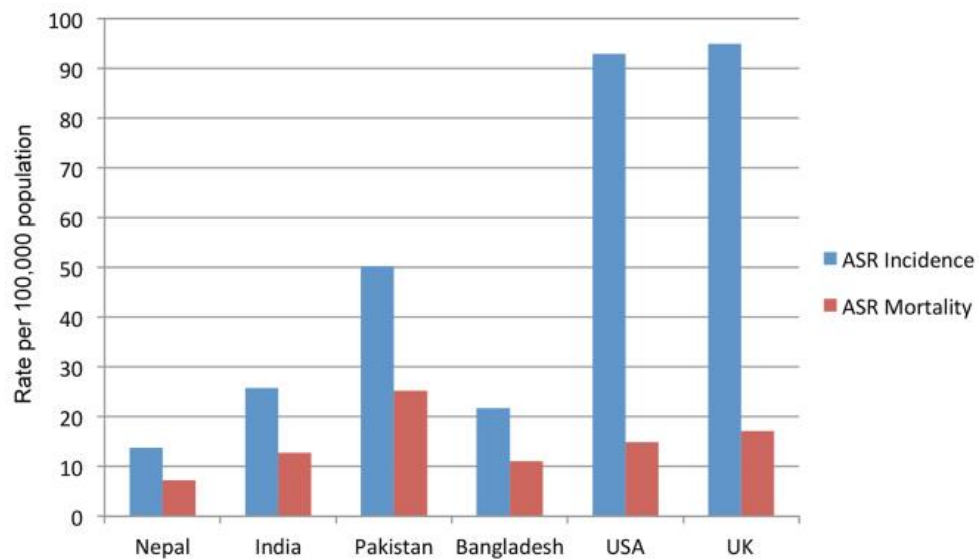


FIGURE 1. Comparison of Age standardized rates of incidence and mortality related to breast cancer in women in Nepal and other countries. (Globocan, 2018)

The purpose of this thesis was to find out the knowledge, attitudes and practices of breast cancer among college students in Nepal. Knowledge of breast cancer and awareness regarding practices is common in developed countries. However, in Nepal, being a conservative cultural community; women seem to be reserved and hesitant to talk about their intimate problems. Research has shown that there is a deficit in awareness regarding breast cancer. (Shrestha, 2012; Garg, 2016.) There are limited research done and are published in Nepal that are focused on this topic. Hence, research on this topic would be preeminent and possibly very beneficial for Nepalese population. Students are focused in this study because they are the integral part of community who plays vital roles in providing further knowledge in their family and society. Hence educating the students about breast cancer and the practice of breast self-examination assists them to detect breast cancer in early phase. This thesis also evaluates the knowledge of participants after the awareness programme. To carry out this thesis, a college from Kathmandu, Nepal was involved for data collection process.

2 THEORETICAL BACKGROUND

There are three steps to diagnose cancer early as shown in figure 2. The first step the WHO focus in diagnosing cancer is also “Awareness”. A multifaceted team approach and coordination is required in improving awareness and access to care that focuses on people-centred services at all levels of care. Step 2 includes diagnosing and staging after the sign and symptoms are detected. The medical professional teams are required to assess the patient clinically and diagnosed the stage. Step 3 includes the treatment after the cancer stage is diagnosed. The oncologists after diagnostic testing and confirming the cancer stage starts the treatment according to the requirement. To access high quality treatment on time is essential for cure which in low-income countries is less than 30% of available treatment services. (WHO, 2020.)

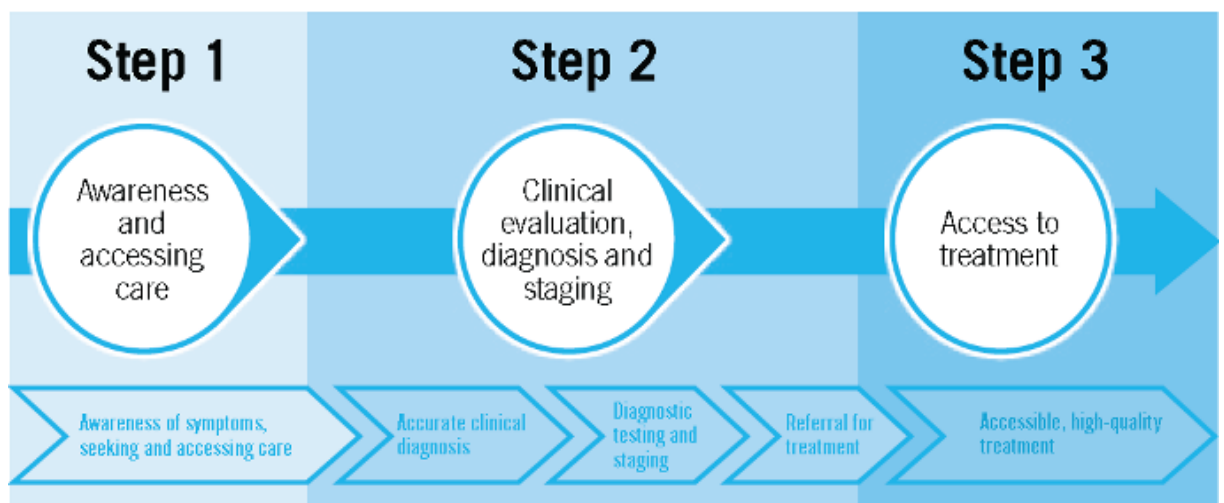


FIGURE 2. Steps for early diagnosing and screening guidelines by WHO

2.1 Awareness in breast cancer

Awareness is defined as to have the knowledge of existence, or understand of a subject based on evidence or experience (Cambridge Dictionary, 2018.) Breast aware is being aware of any abnormal changes in breast, how they look and feel. Breast aware helps detect any changes in breast appearance and seek medical assistance. (CIWA, 2014). Awareness in breast cancer is very important because detecting cancer in early phase can save life. Awareness regarding breast cancer helps people to acknowledge about the disease which not only benefits reducing breast cancer stigmas but also improving health literacy. Awareness in the context of this thesis can be defined as the combination of knowledge, attitudes, practices and health seeking behaviour. After exploring knowledge level, attitudes and practices of participants, the aim is to improve their awareness level towards breast cancer by providing them information on breast cancer. The awareness programme details of the study are described in data collection section (See section 4.5).

2.2 Knowledge of breast cancer

According to Garg (2016), there is lack of awareness of breast cancer in low income countries. This is because the women are unaware of the risk factors and sign and symptoms of breast cancer. Majority of women in developing countries often look for pain as early symptoms of breast cancer and almost all women were unaware that a painless mass could be the first sign and symptom of a breast cancer. The earlier studies in Iraq, by Hamad et al (2018), in Saudi Arab by Sindi et al (2019), Kotepui et al (2014) found good knowledge level of breast cancer. The overall mean knowledge was good level. Most participants responded family history of breast cancer as a risk factor of breast cancer which descended by age, oral contraceptives use and drinking alcohol.

Previous studies (in Jordan by Suleiman (2014), in Angola by Sambanje and Mafuvadje (2012), by Siddeeq (2017) and in Libya by Elzahaf et al (2019)) found poor level of knowledge of breast cancer among students. The majority of the participants were not aware of sign and symptoms and risk factors of breast cancer such as change in colour

or shape of the nipple. 80% participants responded that cancerous lumps in breasts are painful. It was found that participants with better knowledge of breast cancer were associated to family members who had history of breast cancer. Only few participants were aware of breast cancer. There was a significant association between educational status and occupation of the participants with their knowledge regarding breast cancer and breast self-examination.

The cross sectional study conducted in Nepal by Shrestha (2012) found poor level of knowledge regarding breast cancer. More than half participants (61%) responded painless lump as a sign for breast cancer followed by blood discharge from nipple. Knowledge on risk factors of breast cancer in the participants was very low. In another study conducted by Shrestha et al (2017), 78% participants responded growth of extra lump in breast as a primary sign and symptoms of breast cancer. It was followed by painless breast mass, change in shape and size of breasts.

2.2.1 Knowledge and attitudes of male students regarding breast cancer

A study carried out in Kenya with 237 male participants found majority (92%) of participants were aware of breast cancer. However, only 10% participants had correctly answered two or more risk factors of breast cancer. Most participants considered breast cancer a severe disease. There were low knowledge level regarding early detection methods and screening practices. Almost half of male participants were aware of methods to detect breast cancer such as mammography, clinical breast examination or BSE. Majority participants responded that their partner shares their well-being with them. Almost all male participants would decide about their wives health checkup for observed breast lump. Excellent number of participants (90%) responded they would encourage and support their partners to visit hospitals and meet health professionals within a week time period of observing breast lump. Few participants (20%) would let their wives to visit and examined by a male traditional healer. Majority participants had no objection to treat their wives by a male health care worker. (Sayed et al, 2019.)

2.2.2 Sources of information

The most common source of information regarding breast cancer responded by participants in different study were Media/Radio/TV/Newspaper/FB, (Shrestha, 2012; Al-Dubai, 2014; Hamad, 2018), medical professionals, friends and seminars. (Kotepui et al, 2014.) The study carried by Suleiman (2014) in Jordan found the sources to attained knowledge regarding breast cancer were friends and health workers. In a study by Sindi (2019), the students responded the main source to be awareness campaigns (67%) and media (48%).

2.3 Attitudes of women towards breast cancer

A study in Kenya found the women distress to be diagnosed of breast cancer because they fear of being considered undesirable and divorced by husbands. A fear of social rejection was a reason to neglect treatment for breast cancer. For example, they fear of mastectomy. The result also found that female does not find comfortable discussing about breast health with male members in a family. Male members complained they are left out. For example, *“our sisters don’t tell us anything about breasts. Whatever they are told, when they come home they hide it.”* Males were encouraged in the involvement in their partner’s breast health. They responded males should not ignore any symptoms their wives possess and take them for checkup. They also agreed that husbands should involve in the care of their wives during the treatment process by visiting the doctor with their wives. In this way the female does not feel left alone and gets emotional support from the family. Majority of the women participants responded that they need permission from their husband or head of the family for checkup, consultants or treatment. (Sayed et al, 2019.)

In a quantitative study done in 840 Jordanian female students, found excellent attitudes towards breast cancer patient. 78.2% of total 435 participants disagreed that breast cancer patients should be isolated. Majority disagree that breast cancer is a punishment

from God. Almost all responded that breast cancer patients should be supported by community. 29.4% responded women should be afraid of breast cancer. (Suleiman, 2014). A study in Libya found majority (90%) of female students had good attitude towards breast cancer. It also showed no significant difference between attitude and demographic factors (Elzahaf et al, 2019.) A study in Saudi Arab by Sindi et al (2019) found the misconception the female has regarding breast cancer, such as using tight bra for longer period or use of deodorant can cause breast cancer. The students also believed evil eye can cause breast cancer.

2.4 Knowledge of screening practices

Women need to know that breast cancer is treatable when detected early. People need to know about simple steps they can take, like doing self-breast examination and participating in breast screening that can help detect cancer early. It is a fact that breast self-examination helps in detecting cancer in early stage. Most respondents (207, 95.4%) were aware of breast self-examination. 79.3% participants performed BSE in which only 39% were performing monthly. Almost half participants had already performed Clinical breast examination. Two third of participants were unaware of mammogram screening. (Kotepui et al, 2014.)

A cross sectional study carried in India with 206 female participants found very good knowledge level of breast cancer among the participants. The average score for attitude and practices was at poor level. The correlation between knowledge and attitudes towards breast self-examination shows statistically significant difference. (Doshi et al, 2012.)

Research done in Jordon by Suleiman (2014) shows that knowledge regarding practices for breast cancer was found to be poor level as only 34.9% participants knew about BSE and only half of them were performing it. Similarly, study in Angola by Sambanje and Mafuvadje (2012) found very good knowledge of BSE among participants. However, only 40.2% participants could perform BSE confidently and more than half did not know the right time to perform BSE.

A study in Kenya found poor knowledge level of participants regarding methods for early detection of breast cancer. The reasons for not performing breast self-examination were lack of knowledge and had the perception that they do not possess any breast abnormalities. Only few were aware of clinical breast examination. A study in Malaysia found excellent knowledge of BSE. However, few were practicing it. (Sayed et al, 2019; Al-Dubai, 2014.)

Hamad et al (2018) emphasize that 60% participants were unaware of BSE and only one third knew how to perform. Poor knowledge was found for right time to perform BSE. Study in Libya by Elzahaf et al (2019), states that the majority of participants (82.5%) were aware of BSE as a screening method of breast cancer followed by ultrasound. However, only 28.5% students knew the right way to perform BSE. Sindi et al (2019) found the participants in Saudi Arab were aware of BSE and had good knowledge level in practicing BSE (61%). The reason for not performing BSE were the participants had no idea how to perform BSE, some thought they do not expect to get breast cancer and there is no need, few participants felt discomfort, fear and shy.

According to Shrestha (2012), there was poor level of knowledge 26% regarding screening practices. 66% respondents knew the reason to perform BSE is to find breast lump. Only 19 out of 110 participants were actually performing BSE. Only 3 participants were aware of mammogram and 4 were aware of ultrasound as a screening method for breast cancer. All respondents were not aware regarding the age to perform mammogram. The reason for not attending screening were the participants did not know about breast cancer, do not know where to get information and guidance, and afraid of finding abnormality. Shrestha et al (2017) found excellent knowledge reading breast self-examination. For example, 82% participants knew breast self-examination can help detect breast cancer at early stage and only 10% were aware of mammogram as a screening method for breast cancer. 72% participants agreed BSE as a screening of own breast to check any anomalies. Excellent level of knowledge (80%) was found for the right time to perform BSE.

2.5 Health seeking behaviour of breast cancer

Research shows the delay in breast cancer treatment process after the symptoms had been observed. This delay in seeking right treatment option, worsens the disease process. Delays in treatment initiation were associated with family income, education, previous breast symptoms, self-treatment, and travel time to the hospital. The main challenges include the low quality of data registries, inadequate multidisciplinary coordination, and a lack of resource-appropriate prioritization of breast cancer control programs. (Fan et al, 2015.)

