

YANGON UNIVERSITY OF ECONOMICS
DEPARTMENT OF STATISTICS
MASTER OF APPLIED STATISTICS PROGRAMME

BREAST SELF-EXAMINATION AMONG DIPLOMA NURSING
STUDENTS AT YANGON REGION

NI NI LWIN

MAS-12

DECEMBER, 2019

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STUDENTS AT YANGON REGION**

This thesis is submitted to the Board of Examination as partial fulfillment of the requirements for the Degree of Master of Applied Statistics

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ABSTRACT

The cross-sectional study on Breast Self-Examination among Diploma Nursing Students was conducted in all N.T.S in Yangon Region, from January to October 2019. The total number of 500 students, the first year students (44.4%), the second year students (24.4%) and the third year students (31.6%) from those schools, were selected by using stratified random sampling method and surveyed by using self-administered questionnaire. The aim of this study was to identify attitude and knowledge level of the respondents, to study the incidence rate of Breast Cancer in YGH and to find out the latent factors. Descriptive Statistics and Multivariate Factor Analysis Model were used and 72 males and 428 females were involved. The mean age of the respondents was 19.53 years and SD was ± 2.085 . According to the study, moderate level of knowledge was found in 300 (60%) and 260 (52%) respondents had positive attitude. The incidence rate of Breast Cancer increased from 2014 to 2018 according to the YGH hospital's statistics. This study showed that five latent factors were risk factors, preventive measures, right ways of technique, age & gender and health seeking behaviors. Five latent factors mainly influenced on the respondent's attitude towards Breast Cancer and Breast Self-Examination technique.

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LIST OF ABBREVIATIONS

ACS	American Cancer Society
BSE	Breast Self-Examination
CBE	Clinical Breast examination
CVI	Content Validity Index
CT	Computer Tomography
DCIS	Ductal Carcinoma In Situ
EV	Eigenvalues
HRT	Hormone Replacement Therapy
IARC	International Agency for Research on Cancer
KMO	Kaiser Meyer Olkin
MAP	Minimum Average Partial
MAS	Master of Applied Statistics
NBCF	National Breast Cancer Foundation, Inc
NTS	Nursing Training School
ENTS	East Nursing Training School
YNTS	Yangon Nursing Training School
NNTS	North Okkalapa Nursing Training School
NNTS	Nursing Related Field Practice Training School
Thanlyin NTS	Nursing and Midwifery Training School (Thanlyin)
PCA	Principal Component Analysis
SEER	Surveillance, Epidemiology and End Results
UN	United Nations
WHO	World Health Organization
YGH	Yangon General Hospital

CHAPTER I

INTRODUCTION

Cancer has become a public health problem worldwide and it affects all people: the young and the old, the rich and the poor, men and women, children and adult. Among the cancer, Breast cancer is the leading cause of cancer related deaths among women worldwide. Cancer is the second leading cause of deaths over the world, and it is estimated 9.6 million deaths in 2018, about 1 in 6 deaths is due to cancer. 70% of cancer deaths happen in low and middle-income countries approximately. Around 1/3 of cancer deaths was due to the 5 leading risk behavior and dietary pattern: high level body mass index, low rate fruit and vegetable uptake, lack of physical exercises, drug abuse like tobacco, drinking alcohol. The bigger cancer load is because of several factors including growing rate of population and aging (World Health Organization, 2018).

Cancer means that cells are uncontrolled in growth and spread. It can become any part of body frame. The cancer growth occurs gradually in surrounding tissues and it can metastasize to another. The global cancer observatory report estimated that in 2018. There were 18.1 million new cases and 9.6 million deaths with cancer. The happening of cancer gets bigger 1 in 5 men and 1 in 6 women over the world. Cancer leads to death 1 in 8 males and 1 in 11 females from the diseases during their lifetime. The total number of people who are alive within 5 years of cancer diagnosis moaned the 5-year prevalence, is estimated to be 43.8 million (GLOBOCAN Ferlay, Soerjomataram, Siegel, Torre and Jemal, 2018).

Education of patients is one strategy that has been recognized to decrease risk and, consequently, the cost associated with breast cancer (National Institute of Health, 2011). Breast Self-Examination for the disease should be an essential part of each woman's health routine. Females who appear to be at high risk for the disease (by personal or family history or because of other risk factors) is encouraged to begin their assessment at an early age and to have the assessment done more frequently.

Early detection of cysts and tumors of the breast is very important because it can provide the opportunity for treatment and revival from breast cancer. However, less than half of all women in the United States comply with the breast cancer screening recommendations established by the ACS (American Cancer Society, 2011).

Nurses are always the providers of safe and comprehensive effective care for the global population. Nursing professional spend more time with patients and families than any other health professional as they faced serious illness. Expert and quality of nursing care can reduce the more stress and more burden of disease. Comprehensive nursing care ability to support for physical, social, psychological and spiritual need of the patients and their families. If nursing students have more knowledge of Breast Cancer and BSE, they can provide information that is more adequate to people or can do the demonstration skills needed to perform the BSE technique. Prevention of cancer at early stages can cause more survival rates and more reduction in mortality. Therefore, it is necessary to explore if the nursing students from all Nursing Training Schools (3 years Nursing Diploma Program) in Yangon Region are taught in the appropriate content on Breast Self-Examination technique. Therefore, this study aimed to assess the knowledge and attitude Diploma Nursing students in Yangon Region towards Breast Cancer.

1.1 Rationale of the Study

Today Cancer is a global public health problem and the sixth leading cause of death globally. The International Agency for Research on Cancer (IARC, 2018) estimated 18.1 million new cancer cases and 9.6 million cancer deaths in 2018. Lungs Cancer and Breast Cancer in females are the leading types of death worldwide. Colorectal Cancer is the third most commonly diagnosed cancer and Prostate Cancer is the fourth one (WHO, 2018). World Health Organization estimated that approximately 70 % of deaths from cancer occur in low and middle-income countries and that there will be 27.5 million new cancers occur worldwide each year by 2040. (World Health Organization, 2018)

Cancer becomes from the transformation of normal cells into tumor cells in a multistage process. It generally progresses from a pre-cancerous lesion to a malignant tumor. Cancer changes are the result of the interaction between a person's genetic factors and three categories of external agents. External agents are physical

carcinogens, such as ultraviolet and ionizing radiation; chemical carcinogens, such as asbestos, components of tobacco smoke, aflatoxin (a food contaminant), and arsenic (a drinking water contaminant) and biological carcinogens, such as infections from certain viruses, bacteria, or parasites (WHO, 2018).

The exact etiology of Breast Cancer is unknown. Bio chemical factor will be identified. Although Breast Cancer is curable, early detection as BSE technique can have better prognosis and more survival chance. The American Cancer Society also recommends that women from the age of 20 years start should be educated on performing BSE monthly test. People especially women's awareness, knowledge and practice about Breast Cancer and BSE may contribute significantly to medical help-seeking behavior. WHO Breast Cancer Statistics, 2018 estimated that 268,600 women and 2670 men were Breast Cancer diagnosed and 41760 women and 500 men died of this cancer in 2019 in the United State. Early detection and exact diagnosis can greatly increase chances for successful treatment and chance for survival. Therefore, increasing awareness about the possible warning signs of the disease among the public is a necessity. American Cancer Society described that three basic methods are employed in diagnosing Breast Cancer early,(1) Mammography, (2)Clinical Breast Examination (CBE), and(3) Breast Self-Examination (BSE) (ACS, 2010). BSE is low cost, easily, acceptable and a cost-effective method for early detection of Breast Cancer. Mammography is the best screening method, but it is resource scarce for in the developing countries like Myanmar. BSE should be practiced and promoted for early detection of breast cancer .BSE should be prevent related morbidities and mortalities.

The incidence rate of Breast Cancer is one of the most common cancers among women in Myanmar, accounting for nearly 17.5% of newly diagnosed cancers in 2018. An estimated 6277 new cases of Breast Cancer is expected to occur among women in Myanmar during 2018. Breast Cancer is the sixth leading cause of death among cancer and for nearly 6.67% death in Myanmar during 2018 (WHO, 2019). Death rate from cancer has been rising every year in Myanmar, and 150 out of 100,000 people are suffering from cancer in the country currently. In developing countries including Myanmar, over 3 million people die of cancer every year according to WHO's report. It revealed that 35% of the cancer related deaths are

attributed to food; 30% to cigarette and 10% to viruses and 7% to diseases got from sexual activities. (WHO, 2018).

According to the statistics of Radiotherapy Department, Yangon General Hospital, the Breast Cancer is the second most common cancers among Myanmar women. According to (2013) admission record of cancer ward, YGH there was 10% of Breast Cancer in total cancer patients within six months. Mortality rate of Breast Cancer is 9% to 10% of total dead patients of cancer in each month. In Yangon General Hospital in 2014, the numbers of Breast Cancer patients was 1567 out of 7978 cancer patients. The morbidity rate of Breast Cancer was 11.3% in 2010 and 11.2% of all cancer-diagnosed patients in 2011 (Ministry of Health, 2013). From these data, it was noticed that the incidence rate of cancer patients increases year by year. Consequently, this problem becomes a critical issue for health care professional including nurses to deal with.

The statistics from the ten most common cancers registry of Radiotherapy Department Yangon General Hospital have shown that the Breast Cancer is the most common female cancer affecting Myanmar women (Department of Oncology, Y.G.H, 2014). 2000-bedded Yangon General Hospital is the biggest tertiary hospital in our country. In Yangon General Hospital, 1567 women were diagnosed with Breast Cancer, 50.8 % in reproductive aged women and 49.2 % of women over 50 years were diagnosed. In 2014, Breast Cancer patient is 1567 out of 7978 cancer patients (Department of Oncology, Y.G.H, 2014). In 2015, Breast Cancer patient is 951 among approximately 6712 of cancer patients (Department of Oncology, Y.G.H, 2015).

In Myanmar, there are two Nursing Universities in Yangon and Mandalay and 50 Nursing Training Schools in Myanmar during the year (2017-2018). Only 25% of the graduated nurses who entered the nursing profession with depending on their high school total marks are employed as graduated nurses. 100 % of nurses who finished three year diploma course (high school total marks in three subject) worked as technical nurses due to bond to deliver nursing care to the public. They are providing nursing care throughout the whole country. This research was conducted to elicit their knowledge and attitude regarding Breast Cancer and Breast Self-Examination (BSE). In this juncture, authorities including teachers will apply these data in formulating and

enhancing the integrated curriculum for those nurses to deliver quality nursing care to the people.

1.2 Objectives of the Study

General objective

The main purpose of this study was to identify Breast Cancer and Breast Self-Examination knowledge and attitude of Diploma Nursing students who are attending Nursing Training Schools of Yangon Region during the study period.

Specific Objectives

This study focused on the following objectives;

- (1) To identify attitude and knowledge level of the respondents towards Breast Cancer
and Breast Self-Examination
- (2) To study the incidence of Breast Cancer in Yangon General Hospital
- (3) To determine the factors associated with the attitude of Diploma Nursing students regarding Breast Cancer and BSE.

1.3 Method of Study

In this study, 500 sample students including male students were selected from all Nursing Training Schools at Yangon Region. Descriptive Statistics and Multivariate Factor Analysis Model were used in this study. The design of the survey was based on stratified random sampling. The questionnaire includes 15 items for knowledge and 34 items for attitude. The survey was made in all Nursing Training Schools in Yangon Region. This study was conducted in cooperation with all Nursing Training Schools administrators.

1.4 Scope and Limitation of the Study

Prevention is better than cure. Breast Cancer can occur in any age and any gender. Among them, Breast Cancer and BSE knowledge and attitude of Diploma Nursing students have been analyzed by the primary data. A sample survey was conducted in all Nursing Training Schools in Yangon Region, the results of the study could not be generalizable to entire Nursing students. It only involved one region. Data from self-administered questionnaires were analyzed to determine what factors

are related to knowledge and attitude of Breast Cancer and Breast Self-Examination among Diploma Nursing students in Yangon Region.

1.5 Organization of the Study

Five chapters organized this paper. Chapter I was introduction, which consisted of rationale of the study, the objectives of the study, the scope and limitation of the study, the method of study and organization of the study. Chapter II presented the reviews on background literature. Chapter III described the research methodology. Data analysis and result were presented in Chapter IV. Chapter V was conclusion, which included the discussions and the recommendations.

CHAPTER II

REVIEWS ON BACKGROUND LITERATURE

Cancer, a non-communicable disease is an important disease associated with severe suffering before eventual death of the patient. It is the sixth leading cause of death globally, and is responsible for an estimated 9.6 million deaths due to cancer. Approximately 70% of deaths from cancer occur in low-and middle-income countries and nearly five to ten percent of cancers are entire hereditary. Approximately one third of deaths from cancer are due to the five leading behavioral and dietary risks: high body mass index, low fruit and vegetable intake, lack of physical activity, tobacco use, infections, environmental pollution and alcohol use (WHO, 2018).