A study in Africa found a barrier to health seeking behaviour were low self-image, a feeling after acknowledging having breast cancer, and its accompanying humiliation from the family and society. The result also found that women place first priority to their family before their health due to the fear of disgrace their breast cancer can cause to their family members by the society. The health of a woman in Africa is not given importance, hence inhibiting them from going to hospitals or participating in educational programmes. Fear was one of the reasons for women for not seeking treatment after they noticed any symptoms of breast cancer. For example, fear of diagnosis, fear of examining by a male doctor, fear of divorce or left out of family, fear of mastectomy, fear of death and fear of stigmatized by society. (Akuoko et al, 2017)

A study in Kenya found 90% participants would seek medical professional assistance within a week period time if they noticed breast cancer symptoms. Almost half (49%) of the participants responded that their partners would make the health care seeking decisions. Maximum number of participants reported they would seek a lower level health facility. 51% answered dispensary and 16% answered health centre. The distance of hospital from their home could influence their choice of facility. The results were also found that some participants still believe in witchcraft and curses and prefer traditional healers rather than medical assistance. This might be because the community are still unaware about the breast cancer knowledge. Health-seeking behaviours believing more on traditional healers and seeking first help from them were common among the participants who do not consider breast cancer symptoms seriously to seek help from medical

professional by visiting a hospital. The participants from community members and healthcare professionals responded that the people habit of seeking traditional healer treatments delay them in seeking medical assistance. As a result, the disease has already progressed into advance stages where treatment options are limited, and chances of survival rates are less. Some participants also responded the facility like availability; affordability and accessibility of traditional healers attract them. Another reason participant responded for not seeking medical help at first choice was long distance from home to hospital and difficult to get doctor's appointment. (Sayed et al, 2019.)

Majority of participants in a study in Pakistan found that they seek medical consults within a week if any sign and symptoms were observed. The reason for not seeing health professionals were affordability, nervousness, family problems, fear of diagnosis, wrong perception that breast mass would remedy itself. Some responded that cancer is not curable and their partners were opposed of the cure. (Gilani et al, 2010.)

It has been observed that breast cancer is frequently diagnosed at later stage among patients with lower income (48%) and educational status contributing to poorer survival. Delay in early detection could be due to differences in socio demographic and cultural factors, a strong belief in traditional medicine, negative perception of disease, poverty and poor education and coupled with fear and denial. Around 80% of patients with breast cancer reported to refer to health care centers in late stage when the disease had become incurable. A variety of psychosocial and cultural factors predispose women to delay or avoidance of screening for breast cancer symptoms at early stages when treatment is most likely to be successful. Awareness of breast cancer was higher (80%) among literate women than illiterate ones (65.4%). (Pakseresht et al, 2016.)

2.6 Assessment of awareness programme: Pre-post test

Study shows increased in awareness in post test results after providing awareness talk to participants. Research conducted in India focusing 1030 science students age ranged between 18 and 23 years, showed good awareness of breast cancer. However, the

knowledge regarding sign and symptoms and BSE was poor. A power point presentation regarding information on breast cancer was provided to the students after pre-test. In the pre-test the participants thought the older age women are affected by breast cancer and breast cancer are caused by trauma, whereas after the awareness session, post test results showed participants were aware that cancer can affect any age group. The risk factor knowledge also improved considerably. Only 18% knew about BSE but were not performing regularly. The reason for not performing were lack of privacy, embarrassing, some thought it was not important and many did not know how to perform it. Post-test showed that majority were aware of BSE. 90% students said they would perform BSE regularly. Others were still embarrassed to perform it. 90% women said they will pass the knowledge to their family members and friends. (Madhukumar et al, 2017.)

The study conducted in India selecting 110 working women participants randomly showed inadequate knowledge regarding breast cancer in pre-test. Information regarding cancer was provided through email. Post test results showed increased knowledge regarding breast cancer among the participants. The participant's scores regarding sign and symptoms, risk factor, diagnostic techniques, risk prevention of breast cancer improved significantly which conclude that awareness program on breast cancer was significantly effective in improving the knowledge of participants. (Kang & Bisht, 2014.)

A study carried in Turkey with 244 participants found good level (53.7) of knowledge in pre-test which significantly increased to excellent level in post-test results (85.2%) after the education program. The knowledge regarding BSE also increased from good level in pre-test (50.8) to excellent level (80.3%) in post-test. The mean score for knowledge of risk factors of breast cancer was 3.65 in pre-test and was increased to 9.36 in post-test. There was significant difference in pre- and post-test. Similarly, the mean score for screening of breast cancer was 3.58 in pre-test which was increased to 6.65 in the post-test. The result found the overall knowledge score also increased from 9.05 in pre-test to 16.5 in post-test. (Yilmaz et al, 2017.)

2.7 Breast cancer organization in Nepal

There are different organizations in Nepal that are actively working on prevention of cancers, raising awareness and free health camps. The organizations involved are Nepal Cancer support group, Rose foundation, Nepal cancer hospital and research centre, Nepal breast cancer foundation, Rotary club, Nepal cancer relief society, Rotaract, Cancer society Nepal and many small community organizations. These are non-governmental and non-profitable organizations working raising awareness about cancers, symptoms and treatments with the aim of fighting against the spread of cancer in Nepal. Some organization works towards helping cancer patients and their families deal with cancer through a holistic approach. The objectives are public awareness and screening programmes, advocacy and counseling services, training, workshops, rehabilitation service, financial support to cancer patients, research activities and cancer education programmes. (Cancer Society Nepal, 2018; Rose Foundation Nepal, 2017)

A researcher contacted 5 colleges/universities in Kathmandu through email for data collection process. Few did not respond to email at all. Few were reluctant to held mass awareness programme due to viral epidemic. One College, which is located in Kathmandu, Nepal responded quickly and provided the personnel's contact information. The approach was taken positively. The research proposal was sent and permission was granted. The college provided the information on date, time and venue to conduct the programme. The researcher flew to Nepal to conduct the awareness programme and collect the data for this thesis. Everything needed for the awareness programme was discussed beforehand with Dr.Shahi and the college, so it was well prepared. Finally, the information regarding breast cancer was provided and the data were collected with the permission from the college.

3 PURPOSE, AIM AND RESEARCH QUESTIONS

The purpose of this thesis is to find out the knowledge, attitudes and practices regarding breast cancer among college students in Nepal. The aim of this study was to provide information regarding breast cancer to students by conducting an awareness programme and to improve their knowledge of breast cancer. The objective of this programme was the student gets aware of breast cancer sign and symptoms, risk factors and screening practices especially BSE so that they could benefit from it. The goal was also to include the male participants in this study to explore their knowledge level and attitudes towards breast cancer. There are limited studies done in Nepal on knowledge, attitude and practices of breast cancer among females. However, the research on similar topic among male participant`s and general students could not be traced by the researcher. This might be because the studies have not been carried out yet or the articles were not published. The studies have found poor knowledge level and practices among the Nepalese women. (Shrestha 2012; Shrestha et al 2017). There is a necessity of further research focusing students to determine levels of development because students are believed to be knowledgeable, smart, access to technology and youths of this generation. It can be assumed that young students are best knowledgeable compare to middle age, elderly people and people in rural area where there are deficits of education, technology and resources. Therefore, this study can provide a general overview of level of awareness and attitude among students both male and female in metropolitan population. The findings would also provide a clue of what could be expected from the countryside populations; meanwhile urban people are likely to have better access to information. This is essential in planning and implementing suitable awareness design strategies in future.

Research Questions

1. What is the knowledge level regarding breast cancer among female students?
2. What are the attitudes towards breast cancer among students?
3. What are the screening practices of breast cancer among students in Nepal?

4. What are the health seeking behaviors of students regarding breast cancer?
5. Are there differences in knowledge level, attitudes and practices of students regarding breast cancer before and after awareness programme?
6. What are the knowledge level and attitudes regarding breast cancer among male students?

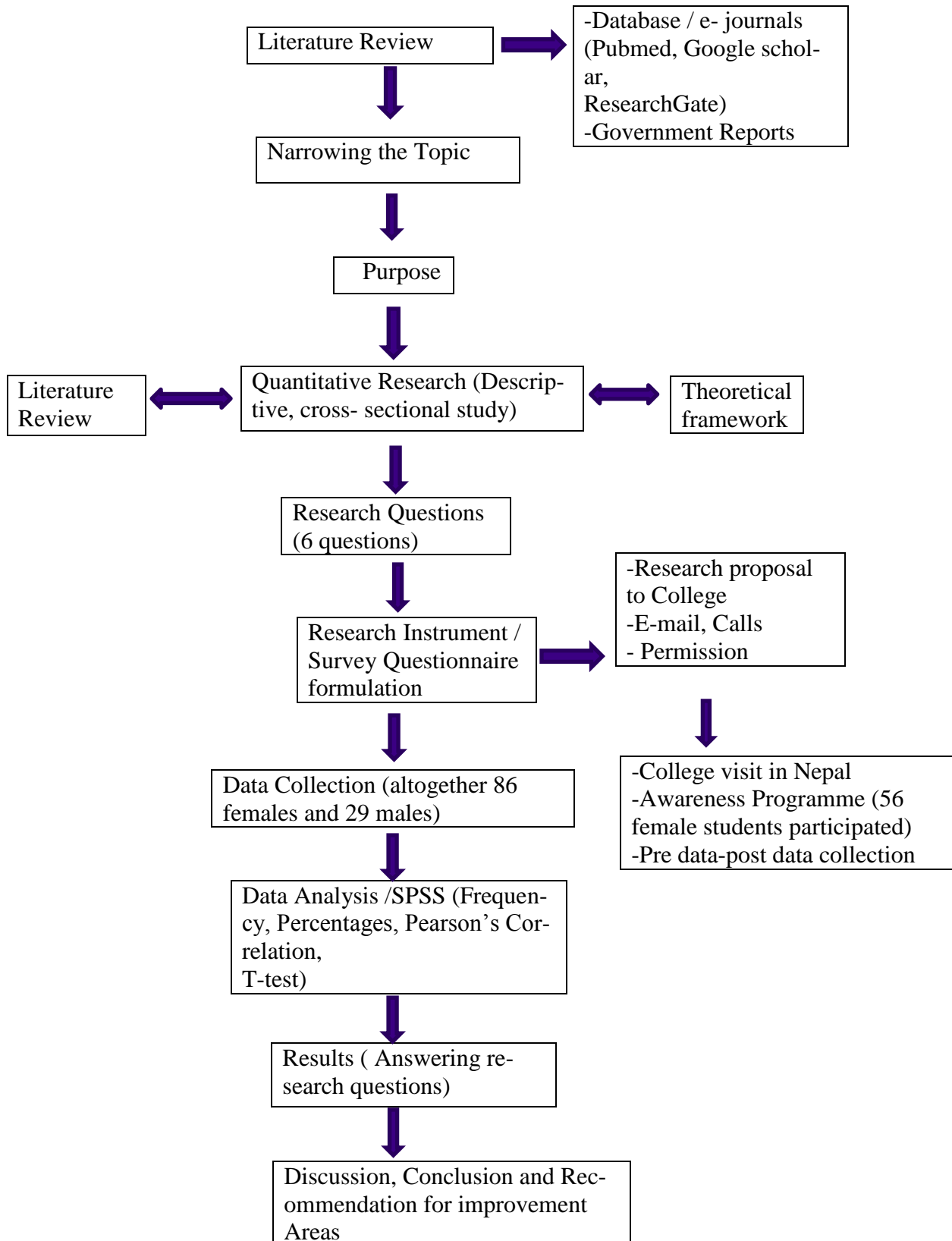
4 METHODOLOGY AND THE RESEARCH PROCESS

The quantitative methodology is coherent, structured and determined. It aims to measure the extent of deviation, measurement of variables and the impartiality of the method. This study aims to measure the knowledge, attitudes and practices concerning breast cancer and the objectivity of the process is well maintained throughout the study. It depends on the basis of sample size and provides significance to the validity and reliability of findings. The findings were analysed in a collective way and conclusions; suggestions were illustrated in a generalised way. (Kumar, 2019.)

This study is a quantitative research. This is a descriptive, cross sectional study which is the most used designs in the social sciences. This design is best suited to studies aimed at finding out the knowledge level, attitude by taking a cross section of the population (Kumar, 2019). Hence, the quantitative research method is used in this thesis to explore the knowledge level of breast cancer among students in Nepal. The research methodology process of this study is shown in table 1.

TABLE 1. Research methodology process

Research Methodology Process



4.1 KAP study

KAP stands for Knowledge, Attitude and Practices. The knowledge refers to the understanding of breast cancer. Attitude states to their belief or stigmas concerning breast cancer. Practice is the way to determine the knowledge and attitude through their actions, in this case breast self-examination practices. Hence, it is an assessment which measures the Knowledge, Attitude and Practices of a population. In this research, KAP theory is followed to explore the knowledge, attitude and practices regarding breast cancer among female students in Nepal. KAP Survey helps researcher to study what participants in community know about breast cancer, what is their attitudes toward breast cancer and people with breast cancer, how they behave in seeking healthcare and are they familiar with breast self-examination practices. KAP surveys can help recognize needs, cultural beliefs, obstacles in delivering information, and also identifying solutions to enable understanding, improving quality of life and achieving set goals. The education delivered during awareness programme benefits the students by understanding the sign and symptoms of breast cancer, risk factors, when to seek medical help and foremost breast self-examination practices knowledge from which they can detect the breast cancer at early stage. The researcher can also explore the area that needs to focus and develop more for future. (Kaliyaperumal, 2004; Alhaj, 2018)

4.2 Study area and participants

The research was conducted in one College in Kathmandu, capital city of Nepal. The author contacted Dr. Shahi, who has already performed cancer awareness programme and has published article in similar field. After discussing with Dr. Shahi and the college, it was concluded that the awareness programme would benefit female students the utmost and participation of females exclusively would make the students comfortable in discussing the topic freely. Only female students were invited because breast cancer is a very sensitive topic and a conservative society in Nepal, it is not discussed openly. This was observed and the researcher was overwhelmed by the questions raised by the stu-

dents and discussed openly on the topic after the information was provided. There were altogether 80 female students studying in Bachelor in Computer Science and Information Technology and Bachelor of Management level. The population sample size was calculated from Raosoft, 2004, sample size calculator with 95% confidence level and 5% margin error. According to sample size calculator, the sample size would need to be 67 students. However, only 56 female students, studying in bachelor level participated voluntarily in awareness programme. The researcher thought the participant's number was less than the sample size calculator, thus could affect validity and reliability. Permission was requested from the college head to collect data from grade 11 and 12 students in the same college. The researcher, on granting permission, approaches herself to higher secondary students and explained about the research, ethical considerations and distributed the questionnaires. 30 female students participated and filled up the pre questions. Due to time limitations and on-going exam of the students, the awareness programme was not held, thus post data were not obtained.

The researcher explained about the research, aim and purpose of the research. The ethical considerations were discussed before the questions were distributed. The pre-questionnaires were distributed and filled by the participants. The questionnaires were collected, and the awareness programme was conducted. The pre and post questionnaires were differentiated beforehand with the pre and post printed in the form itself for easier handling and avoiding the confusion that can create when the questionnaires were mixed. Similarly, the post questionnaires were filled by the same participants after the information were delivered. The participants took around 20-30 minutes to fill up the form.

While reading articles, the researcher came across with the data collected from male students as well. This was rare but the researcher found it very important to know what the male society knows about breast cancer. Nepal is a male dominant country. Most decisions are made by male. Hence, their knowledge and attitudes regarding breast cancer can have direct effect on females sharing their disease or feelings. 29 male students filled up the questionnaires voluntarily after getting permission from the college Head.

4.3 Research instrument

Research instrument is defined as “*An instrument that becomes a means of collecting information for a study*”. The first applied step in carrying out a study is a formation of a research instrument. (Kumar, 2019.) Thus, this research constructs a questionnaires as primary data collection as a research instrument. The objective of questionnaire in quantitative research is to achieve significant data in reliable and valid manner. It is helpful to determine the reliability and validity of the data obtained. (Taherdoost, 2016). The students were interviewed through survey questionnaires. Survey questionnaires are easy to fill for the participants since it is a multiple choice or closed ended question type.

4.4 Questionnaires formulation

The questions were formulated focusing on research questions. The questionnaires were constructed reading thoroughly previous articles and findings. The articles were searched from pubmed, google scholar and research gate. Similar articles were chosen and the findings that answer the research questions were used to formulate the questionnaires. More articles were searched, read through, collected ideas and formulated more questions for the data collection. This process has been repeated several times in order to make sure the formulated questions meet the standard to answer all research questions. The questions were formulated from CDC (Centers for disease control and prevention, 2018) assessing breast cancer information such as risk factors, sign & symptoms, screening and previous studies by Rafique (2018), Sarwar (2015), Siddeeq (2017), Rao et al (2017), Aydogan (2015), Doshi et al (2012), Gilani et al (2010), Giri et al (2018) along with other mentioned articles in background. The questions were divided into 5 subtypes which is shown in table 2: Questions 1-5 provides Demographic characteristics. Questions 6-14 answers knowledge regarding breast cancer. Questions 15-18 provides answers for practices of breast self-examination. Questions 19-23 provides answers for health seeking behavior. Questions 24-26 is for sources of breast cancer information and questions 27-31 provides answer for attitude regarding breast cancer. 31 closed ended questions along with demographic profile were formulated to gather data as in appendix 2. The correct answers for the questionnaires were referred from

CDC (Centers for disease control and prevention, 2018). Each participant will be scored based on knowledge and attitude regarding breast cancer on the number of answers provided. For the male participants, 23 closed questions were formulated as in appendix 3. The questionnaires were divided in three parts: Knowledge, Sources and Attitudes regarding breast cancer as shown in table 3. The questions are formulated in simple language that participants could easily answer. The main questionnaire was formed in English language. It was translated in simple understandable Nepali language by the researcher for the ease of participants. Nepali language is researcher's mother tongue; hence it was easy to translate the questionnaires. The students felt the English version was easier for them to answer; the researcher translated or explained when the participants had confusions.

TABLE 2. Formulation of questionnaire sub types according to research questions among female students

Research questions	Questionnaire subtype	Questions
1. What is the knowledge level regarding breast Cancer among female students	Provides answers to knowledge of breast cancer.	6-14
	Sources of information	24 -26
2. What are the attitudes towards breast cancer among students?	Provides answer to attitude regarding breast cancer	27-31
3. What are the screening practices of breast cancer among students in Nepal?	Provides answers to screening practices of breast cancer	15-18
4. What are the health seeking behaviors of students regarding breast cancer?	Provides answers to health seeking behavior	19-23
5. Are there differences in knowledge level, attitudes and practices of students regarding breast cancer before and after awareness programme?	Pre data versus post data	1 - 31

TABLE 3. Formulation of questionnaire sub types according to research questions among male students

Research questions	Questionnaire subtype	Questions
6. What are the knowledge level and attitudes of breast cancer among male students?	Provides answers to the knowledge regarding breast cancer among male students	5 -13
	Provides answer regarding the sources of information.	14 - 16
	Provides answers to attitudes among male students.	17 - 23

4.5 Data collection

Data were collected using structured questionnaire. Structure interviews are defined as an interview in which the questions, their wordings and order are predetermined. Everything related to interview question is predetermined and any deviation from it is not permitted. Interview schedules in this study is a written list of closed ended questions, thoroughly pre-tested for standardised wording, meaning and interpretation, prepared for use for data collection. (Kumar, 2019.)

By the end of the study, the objective is to know the awareness level. 86 female students and 29 male students were participated in data collection process. The researcher along with Dr. Shahi provided information to the students. Introduction to breast cancer, sign and symptoms, risk factors, possible treatment methods, screening practices of breast cancer; BSE, mammography and the statistical female breast cancer data worldwide and in Nepal were covered. The purpose of awareness programme was to make the participants aware about the risk factors, risk groups by knowing their history background, keen observation for signs and symptoms and not to ignore if any detected. There were many steps to be planned before implementing an awareness programme. The female students attended the awareness programme where the data collection process took place. The researcher made a 26 powerpoint slides to present during the awareness pro-

gramme. The content of the slides included purpose of the thesis, introduction to breast cancer, sign and symptoms of breast cancer, risk factors, stages of breast cancer, statistical figures of breast cancer of the world and in Nepal, preventive measures, screening methods, BSE: How to perform BSE, mammography, treatment and conclusion. The education time was around 40 minutes and 15 minutes for discussions. In addition, the dummy was used to show how the breast self-examination needs to be done correctly. This is because breast self-examination has proved to be the initial way of detecting breast cancers. If done correctly, the lumps can be detected at initial stage, which improves treatments options and better cure. In the end, there were open discussions, where the participant's queries were discussed and answered. The pre data were filled by the participants before the awareness programme. After an awareness programme, 56 female students filled up the post questionnaires. The goal was to do post-test analysis for evaluation of awareness programme. The same questionnaires were provided to same participants who had already filled up the pre- questionnaires and are available to awareness program. This way the author can evaluate the participant's knowledge before education program and compare it after the awareness education.

4.6 Data analysis

Data analysis is defined as “The processes of assessing data using analytical and logical reasoning to assess each element of the data collected.” (Business dictionary). *Data processing in quantitative research starts with editing, followed by coding, which entails developing a code book, pretesting it, the actual coding and verifying the coded data. A code book provides a set of rules for assigning numerical values to answers obtained from respondents.* (Kumar, 2019)

Data are analysed using IBM SPSS(statistical package for social science) statistics 19. SPSS is the most widely used software for statistical analysis of quantitative data. (Greasley, 2007). Data are calculated as frequencies and percentages for different categorical variables. Data are also analysed as pre-test and post-test analysis. For knowledge items, categorical responses Yes, No, Do not know were applied. The demographic data are taken as independent variables whereas the knowledge, practices,

attitudes and sources are dependent variables. When data are calculated, for positive responses yes, 1 score is given and 0 is scored for incorrect answer and do not know answers. The overall knowledge score was calculated by adding all positive scores of knowledge category, first calculating the frequency and then converting it into the percentage. A total score of 100 is calculated for each participant percentage score. 80% or more score is measured as excellent knowledge; a score between 60% and 79% is measured as very good knowledge. A score between 40% and 59% is measured as good knowledge and a score less than 40% is measured as poor knowledge.

Descriptive statistics with cross-tabulations were executed and frequencies were calculated for correct and incorrect answers for all questionnaires. Correlation was analysed by using Pearson's correlation coefficient and with significance level set at p. p-value of <0.05 was considered statistically significant. The findings were evaluated at a 0.05 significance level with a 95% confidence interval. For comparisons between pre- and post-test knowledge, the t-Test analysis was used. To determine the relationship between continuous variables, the multiple linear regression analysis was applied.

4.7 Ethical Considerations

Ethics is the moral values of professional conduct that are considered desirable for good professional practice. There are many ethical issues to consider in relation to the participants in a research activity. It is important that the consent is voluntary. (Kumar, 2019.)

The author was committed to respect other's work. The references were provided for each data used in the text and in the reference section according to Diak's guidelines for writing thesis papers. (Finnish Advisory Board on Research Integrity, 2012). There are ethical actions necessary in research which comprises protection of the participant's rights, balancing benefits and risks in a study, submitting a research proposal for institutional review and obtaining permissions. (Burns and Grove, 2005.) During the research process, the author followed all the above mentioned ethical actions. The author submitted the research proposal to the concerned head of the College. The proposal was then forwarded and discussed with the academic team of the college for permission to con-

duct the research. Meanwhile the topic breast cancer is sensitive and when dealing with young females, many things needs to look after and study before getting the permission. The permission to conduct the research was granted by the College. The researcher took the ethical approval from the university/college for this research. Informed consent has to be taken from each participant before data collection. Informed consent denotes that participants are well informed about the need and types of the information sought, how and where information are going to be used and how they should participates in the study. (Kumar, 2019.) The head of the College advice the author not to take the informed consent individually as it is not common in Nepal; the college permission letter is alone enough. The researcher explained ethical considerations to the students and provided full autonomy to participate. Informed consent was taken verbally. None was forced to fill up the questionnaires. Data provided will be kept confidential and anonymous. Data will be destroyed after they are documented. Data are used only for this study. This study is not done for personal financial benefits. The ethical guidelines issued by the Finnish National Advisory Board on Research Ethics (Finnish National Board on Research Integrity, 2009) were followed by the author throughout the research process.

5 RESULTS

Altogether 86 female students and 29 male students were participated in this study. The demographic study shows majority of the participants were aged between 16 to 20 and were single. One third of the participants were doing 10+2 studies whereas nearly two third were doing their bachelor studies. Most said their first period started age between 12-14 years, few said below 12 years. Almost all participants (99 %) had heard of breast cancer and 98% thinks breast cancer is not a communicable disease. Only 6% had family history of breast cancer as shown in table 4.

TABLE 4. Demographic data of participants (n=86)

Age (n=86)	Frequency	Percent%
16-20	81	95
21-25	1	1
26-30	2	2
30-35	2	2
Marital status		
Married	2	2
Unmarried	84	98
Educational status		
10 + 2	30	35
Bachelor	56	65
Age when your first period started		
10 to 11	6	7
12 to 14	70	81
15 to 16	10	12
Family history of breast cancer	5	6
Have you heard of breast cancer?	85	99
Breast cancer is not communicable disease?	84	98

5.1 Knowledge of breast cancer

The findings show the overall mean knowledge score for pre-test was 5.07 out of a maximum score of 16, which is equal to 35.6%. It can be concluded that the knowledge score of participants before the awareness programme was at poor level. The results in table 5 shows the percentage of right answer responded by the participants regarding risk factor of breast cancer. 71% responded previous history of breast cancer as a risk factor, which descended to 70% family history of breast cancer, 69% drinking alcohol. Risk factors such as breastfeeding, obesity, reproductive history, first pregnancy after age 30, age and oral contraceptive use were responded by less than 30%. It was good to know that only 3% thought spiritual belief as a risk factor. It can be concluded that most participants believe previous history, heredity and alcohol consumption is the main risk factor rather than reproductive history.

TABLE 5. Response of participants: Risk of breast cancer

Response of participants: Risk of breast cancer (n = 86)	Frequency	Percent %
Age	9	10
Reproductive history: early menstrual age 12 and 55	14	16
Family history of breast cancer	60	70
Having the first pregnancy after age 30	10	12
Drinking alcohol	59	69
Obesity	22	26
Previous history of breast cancer	61	71
Oral contraceptive use	9	10
Breast feeding	25	29
Spiritual	3	3

Regarding sign and symptoms of breast cancer most of the respondents (73%) answered pain in the breast region as the symptoms for breast cancer. It was followed in descending order by 43% painless lump. All other sign and symptoms of breast cancer such as change in breast shape, nipple discharge, discoloration of skin, lump under armpit and inversion of the nipple were responded in poor level as shown in figure 3.

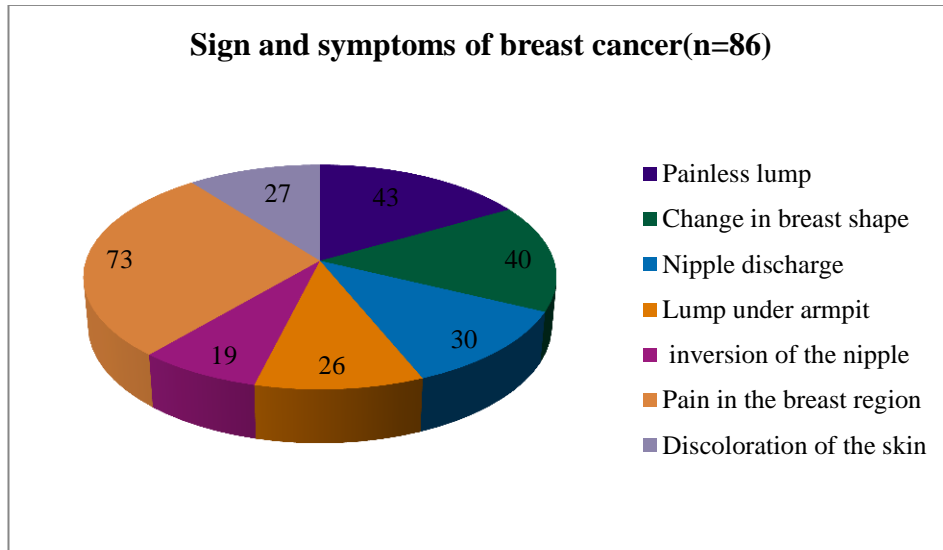


FIGURE 3. Response of participants: sign and symptoms of breast cancer

The findings show the knowledge regarding methods to reduce breast cancer with physical activity was in very good level (65%). The other options like breast feeding, alcohol consumption limitation and avoiding hormonal replacement therapy was in poor level as shown in figure 4.

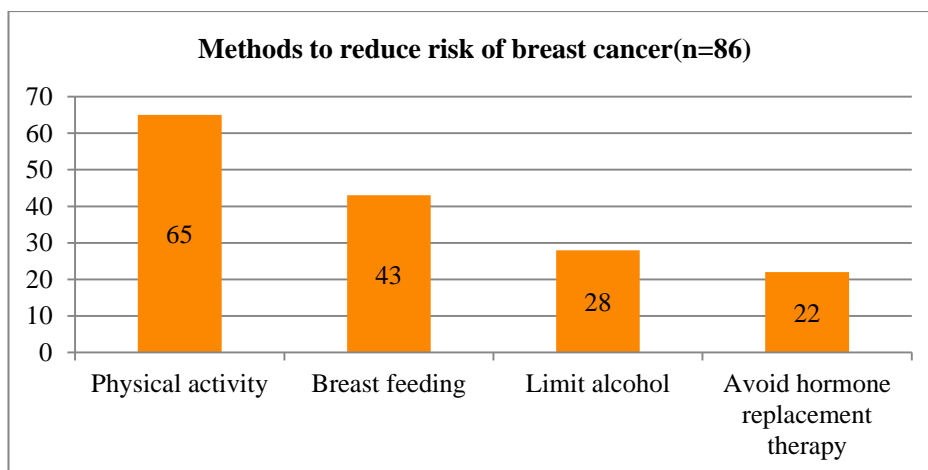


FIGURE 4. Methods to reduce risk of BC

Majority of participants responded knowing signs and symptoms could detect breast cancer at early stage. Methods such as knowing the risk factors groups and regular screening, performing BSE and regular mammogram after age of 40 were responded in poor level as shown in figure 5.