The etiology of cancer is that factors implicated or known to induce carcinogenesis include viruses and bacteria, physical agents, chemicals, genetic or family factors, diet, and hormones. Cancer is a disease caused by genetic changes leading to controlled cell growth and tumor formation. The basic cause of sporadic (non-familial) cancer is DNA damage and genomic instability. The minority of cancers is due to inherited genetic mutations. Most cancers are related to environmental, lifestyle, or behavioral exposures. Cancer is generally not contagious in humans. The term “environmental” that is used by cancer researchers, refers to everything outside the body that interacts with humans. The environment is not limited to the biophysical environment but also includes lifestyle and behavioral factors (Hinkle and Cheever, 2014).

The female breasts, also known as the mammary glands, are located on the front of the body. It overlies the second to sixth rib; two-thirds of it rests on pectoralis major, one-third on serratus anterior, while its lower medial edge just overlaps the upper part of rectus sheath. They extend out of the chest wall between the abdomen and the neck. Since a gland is an organ or a part of the body that can create a substance or secretion, the breasts are able to produce breast milk .The ability to make breast milk allows women to provide nutrition and nourishment to their children through breast feeding.

Signs and symptoms of cancer will vary depending on what part of the body is affected. If one has any of these signs, consults with health care professional. These are potential of seven important cancer symptoms: Change in bowel or bladder habits, a sore that does not heal, Unusual bleeding or discharge, Thickening or lump in the breast or elsewhere, Indigestion or difficulty in swallowing, Obvious change in a wart or mole and Nagging cough or hoarseness. Again, if one is experiencing any of these cancer symptoms, please see a specialist to schedule an examination and screening (National Cancer Institute, 2015).

2.1 Related Global Studies

Segni et al., (2016) conducted a study using cross-sectional study design to select 368 study subjects randomly. The researcher studied on breast self-examination; Knowledge, Attitude and Practice among Female Health Science Students at Adama Science and Technology University. Self-administered questionnaires were used to collect information. By using SPSS version 21 for further analysis. Bivariate and multivariate analyses were also performed with logistic regression to measure the association between dependent and independent variables. 368 respondents participated in the study, of these, only 8.7% of them had good knowledge and 59.2% had positive attitude towards BSE. About two fifth (39.4%) of the respondents had done breast self-examinations, from these only 9.7% of them practiced monthly. Statistically significant association was found only in the levels of education of the participants, father's educational level and program of the enrolment.

Gaud, L. E (2016) conducted the quantitative research study on Nursing Student's Breast Cancer Knowledge and Breast Self- Examination Technique Confidence. An online survey was administered to measure the students 'Breast Cancer Knowledge and Breast Self- Examination Technique Confidence. A sample 100 nursing students (54 senior and 46 Freshman) included the social cognitive Theory guided study. The study results indicated that senior nursing students had higher mean scores on the BCK and BSE –Tc, as would be expected. However, and senior nursing students' BCK_BSE_TC scores were also found to be very low. This is a concern for the future of breast cancer detection. This study provided data showing that breast cancer screening concepts are unclear to fresher students, and remain unclear with senior students. Nursing educational curriculum about in breast

cancer screening should be revised for the improvements in nurses' role in advising and educating patients.

Abdelmaqsoud1 et al., (2014) conducted an observational cross-sectional study among Faculty of Medicine, Taif University during October 2013. Sample size was 378. The study was to determine knowledge, attitude and practice among students of Saudi female medical university towards Breast Self-Examination (BSE) and also to explore their knowledge about breast cancer. The study revealed that only 8.2% of participants had good overall knowledge about breast cancer and BSE. Although 66% of the study sample had positive attitude towards BSE, only 17% reported that they practiced BSE monthly. The researcher recommended that: although there was lack of knowledge about breast cancer and BSE yet, positive attitude towards BSE should be encouraged. Most female medical students in our sample did not perform BSE or perform it irregularly. Therefore, more intensified awareness programs among the students of medical university are necessary to keep in view their current status of breast cancer and BSE knowledge. Further researches are needed to identify causes of inadequate knowledge and practice of BSE among medical students in Taif.

Segni,M.T &Tadesse ,D. M (2015) conducted a study using a cross-sectional study design at Adama science and Technology University in 2014. . Sample size was 368. The study was to determine Knowledge, Attitude and Practice of regular Breast self-examination amongst female health science students of Adama science and Technology University. Self-administered questionnaires were used to collect information. Bivariate and multivariate analyses were also performed with logistic regression to measure the association between dependent & independent variables. A total of 368 respondents participated in the study, of these, only 8.7% of them had good knowledge and 59.2% had positive attitude towards BSE. About two fifth (39.4%) of the respondents had done breast self-examinations, from these only 9.7% of them practiced monthly. The researcher recommended that Knowledge and practise of BSE was low, even though majority of them had positive attitude. Being health care professional was the major mentioned reason for not doing BSE. The Ministry of Health is recommended to promote awareness about BSE through emergence of groups in the University, celebrating days like breast cancer day.

Juanita ,(2013) conducted a descriptive study on seventy-six nursing students to make a survey about the level of BSE practice among female nursing students from the Public Nursing College, Syiah Kuala University in Aceh, Indonesia. This study revealed that only 39.5% of the students practised BSE with more than half of the students saying they did not practise BSE (60.5%). The main factors that influenced on the students' performing BSE were not having a family history of breast cancer being single, and no history of breast illness. Among the thirty students who practised BSE, most of them did not practise it routinely (70%), nor at the correct time (86.7%), and their confidence level in performing BSE was at a moderate level, with a high level for BSE procedural efficacy and moderate level for barrier management efficacy. The researcher recommended that majority of the Acehnese nursing students did not practice BSE, and those who did had only a moderate level of BSE self-efficacy. Therefore, the results of this study suggested emphasizing on the need to teach nursing students about BSE in their undergraduate courses, with future follow-up research regarding the success of the educational program.

Ayed,(2015) conducted a descriptive, cross sectional study on BSE knowledge, attitude, and practice among female nursing students in Arab American University /Jenin. 97 female nurses students were included. The results indicated that 15.5% of the respondents had good overall knowledge towards BSE, The major source of information about BSE (57.6 %) was mass media in the study, 75.3% of the participants had positive attitude towards BSE, and 4.1% always practise BSE every month. There was a significant difference between age and academic level towards Knowledge of BSE. At the same time, there was a significant difference between overall knowledge and practice of BSE ($P= 0.000$).This study recommended that most females nursing students had poor knowledge about BSE and did not perform BSE. Mass Media is an important source of information about BSE to improve awareness among the community.

2.2 Related Local Studies

The results of the study conducted by Khin- May- Ohn, Nang- Htawn Hla, Khin- Nyo, Nang- Voe- Phan, Khin- Ma- Ma, Pan-Ei- Phyu and Nyi- Nyi- Htay (2007) surveyed on the knowledge, attitude and practice of adult women with regard to breast self -examination among women, in Dawpone Township. A cross-sectional

exploratory community perceived based study was carried out on randomly selected 1110 adult women aged (15-60+) years of Dawpone Township, Yangon Division in March, 2005. The researchers stated 17.2 % believed to develop breast cancer , 34% perceived so high risk group , 9.8 % perceived as any age ,9.8 % knew methods of detecting breast cancer ,9.4 % did not know at which age the breast cancer could occur Knowledge about the existence of breast cancer is statistically significantly associated with higher educational level. Younger age group, which higher education level and being single more believed BSE should be done regularly and feel that they may develop breast cancer. Those with older age and higher education level practice BSE more.

Myo-Myo-Mon, Mon-Mon and Kyu-Kyu-Than (2009) studied about Women's Awareness, Knowledge and Perceived Magnitude Regarding Common Female Cancers. A community-based, cross-sectional study was conducted with total of 400 women from 43 townships of Yangon Division, 4 peri-urban townships were randomly selected namely Hlaing Thar Yar, East Dagon, South Dagon and Shwe Pyi Thar, using a pretested, structured questionnaire. Mean age of women was 48.4 years, most were married, dependents and primary school passed. Almost all (99.3%) were aware of breast cancer More than half (56.2%) thought that breast cancer was preventable and (93.2%) agreed that breast self-examination can be done to detect the breast lump at early stage. This study suggested that health education activities. They were risk factors and early warning signs of cancer still need to be promoted.

Hlaing-Ya-Min-Myint,(2015) conducted a cross-sectional descriptive research study on knowledge and attitude towards breast self examination among 400 pregnant women in Central Women Hospital, Yangon by using structured questionnaire in 2015. Convenience sampling method was used and instrument was based on Health Belief Model. SPSS version 20 was used for data analysis. The study revealed that only 16.5% had high level of knowledge and 51.3% had positive attitudes. Knowledge level of BSE was associated with the age, education level and occupation. Although the women who had family history or previous history of breast problems, the level of awareness on breast cancer including breast cancer screening which is one of the method for early detection of breast cancer is poor. The researcher recommended that Education program is needed to increase awareness about breast

cancer, Mass media should have a role in awareness raising on breast cancer and Educational materials such as pamphlets, poster and handbills should be accessible to facilitate better learning.

Kay-War-Win , Khin- Hnin- Mon , Khin- May-Lwin-Htun (2019) conducted A cross-sectional study on knowledge of women regarding breast cancer in Shwe-Lin-Pann Village, Hlaing-Thar-Yar Township, Yangon Region. 220 respondents (20 to 40 years old adult women in in Shwe-Lin-Pann Village, Hlaing-Thar- Yar Township, Yangon Region by using structured questionnaire in 2019. Multistage sampling method was used in this study. There are 40 items of questionnaires and total knowledge level of women between 20 to 40 years of age were low level (n=27) 12.3%, moderate level (n=177) 80.5% and high level (n= 16) 7.3%. The researcher recommended that education about breast cancer should be emphasized to reduce morbidity and mortality of breast cancer among women.

Swe-Swe-Win-Htet (2018) conducted Social Media Impact on Students in Bago University. This study was conducted with 550 sample students within the age 16-24 were selected from Bago University. Stratified random sampling method was used and self-structured questionnaire includes 40 items and 5-point Likert type scale was used. Descriptive Analysis, Exploratory Factor Analysis, Confirmatory Factor Analysis and Independence Sample Test has been applied in this study. Finally, the study identifies through the confirmatory and exploratory factor analysis, 39 items on the effects of social media usage among 40 variables were clearly found out 8 key main factors outcome; learning usage, usage people, sad impact , addiction, multiple uses , health problem and personal problem. According to the exploratory factor analysis and confirmatory factor analysis, the variance and covariance of each factor and overall factor are from 87.8 % to 100 % explained by the model and that are acceptably fit. It was found that the postulated eight factors by conducting the factor analysis are acceptable fit. Their model are acceptable.

CHAPTER III

RESEARCH METHODOLOGY

Research Methodology is the basic portion of the study that presents how to conduct the research. Methodology is the philosophical framework within which the research is conducted or the foundation upon which the research is based. Quantitative research is a formal, objective, rigorous, systematic process for generating numerical information about the world (Burns and Grove, 2011). It consists of research design, research setting, population and sample size, research instruments, data collection procedure, data management and analysis procedure.

3.1. Study Design

The cross-sectional descriptive research survey design was used in this study. Study period was from January 2019 to September 2019. The study population were all Nursing Diploma Students who were attending at all Nursing Training Schools in Yangon Region. There are (5) Nursing Training Schools in Yangon named Yangon Nursing Training School, East Nursing Training School, Nursing Related Field Practice Training School, Thanlyin Nursing Training School and North Nursing Training School.

3.2 Determining the Sample Size and

There are 920 students studying in 5 Nursing Training Schools, which are situated in Yangon Region at 2019. In this study the proportion of student's BSE knowledge is assumed to be 0.5. the appropriate stratified random sample is chosen with a bound on the error of estimation B of 0.05 (assumed) by using following "Proportional to allocation method formula .

$$n \geq \frac{\sum \left(\frac{N_h^2 \hat{p}_h \hat{q}_h}{w_h} \right)}{N^2 D + \sum_{h=1}^L N_h \hat{p}_h \hat{q}_h}$$

where

N_h = Number of units in stratum h (each nursing training school)

\hat{p}_h = Proportion of student's BSE knowledge for stratum h (maximum possible proportion = 0.5)

$\hat{q}_h = (1 - \hat{p}_h)$ proportion of students unknown for BSE knowledge for stratum h (each Nursing Training School)

B = Bound on the error of estimation = 0.05

D = Margin of error

$$= \frac{B^2}{4} = \frac{(0.05)^2}{4} = \mathbf{0.00625}$$

$w_h = \frac{N_h \hat{p}_h \hat{q}_h}{\sum N_h \hat{p}_h \hat{q}_h}$ = the fraction of observations allocated to stratum h (each Nursing Training School)

$$n \geq \frac{215.628}{(920)^2 \times 0.000625 + 230} \geq \mathbf{444.709} \approx \mathbf{445}$$

The required sample size is at least 445 students. However, in many health science research survey, the response rates are typically well below 100%. Therefore required sample size (round about 90% rate assumed) is 500 (445/0.89) students. Since the cost of sampling in each Nursing Training School (stratum) does not vary from stratum to stratum, the sample size of each stratum is determined by using the following Neyman allocation method.

$$n_h = n \times w_h$$

where,

n_h = sample size for stratum h

The corresponding allocation for each stratum (Nursing training schools) is presented in appendix Table (3.1) and Table (3.2). The sample size (500) for each stratum are - 223, 105, 51, 18 and 102 respectively.