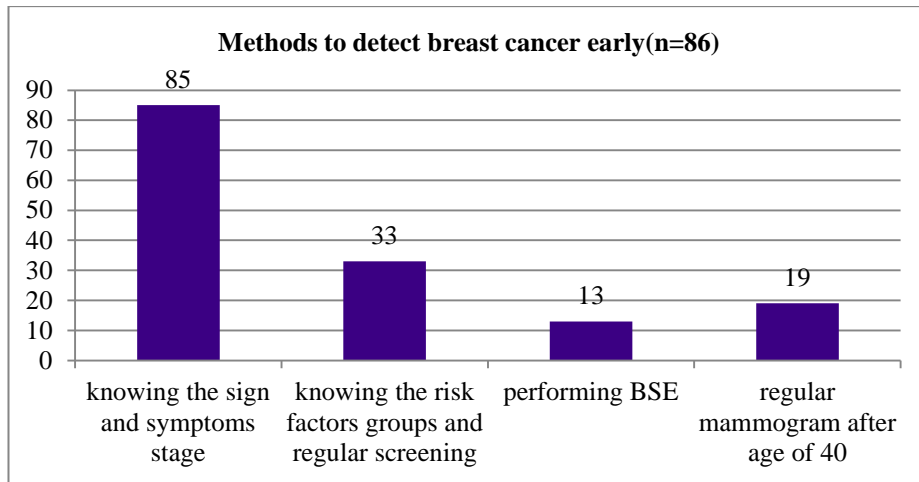


FIGURE 5. Methods to detect BC early

Majority responded that breast cancer can be detected early. Almost all participants agreed that early detection can improve chances of survival and 76% said breast cancer is curable as shown in figure 6.

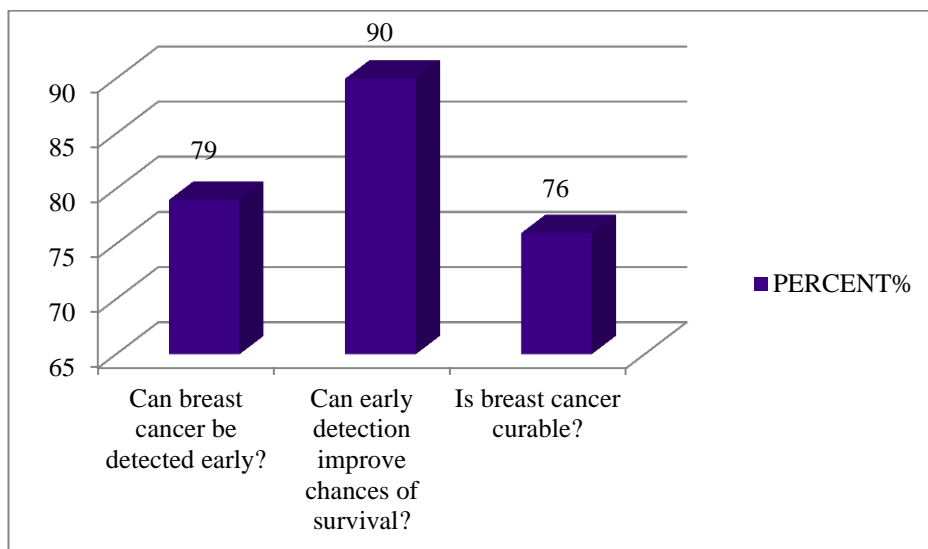


FIGURE 6. Results showing knowledge level

The findings illustrate the correlation between the overall knowledge of the respondents in pre data and their attitude towards breast cancer is statistically not significant, $p=0.68$ which is higher than ($p \leq 0.05$) as shown in table 6. The overall knowledge of students is not associated with their attitudes towards breast cancer. According to rule of thumb for interpreting the size of a correlation coefficient, Pearson correlation, $r=.04$ is close to 0 which means there is a weak relationship between attitudes and knowledge. This con-

cludes that knowledge of the participants is not correlated with changes in attitude. Knowledge and attitudes of participants were not strongly correlated.

TABLE 6. Correlation between overall knowledge and attitude towards BC

Correlation (n=86)	Overall Knowledge	Attitude
Pearson Correlation	1	0.044
Sig.(2-tailed)		0.686

The result shows there is statistically significant correlation between overall knowledge of participants in pre data and their screening practices of breast cancer, $p=0.007$ as shown in table 7. There is association between overall knowledge of students and screening practices. For example, those participants who had higher level of knowledge had higher screening practices behavior. According to rule of thumb for interpreting the size of a correlation coefficient, Pearson correlation, $r=.288$ is less than 0.3 which means negligible correlation.

TABLE 7. Correlation between overall knowledge and screening practices of BC

Correlation (n=86)	Overall Knowledge	Screening practices
Pearson Correlation	1	0.288
Sig.(2-tailed)		0.007

5.2 Attitudes towards breast cancer

Regarding the attitudes towards breast cancer, majority (91%) of participants responded that breast cancer patient should not be isolated. All participants thought breast cancer is not a punishment from God. Almost all participants (94%) felt breast cancer patient should be supported and care by the family and community whereas there are still 6% who do not feel the same. More than half responded that breast cancer patient should not breastfeed. 71% responded women should be afraid of breast cancer as shown in table 8.

TABLE 8. Attitudes towards breast cancer.

Attitudes towards breast cancer (n= 86)	Frequency	Percent %
Breast cancer patient should not be isolated?	78	91
Breast cancer is a punishment from God?	0	0
Patient supported by the family and community?	81	94
Breast cancer patients should breastfeed?	54	63
Women should not be afraid of breast cancer?	61	71

5.3 Practices of breast examination

The overall knowledge for methods of screening of breast cancer was found to be poor level. For example, only 24% participants were aware of BSE, 7% ultrasound and 23% mammography. More than half of the participants (60%) did not know any methods of screening as shown in figure 7.

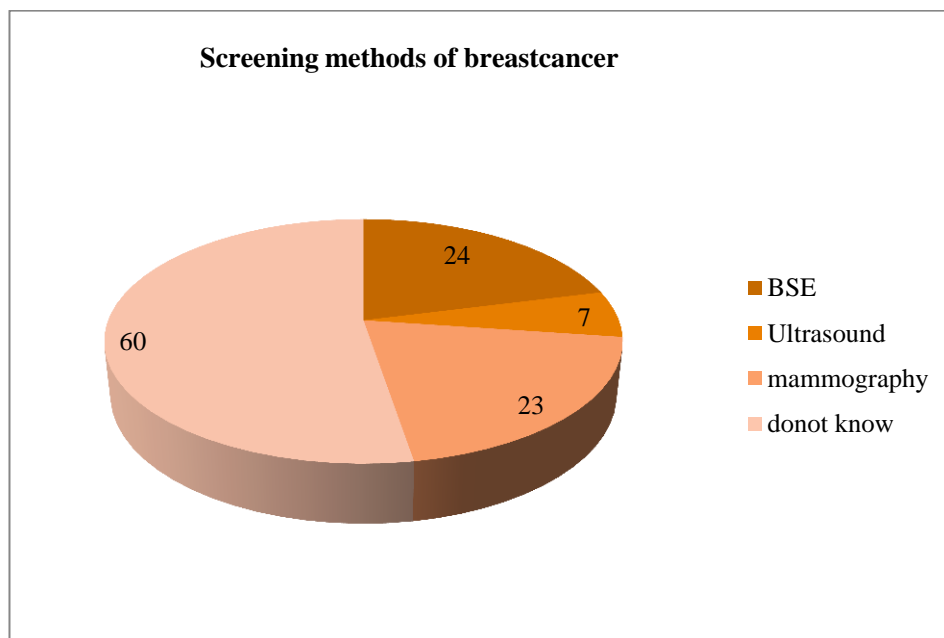


FIGURE 7. Screening methods

The knowledge regarding breast self-examination was found to be poor level. Few participants were aware of BSE. Only 9% participants practices BSE. The reasons for not performing BSE were they felt inconvenient and uncomfortable, some thought it was not necessary. Most responded (64%) they do not know how to perform it. There was poor level of knowledge found regarding right time to perform BSE. Only 20 % gave the correct answer that BSE should be performed monthly as shown in table 9.

TABLE 9. Practices of breast cancer

Screening methods of breast cancer(n=86)	Frequency	Percent%
BSE	21	24
Ultrasound	6	7
Mammography	20	23
Do not know	52	60
Have you ever done BSE?	8	9
Reason for not performing BSE		
Inconvenient/uncomfortable	12	14
Not necessary	11	13
Do not know how to do	55	64
Others	7	8
Correct BSE frequency		
Daily	2	2
Weekly	2	2
Monthly	17	20
Yearly	6	7
Do not know	28	33

5.4 Health seeking behaviour of breast cancer

Most respondents reacted that they will seek medical advices immediately if sign and symptoms are noticed. The reason for not seeking medical help were scared 5%, worried about bad results 6%, uncomfortable talking about the symptoms 2%, hospitals remotely 1% and difficult to get doctor's appointment 1%. 93% responded that they will

see doctor if any abnormality is found during BSE. The findings show that most students mainly seek medical consults. Only 1 % responded to hide the news from family if breast cancer symptoms were detected. The reason for hiding the news is the thought that breast cancer is incurable as shown in table 10.

TABLE 10. Health seeking behaviour

Health seeking behaviour	Frequency	Percent%
Seek medical advices if sign and symptoms noticed?	83	97
Reason for not seeking help		
Scared	4	5
Worried about the bad results	5	6
Would not feel comfortable talking about the symptoms	2	2
Too busy to visit a doctor	0	0
Too many other things to worried about	0	0
Hospitals far away	1	1
Worried about the doctor's fees	0	0
Difficult to get doctor's appointment	1	1
Do if notice any abnormality during BSE		
Pray	1	1
Traditional, spiritual treatment methods	0	0
See a doctor	80	93
Do nothing	0	0
Others, specify	2	2
Hide the news after you detect breast cancer symptoms?	1	1
Fear of rejection from family	0	0
Expensive treatment	0	0
Breast cancer is incurable	1	1
Fear of mastectomy	0	0
Others, specify	1	1

5.5 Sources of breast cancer information

The most common source of information informed by the participant is media (73%) such as TV, radio, Facebook, followed by 42 % family or friends, 17% informed health professionals and 7% others as shown in figure 8.

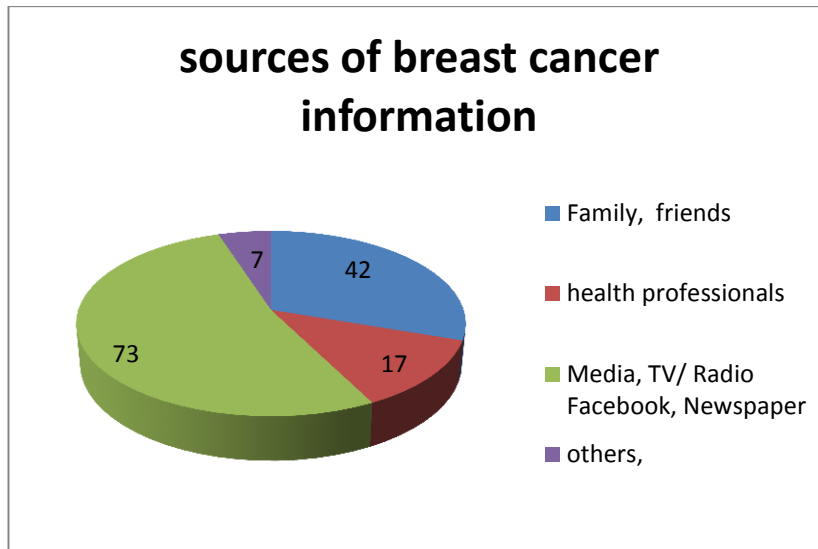


FIGURE 8. Sources of breast cancer information

The most participants responded awareness programme (72%) and medical consults (73%) as a method to receive more information about breast cancer. 65% of the participants knew where they can get the information regarding breast cancer as figure below.

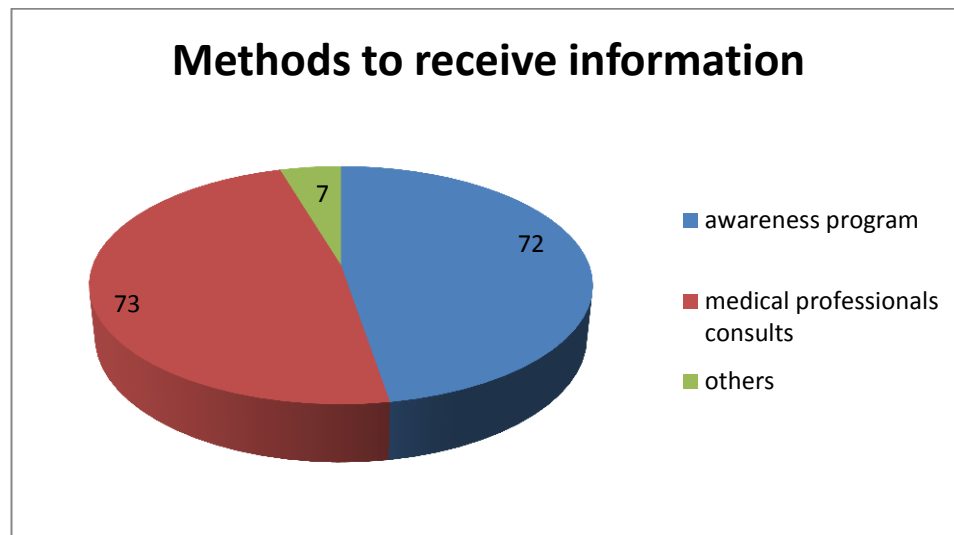


FIGURE 9. What helps to know more about breast cancer?