Table (3.1) Sample Size Allocation from each School

No	Names of Schools	Male Students	Female Students	Total Students	Selected Students
1	Y.NTS	32	378	410	223
2	E.NTS	21	173	194	105
3	NRFTS	8	86	94	51
4	Thanlyin NTS	3	31	34	18
5	N.NTS	16	172	188	102
	All Total Students	80	840	920	500

(Source-Survey Data 2019)

Table (3.2) Sample Sizes from Each Strata Calculation

Strata	Names of Schools	N_h	\hat{p}_h	\hat{q}_h	$N_h\hat{p}_h\hat{q}_h$	$w_h = \frac{N_h\hat{p}_h\hat{q}_h}{\sum N_h\hat{p}_h\hat{q}_h}$	$N_h\hat{p}_h\hat{q}_h/w_h$	Sample sizes of each strata $n_h = nw_h$
I	Y.NTS	410	0.5	0.5	102.5	0.44565	22.718	$n_1 = 500 \times 0.4456 = 222.825 = 223$
II	E.NTS	194	0.5	0.5	48.5	0.21087	33.026	$n_2 = 500 \times 0.21087 = 105.4 = 105$
III	NRFTS	94	0.5	0.5	23.5	0.10217	47.445	$n_3 = 500 \times 0.10217 = 51.085 = 51$
IV	ThanLyin	34	0.5	0.5	8.5	0.03696	78.889	$n_4 = 500 \times 0.03696 = 18.48 = 18$
V	N.NTS	188	0.5	0.5	47	0.20435	33.549	$n_5 = 500 \times 0.20435 = 102.175 = 102$
		920	-	-	230		215.627	$n = 500$

(Source-Survey Data, 2019)

3.3 Data Analysis

Descriptive Statistics and Multivariate Factor Analysis were used to interpret the demographic data. Knowledge statements were constructed as True or False. The respondents who selected the correct answer for knowledge questions obtained (1) mark, wrong answer obtained (0) mark and weightage was converted into percentage from 0% to 100%. The correct answer for negative items obtained the same score as positive items. The levels of knowledge about Breast Self-Examination were determined by using Bloom's classification (<60% as low level of knowledge, 60-80% as moderate level of knowledge and >80% as high level of knowledge) For positive attitude statements, scores of five, four, three, two and one mark for “strongly agree”, “agree” “unknown” “disagree” and “strongly disagree” were obtained respectively. This scoring was reversed for the negative statements. For the fifteen attitude statements, total score was ranged from 34 to 170 points and divided into 2 categories as positive attitude and negative attitude. Negative attitude was below mean and positive attitude was mean and above mean.

Content Validity Testing of Research Instrument

Content validity is the extent to which an instrument has an appropriate sample of items for the construct being measured and is an important procedure in scale development. Content validity index (CVI) is the most widely used index in quantitative evaluation. There are two kinds of CVI: I-CVI and S-CVI. The first type involves the content validity of individual items and the second involves the content validity of the overall scale. Validation of a scale should be done with a minimum of three experts, but a larger group is preferable. Researchers recommend that a scale with excellent content validity should be composed of I-CVIs of 0.78 or higher and (S-CVI) should be at 0.90 or higher (Polit and Beck, 2008). Five experts were requested to judge the degree of validity of the contents of the research instruments. The experts were credited in the appendix V. Firstly, five experts were given the title and objectives of the study, questions (English version). To calculate the CVI, each item was ranked on (1 = not relevant, 2 = unable to assess relevance without item revision, 3 = relevant but needs minor alteration and 4 = very relevant and succinct). The ratings of 3 and 4 are considered as “content valid” (Lynn, 1986). For each item,

the CVI was calculated as the number of experts who provided a rank of 3 or 4, divided by the total number of experts.

Secondly, the following formula suggested by Lynn (1986) was used to compute the content validity index (CVI).

$$CVI = \frac{n_e}{N}$$

where,

n_e = number of experts rating the items as 3 or 4

N = total number of experts

Finally, both content validity index for scale (S-CVI) and content validity index for items (I-CVI) were computed. The CVI of at least 0.80 is considered to be a good criterion for accepting an item as valid (Davis, 1992). In this study, the values of S-CVI and I-CVI for each of the scales were acceptable as shown in Table (3.3).

Table (3.3) (CVI) of the Research Instruments

No.	Instrument	S-CVI (5 Experts)	I-CVI (Range) (5 Experts)
1.	Knowledge Questions(15 items)	0.94	0.8 – 1
2.	Attitude Questions (34 items)	0.98	0.8 – 1

(Source-Author's Computation Based on Survey Data, 2019)

Reliability Test

Before data collection, the questionnaire were to obtain validity and reliability of the research instruments. The investigator sought suggestion from the expert personel in nursing. Thereafter, 30 nursing students were selected from Mandalay Nursing Training School for pre-test of the questionnaire. After the pre-test, the questionnaire were revised and finalized accordingly. Reliability of an instrument is an essential component in quantitative measure. Internal consistency and reliability is the most broadly reliability approach. (Polit and Beck, 2008). The most useful method for evaluating internal consistency is coefficient alpha (or Cronbach's Salpha). Alpha value above 0.70 is considered acceptable; however, values above 0.80 are preferable (Pallant, 2009).Reliability of the instrument was tested by performing pretest. Based

on the subject criteria of the selection, 30 nursing students were selected from Mandalay Nursing Training School to test internal consistency of the research instrument. The reliability of the questionnaires (Cronbach's alpha coefficient) was tested by using SPSS 22.0 version software. In this study, reliability test was 0.911 for knowledge questions and 0.868 for attitude questions for following Tables (3.4),(3.5) and (3.6).

Table (3.4) Reliability Testing of the Research Instruments

(Knowledge Questionnaire for pretest)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.911	.915	15

(Source-Author's Computation Based on Survey Data, 2019)

Table (3.5) Reliability Testing of the Research Instruments

(Attitude Questionnaire for pretest)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
.868	.872	34

(Source-Author's Computation Based on Survey Data, 2019)

Table (3.6) Reliability Testing of the Research Instruments

(Knowledge & Attitude Questionnaire for pretest)

Reliability Statistics

Sr. No	Instrument	Pretest (n=30)
1.	Knowledge Questions(15 items)	.911
2.	Attitude Questions(51 items)	.868

(Source-Author's Computation Based on Survey Data, 2019)

3.4 Factor Analysis

Factor analysis is a branch of statistical science but because of its development and extensive use in psychological aspect, the technique itself is often mistakenly considered as psychological theory.

Reliability Analysis

The reliability of an instrument is an essential component in quantitative measure. Internal consistency reliability is the most broadly reliability approach. (Polit and Beck, 2008). The most useful method for evaluating internal consistency is coefficient alpha (or Cronbach's alpha). Alpha value above 0.70 is considered acceptable; however, values above 0.80 are preferable (Pallant, 2009).

Reliability is the scale construction counterpart of precision and accuracy in physical measurement. Reliability can be thought of as consistency in measurement. To establish the reliability of the data, the reliability coefficient (Cronbach Alpha) was verified. There are a number of different reliability coefficients. One of the most commonly used is Cronbach's alpha. Cronbach's alpha can be interpreted as a correlation coefficient; it ranges a value from 0 to 1. Robinson and Shaver (1973) suggested that if Alpha is greater than 0.7, it means high reliability and if Alpha is smaller than 0.3, it means low reliability. Moreover, it is often said that Cronbach's Alpha is the more reliable scale.

Before using the factor analysis, it is very important to test the reliability of the dimensions in the questionnaires. Cronbach's alpha, a statistical test used to examine the internal consistency of attributes, was determined for each dimension. This statistical test shows that the attributes are related to each other and to the composite score. The composite score for each section of the questionnaires was obtained by summing the scores of individual statements. Cronbach's alpha is defined as:

$$\alpha = \frac{K}{K - 1} \left[1 - \frac{\sum_{i=1}^k S_i^2}{S_T^2} \right]$$

where

α =Cronbach's alpha,

K= Number of Statement

S_i^2 = variance of each statement

S_7^2 = variance for sum of all items

If alpha value is high, then this suggests that all of the items are reliable and the entire test is internally consistent. If alpha is low, then at least one of the items is unreliable and must be identified via item analysis procedure. However, the Cronbach's alpha value should be above 0.7.

Testing for Sampling Adequacy

Kaiser-Meyer-Olkin (KMO) Test is a measure of how suited the data which is used for factor analysis. The test measures sampling adequacy for each variable in the model and for the complete model. The statistic is a measure of the proportion of variance among variables that might be common variance. The lower the proportion, the more suited the data are for factor analysis. KMO return values between 0 and 1. A rule of thumb for interpreting the statistics. KMO value less than 0.8 and 1 indicate the sampling is adequate. KMO value less than 0.6 indicate the sampling is not adequate and that remedial action should be taken. KMO values close to zero means that there are large partial correlations compared to the sum of correlations. KMO measure of sample adequacy compares magnitudes of observed correlation . Kaiser gives value of

KMO > 0.9 Marvelous

0.8 < KMO < 0.9 Meritorious

0.7 < KMO < 0.8 Middling

0.6 < KMO < 0.7 mediocre

0.5 < KMO < 0.6 Miserable

KMO < 0.5 unacceptable

The Bartlett's Test that is used to determine if values in the correlation matrix are different from an identity matrix.. The Bartlett's Test of Sphericity relates to the significance of the study and thereby shows the validity and suitability of the responses collected to the problem being addressed through the study. For a large sample, Bartlett's test approximates a Chi-square distribution. However, the Bartlett's test compares the observed correlation matrix to the identity matrix. Therefore; the Bartlett's Test forms something of a bottom line test for large samples, but is less reliable for small samples. For factor analysis to be recommended suitable, the Bartlett's Test of Sphericity must be less than 0.05. In addition to, very small values of significance (below 0.05) indicate a high probability that there are significance

relationship between the variables, whereas higher values (0.1 or above) indicate the data is inappropriate for factor analysis.

Orthogonal Factor Model

The orthogonal factor (Richard A. Johnson, 1992) was described. The observable random vector X , with p components, has mean μ and covariance matrix Σ . The factor model postulates that X is linearly dependent upon a few unobservable random variables F_1, F_2, \dots, F_m , called common factors, and p additional sources of variation e_1, e_2, \dots, e_p , called errors or, sometimes, specific factors. In particular, the factor analysis model is as:

$$\begin{aligned} X_1 - \mu_1 &= \ell_{11} F_1 + \ell_{12} F_2 + \dots + \ell_{1m} F_m + e_1 \\ &\vdots \\ X_p - \mu_p &= \ell_{p1} F_1 + \ell_{p2} F_2 + \dots + \ell_{pm} F_m + e_p \end{aligned}$$

(or) in matrix notation,

$$X - \mu = L F + \varepsilon$$

$(p \times 1)$ $(p \times m)$ $(m \times 1)$ $(p \times 1)$

μ_i = mean of variable i

ε_i = i th specific factor

F_j = j th common factor

ℓ_j = loading of the i th variable on the j th factors

The unobservable random vectors F and ε satisfy the following conditions:

F and ε are independent

$$E(F) = 0, \text{Cov}(F) = I$$

$$E(\varepsilon) = 0, \text{Cov}(\varepsilon) = \Psi, \text{ where } \Psi \text{ is a diagonal matrix}$$

Covariance Structure

The orthogonal factor model implies a covariance structure for X ,

$$\begin{aligned} \Sigma &= \text{Cov}(X) = E(X - \mu)(X - \mu)' \\ &= LE(FF')L' + E(\varepsilon\varepsilon') \\ &= LL' + \Psi \end{aligned}$$

by independence, $\text{Cov}(\varepsilon, F) = E(\varepsilon F') = 0$

$$\text{Cov}(X) = LL' + \Psi \quad (\text{or})$$

$$\begin{aligned}\text{Var}(X_i) &= \ell_{i1}^2 + \dots + \ell_{im}^2 \\ \text{Cov}(X_i, X_k) &= \ell_{i1}\ell_{k1} + \ell_{i2}\ell_{k2} + \dots + \ell_{im}\ell_{km} \\ \text{Cov}(X, F) &= L \\ \text{(or)} \quad \text{Cov}(X_i, F_j) &= \ell_{ij}\end{aligned}$$

The model $X - \mu = LF + \varepsilon$ is linear in the common factors. The portion of the variance of the i th variable contributed by the m common factors is called the i th communality. That portion of $\text{Var}(X_i) = \sigma_{ii}$ due to the specific factor is called uniqueness or specific variance. Denoting the i th communality by h_i^2 ,

$$\begin{aligned}\sigma_{ii} &= \underbrace{\ell_{i1}^2 + \ell_{i2}^2 + \dots + \ell_{im}^2}_{\text{communality}} + \psi_i \\ \text{Var}(X_i) & \qquad \qquad \qquad \text{Specific Variance}\end{aligned}$$

(or)

$$h_i^2 = \ell_{i1}^2 + \ell_{i2}^2 + \dots + \ell_{im}^2$$

and

$$\sigma_{ii} = h_i^2 + \psi_i, \quad i = 1, 2, \dots$$

The i th communality is the sum of squares of the loadings of the i th variable on the m common factors.

Methods of Estimation

The sample covariance matrix S is an estimator of the unknown population covariance matrix Σ . If the off-diagonal elements of S are small or those of the sample correlation matrix R essentially zero, the variables are not related, and a factor analysis will not prove useful. In these circumstances, the specific factors play the dominate role, whereas the major aim of factors analysis is to determine a few important common factors.