5.6 Pre and Post-test knowledge differences

There was an increase in knowledge level of the participants after the awareness programme. It can be concluded that awareness programme helped them increase their knowledge level regarding breast cancer. The knowledge levels of female students when comparing risk factors and sign and symptoms data: pre-test results was 35.6% and post-test was 70%. The overall knowledge (comparing data from questions 6-14) was found to be 41.6% in pre data which increased to 77% after awareness programme. Similarly, Screening practices findings were 18.5% in pre-test results whereas after the awareness programme, it was increased to 86 % which can be said to have excellent knowledge score as shown in table 11.

TABLE 11. Overall knowledge pre and post awareness programme (n=56)

	pre%	post%
Knowledge about BC(risk factor & sign and symptoms)	35.6	70
Overall knowledge level	41.6	77
Attitude towards BC	50.2	56
Practice of BSE	18.5	86

T- test was used to calculate the difference in knowledge of breast cancer (risk factor and sign and symptoms) pre and post awareness programme. The data from 56 participants who attended the awareness programme and filled up the pre and post questionnaires were used to calculate the paired samples test. The result is shown in table 12. The $p=0.001$ denotes that the effect of awareness programme has been seen and there was statistically significant increase in knowledge level post awareness programme. The overall mean knowledge score for pre-test was 5.07 out of a maximum score of 16 which significantly increased to 11.73 in post-test. The awareness programme was associated to increment of knowledge level in post test results.

TABLE 12. T test for pre and post samples

	Paired samples test					t	df	Sig. (2-tailed)
	Mean	Std. deviation	Std. Error Mean	95 % confidence interval of the Difference				
				Lower	Upper			
Pre	5.0714	2.44099	0.32619	-7.62192	-5.69950	-13.887	55	0.0001
Post	11.7321	3.07773	0.41128					

The figure 10 and table 13 shows the differences in risk factor and sign and symptoms of breast cancer pre and post awareness programme. The findings shows that after the awareness programme majority of participants were aware of risk factors such as oral contraceptive use, obesity, having first pregnancy after age of 30, age and reproductive history. Similarly, more than half of respondents answered all sign and symptoms of breast cancer. The green bar denotes the post data and the increase in knowledge is easily distinguishable.

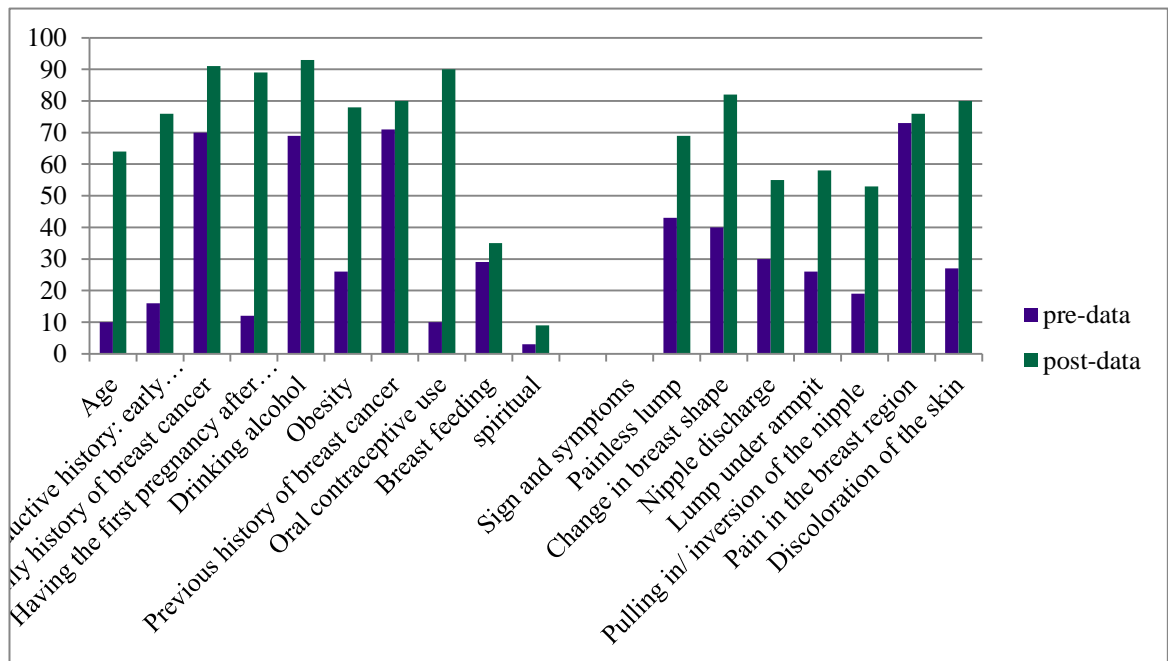


FIGURE 10. Comparison of risk factors and sign and symptoms of breast cancer

After the awareness program, 100% responded that early detection can improve chances of survival. 98% said breast cancer can be detected early and 93% understood breast cancer is curable as shown in table 13.

TABLE 13. Comparison of pre and post-test data

Risk factor of Breastcancer	pre-data	post-data
Age	10	64
Reproductive history: early menstrual age of 12 and 55	16	76
Family history of breast cancer	70	91
Having the first pregnancy after age 30	12	89
Drinking alcohol	69	93
Obesity	26	78
Previous history of breast cancer	71	80
Oral contraceptive use	10	90
Breast feeding	29	35

Sign and symptoms		
Painless lump	43	69
Change in breast shape	40	82
Nipple discharge	30	55
Lump under armpit	26	58
Pulling in/ inversion of the nipple	19	53
Pain in the breast region	73	76
Discoloration of the skin	27	80

Methods that can help reduce the risk of breast cancer		
Physical activity	65	89
Breast feeding	43	85
Limit alcohol	28	80
Avoid hormone replacement therapy	22	45
Methods to detect breast cancer early(n=86)		
knowing the sign and symptoms stage	85	87
knowing the risk factors groups and regular screening	33	82
performing BSE	13	80
regular mammogram after age of 40	19	64
Can breast cancer be detected early?	79	98
Can early detection improve chances of survival?	90	100
Is breast cancer curable?	76	93

The common source of information for health professionals was distinctly raised after awareness programme compare to other sources as shown in figure 11.

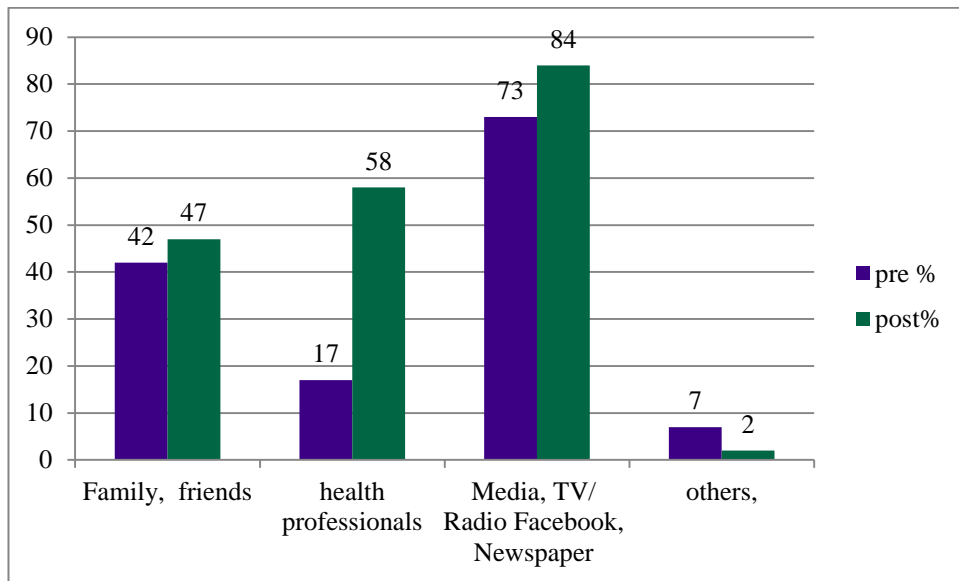


FIGURE 11. Sources of information

There were not considerable differences in attitudes towards breast cancer pre and post awareness programme. The percentage slightly decreased from 9 to 5% for breast cancer patient should be isolated. Almost everyone supported that breast cancer patients should be cared and supported by family and community. The results can be seen in table 14.

TABLE 14. Results showing attitudes towards breast cancer

Attitudes towards breast cancer (n= 86)	Pre result %	Post result %
Breast cancer patient should be isolated?	9	5
Breast cancer is a punishment from God?	0	0
Patient supported by the family and community?	94	98
Breast cancer patients should breastfeed?	63	49
Women should not be afraid of breast cancer?	71	63

The mean value of screening methods of breast cancer and correct BSE frequency time in pre-test was 18.5% and raise to 86% in post-test result. This concludes that

participants have gained knowledge on screening methods of breast cancer and they know BSE should be performed monthly. They are also familiar with the screening methods.

5.7 Results of male participants

The male participant's age was between 19 to 32, with majority participants between age 19 to 21. Almost all participants (90%) were single and were studying bachelors' level. 17% responded family history of breast cancer. Majority of male participants (96%) had heard about breast cancer and responded breast cancer is not a communicable disease (98%).

The findings from the male participants shows more than half participants (68%) responded previous history of breast cancer and family history as a risk factor of breast cancer. There was poor knowledge level for risk factors such as drinking alcohol, breastfeeding, obesity, reproductive history, first pregnancy after age 30, age and oral contraceptive use. None thought spiritual belief as a risk factor. It can be concluded that most participants believe previous history, heredity and alcohol consumption is the main risk factor which was similar in female data. The most of respondents (71%) answered pain in the breast region as the sign and symptoms for breast cancer. Sign and symptoms such as painless lump and lump under armpit were found to be in good level whereas change in breast shape, discoloration of skin, inversion of the nipple and nipple discharge were at poor level. The overall knowledge level of male participant was 44.3% which according to KAP score is a good knowledge. Majority reacted they know where to get more information regarding breast cancer. The findings show that 79% chose physical activity as a method that can help reduce the risk of breast cancer followed by 32% breast feeding, 29% alcohol consumption limitation and 25% avoiding hormonal replacement therapy. Majority responded that knowing signs and symptoms could detect breast cancer at early stage. Few participants responded to knowing the risk factors groups and regular screening, performing BSE and regular mammogram after age of 40. More than half participants (68%) believe that breast cancer can be detected early and almost all (96%) responded early detection can improve chances of survival

which was an excellent knowledge level. Majority of participants believe breast cancer is curable as shown in table 15.

TABLE 15. Knowledge of breast cancer among male participants

Risk factor of Breast cancer	%	Methods to reduce risk of BC	%
Age	25	Physical activity	79
early menstrual age of 12 and 55	14	Breast feeding	32
Family history of breast cancer	68	Limit alcohol	29
Having first pregnancy after age 30	25	Avoid hormone replacement therapy	25
Drinking alcohol	39		
Obesity	36	Methods to detect breast cancer early	
Previous history of breast cancer	68	Knowing sign and symptoms stage	86
Oral contraceptive use	14	Knowing risk factors groups and screening	29
Breast feeding	18	Performing BSE	32
spiritual	0	Regular mammogram after age of 40	29
Sign and symptoms		Can breast cancer be detected early?	68
Painless lump	46	Early detection improve survival chances?	96
Change in breast shape	32	Is breast cancer curable?	89
Nipple discharge	7	Methods to get more information	
Lump under armpit	43	Awareness program	89
Pulling in/ inversion of the nipple	11	Medical professional consults	64
Pain in the breast region	71	Others	14
Discoloration of the skin	21	Get information on breast cancer?	96

Concerning attitudes of breast cancer among male participants, all respondents agreed to support women with breast cancer. Majority (96%) supported that breast cancer patients should be supported and care by family and community. Less than half participants responded women should be afraid of breast cancer. Few responded breast cancer patient should be isolated and believed breast cancer is a punishment from god. It concludes that although in small number, but the stigma regarding breast cancer still exists in society. Young people still think it is a punishment and patient need to be isolated.

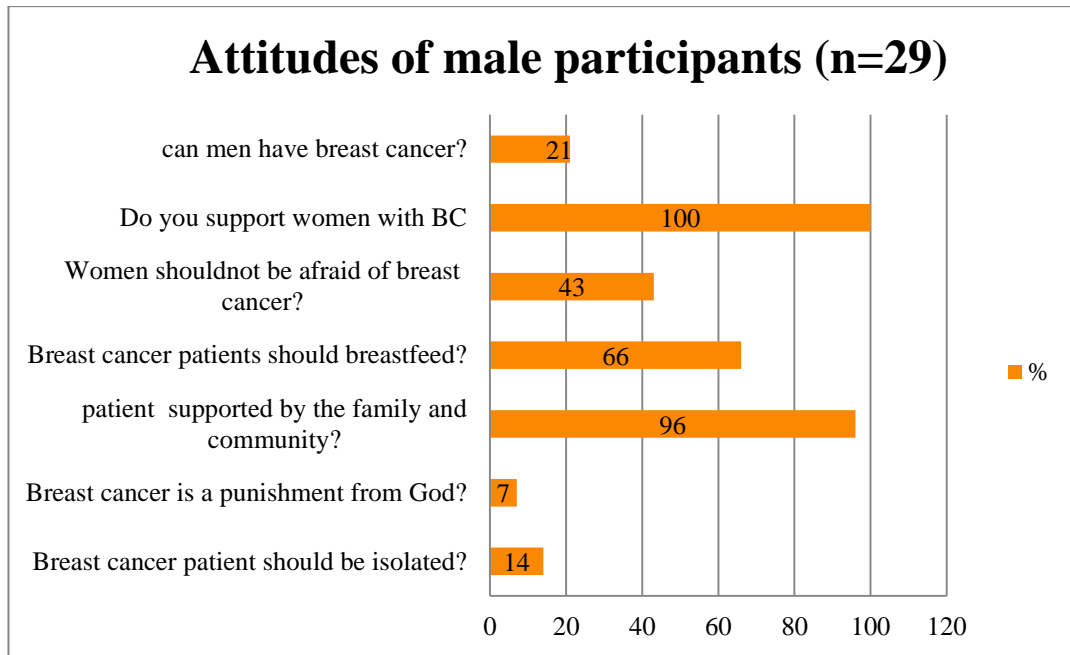


FIGURE 12. Attitudes of male participants

The most common sources of information were media, radio, TV, newspaper, Facebook. 89% responded awareness programme as a method to get more information on breast cancer followed by 64% medical professional consults.

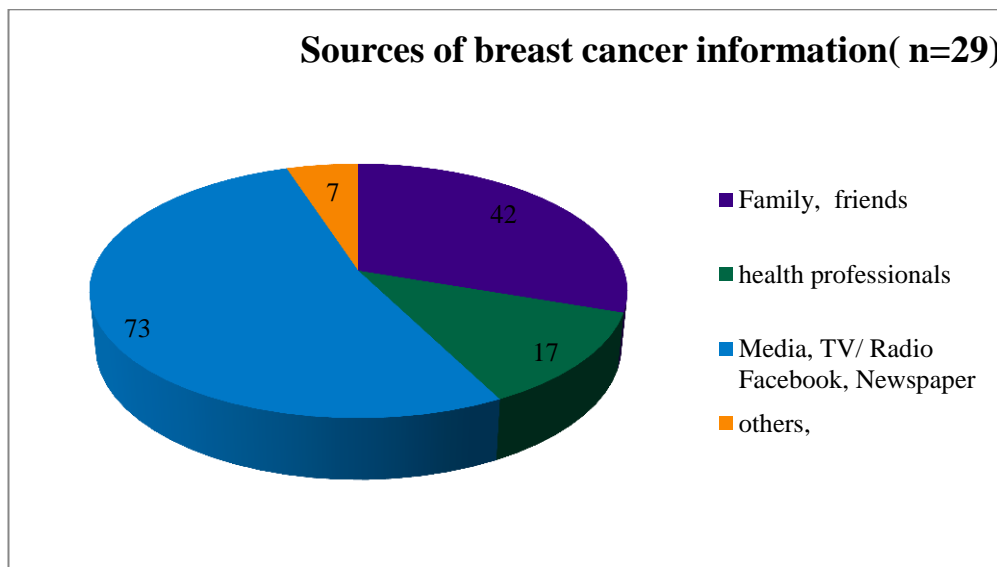


FIGURE 13. Sources of information

6 DISCUSSION

6.1 Discussion of the results

The overall knowledge (sign & symptoms and risk factor) of the participants in this study were at poor level (less than 40%) which supports with the earlier studies (Turkey by Yilmaz et al, in Jordan by Suleiman, in Iraq by Hamad et al, in Libya by Elzahaf et al, Sambanje and Mafuvadje and in Nepal by Shrestha). Poor level of knowledge among the students might be due to lack of awareness regarding breast cancer. The proven ways to detect breast cancer early is self-awareness. The knowledge of sign and symptoms, risk factors of breast cancer, habit of performing breast self-examination regularly once a month helps a person notice any changes in their body, hence alerting them to seek health professional for early diagnosis. Also regular mammography for certain age group women helps to detect breast cancer. Women should be acknowledging about the screening programmes.

Majority participants in this study responded pain in the breast as the main sign and symptoms, which supports to the findings that 80% Angola students believe the same. The findings associates to the misperception that cancerous breasts lump are painful in a study by Shrestha and Garg. People still wait for the pain to get excess to treatment when it is already late. This could lead women who detect a painless lump in the breast, assumes it to be harmless and they do not seek assistance from health professionals. Many women may not seek care when they detect the sign and symptoms because they are unaware of what it represents. It was distinct that most respondents were not aware of evident risk factors, sign and symptoms that can relate to breast cancer. For instance, 30% and below participants were aware of the sign and symptoms of breast cancer such as nipple discharge, discoloration of the skin, lump under armpit and inversion of the nipple.

The study found low levels of knowledge observed for risk factors such as breastfeeding, obesity, reproductive history, first pregnancy after age 30, age and oral contraceptive use. This results supports with the study by Gupta et al, Shrestha & Elzahaf et al in

which poor knowledge was observed for important risk factors such as reproductive history and having first pregnancy after age of 30. Women usually assumed that use of alcohol and tobacco were more important risk factors than reproductive history, which is one of the most determining risk factor of breast cancer.

The participants were unaware of the most of the major risk factors that can cause breast cancer. This finding supports the study carried in Jordan by Suleiman who found poor level of knowledge for risk factor of breast cancer among participants. For example, 99 (22.7%) responded risk factor to be medical condition, 56 (12.8%) respondents to heredity. A study in Libya by Elzahaf et al also found poor level of knowledge regarding risk factors. A lack of knowledge regarding risk factors among the participants was observed in many studies. Awareness regarding breast cancer and providing knowledge regarding risk factors and sign and symptoms is a preventive measure. It help one for early diagnosis of disease and better treatment options which leads to improved chances of saving lives. (Rouse, 2018.) Using preventive measures in breast cancer would be identifying risk factors and then reducing the risks that can cause breast cancer. For example, living healthy lifestyles, maintaining a healthy weight, eating healthy foods, exercising regularly, sleeping well, avoiding smoking and limiting alcohol consumption, avoiding unnecessary radiation, avoiding hormonal therapies and oral contraceptive use, performing BSE monthly, participating in screening programmes, and identifying risk groups.

The findings show that participants have poor knowledge of screening methods. 60% responded they do not know about screening methods, which supports to the study carried in Iraq by Hamad et al. Lack of knowledge of the participants was the most common reasons for not performing BSE, similar to findings of recent study of Sayed et al in Kenya. Only 9% performed BSE. The common reason for not performing BSE were the participants had no idea how to perform BSE, some thought there is no need or they do not fall in risk groups and few participants felt discomfort, fear and shy. More than half respondents do not know the screening methods for breast cancer. This result is in contrast with the study carried out by Sindi et al, in Saudi Arab, Hamad et al in Iraq and Sayed et al in Kenya where the BSE performance rate were more than 50%. This might be due to lack of awareness of BSE in Nepal. Women, mostly young females feel shy to see their own body parts. This might be because of the Nepalese cultural values, con-

servative thoughts have shaped them. It was also found that people have heard of BSE but ignores to perform it. Women themselves or their partners had detected symptoms of breast cancer. Hence, knowledge plays a key role to improve health seeking behavior of women and also participate in screening practices.

The findings revealed that almost every student (99%) have heard of breast cancer in this study in contrast to the study done in Jordan students by Suleiman which concluded 51.8% being aware of breast cancer. This could be because internet and technologies has ruled the world. As a significance of this, people are update with the media, news, educative learning. In Nepal most youths and adults use Facebook. The awareness and educative things shared in social network have been very productive. This supports to the findings that 73% responded media, FB to the sources of information about breast cancer which was the highest of all. These findings supports to the study of Hamad et al, 2018, in Iraq and Iheanacho et al, 2013 in Nigeria. Media plays an important role in spreading information to all corners in a country. In addition to this, the government should also provide awareness program in regular basis to schools and community.

Most respondents (97%) reacted that they will seek medical advices immediately if sign and symptoms are noticed which supports by a study in Kenya where 90% participants also responded they would seek medical professional assistance within a week period time if they noticed breast cancer symptoms. The reason for not seeking medical help were scared, worried about bad results, uncomfortable, hospitals remotely and difficult to get doctor's appointment. The findings show that most students mainly seek medical consults. Delay in early detection could be due to differences in socio demographic and cultural factors, a strong belief in traditional medicine, negative perception of disease, poverty and poor education combined with fear and denial. Results revealed that majority of patients with breast cancer seek health facility at late stage when the treatment options are limited and disease is incurable. Health-seeking behaviors believing more on traditional healers and seeking first help from them were common among the participants who do not consider breast cancer symptoms seriously to seek help from medical professional by visiting a hospital. This might be because the community is still unaware about the breast cancer knowledge. Awareness regarding breast cancer is important in seeking medical professional consults that enhances detecting breast cancer at earlier stage.

Half of the respondents had positive attitude towards breast cancer which supports by a study in Jordanian female students by Suleiman and in Libya by Elzahaf et al where majority of female students had good attitude towards breast cancer. Majority participants disagreed that breast cancer patients should be isolated and breast cancer is a punishment from God. A fear of social rejection was a reason to neglect treatment for breast cancer. The result also found out that female does not find comfortable discussing about breast health with male members in a family. Males should be encouraged in the involvement in their partner's breast health. Husbands should participate and involve in the care of their wives during the treatment process by visiting the doctor with their wives. In this way the female does not feel left alone and gets emotional support from the family.

The stigma of breast cancer and the associated societal implications of its treatments, especially mastectomy discourage women from seeking treatment early. Education need to address the reality that is concerned about the stigma of cancer. They distress being rejected by their community and their partners, fear the potential loss of the breast, or believe there are no effective therapies for the disease especially when they have experienced their relative's death with breast cancer. The facility of better primary healthcare, education, and better medical outcomes will reduce stigma and fear that will arise from complex technologies treatment, such as mammography or adjuvant therapy. (Lawrence, 2010.) The breast cancer survivor can be the best teacher in providing counseling. They are the example that breast cancer is curable. They have already been through the complications and can support the women overcome physically and psychologically. Acknowledging the community will lead to positive attitude towards breast cancer and enhances supporting behavior towards women with breast cancer. Creating awareness about breast cancer could be an effective strategy to reduce mortality due to breast cancer in low- and middle-income countries. There is a crucial need to explore the awareness deficits and stigma surrounding breast cancer, both in the general population and among health care professionals. It is important to understand the barriers for strategic and effective awareness campaigns and interventions on prevention and early detection. In order to increase knowledge for early detection of breast cancer, education is needed. (Gupta et al, 2015)

The findings of this thesis revealed that there was poor knowledge level of breast cancer among female students in the pre-test which significantly increased to very good knowledge level after the awareness programme. The educational programme was proved to be beneficial on increasing knowledge level regarding breast cancer for the participants. The preventive measure to detect breast cancer early is to know the risk factor, screening programmes and sign and symptoms. Therefore, by providing training programs in the community can increase knowledge and create awareness towards breast cancer. The results supports with the findings by Yilmaz et al in Turkey and in India by Madhukumar which states there was a significant increase in knowledge level from the pre to the post-test after awareness programme.

Male participants were also included in this research and their knowledge level and attitude were studied. Men are the support to the suffered family members and society. Though male participants had good knowledge level in this study, only 21% responded men can have breast cancer which agrees with the study in Kenya by Sayed et al that only 30% of participants were aware that men can have breast cancer. Breast cancer is not common among males; however 1% men are affected by breast cancer. (Breast-cancer.org, 2020). Thus, men should also be focused to awareness programmes. All male participants responded that they supports women with breast cancer and 96% responded that breast cancer patients should be cared and support by the family and community. It was good to know male participants attitude towards female breast cancer patients. Nepal is a male dominant country. In many developing Asian and African country, male plays a vital role in a family. They are the decision makers for everything at home. They are the one who decides if a female member in a family needs to seek medical consults if sick or traditional healers. Women's health completely depends on them. Therefore, it is very important in male dominant countries to teach, involve male participants in breast cancer awareness programme. This can be very fruitful in a long run. If the head of the family knows about the breast cancer, they can teach other members of a family and can provide right decision in health seeking behavior and treatment.

To carry out the research for this thesis, a guidance and support from an organization was needed. To conduct awareness programme alone was not possible, it is a huge task. Therefore, a college from Kathmandu, Nepal was involved for data collection process.

In addition, a researcher contacted Dr. Shahi. The reason to involve him in this project was to get assisted in implementing awareness programme.

6.2 Reliability and validity of the study

In quantitative research, “reliability refers to the consistency, stability and repeatability of results”. (Twycross & Shields, 2004). Validity is the extent to which any measuring instrument measures what it is intended to measure. Validity is the quality of research being used to support the argument being made (Thatcher, 2010). In this thesis, validity of the questionnaires from knowledge, attitudes and practices of breast cancer was tested through Pearson correlation. The testing criteria were

- Valid if the correlation value, Pearson correlation $> r$ table, in this case for df value $(n-2)84$, $r > .21$ for two tail tests at significance by pvalue 5% (0.05) .
- Invalid if correlation value, Pearson correlation is $< r$ table, 0.21.

Hence, it can be concluded that the questionnaires for knowledge, practices and attitudes were analyzed to check the validity. The table 16 shows the

Pearson correlation for knowledge is $0.668 > 0.21 = \text{Valid}$.

Pearson correlation for Attitude $0.510 > 0.21 = \text{Valid}$.

Pearson correlation for Practices is $0.769 > 0.21 = \text{Valid}$.

TABLE 16. Validity of the questionnaires

	Knowledge	Attitude	Practices
Pearson Correlation	0.668**	0.510**	0.769**
Sig. (2-tailed)	0.000	0.000	0.000
N	86	86	86

** Correlation is significant at the 0.01 level (2-tailed).

In this thesis, a researcher assured all the findings were based on the data collected. The data was collected by the researcher, herself. The questionnaires were explained by the

researcher when it was not understood by the participants. The data analysis was done very carefully. All the data were rechecked while inserting the values in the software. The data was analyzed according to the research questions. Data analysis of this study was done using SPSS programme. The researcher gets acquainted with the SPSS software. A noteworthy time was spent in learning the tools and making preeminent use of the available tools. The analyzed data was presented in the forms of tables and figures for the quick understanding. The researcher made sure that the analysis was done correctly by re-checking the analysis process. A pilot testing could have been worth taking to calculate the findings and reconstruct the questionnaires accordingly into more simpler and understandable form. Hence, this could have altered in case of reliability.

6.3 Limitation of the study

The study, however, is subject to several limitations. The sample size for the data collection was not sufficient as stated by sample size calculator. Only one college was involved. The results could have altered if the study has increased number of participants. It could have been better if other college student were also included to provide the generalized result of the population. The result of this study might be biased as the sample size was limited and they were not selected randomly. The level of knowledge of students after awareness programme was assessed soon after providing the education; hence, it was not assured if the participants are applying the education to their daily habit and behaviors. It is recommended that studies should be carried out for time intervals for evaluating the effectiveness of the educative programme. Due to time limitation, the concentration level of the students regarding awareness programme was relatively less. A less interest and rapidity was also observed when filling up the questionnaires. This might be because the pre data and post data along with the awareness programme was conducted on the same day, making the students lethargic after their lectures. This limitation needs to be measured when interpreting the findings of this study.

7 CONCLUSION

The findings showed significant difference in knowledge level of students prior to awareness program and after the program. The students had poor knowledge level regarding breast cancer, sign and symptoms, risk factors, practices and screening of breast cancer according to pre data results. The awareness programme had intense effects on breast cancer knowledge, risk factors, sign and symptoms, practices and health beliefs of women. The students had increased knowledge concerning breast cancer after the educational program.

Breast cancer is curable when detected early and treated at first stage. Although Nepal has very low incidence rate of breast cancer, almost half of affected person is dying. (WHO 2017). This can be altered as in developed countries. Education regarding general awareness program, screening for breast cancer is common in developed countries, however in the developing countries, conservative community, women seems to be reserved talking about their problems.