If Σ appears to deviate significantly from a diagonal matrix, then a factor model can be entertained, and the initial problem is one of estimating the factor loadings ℓ_{ij} and specific variances ψ_i . Two most popular method of the parameter estimation are the principal component method and the maximum likelihood method. The solution from either method can be rotated in order to simplify the interpretation of factors. If the factor model is appropriate for the problem to try, more than one method of solutions should be consistent with one another.

The Principal Component Method (Principal Factor)

The Principal Factor (Richard A. Johnson, 1992) was described. The spectral decomposition provides with one factoring of the covariance matrix Σ . Let Σ has eigenvalue – eigenvector pairs (λ_i, e_i) with $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_p \geq 0$ then,

$$\begin{aligned} \Sigma &= \lambda_1 e_1 e_1' + \lambda_2 e_2 e_2' + \dots + \lambda_p e_p e_p' \\ &= \begin{bmatrix} \sqrt{\lambda_1} e_1 & & & \\ & \sqrt{\lambda_2} e_2 & & \\ & & \dots & \\ & & & \sqrt{\lambda_p} e_p \end{bmatrix} \begin{bmatrix} \sqrt{\lambda_1} e_1' \\ \dots \\ \sqrt{\lambda_2} e_2' \\ \dots \\ \sqrt{\lambda_p} e_p' \end{bmatrix} \end{aligned}$$

This fits the prescribed covariance structure for the factor analysis model having as many factors as variables ($m = p$) and specific variances $\psi_i = 0$ for all i . The loading matrix has j th column given by $\sqrt{\lambda_j} e_j$. That can be written as

$$\Sigma_{(p \times p)} = L_{(p \times p)} L'_{(p \times p)} + 0 = LL'$$

Apart from the scale factor $\sqrt{\lambda_i}$, the factor loadings on the j th factor are the coefficients for the j th principal component of the population.

Although the factor analysis representation of Σ is exact, it is not particularly useful. It employs as many common factors as there are variables and does not allow for any variation in the specific factors ε .

One approach when the last $p-m$ eigenvalues are small, is to neglect the contribution of $\lambda_{m+1} e_{m+1} e_{m+1}' + \dots + \lambda_p e_p e_p'$ to Σ . Neglecting this contribution, the approximation will be obtain as:

$$\Sigma \approx \begin{bmatrix} \sqrt{\lambda_1} e_1 & & & \\ & \sqrt{\lambda_2} e_2 & & \\ & & \dots & \\ & & & \sqrt{\lambda_m} e_m \end{bmatrix} \begin{bmatrix} \sqrt{\lambda_1} e_1' \\ \dots \\ \sqrt{\lambda_2} e_2' \\ \dots \\ \sqrt{\lambda_m} e_m' \end{bmatrix} = L_{(p \times m)} L'_{(m \times p)}$$

The approximate representation is assuming that the specific factors ε are minor importance and can also be ignored in the factoring of Σ . Allow for specific factors we find that the approximation becomes,

$$\Sigma = LL' + \psi$$

$$= \begin{bmatrix} \sqrt{\lambda_1} e_1' & & & \\ & \sqrt{\lambda_2} e_2' & & \\ & & \ddots & \\ & & & \sqrt{\lambda_m} e_m' \end{bmatrix} + \begin{bmatrix} \psi_1 & 0 & \cdots & \\ 0 & \psi_2 & \cdots & \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & \end{bmatrix}$$

where $\psi_i = \sigma_{ii} - \sum_{j=1}^m \ell_{ij}^2 \quad i = 1, 2, \dots, p$

To apply this approach to a data set x_1, x_2, \dots, x_n , it is customary first to center the observations by subtracting the sample mean \bar{x} . The cantered observations

$$x_j - \bar{x} = \begin{bmatrix} x_{j1} \\ x_{j2} \\ \vdots \\ x_{jp} \end{bmatrix} - \begin{bmatrix} \bar{x}_1 \\ \bar{x}_2 \\ \vdots \\ \bar{x}_p \end{bmatrix} = \begin{bmatrix} x_{j1} - \bar{x}_1 \\ x_{j2} - \bar{x}_2 \\ \vdots \\ x_{jp} - \bar{x}_p \end{bmatrix} \quad i = 1, 2, \dots, n$$

have the same sample covariance matrix S as the original observation. In cases where the units of the variables are not commensurate, it is usually desirable to work with the standardized variables.

$$z_j = \begin{bmatrix} \frac{(x_{j1} - \bar{x}_1)}{\sqrt{s_{11}}} \\ \frac{(x_{j2} - \bar{x}_2)}{\sqrt{s_{22}}} \\ \vdots \\ \frac{(x_{jp} - \bar{x}_p)}{\sqrt{s_{pp}}} \end{bmatrix} \quad j = 1, 2, \dots, n$$

This sample covariance matrix is the sample correlation matrix R of the observations x_1, x_2, \dots, x_n . Standardization avoids the problems of having one variable with large variance unduly influencing the determination of factor loadings. The sample covariance matrix S or the sample correlation matrix R is known as principal component solution.

Principal Component Solution

The principal component factor analysis of the sample covariance matrix S is specified in terms of its eigenvalue – eigenvector pairs $(\hat{\lambda}_1, \hat{e}_1), (\hat{\lambda}_2, \hat{e}_2), (\hat{\lambda}_3, \hat{e}_3), \dots, (\hat{\lambda}_p, \hat{e}_p)$ where $\hat{\lambda}_1 \geq \hat{\lambda}_2 \geq \hat{\lambda}_3 \geq \dots \geq \hat{\lambda}_p$. Let $m < p$ be the number of common factors. Then the matrix of estimated factor

loading ($\tilde{\ell}_{ij}$) is given ... $\tilde{\ell}_{ij} = \begin{bmatrix} \sqrt{\hat{\lambda}_1} \hat{e}_{1j} & \sqrt{\hat{\lambda}_2} \hat{e}_{2j} & \sqrt{\hat{\lambda}_3} \hat{e}_{3j} & \dots & \sqrt{\hat{\lambda}_m} \hat{e}_{mj} \end{bmatrix}$

The estimated specific variance are provided by the diagonal elements of the matrix $S - \tilde{\ell} \tilde{\ell}'$.

$$\Psi = \begin{bmatrix} \psi_1 & 0 & \dots & 0 \\ 0 & \psi_2 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & \psi_m \end{bmatrix} \quad \text{with} \quad \psi_i = s_{ii} - \sum_{j=1}^m \ell_{ij}^2$$

Communalities are estimated as

$$h_i = \tilde{\ell}_{i1}^2 + \tilde{\ell}_{i2}^2 + \dots + \tilde{\ell}_{im}^2$$

The principal component factor analysis of the sample correlation matrix is obtained by starting with R in place of S .

Residual Matrix

If the number of common factors is not determined by a priority considerations based on the estimated eigenvalues in much the same manner as with principal components, consider the residual matrix

$$S - (\tilde{\ell} \tilde{\ell}' + \tilde{\Psi})$$

resulting from the approximation of S by the principal component solution. The diagonal elements are zero.

Sum of squared entries of $(S - (\tilde{\ell} \tilde{\ell}' + \tilde{\Psi}))_{ii} = \hat{\lambda}_{m+1}^2 + \dots + \hat{\lambda}_p^2$

The contributions of the first few factors to the sample variances of the variables should be large. The contribution to the sample variance s_{ii} from the first common

factor is $\tilde{\ell}_1^2$. The contribution to the total sample variance, $s_{11} + s_{22} + \dots = \text{tr}(\mathbf{S})$, from the first common factor is then

$$\tilde{\ell}_1 \tilde{\ell}_1 \dots \tilde{\ell}_1 \left(\sqrt{\hat{\lambda}_1} \hat{e}_1 \right)' \left(\sqrt{\hat{\lambda}_1} \hat{e}_1 \right) = \hat{\lambda}_1$$

Since the eigenvector \hat{e}_1 has unit length. In general

$$\left(\begin{array}{l} \text{Proportion of total} \\ \text{sample variance} \\ \text{due to } j\text{th factor} \end{array} \right) = \left\{ \begin{array}{ll} \frac{\hat{\lambda}_j}{s_{11} + s_{11} + s_{11} + \dots} & \text{for a factor analysis of } \mathbf{S} \\ \frac{\hat{\lambda}_j}{p} & \text{for a factor analysis of } \mathbf{R} \end{array} \right.$$

Frequently used as a heuristic device for determining the appropriate number of common factors. The number of common factors retained in the model is increased until a “suitable proportion” of the total sample variance has been explained.

Factor Rotation

The factor rotation (Richard A. Johnson, 1992) was described. All factor loadings obtained from the initial loadings by a orthogonal transformation have the same ability to reproduce the covariance matrix. An orthogonal transformation of the factor loadings as well as the implied orthogonal transformation of the factors is call factor rotation. If \hat{L} if the $p \times m$ matrix of estimated factor loadings obtained by any method then,

$$\hat{L}^* = \hat{L}T, \quad \text{where } TT' = T'T = \mathbf{I} \quad \text{is a } p \times m \text{ matrix of rotated loadings.}$$

The estimated covariance matrix remains unchanged, since

$$\hat{L}\hat{L}' + \hat{\Psi} = \hat{L}TT'\hat{L}' + \hat{\Psi} = \hat{L}^*\hat{L}^{*'} + \hat{\Psi}$$

Equation indicates that the residual matrix $S_n - \hat{L}\hat{L}' - \hat{\Psi} = S_n - \hat{L}^*\hat{L}^{*'} + \hat{\Psi}$ remains unchanged. The specific variance $\widehat{\psi}_i$ and hence the communalities \hat{h}_i^2 , are unaltered. Thus, from a mathematical viewpoint, it is immaterial whether \hat{L} or \hat{L}^* is obtained.

The original loading may not be readily interpretable it is usual practice to rotate the until a simpler structure is achieved. Each variable loads highly on a single factor and has small to moderate loadings on the remaining factors. It is possible to

get this simple structure and the rotated loading for the decathlon data provide a clearly pattern. Graphical and analytical methods should be concentrated for determining an orthogonal rotation to a simple structure.

Oblique Rotation

The oblique rotation (Richard A. Johnson, 1992) was described. Orthogonal rotations are appropriate for a factor model in which the common factors are assumed independent. Many investigators in social sciences consider oblique (nonorthogonal) rotations, as well as orthogonal rotations. Oblique rotation is frequently a useful aid in factor analysis.

If the m common factors are as coordinate axes, the point with the m coordinates $(\hat{\ell}_{i1}, \hat{\ell}_{i2}, \hat{\ell}_{i3}, \dots, \hat{\ell}_{im})$ represents the position of the i th variable in the factor space. Assuming that the variables are grouped into non overlapping clusters, an orthogonal rotation to a simple structure corresponds to a rigid rotation of the coordinate axes such that the axes, after rotation, pass as closely to the clusters as possible. An oblique rotation to a simple corresponds to a nonrigid rotation of the coordinate system such that the rotated axes (no longer perpendicular) pass (nearly) through the clusters. An oblique rotation seeks to express each variable in terms of a minimum number of factors preferably, a single factor.

Varimax Rotation

The Varimax Rotation (Richard A. Johnson, 1992) was described. When principal components analysis and factor analysis identify the underlying factors then $d3.0$ is used as a greedy algorithm. They begin by identifying the first component in such a way that it explains as much variance as possible, and proceed by identifying the next component in such a way that it explains the maximum possible amount of the remaining variance and so on.

In statistics, a varimax rotation is used to simplify the expression of a particular sub-space in terms of a few major items each. The actual coordinate system is unchanged; it is the orthogonal basis that is being rotated to align with those coordinates. The sub-space found that principal component analysis or factor analysis is expressed as a dense basis with many non-zero weights which make it hard to interpret. Varimax is so called because it maximizes the sum of the variances of the

squared loadings (squared correlations between variables and factors). In addition to, varimax rotation, where the factor axes are kept at right angles to each other, is most frequently chosen. Ordinarily, rotation reduces the number of complex variables and improves interpretation. Almost all applications of principal component analysis and factor analysis in survey research apply the varimax rotation method.

Velicer's Minimum Average Partial (MAP) Test for Verifying Analysis

The MAP method (Velicer, 1976) was developed in the context of principal component analysis and is based on the matrix of partial correlations. Each component is partial led out of the correlation matrix and the average of the squared partial correlations is computed. The number of factors to retain is determined by the point where the minimum average of the squared partial correlations is obtained. The rationale of this procedure can be described as follows: as common variance is partial led out of the correlation matrix for each successive component, the MAP criterion will keep on decreasing. At the point where the common variance has been removed, extracting additional components will result in unique variance being partial led out, and the MAP criterion will begin to rise. The MAP procedure, therefore, provides an unequivocal stopping point for the number of factors by separating the common and unique variance and retaining only those factors that consist primarily of common variance. The MAP procedure begins with the computation of the partial covariance matrix,

$$\mathbf{C}_m = \mathbf{R} - \mathbf{A}_m \mathbf{A}_m^T$$

\mathbf{C}_m = The partial covariance Matrix that results from partialling out the first m components from \mathbf{R}

\mathbf{R} = The correlation matrix

\mathbf{A}_m = The component loading matrix for components 1 to m .