In conclusion, in order to raise the knowledge about the early detection practices like BSE, mammography and all the possible preventive practices, more awareness strategies need to be developed. Early detection is very important in breast cancer in order to overcome with best possible outcome. Therefore, the practice should be developed in proper cooperation and coordination with the education networks and media in order to effectively implement the awareness program. It is recommended that the college should offer educative awareness programme to students regularly. This way the education can be spread not just to students but also to their family members. The other way to raise awareness is by providing evidence based training regarding breast cancer to healthcare providers and community workers so they can share and educate this knowledge to other population in the society. The plan should not only include healthcare delivery but also promote awareness and early detection. The interventions should specifically focus on the needs of women who cannot easily get access to health systems. The simple steps of educating women about awareness regarding breast cancer and when to seek medical assistance can help them detect breast cancer early. This leads to better treatment and high survival rates.

The findings also showed that men supports women with breast cancer and believes the breast cancer patient should be loved, cared and support by family and community. The men should also be involved in education program so that they can provide support to the women. Further research needs to be done to study knowledge and attitudes of male in larger population size to generalize the findings.

This study found that women's beliefs to breast screening practices were significantly increased in the post-test. However, education programme should be persistent for the reason that better knowledge level can influence positive behavior about early detection of breast cancer. The screening practices such as breast self-examination will teach individual to raise awareness in detecting the breast cancer at early stage hence, this study stress the necessity to teach individuals about the importance of early detection techniques. To provide the necessary information and services to reach all age group, educational and social level; the interventions should be developed aiming to deliver healthcare education and to encourage preventive healthcare behaviors. This finding can be used as a reference for future studies in similar context.

REFERENCES

- Akuoko,C.P., Armah, E., Sarpong, T., Quansah, D,Y., Amankwaa, I. & Boateng, D. (2017). *Barriers to early presentation and diagnosis of breast cancer among African women living in sub-Saharan Africa*. Retrieved from <https://doi.org/10.1371/journal.pone.0171024>
- Al-Dubai, S., Nimir, A., AL-Shagga, M. & Saliem, A. (2014). *Knowledge and practice of breast self-examination among students in a private higher learning institution in Malaysia*. Retrieved on 10 Feb 2019 from [https://www.researchgate.net/publication/269223331Knowledge and practice of breast self-examination among students in a private higher learning institution in malaysia](https://www.researchgate.net/publication/269223331Knowledge_and_practice_of_breast_self-examination_among_students_in_a_private_higher_learning_institution_in_malaysia)
- Alhaj, S. (2018). *KAP surveys : how to develop knowledge, attitude and practice survey*. Retrieved from <https://www.linkedin.com/pulse/kap-survey-how-develop-knowledge-attitude-practice-alhaj->
- Aydogan, U. (2015). *Predictors of Knowledge Level and Awareness towards Breast Cancer among Turkish Females*. *Asian Pacific journal of cancer prevention: APJCP* 16(1):275-82
- Breastcancer.org. (2020). Male breast cancer. Retrieved from https://www.breastcancer.org/symptoms/types/male_bc
- Burns, N. & Grove, S. K. (2005). *The practice of Nursing Research: Conduct, Critique and utilization*. 5th ed. St. Louis: Elsevier Saunders
- Business Dictionary, 2018. Retrieved from <http://www.businessdictionary.com/definition/data-analysis.html>.
- Cambridge Dictionary, 2018. Retrieved from <https://dictionary.cambridge.org/dictionary/english/awareness>
- Cancer Society Nepal. (2018). Retrieved from <https://www.uicc.org/membership/cancer-society-nepal>
- CDC. (2018). Breast cancer. US department of health & human services. Retrieved from https://www.cdc.gov/cancer/breast/basic_info/symptoms.htm
- CIWA. (2014). Breast health initiative for newcomers. Calgary Immigrant Women’s Association.

- Doshi, D., Reddy, S., Kulkarni, S. & Karunakar, P. (2012). *Breast Self-examination: Knowledge, Attitude, and Practice among Female Dental Students in Hyderabad City, India*. *Indian J Palliat Care*, 18(1): 68–73.
- Elzahaf, R., Mekraz, E., Arhaim, S. & Almansouri, M. (2019). Knowledge, Attitude, and Practice Regarding Breast Cancer among Female Students at College of Medical Technology/Derna. *Libyan Journal of medical sciences*.
- Fan, L, Gossb, P.E.,and Strasser-Weippl, K.,(2015). *Current Status and Future Projections of Breast Cancer in Asia*. *Breast Care* 10:372–378
- Finnish National Board on Research Integrity. (2009). *Ethical principles of research in the humanities and social and behavioural sciences and proposals for ethical review*. Retrieved from <https://www.tenk.fi/sites/tenk.fi/files/ethicalprinciples.pdf>
- Finnish Advisory Board on Research Integrity. (2012). *Responsible conduct of research and procedures for handling allegations of misconduct in Finland*. Retrieved from https://www.tenk.fi/sites/tenk.fi/files/HTK_ohje_2012.pdf
- Garg, P. (2016). Awareness that early cancer lump is painless could decrease breast cancer mortality in developing countries. *World Journal of clinical oncology*. 7(3): 321–323.
- Globocan. (2018). Factsheets by populations. Retrieved from <http://gco.iarc.fr/today/fact-sheets-populations>.
- Gilani, S. L., Khurram, M., Mazhar, T., Mir, S.T., Ali, S., Tariq, S. & Malik, A.Z. (2010). Knowledge, attitude and practice of a Pakistani female cohort towards breast cancer.
- Giri, M., Giri, M., Thapa, R.J., Upreti, B. & Pariyar, B. (2018). *Breast cancer in Nepal: current status and Future directions*. *Biomedical Reports*, 8(4): 325–329.
- Greasley, P. (2007). *Quantitative Data Analysis Using SPSS : An Introduction for Health and Social Studies*. McGraw-Hill Education.
- Gupta, A., Shridhar, K. & Dhillon, P.K. (2015). A review of breast cancer awareness among women in India: Cancer literate or awareness deficit? *European Journal of Cancer* 51, 2058– 2066
- Hamad, K., Khalil, H. & Awlla, H. (2018). *Knowledge of breast cancer risk factors and practice of breast self-examination among female students of soran technical institute*. *Polytechnic journal. International journal of preventive medicine*. Retrieved from

http://www.ijpvmjournal.net/viewimage.asp?img=IntJPrevMed_2015_6_1_130_172803_t4.jpg

- Iheanacho, P., Ndu, A. & Emenike, A.D. (2013). Awareness of breast cancer risk factors and practice of breast self-examination among female undergraduates in university of Nigeria Enugu campus. *OJN*; 3:147-152.
- Kaliyaperumal, K. (2004). *Guideline for Conducting a Knowledge, Attitude and Practice (KAP) Study*. Community Ophthalmology. Retrieved from http://v2020eresource.org/content/files/guideline_kap_Jan_mar04.pdf
- Kang, H. K., & Bisht, B. (2014). Assessing the Impact of Awareness program on Breast and Cervical Cancer Knowledge Empowerment among Working Women in Education Sector. Retrieved from https://www.researchgate.net/publication/277620458_
- Kotepui, M., Piwkham, D., Chupeerach, C. & Duangmano, S. (2014). Knowledge, attitudes and practice of breast cancer screening among female personnel of Walailak University. John wiley & sons ltd.
- Kumar, R. (2019). *Research Methodology: a step by step guide for beginners (5th ed.)*. London EC1Y 1SP: Sage publications.
- Lawrence, N. S., Walter, W., Amy, S. & Felicia, M. K. (2010). *Breast cancer in developing countries: Opportunities for improved survival*. *Journal of Oncology*.
- Madhukumar, S., Thambiran, U.R., Basavaraju, B. & Bedadala, M. R. (2017). A study on awareness about breast carcinoma and practice of breast self-examination among basic sciences' college students, Bengaluru. Departments of Community Medicine, MVJ Medical College and Research Hospital. 6 (3): 487-490.
- Pakseresht, S., Ingle, G.K., Garg, S., and Sarafraz, N.(2016). *Stage at Diagnosis and Delay in Seeking Medical Care among Women with Breast Cancer, Delhi, India*. *Iran Red Crescent* 16(12):e14490.
- Rafique, S. (2018). Breast cancer awareness, attitude and screening practices among university students: intervention needed.
- Rao, S., Gupta, D., Narang, R. & Singh, P. (2017). Knowledge, attitude and practice about breast cancer and breast self-examination among women seeking out-patient care in a teaching hospital in central India. *Indian Journal of cancer*.

- Raosoft, 2004. Sample size calculator. Retrieved from
<http://www.raosoft.com/samplesize.html>
- Rouse, M. (2018). *Preventive health*. Retrieved from
<https://whatis.techtarget.com/definition/preventive-health>
- Rose foundation Nepal. (2017). Retrieved from
<http://www.rosefoundationnepal.org/Rose-Foundation-Nepal/cervical-and-breast-cancer-free-screening-program/>
- Sambanje, M., & Mafuvadze, B. (2012). Breast cancer knowledge and awareness among university students in Angola. *African medical journal*.
- Sarwar, M.Z. (2015). Knowledge, attitude and practices amongst the Pakistani females towards breast cancer screening programme.
- Sayed, S., Ngugi, A.K., Mahoney, M.R., Kurji, J., Talib, Z.M., Macfarlane, S.B., Wynn, T.A., Saleh, M., Lakhani, A., Nderitu, E., Agoi, F., Zujewski, Z. & Moloo, Z. (2019). *Breast Cancer knowledge, perceptions and practices in a rural Community in Coastal Kenya*. *BMC Public health*.
- Siddeeq, K. (2017). Breast self-examination: assessing its knowledge attitude and practice among ethnic Kashmiri females.
- Sindi, R., Alzahrani, A., Alzahrani, N., Salman, B., Alshareef, S., Tabassum, A., Iqbal, M. & Ahmad, R. (2019). Awareness Level, Knowledge and Attitude towards BreastCancer between Medical and Non-Medical University Students in Makkah Region: A Cross Sectional Study. *International Journal of cancer and clinical research*.
- Shrestha, K. (2012). Breast cancer knowledge and screening practice among women visited to kist medical college. *Nepal medical college*, 14(4): 305-311
- Shrestha, S., Chhetri, S. & Napit, J. (2017). *Awareness on breast self examination among reproductive age women*. *JCMS Nepal*. 13(4):425-9.
- Suleiman, A. (2014). Awareness and attitudes regarding breast cancer and breast self-examination among female Jordanian students. *Journal of basics and clinical pharmacy*. 5:74-8.
- Taherdoost, H. (2016). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. SSRN.
- Thatcher, R. (2010). *Validity and Reliability of Quantitative Electroencephalography*. *Journal of Neurotherapy*, 14, 122-152.

- Twycross, A., & Shields, L. (2004). *Validity and Reliability-What's it All About? Part 2: Reliability in Quantitative Studies*. *Paediatric Nursing*, 16 (10), 36.
- WHO. (2017). World health rankings. Nepal breast cancer. Retrieved from <https://www.worldlifeexpectancy.com/nepal-breast-cancer>
- WHO. (2018). *Breast cancer detection*. Retrieved from <http://www.who.int/cancer/detection/breastcancer/en/>
- WHO. (2020). *Early diagnosing and screening*. Retrieved from <https://www.who.int/cancer/prevention/diagnosis-screening/en/>
- Yılmaz, M., Sayın, Y. & Cengiz, H. (2017). The Effects of Training on Knowledge and Beliefs About Breast Cancer and Early Diagnosis Methods Among Women. *Eur J Breast Health*.

APPENDIX 1. Consent Form

Namaste! I am Salina Shrestha-Bogati, currently studying Master's in Global Health Care from Diaconia University of Applied Sciences in Finland. I am doing my thesis research on Knowledge, attitudes and practices of Breast Cancer among college students of Nepal. The main purpose of this research is to explore the knowledge of breast cancer among students. The aim of this research is that the college student benefits through information shared on Awareness programme. Your responses will be kept confidential and anonymous. The data will be destroyed after the findings are documented. The results will be published in master thesis in June 2020. Your honest answer will be appreciated. Participation is voluntary. The ethical approval has been done by the school and Diaconia University of Applied Sciences for this study. Thank you for responding and for your time. Please, take a few moments to answer the questions. Thank you. This survey is intended for college students.

Please feel free to contact if any queries at salina72@hotmail.com. Below is the consent form you could sign and give me approval to use your data in this study.

I have read and understood the information provided to me. I am aware of this research and the data can be used for this study. I agree to give my consent for this study.

Name of the participant

Signature

Date

APPENDIX 2. Questionnaires for Female participants

Demographic characteristics

1. Age-
2. Marital status-
3. Educational status-
4. Age when your first period started -
5. Family history of breast cancer- Do you know if someone in your family is/was diagnosed of breast cancer?
 - a. Yes
 - b. No

Knowledge of Breast cancer

6. Have you heard of breast cancer?
 - a) Yes
 - b) No
7. Is breast cancer communicable disease?
 - a) Yes
 - b) no
 - c) Do not know
8. What do you think is risk factor of breast cancer. Tick all that apply
 - a) Age
 - b) Reproductive history: early menstrual before age of 12 and menopause after age of 55.
 - c) Family history of breast cancer
 - d) Having the first pregnancy after age 30.
 - e) Drinking alcohol
 - f) Obesity
 - g) Previous history of breast cancer
 - h) Oral contraceptive use
 - i) Breast feeding
 - j) Spiritual
9. Do you know sign and symptoms of breast cancer? Tick all that apply
 - a) Painless lump
 - b) Change in breast shape
 - c) Nipple discharge
 - d) Lump under armpit
 - e) Pulling in/ inversion of the nipple
 - f) Pain in the breast region
 - g) Discoloration of the skin

10. What methods do you think can help reduce the risk of breast cancer? Tick all that apply

- a) Physical activity
- b) Breast feeding
- c) Limit alcohol
- d) Avoid hormone replacement therapy
- e) All of the above

11. What do you think can detect breast cancer in early stage? Tick all that apply

- a) Knowing the sign and symptoms
- b) Knowing the risk factors groups and regular screening
- c) Performing BSE
- d) Regular mammogram after age of 40.

12. Can breast cancer be detected early?

- a) Yes
- b) No
- c) Do not know

13. Can early detection improve chances of survival?

- a) Yes
- b) No
- c) Do not know

14. Is breast cancer curable?

- a) Yes
- b) No
- c) Do not know

Practices of Breast Examination

15. Do you know the methods of screening of Breast Cancer? Tick all that apply

- a) Breast self-examination
- b) b) Ultrasound
- c) c) Mammography
- d) d) Do not know

16. Have you ever done breast self-examination?

- a) Yes
- b) No

17. If no, why?

- a. Not convenient/uncomfortable
- b. Not necessary
- c. Do not know how to do
- d. Others, Please specify-

18. How often should BSE be performed?

- a) Daily
- b) Weekly
- c) Monthly
- d) Yearly
- e) Do not know

Health Seeking Behavior of Breast Cancer

19. If you notice sign and symptoms of breast cancer in you, do you seek medical advices immediately?

- a) Yes b) No

20. If No, why? Tick all that apply

- a) Scared
- b) Worried about the bad results
- c) Would not feel comfortable talking about the symptoms
- d) Too busy to visit a doctor
- e) Too many other things to worry about
- f) Hospitals far away
- g) Worried about the doctors' fees
- h) Difficult to get doctor's appointment

21. If you notice any abnormality during BSE, what will you do?

- a) Pray
- b) Traditional, spiritual treatment methods
- c) See a doctor
- d) Do nothing
- e) Others, specify

22. Will you hide the news from your family after you detect breast cancer symptoms?

- a) Yes b) No

23. If yes, why?

- a) Fear of rejection from family
- b) Expensive treatment
- c) Breast cancer is incurable
- d) Fear of mastectomy
- e) Others, specify.

Sources of breast cancer information

24. From whom did you hear about breast cancer? Tick all that apply

- a) Family, friends
- b) Health professionals
- c) Media, TV/ Radio, Facebook, Newspaper
- d) Others, specify-

25. What do you think can help you know more about breast cancer? Tick all that apply

- a) Awareness program
- b) Medical professionals consult

APPENDIX 3: Questionnaires for Male participants

Demographic characteristics

1. Age-
2. Marital status-
3. Educational status-
4. Family history of breast cancer- Do you know if someone in your family is/was diagnosed of breast cancer?
 - a. Yes
 - b. No

Knowledge of Breast cancer

5. Have you heard of breast cancer?
 - a) Yes
 - b) No
6. Is breast cancer communicable disease?
 - a) Yes
 - b) No
7. What do you think is risk factor of breast cancer. Tick all that apply
 - a) Age
 - b) Reproductive history: early menstrual before age of 12 and menopause after age of 55.
 - c) Family history of breast cancer
 - d) Having the first pregnancy after age 30.
 - e) Drinking alcohol
 - f) Obesity
 - g) Previous history of breast cancer
 - h) Oral contraceptive use
 - i) Breast feeding
 - j) Spiritual
8. Do you know sign and symptoms of breast cancer? Tick all that apply
 - a) Painless lump
 - b) Change in breast shape
 - c) Nipple discharge
 - d) Lump under armpit
 - e) Pulling in/ inversion of the nipple
 - f) Pain in the breast region
 - g) Discoloration of the skin

9. What methods do you think can help reduce the risk of breast cancer? Tick all that apply
- a) Physical activity
 - b) Breast feeding
 - c) Limit alcohol
 - d) Avoid hormone replacement therapy
10. What do you think can detect breast cancer in early stage? Tick all that apply
- a) Knowing the sign and symptoms
 - b) Knowing the risk factors groups and regular screening
 - c) Performing BSE
 - d) Regular mammogram after age of 40.
11. Can breast cancer be detected early?
- a) Yes
 - b) No
12. Can early detection improve chances of survival?
- a) Yes
 - b) No
13. Is breast cancer curable?
- a) Yes
 - b) No

Sources of breast cancer information

14. From whom did you hear about breast cancer? Tick all that apply
- a) Family, friends
 - b) Health professionals
 - c) Media, TV/ Radio, Facebook, Newspaper
 - d) Others, specify-----
15. What do you think can help you know more about breast cancer? Tick all that apply
- a) Awareness program
 - b) Medical professionals consult
 - c) Others, specify.
16. Do you know from where can you get information about breast cancer?
- a) Yes
 - b) No

Attitudes towards breast cancer

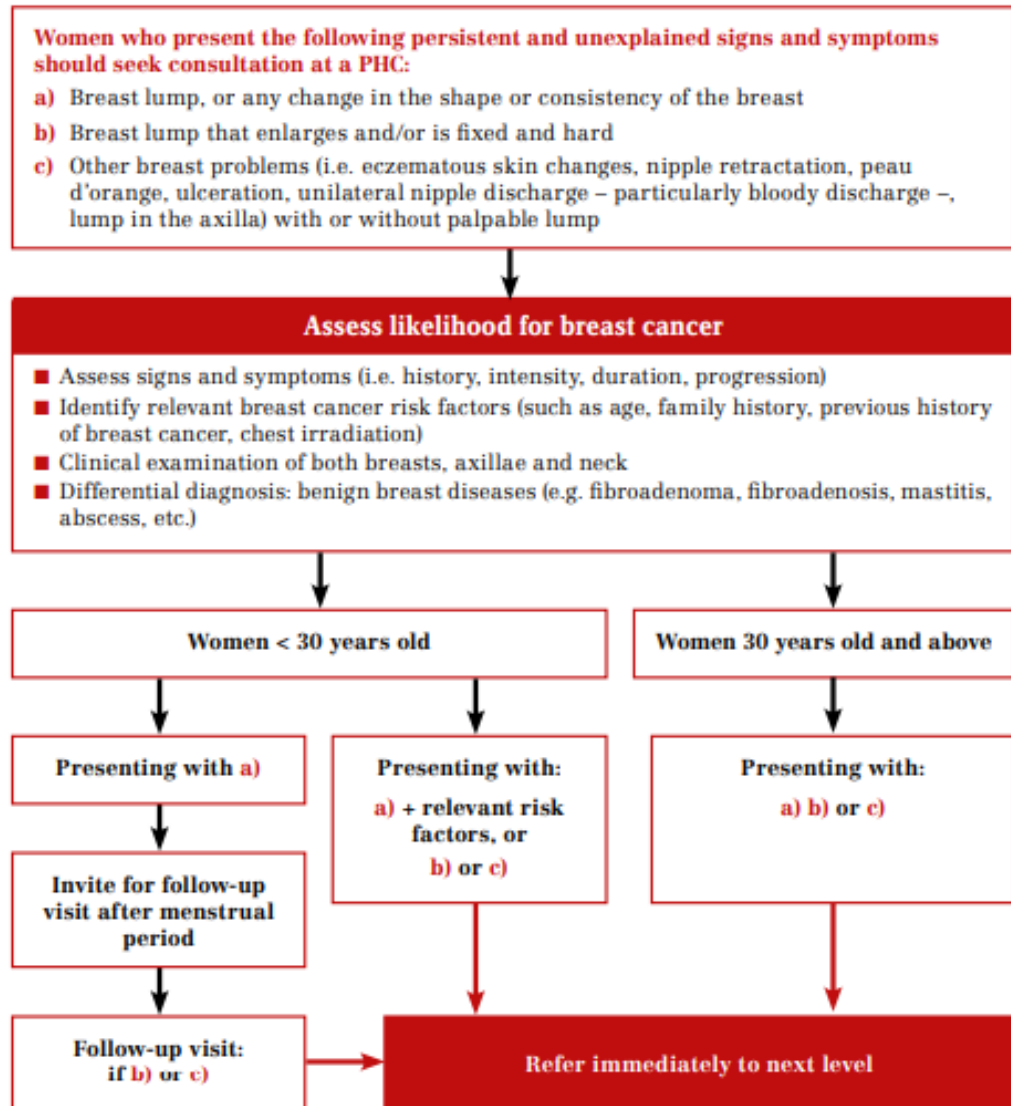
17. Breast cancer patient should be isolated?

APPENDIX 4 WHO Pen protocol

Package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings

WHO PEN Protocol 4

4.1 Assessment and referral of women with suspected breast cancer at primary health care



APPENDIX 5. Summary of previous research findings

Author	Topic	Participants/ settings	Methods	Findings
Suleiman, A. 2014	Awareness and attitudes regarding breast cancer and breast self-examination among female Jordanian students	840 university students Jordan	Cross sectional research design	Out of 840 participants, half of them (51.8%) were aware of breast cancer. Result found poor level of knowledge for risk factor of breast cancer among participants. Result found excellent attitudes towards breast cancer patient. The sources to attained knowledge regarding breast cancer were friends (45.2%) and health workers. Less than 20% thought media as a source for breast cancer education.

Author	Topic	Partici- pants/ set- tings	Meth- ods	Findings
Sam- banje, M., & Ma- fuvadze, B. (2012).	Breast cancer knowledge and awareness among university students in Angola	595 univer- sity stu- dents in medical and non- medical programs. Angola	cross- sec- tional survey	Result found inadequate knowledge of breast cancer among university students. The majority of the participants were not aware of sign and symptoms and risk factors of breast cancer such as change in color or shape of the nipple. Study showed very good knowledge of BSE. However, only 40.2% participants could perform BSE confidently and more than 50% did not know the right time to perform BSE

Au- thor	Topic	Partici- pants/ settings	Meth- ods	Findings
Hama d, K., Kha- lil, H. & Awlla , H. (2018).	knowledge of breast cancer risk factors and practice of breast self examination among female students of soran technical institute.	100 fe- male stu- dents Iraq	de- scrip- tive, cross- sec- tional study	hamad et.al found only 35% participants had overall good knowledge level of breast cancer. Good knowledge level was found for sign and symptoms with 86% saying painless lump in breast .Regarding BSE, 60% participants were unaware of BSE and only 32% knew how to perform. Poor knowledge(25%) was seen for right time to perform BSE. The reasons for not performing BSE were the participants were unaware how to perform which followed by do not expect to get breast cancer and do not think BSE is important

Author	Topic	Participants/ settings	Methods	Findings
Sindi, R., Alzaharani, A., Alzaharani, N., Salman, B., Alshareef, S., Tabassum, A., Iqbal, M. & Ahmad, R. (2019).	Awareness Level, Knowledge and Attitude towards Breast-Cancer between Medical and Non-Medical University Students in Makkah Region:	250 medical students and 250 non-medical students. Saudi Arab	A Cross Sectional Study	A study found good knowledge score (61%) for medical students and poor knowledge score (45%) for non-medical students. There were significant correlations between overall knowledge and attitude, and between overall knowledge and practice of BSE. The participants were aware of BSE and had good knowledge level in practicing BSE(61%). The reason for not performing BSE were the participants had no idea how to perform BSE, some thought there is no need and few participants felt discomfort, fear and shy. the students responded the main source to be awareness campaigns (67%) and media (48%)

Author	Topic	Participants/ settings	Methods	Findings
Elzahaf , R., Mekraz , E., Arhaim , S. & Almansouri, M. (2019)	Knowledge, Attitude, and Practice Regarding Breast Cancer among Female Students at College of Medical Technology	200 Female students. Libya	descriptive cross-sectional survey	majority (87.5%) of participants with poor knowledge level regarding breast cancer. 98% students responded lump in breast as a common symptoms. The common risk factors of breast cancer the participants responded were family history (83%) and the least 13.5% responded early onset of menarche (13.5). The majority of participants(82.5%) were aware of BSE as a screening method of breast cancer followed by ultrasound (47.5%). However, only 28.5% ($n = 57$)students knew the right way to perform BSE

Author	Topic	Participants/ settings	Methods	Findings
Yılmaz, M., Sayın, Y. & Cengiz, H. (2017).	The Effects of Training on Knowledge and Beliefs About Breast Cancer and Early Diagnosis Methods Among Women.	244 women Turkey	semi-empirical single group pre-test & post-test research model	A study carried in Turkey with 244 participants found good level (53.7) of knowledge in pre-test which significantly increased to excellent level in post-test results (85.2%) after the education program. The knowledge regarding BSE also increased from good level in pre-test (50.8) to excellent level (80.3%) in post-test. The mean score for knowledge of risk factors of breast cancer was 3.65 in pre-test and was increased to 9.36 in post-test. There was significant difference in pre- and post-test.

Author	Topic	settings	Methods	Findings
Sayed, S., Ngugi, A.K., Mahoney, M.R., Kurji, J., Talib, Z.M., Macfarlane, S.B., Wynn, T.A., Saleh, M., Lakhani, A., Nderitu, E., Agoi, F., Zujewski, Z. & Moloo, Z. (2019).	Breast Cancer knowledge, perceptions and practices in a rural Community in Coastal Kenya	442 women and 237 male. Kenya	Cross-Sectional study	Study found majority (92%) of participants were aware of breast cancer. However, only 10% participants had correctly answered two or more risk factors of breast cancer. Most participants considered breast cancer a severe disease. There were low knowledge level regarding early detection methods and screening practices. A study in Kenya found 90% participants would seek medical professional assistance within a week period time if they noticed breast cancer symptoms. Almost half (49%) of the participants responded that their partners would make the health care seeking decisions.

Author	Topic	Participants/ settings	Methods	Findings
Pakseresht, S., Ingle, G.K., Garg, S., and Sarafraz, N.(2016).	Stage at Diagnosis and Delay in Seeking Medical Care among Women with Breast Cancer, Delhi, India	172 females, Delhi, India	Cross Sectional study	Awareness of breast cancer was higher (80%) among literate women than illiterate ones (65.4%). One of the reasons for increased cancer mortality in developing countries is delay in seeking medical advice. Delay in early detection could be due to differences in sociodemographic and cultural factors, a strong belief in traditional medicine, negative perception of disease, poverty and poor education and coupled with fear and denial.

Author	Topic	Participants/ settings	Methods	Findings
Shrestha S, Chhetri S, Napit J. 2017	Awareness on breast self examination among reproductive age women.	50 females Nepal	Descriptive study	Regarding the meaning of breast cancer, 39 (78%) of the respondents stated growth of extra lump in breast. More than three fourth 82% of the respondent's state breast self-examination is the method of diagnosing breast cancer at early stage. Regarding the sign and symptoms of breast cancer, more than three fourth (82%) of the respondents answered painless abnormal growth in breast, seventy eight percent (78%) of the respondents answered change in size and shape of the breasts. 60% of the respondent's state health workers as source of information.

Author	Topic	Participants/ settings	Methods	Findings
Shrestha. K., 2012.	Breast cancer knowledge and screening practice among women visited to kist medical college	110 women Kathmandu, Nepal	cross-sectional descriptive study	Among 110 women only 26% women knew about the breast screening. and women who were doing breast self examination were 19, mammogram 3, and ultrasound were 4 in number. Out of 26 respondents only 31 % women had knowledge of mammogram. Result of this study shows low knowledge on breast cancer, risk factors and screening practice among women groups of this study

Author	Topic	settings	Methods	Findings
Gupta, A., Shridhar, K., Dhillon, P.K.(2015).	A review of breast cancer awareness among women in India: Cancer literate or awareness deficit?	India	Peer review	High mortality rates are due to lack of cancer awareness, the presence of humiliation, fear, gender inequity and reduced engagement in screening behaviors, such as breast self-examinations. The barriers to breast cancer care, limited access to treatment, and limited knowledge of health professionals are major barriers to cancer prevention and detection in developing countries.

Awareness programme in Nepal