Next, the partial correlation matrix is obtained

$$R_m^* = \mathbf{D}^{-\frac{1}{2}} \mathbf{C}_m \mathbf{D}^{-\frac{1}{2}}$$

R_m^* = The partial correlation matrix

$\mathbf{D} = \text{diag}(\mathbf{C}_m)$

The MAP criterion is then obtained by averaging the squares of the partial correlations contained in R_m^* .

$$\text{MAP}_m = \sum_{i=1}^p \sum_{\substack{j=1 \\ i \neq j}}^p \frac{r_{ijm}^{*2}}{p(p-1)},$$

where p is the number of variables

This procedure is repeated until $p - 1$ components have been partialled out of \mathbf{R} (partialling out p components would result in a null partial covariance matrix). Finally, the first factor by averaging the squares of the correlations contained in \mathbf{R} :

$$\text{MAP}_0 = \sum_{i=1}^p \sum_{\substack{j=1 \\ i \neq j}}^p \frac{r_{ij}^{*2}}{p(p-1)},$$

$\text{MAP}_0 < \text{MAP}_1$, no factors should be extracted

MAP method with continuous variables had been evaluated in some of the most relevant factor retention. Zwick and Velicer (1982) carried out the first systematic examination of this procedure and found it to be more accurate than other stopping rules such as the eigenvalue greater than 1 rule and Bartlett's significance test (Bartlett, 1950, 1951).

Their results also showed that it was affected primarily by the size of the factor loadings and had a tendency to under factor with a small number of variables per factor. The same tendency to under factor with low factor loadings and a small number of variables per factor was found in this study, replicating previous results.

Determining Significant Loadings

Parallel Analysis determines which variable loadings are significant for each component (Buja & Eyuboglu 1992; Pohlmann unpubl.), thus parsimoniously simplifying structure and reducing the analysis of noise. The Parallel Analysis procedure would replace subjectively determined thresholds (e.g. common thresholds are 0.5 and 0.8), and the inappropriate interpretation of correlation significance between variables and components. PCA extracts as much variance as possible out of the data. Even when the variables are uncorrelated, PCA will produce non zero component correlations. If a matrix of zero correlations, with values of one along the diagonal, is subjected to PCA, all eigenvalues (sum of the squared variable component correlations) will equal one. Hence, the average squared variable-component correlation is the reciprocal of the number of variables. Any inferential

analysis of variable-component correlations must consider this bias. Correlation tables fail to provide guidance in the distribution of variable loadings. A Parallel Analysis procedure applying the same methodology (e.g. rotations) as PCA can be used to derive random variable loadings. Multiplying the total number of variable loadings (number of variables \times number of extracted components) by the significance level (i.e. 0.05= 95th percentile) results in an empirical estimate of the 95th percentile. This empirical estimate is an objectively determined threshold for significant loadings and is appropriate for either correlation or covariance matrix PCA loadings. Buja & Eyuboglu (1992) also report a series of loadings tables (median, 90th, 95th, and 99th quantiles) for determining the significant variable loadings prior to rotation for a correlation matrix. The determination of significant loadings may seem cumbersome, but it was necessary when using a technique without objective stopping rules.

3.5 Ethical Consideration

Prior to conduct this study, the approval from Academic Committee of University of Economics (Yangon) was obtained. In addition, the permission from administrator of all NTSs in Yangon Region was obtained before conducting this study. The individuals were invited to participate in the research and the participation was voluntary. The informed consent was taken after thorough explanation of the nature, purposes, procedure, duration, benefits and risks of the study.

Confidentiality and Anonymity of the participants were ensured to protect the dignity of them. For confidentiality, a code number was used instead of a participant's name. It is the choice of the participants to participate or refuse and all of the participants' rights were respected. Participants were requested to participate until completion of data collection. They were not allowed to refuse or withdraw from the study after completion of data collection. As remarkable thanks for participation in this study, some gifts were provided. Based on the above-mentioned survey design, the data were collected and sorted into the SPSS (version 22). The detailed analysis will be presented in the next chapter.

CHAPTER IV

DATA ANALYSIS AND RESULTS

This chapter described the findings that were interpreted after analysis of the data by using Statistical Package for Social Science (SPSS) software version 22.0 and results were shown according to the objectives of the study. The findings were presented with three portions. The first portion presented socio-demographic characteristics of the respondents and knowledge, attitude levels of the respondents. The second portion described the 2014-2018 cancer data of the Yangon General Hospital. The third portion demonstrated by using Multivariate Factor Analysis of the respondents.

4.1. Socio-demographic Characteristics

Gender, age group, attending class, attending school, race, religion, marital status, knowledge, attitude levels of respondents were included in socio-demographic data. Five hundred Diploma nursing students in Yangon region participated in this study. The table showed the number of respondents according to socio-demographic characteristics.

Gender Distribution of the Respondents

As shown in Table (4.1), 428 (85.6 %) respondents were female students and 72 (14.4 %) respondents were males students. The number of female was more than male because of the policy of the Diploma Nursing entrance system by Ministry of Health and Sports.

Table (4.1) Gender Distribution of the Respondents

Gender	Number of Respondents	Percent
Female Students	428	85.6 %
Male Students	72	14.4 %
Total Students	500	100 %

(Source-Survey Data-2019)

Age Groups of the Respondents

Age groups of the respondents were purposefully categorized into 17 to 20 years, 21 to 24 years, 25 to 28 years, and 29 and above years. Table (4.2) showed the age characteristics of the respondents where 415 (83%) were between the age of 17 to 20 years. About 67 (13.4%) were between the age of 21 to 24 years, 12 (2.4%) were between the age of 25 to 28 years and six (1.2%) were 29 years and above. Mean age is 19 years old. The mean age of the study population was 19.53 (SD \pm 2.085); age range (17-33) years. The respondents who were over 20 years were in service students who were Midwifery Diploma holders so they were older than others.

Table (4.2) Age Group of the Respondents

Age Group (Years)	Number of Respondents	Percent	Cumulative Percent
17 -20	415	83 %	83 %
21-24	67	13.4%	96.4 %
25-28	12	2.4 %	98.8 %
29 -29 above	6	1.2 %	100 %
Total	500	100 %	100 %

(Source-Survey 2019)

The Schools the Respondent are Attending

According to the Table (4.3), the respondents 223 (44.4%) were attending at YNTS, the respondents 102 (20.4 %) were at NNTS, the respondents 105 (21%) were ENTS, the respondents 51(10.2 %) were at NRFTS and the respondents 19 (3.8%) were Thanlyin NTS.

Table (4.3) The Schools the Respondent are Attending

School	Male Students	Female Students	Total Students	Percent	Cumulative Percent
YNTS	27	196	223	44.6 %	44.6 %
ENTS	18	87	105	21 %	65.6 %
NRFTS	5	46	51	10.2%	75.8 %
Thanlyin NTS	3	16	19	3.8 %	79.6 %
NNTS	19	83	102	20.4 %	100 %
All Total students	72	428	500	100 %	100 %

(Source-Survey data 2019)

Education Levels of the Respondents

According to the Table (4.4), the respondents 222 (44.4%) were the First Year students, the respondents 120 (24 %) were the Second Year students and the respondents 158 (31.6%) were the Third Year Diploma Nursing Students.

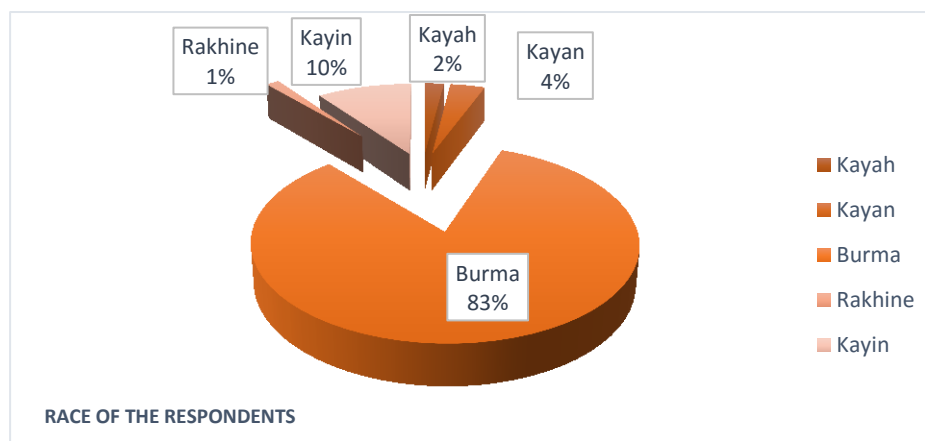
Table (4.4) Education Levels of the Respondents

Education Level	Male Students	Female Students	Total Students	Percent	Cumulative Percent
First Year	30	192	222	44.4 %	44.4%
Second Year	23	97	1 20	24 %	68.4%
Third Year	19	139	158	31.6 %	100 %
All Total	72	428	500	100 %	100 %

(Source-Survey data 2019)

Race of the Respondents

Figure (4.1) described that almost all of respondents 416 (83.2%) were Burmar, 49(9.8%) respondents were Kayin, 7(1.4%) respondents were Rakhine,18(3.6%) respondents were Kayan , 10(2%) respondents were Kayah.

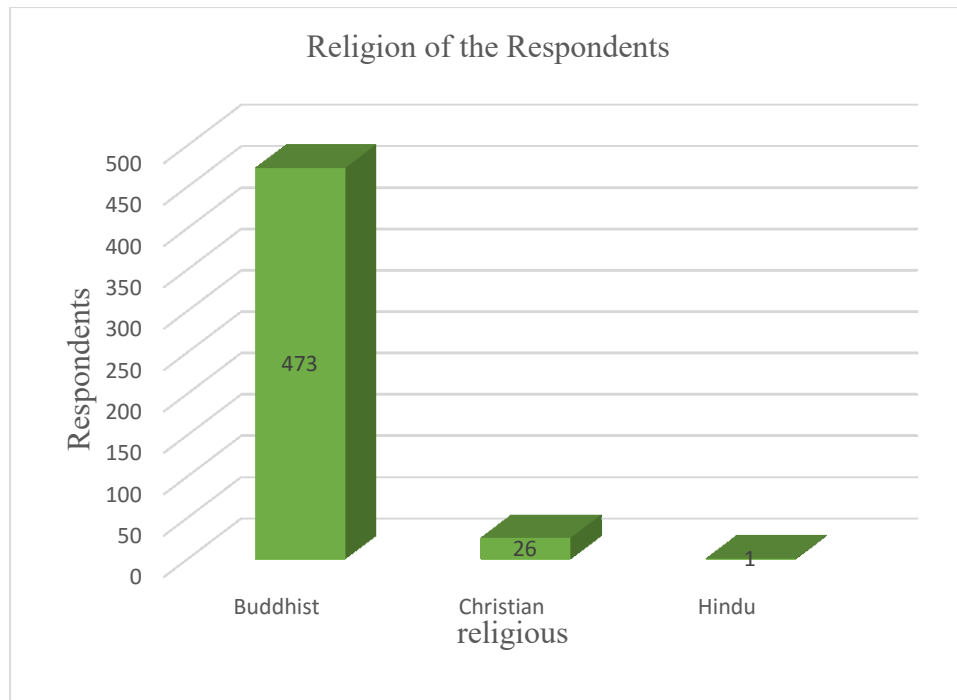


(Source-Survey data 2019)

Figure (4.1) Race of the Respondents

Religion of the Respondents

Figure (4.2) described that almost all of respondents 473 (94.6%) were Buddhists and 26 (5.2%) respondents were Christian and one (0.2%) was Hindu.

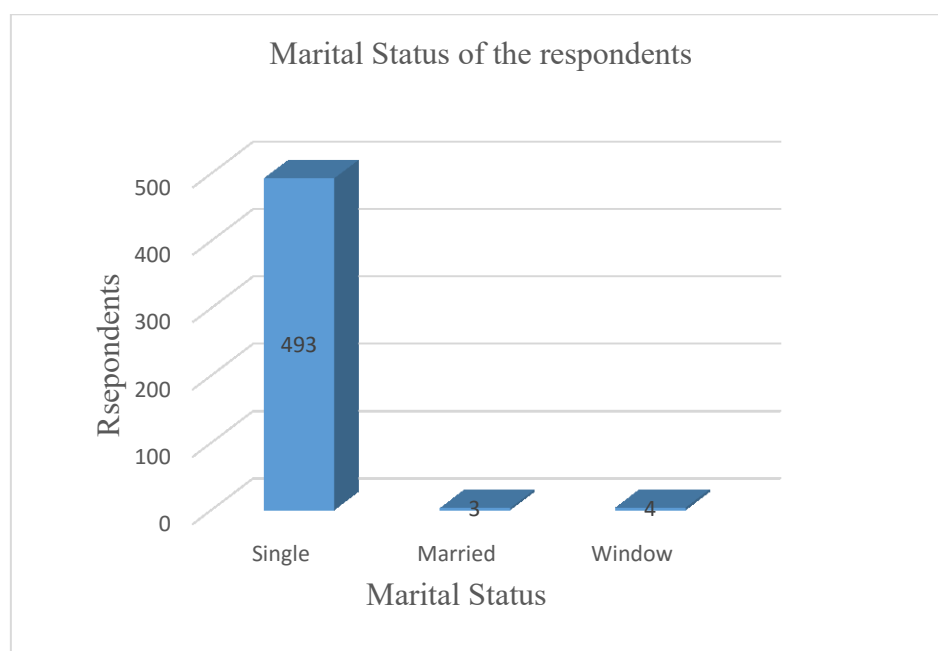


(Source-Survey data 2019)

Figure (4.2) Religion of the Respondents

Marital Status of the Respondents

According to the results from the Figure (4.3), 493 (98.6%) were single, three (0.6%) were married and window were four (0.8%) were window.

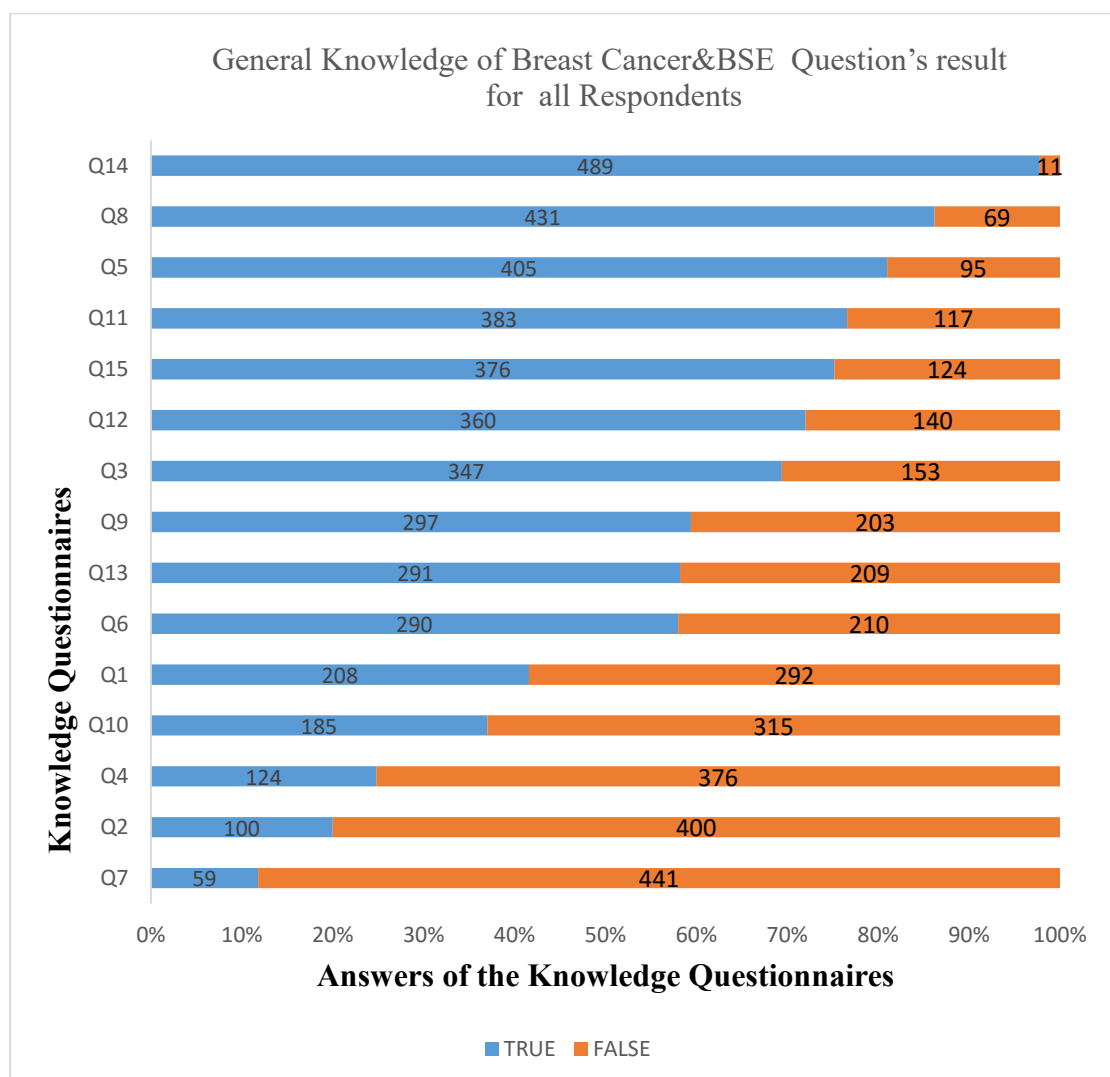


(Source-Survey data 2019)

Figure (4.3) Marital Status of the Respondents

4.2 General Knowledge

The following Figure showed with General knowledge of Breast-Cancer and BSE results. According to the results from the figure (4.4), nearly 98% of the respondents answered correctly to Question 14 and nearly 11% of the students answered correctly to Question 7. Question No.3, 5, 6, 8, 9, 11, 12, 13, 14, 15 were correctly responded by 50% of students and the rest of the questions were uncorrectly answered. . Among the respondents, 489 (97.8%) had no problem with breasts and eight (1.6 %) had cyst in their breast and three (0.6 %) had other problem in the breast.



(Source-Survey data 2019)

Figure (4.4). General Knowledge Results

General Knowledge Levels

According to the Table (4.5) showing General knowledge on Breast Cancer results of all respondents , low level of knowledge was found in 198 (39.6%), moderate level of knowledge was in 300 (60 %) and two (0.4 %) had high level of knowledge. Students who scored up to eight marks can be considered as low level of knowledge; 9-12 marks can be considered as moderate level of knowledge and 13 marks and above as high level of knowledge by following the rule of Bloom's (1956) cut of point. The moderate level of knowledge is found in 60% so it is clearly higher than the other levels. Therefore, it is clear that Breast Cancer knowledge level of all respondents is found to be at level moderate.

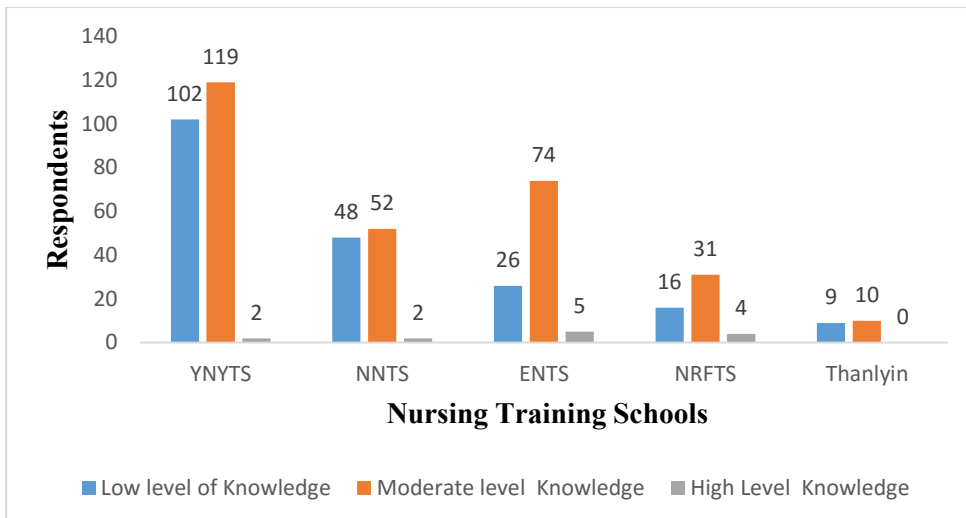
Table (4.5) General Knowledge Levels

No	Level of Knowledge	Cut of Point Mark (Bloom's 1956 cut of point)	Obtain Data (Respondents)	
1	Low level of Knowledge	up to 8 Marks (under 60% of total Marks)	198	39.6%
2	Moderate Level of Knowledge	9-12 Marks (60- 79 % of total Marks)	300	60%
3	High Level of Knowledge	13 Marks and above (80 % and above of total Marks)	2	0.4%
Total Students			500	100%

(Source –Survey Data 2019)

Knowledge Levels (School)

According to the Figure, (4.5) comparison was done on three levels of knowledge of all Nursing Training Schools students of Yangon Region. This figure represented all of the first year, the second year and the third year students in all total schools. All of the levels, low, moderate and high level of knowledge can be seen in all Nursing Training Schools except for Thanlyin Nursing Training School, which only has low and moderate levels in knowledge.

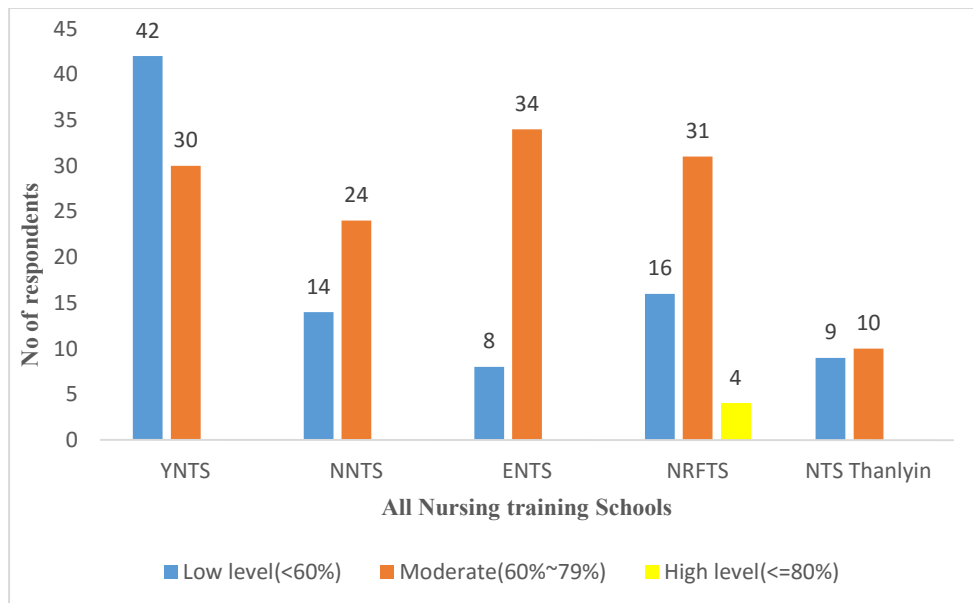


(Source –Survey data 2019)

Figure (4.5) Knowledge Levels of All Respondents in each School

Compare the Knowledge Levels of the First Year Respondents in each School

The Figure (4.6) compared the knowledge levels of the first year respondents in each school.



(Source-Survey Data 2019)

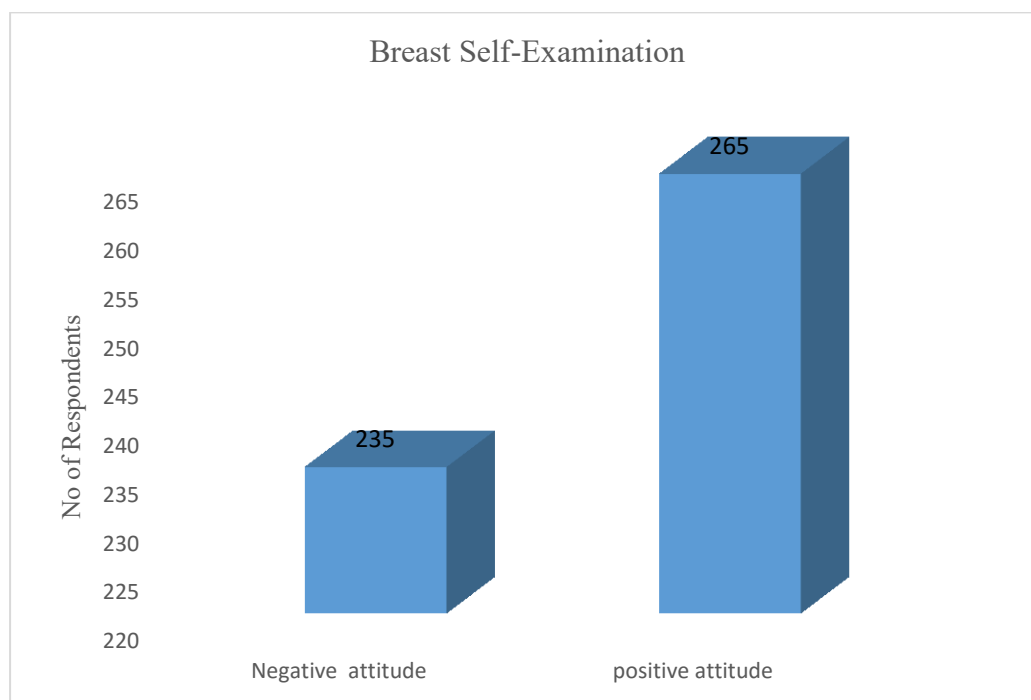
Figure (4.6) Knowledge Levels of the First Year Respondents in each School

This Figure (4.6) represented all of the first year students in all five schools. The moderate level of knowledge found in ENTS (East Nursing Training School) is highest compared to that of the others. In NRFTS (Nursing Related Field Practice Training School), all of the three levels can be found but for the others, only low and

moderate level of knowledge can be found. In Thanlyin Nursing Training School, the percentage of low level of knowledge and moderate level of knowledge are found to be nearly equal in all Training School.

4.3 Overall Attitude of the Respondents Result

The Figure (4.7) showed the overall attitude of respondents regarding BSE.



(Source-Survey Data)

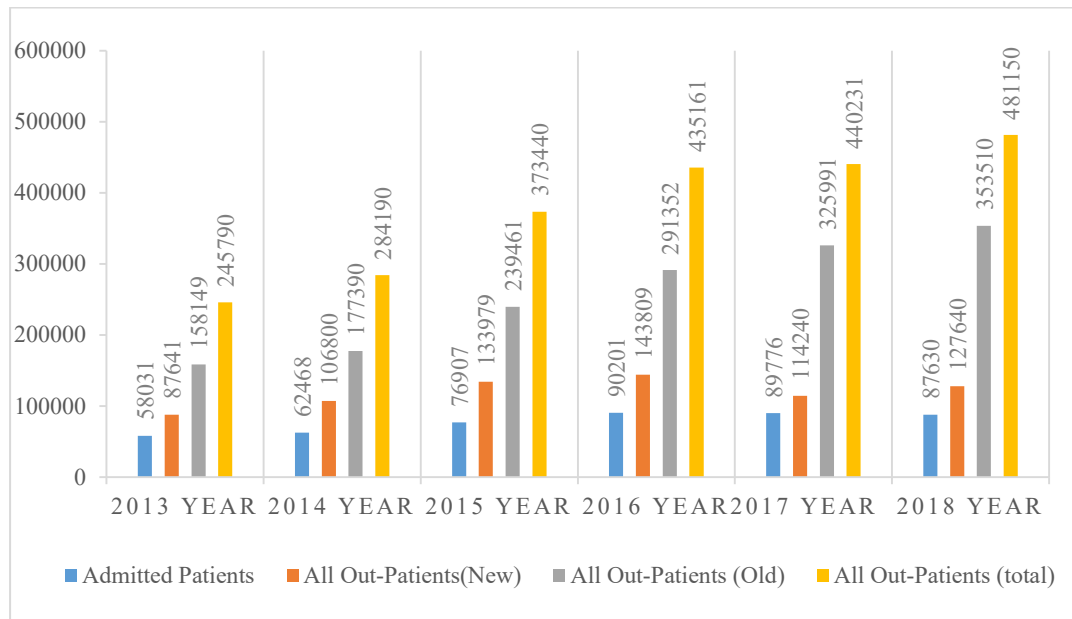
Figure :(4.7) Overall Attitude of Respondents regarding BSE

Mean Score considered the attitude level (196.6 marks). Below mean score is considered as negative attitude, mean, and above mean are considered as positive attitude. According to the study, the respondents 240 (48%) have negative attitude and the others 260 (52%) have positive attitude

4.4 All Patients' Data in YGH (2013 -2018)

Yangon General Hospital also known as now a days 2000 bedded, Tertiary Care Teaching Hospital was established in 1899. There were 342 beds in 1905 and 546 beds were increased after the Second World War. In 1964, it was upgraded to 1500 beds hospital with expansion of new specialist wards and extension of the new buildings. In 2016, it was upgraded into 2000 bedded hospital sanction was with new five-storied surgical complex and PET-CT (5 storeyed) built. In 2018, 5 stored cancer

building was opened. The following Figure (4.8) represented all patients in (2013-2018) at YGH.



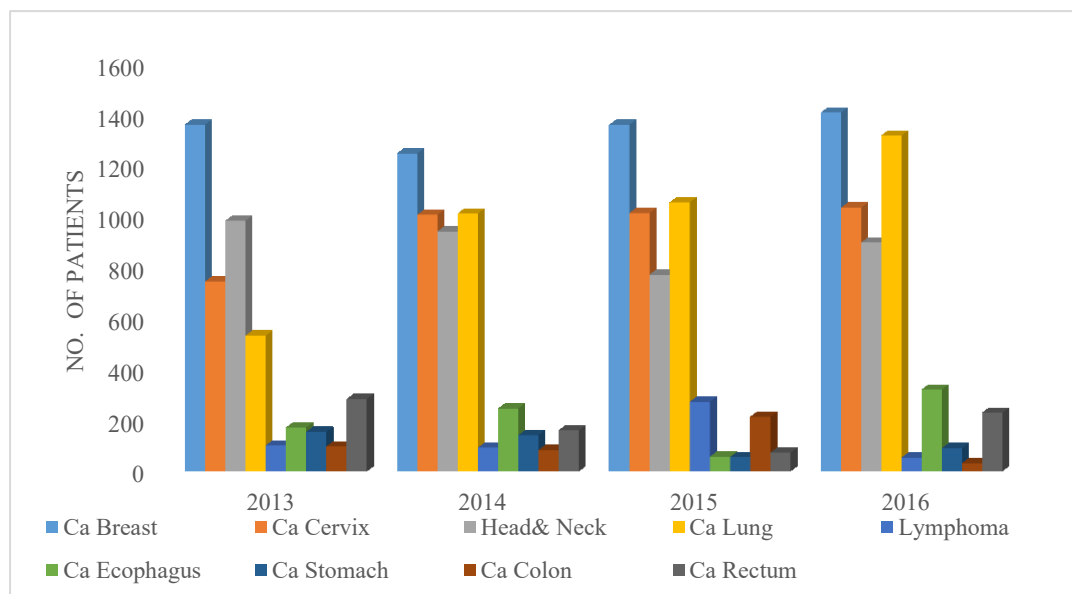
(Source- YGH Hospital Statistics 2019)

Figure :(4.8) All Patients Data in YGH (2013-2018)

The above data showed (1) Admitted patients (2) all Out-patients (New) (3) all Out-patients (Old) and (4) all Out-patients (Total) from 2013 to 2018. By looking at the data, it increase was found to year by year.

Cancer Data of the YGH (2013-2016)

Following Figure (4.9) represented the most common types of Cancer patients in YGH (both old patients and new patients) from 2013 year to 2016 year.



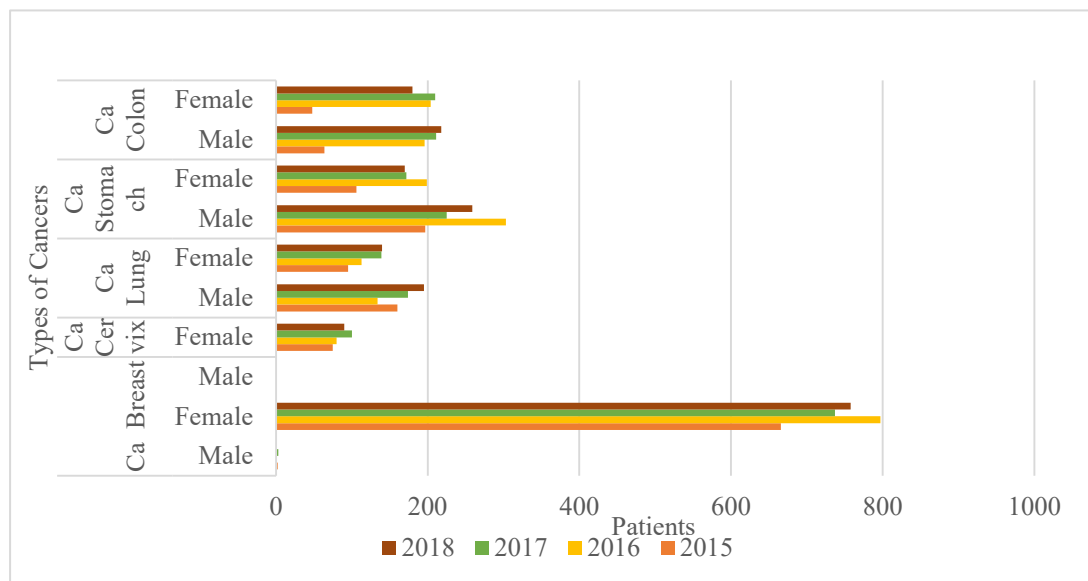
(Source- YGH Hospital Statistics 2019)

Figure (4.9) Cancer Data of the YGH (2013-2016)

Above Figure (4.9) showed all admitted all cancer patients in cancer ward of YGH (old patients+ new patients) (2013-2016). By looking at the data, Breast Cancer (Ca Breast) rate is increasing year by year.

The Most Common Cancers in YGH (2015- 2018)

Following Figure (4.10) showed all represented the most common types of



cancers in YGH's patients (Only New Patients) at YGH (2015 to 2018).

(Source-Hospital Statistics 2019)

Figure (4.10) The Most Common Cancers for Male & Female at YGH (2015- 2018)

Above Figure (4.10) represented the most common types of cancer patients in YGH (Only New Patients male & female) at YGH (2015 to 2018). According to Hospital data of 2015 to 2018, the Breast Cancer was found to be the highest one in females during the intervals. Breast Cancer was mostly found in females in 2016. Stomach Cancer mostly occurred in males in this time interval followed by Lung Cancer in males.

4.5 Multivariate Factor Analysis

Factor analysis was used with (34) Likert items construct for the factors that are related to Breast Self –Examination knowledge among Diploma Nursing students.

Testing for Sampling Adequacy

According to survey data, using SPSS Versions (22) output for KMO and Bartlett's Test are shown in Table (4.6).

Table (4.6) KMO and Bartlett's Test

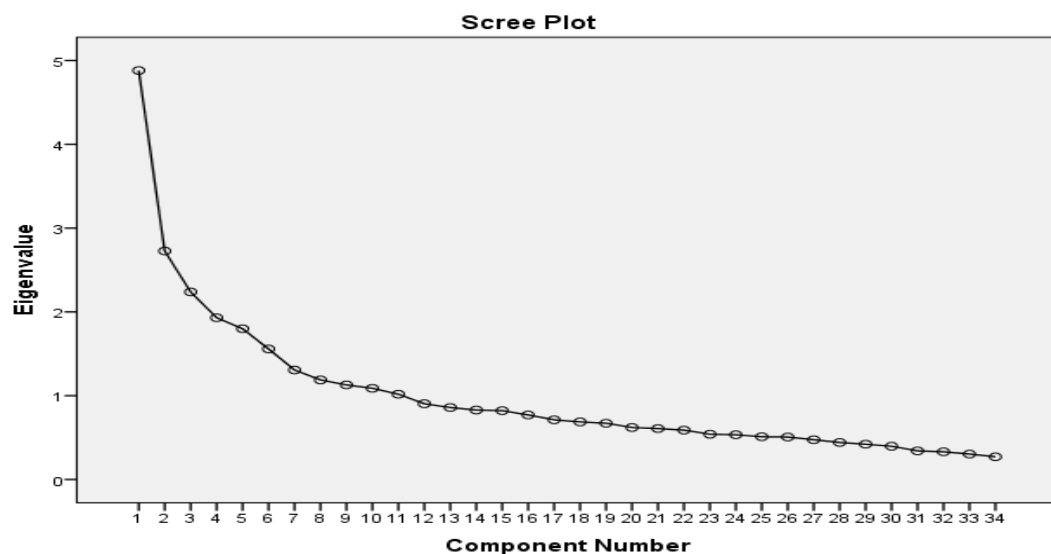
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.727
Bartlett's Test of	Approx. Chi-Square	3847.497
Sphericity	Df	528
	Sig.	.000

(Source-Author's Computation Based on Survey Data, 2019)

As shown in Table (4.6), Principal Component and Factor Analysis are suitable to analyze the survey data. KMO measure of Sampling Adequacy is 0.727 and significant of Bartlett's Test of Sphericity is 0.000. It is desired to have a p-value less than the level of significant 0.05. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy ranges from 0 to 1 where greater value indicates high level of suitability and a value greater than 0.7 is statistically acceptable. Therefore, factor analysis was considered as an appropriate technique for analyzing factor loading.

The Scree plot gives the number of factors of first drops or fracture points as seen in Figure (4.11). According to the Scree plot (eigenvalue graph), the number of factors in the items can be limited to eleven.



(Source-Author's Computation Based on Survey Data, 2019)

Figure (4.11) The Scree Plot (eigenvalue graph)

According to scree plot (eigenvalue graph), the first 11 Components were obtained because their eigenvalues are greater than one. Factor loadings are those values which explain how closely the variables are related to each factor discovered. It is the absolute (rather than the signs, plus or minus) of the loading that is important in the interpretation.

Factor Analysis (First Run)

Factor analysis is a branch of statistical science, but because of its development and extensive use in psychological factor, the technique itself is often mistakenly considered as psychological theory. There are 34 variables which are related to the knowledge and attitude of breast Self-Examination and some of them have strong correlations (Refer to appendix). Exploratory factor analysis (EFA) was applied to 34 variables. Principal Component Method extracted 11 components, which have more than one Eigenvalue. By using factor analysis, these variables were reduced to 11 components from original variables 34 items. Therefore, it is necessary to rename or latent variables these 11 factors by representing variables concerned.

Communalities

This subsection is to observe the communalities. These communalities indicate the proportion of variance in each variable explained by the factor extracted. If any variable has communality less than 0.5, it is advised to remove it. That variable from the analysis as the amount of variance explained by the factors is less than 50%. This is similar to R-square in regression analysis. The result of communalities shown in Appendix. It is observed that all communalities are more than 0.5 for current case. Thus, over 50% of the variance in all variables is accounted by the extracted factors.

Total Variance Explained

The Total Variance Explained by the components from all the variables is put together in this section. The result of Total Variance Explained is shown in following Table (4.7).

Table(4.7) Total Variance Explained
Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.880	14.354	14.354	4.880	14.354	14.354	2.271	6.679	6.679
2	2.727	8.019	22.373	2.727	8.019	22.373	2.154	6.335	13.014
3	2.238	6.581	28.955	2.238	6.581	28.955	2.121	6.237	19.251
4	1.930	5.678	34.633	1.930	5.678	34.633	2.043	6.008	25.259
5	1.799	5.292	39.924	1.799	5.292	39.924	2.024	5.953	31.213
6	1.557	4.580	44.505	1.557	4.580	44.505	1.998	5.877	37.089
7	1.306	3.842	48.347	1.306	3.842	48.347	1.960	5.765	42.854
8	1.188	3.494	51.840	1.188	3.494	51.840	1.695	4.986	47.840
9	1.129	3.319	55.160	1.129	3.319	55.160	1.668	4.907	52.747
10	1.088	3.201	58.361	1.088	3.201	58.361	1.567	4.607	57.354
11	1.017	2.992	61.353	1.017	2.992	61.353	1.360	3.999	61.353
12	.904	2.660	64.013						
13	.858	2.525	66.538						
14	.829	2.438	68.975						
15	.822	2.417	71.392						
16	.770	2.265	73.657						
17	.712	2.095	75.752						
18	.687	2.020	77.773						
19	.671	1.974	79.747						
20	.620	1.824	81.571						
21	.607	1.786	83.358						
22	.589	1.732	85.090						
23	.540	1.588	86.678						
24	.534	1.570	88.249						
25	.511	1.502	89.750						
26	.507	1.490	91.240						
27	.474	1.395	92.635						
28	.442	1.299	93.934						
29	.421	1.238	95.172						
30	.396	1.166	96.338						
31									
32									
33									
34	.270	.795	100.000						

Extraction Method: Principal Component Analysis.

(Source-Author's Computation Based on Survey Data, 2019)

Rotated Component Matrix

The Rotated Component Matrix was presented after 10 iterations rotation converged to using with Principal Component Analysis extraction method and Varimax with Kaiser Normalization rotation method. The rotation factor structures were shown in the Table (4.7). Q29, Q28, Q30 and Q24 are Factor (1). Q26 and Q 11 are Factor (2). Q31and Q33 are Factor (3). Q15, Q25, Q31 and Q 27 are Factor (4). Q32 and Q34 are Factor (5), Q5, Q6, Q1 and Q7 are Factor (6), and Q3, Q4 and Q2

are Factor (7). Q21, Q19, Q20, Q23 and Q14 are Factor (8), Q9, Q12, Q16 and Q17 are Factor (9). Q10 and Q18 are Factor (10); Q8 and Q21 are Factor (11).

Table (4.8) Rotated Component Matrix^a

	Component										
	1	2	3	4	5	6	7	8	9	10	11
b29	.771										
b28	.739										
b30	.671										
b24	.506										.391
b26		.946									
b11		.946									
b31			.905								
b33			.905								
b15				.754							
b25				.642							
b13				.441							
b27	.373			.387							
b34					.921						
b32					.921						
b5						.771					
b6						.692					.388
b1						.551					
b7						.539					
b3							.762				
b4							.754				
b2							.742				
b22								.699			.332
b19								-.650			
b20				.355				.591			
b23				.366				.438			
b14						.389		.427	.389		
b9									.617		
b12		.339							.564		
b16									.552		
b17									.547		
b10										.770	
b18										.737	
b8											.691
b21				.444							.504

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 12 iteration.

(Source-Author's Computation Based on Survey Data, 2019)

Velicer's Minimum Average Partial (MAP) Test

The determining of MAP test was shown in the following factors focused on the common variance in a correlation matrix.

Run MATRIX procedure:**Velicer's Minimum Average Partial (MAP) Test:****Table (4.9) Minimum Average Partial Matrix**

Eigenvalues	Number of Components	Squared	Power4
4.8804	.0000	.0237	.0018
2.7266	1.0000	.0134	.0007
2.2377	2.0000	.0126	.0005
1.9304	3.0000	.0199	.0004
1.7992	4.0000	.0117	.0005
1.5573	5.0000	.0118	.0004
1.3063	6.0000	.0123	.0004
1.1879	7.0000	.0132	.0005
1.1286	8.0000	.0145	.0007
1.0884	9.0000	.0160	.0009
1.0174	10.0000	.0175	.0010
.9043	11.0000	.0190	.0013

(Source-Author's Computation Based on Survey Data, 2019)

The smallest average squared partial correlation is (.0117)

The smallest average 4rth power partial correlation is **(.0004)**

The Number of Components According to the Original (1976) MAP Test is **(4)**

The Number of Components According to the Revised (2000) MAP Test is **(5)**

Velicer's MAP test first section described the eigenvalues generated from PCA on the 34 variables and also it presented which variables' eigenvalues was greater than 1.00. Second section presented that the smallest average squared partial correlations was 0.117 and the smallest average Power 4 partial correlation is 0.0004 and the number of factors corresponding value was 5. Therefore, MAP test indicated five factors.

Factor Analysis (Second Run)

In this analysis, the majority of different dimensions on nursing respondents was studied. In this step, five factors were selected to extract in Factor Analysis Extraction.

Total Variance Explained

The result of the second run total variance explained five factors of initial eigenvalues factors was the same in four factors of the first run shown in Table(4.10). The percentage of total variance in the second run was 14.354%, 8.019 %, and 6.581 %, 5.678 % and 5.292 % respectively. These factors contributed 39.924% of the total variance. The rest of 34 factors were only about 61.353% of the variance.

Table (4.10) Five Factors Structure Output for Total Variance Explained

	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.880	14.354	14.354	4.880	14.354	14.354	3.591	10.561	10.561
2	2.727	8.019	22.373	2.727	8.019	22.373	3.106	9.137	19.697
3	2.238	6.581	28.955	2.238	6.581	28.955	2.370	6.970	26.668
4	1.930	5.678	34.633	1.930	5.678	34.633	2.279	6.704	33.371
5	1.799	5.292	39.924	1.799	5.292	39.924	2.228	6.553	39.924
6	1.557	4.580	44.505						
7	1.306	3.842	48.347						
8	1.188	3.494	51.840						
9	1.129	3.319	55.160						
10	1.088	3.201	58.361						
11	1.017	2.992	61.353						
12	.904	2.660	64.013						
13	.858	2.525	66.538						
14	.829	2.438	68.975						
15	.822	2.417	71.392						
16	.770	2.265	73.657						
17	.712	2.095	75.752						
18	.687	2.020	77.773						
19	.671	1.974	79.747						
20	.620	1.824	81.571						
21	.607	1.786	83.358						
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23	.540	1.588	86.678						
24	.534	1.570	88.249						
25	.511	1.502	89.750						
26	.507	1.490	91.240						
27	.474	1.395	92.635						
28	.442	1.299	93.934						
29	.421	1.238	95.172						
30	.396	1.166	96.338						
31	.341	1.004	97.341						
32	.330	.971	98.313						
33	.303	.892	99.205						
34	.270	.795	100.000						

Extraction Method: Principal Component Analysis.

(Source-Author's Computation Based on Survey Data, 2019)

Rotated Component Matrix

The second run, rotated component matrix presented variables such as Q32, Q34, Q33 and Q31 is factor (1). Variables Q26, Q11, Q12, Q16, Q 17, Q15 and Q25 in Factor (2). Q20, Q23, Q14, Q21, Q6, Q22, Q1, Q13 and Q 8 in Factor (3). Q29, Q30, Q28, Q24, Q27 in Factor (4). Variable Q4, Q2, Q3, Q5 and Q7 in Factor (5) respectively. Rotated Component Matrix result shown in Table (4.11).

Table (4.11) Five Factor Structure Output for Rotated Component Matrix

	Component				
	1	2	3	4	5
b32	.854				
b34	.854				
b33	.804				
b31	.804				
b26		.858			
b11		.858			
b12		.520			
b16		.515			
b17		.408			.349
b15		.363			
b25		.338			
b10					
b18					
b20			.597		
b23			.595		
b14			.470		
b21			.464		-.338
b6			.457		
b22			.417		
b1			.403		.367
b13			.402		
b8			.362		
b19					
b30				.727	
b29				.725	
b28				.690	
b24		.333		.436	
b27				.392	
b9					
b4					.677
b2					.642
b3					.616
b5	.342				.500
b7				-.418	.459

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.^a

a. Rotation converged in 9 iterations.

(Source-Author's Computation Based on Survey Data, 2019)

After clarifying in the deleted cross loaded items in the five factors tables were shown as the following; Factor (1) Risk Factors , Factor (2) Preventive Measures, Factor (3) Right Ways of BSE & Treatment, Factor (4) Regardless effect of age & gender and Factor (5) Health Seeking Behavior.

Factor (1) contains four variables that was reflected in **Risk Factors**. Aging, Socioeconomics, Ethnicity and Obesity are closely related to incidence of Breast Cancer. It is shown in Table (4.12)

Table (4.12) Risk Factors

Question	Variables	Loading
Q32	Aging is closely related to incidence of Breast Cancer	.854
Q34	Socioeconomic status is closely related to incidence of Breast Cancer	.854
Q33	Ethnicity is closely related to incidence of Breast Cancer	.804
Q31	Obesity is closely related to incidence of Breast Cancer	.804

(Source-Author's Computation Based on Survey Data, 2019)

Factor (2) in Table (4.13) contains seven variables that were reflected in **Preventive Measures** of BSE. Radiation, sex, BSE practice, right technique, consultation and monthly test doing were reflected in Preventive Measures of BSE.

Table (4.13): Preventive Measures

Question	Variables	Loading
Q26	Frequent exposure to radiation is the risk factors of breast cancer.	.858
Q11	Women may suffer Breast Cancer than Men.	.858
Q12	To detect early breast cancer, correct BSE is needed	.520
Q16	Doing BSE prevents me from having future problems related with breast.	.515
Q17	I really care about my BSE with right Technique	.408
Q15	When any abnormality in Breast is identified during BSE, you should consult with health personnel	.363
Q25	Completing BSE each month may help me to detect early breast lump and any changes in breast	.338

(Source-Author's Computation Based on Survey Data, 2019)

Factor (3) contains nine variables that were reflected the **Right ways of Technique**. Time, no need mammogram, home remedies, public health center, privacy, method, family history and mastectomy were reflected in the Right ways of Technique.

Table (4.14): Right Ways of Technique

Question	Variables	Loading
Q20	Doing Breast Self- Examination is a waste time for me.	.597
Q23	I don't perform BSE as I think it is time consuming.	.595
Q14	I think if I take mammogram, BSE is not needed to perform.	.470
Q21	When any abnormality in breast is identified during BSE, it must be treated with Home remedies.	.464
Q6	If you notice any abnormality, You should directly go to public health center.	.457
Q22	I don't perform BSE as I don't have enough privacy to do BSE.	.417
Q1	Do you agree you should learn the correct method of BSE?	.403
Q13	I think if I had no family history, BSE practice is not necessary for me.	.402
Q8	By detecting breast changes by self- early, it can improve the chances of saving breast by avoiding mastectomy and may reduce the need for chemotherapy.	.362

(Source-Author's Computation Based on Survey Data, 2019)

Factor (4)c contains five variables that reflect **Age & Gender**.

Table (4.15): Age & Gender

Question	Variables	Loading
Q29	Everyone male or female should take BSE, as there is possibility to suffer from Breast Cancer.	.727
Q30	Men should take BSE since they have possibility of suffering Breast Cancer.	.725
Q28	Both male and female should have to do BSE monthly.	.690
Q24	If I perform regular BSE, it can help me to be familiar with the characteristics of the breast.	.436
Q27	Every person can suffer Breast Cancer regardless of age and gender	.392

(Source-Author's Computation Based on Survey Data, 2019)

In Factor (5) contains five variables that reflected **Health Seeking Behaviors**. Discussing, Learning, friends, health- staff and at least one time testing were reflected in the Health Seeking Behavior.

Table (4.16): Health Seeking Behaviors

Question	Variables	Loading
Q4	You should discuss with your friends about BSE properly.	.677
Q2	It is very good to learn BSE from your parents.	.642
Q3	It is very good to learn BSE from your friends.	.616
Q5	You should learn how to test BSE from health-stuff.	.500
Q7	You should perform BSE at least once in 6 months.	.459

(Source-Author's Computation Based on Survey Data, 2019)

Table (4.17): Determining the Critical Factors

Component	Latent Variable	Name of Variables	No of Variables	Cronbach's Alpha	Eigen Value	% variance Explained	Cumulative variance %
1	Risk Factors	-Aging -Socioeconomic status -Ethnicity -Obesity	4	.881	4.880	14.354	14.354
2	Preventive measure	-Frequent exposure to radiation -Women more occur than Men -correct BSE -BSE prevents from future problem -BSE with Right Technique. -consult with health personnel -Completing BSE every month	7	.708	2.727	8.019	22.373
3	Right ways of BSE	-BSE is not a waste of time -BSE is not time consuming -take mammogram -directly go to public health center -enough privacy to do BSE -learn the correct method of BSE -BSE practice -avoiding mastectomy and chemotherapy	8	.592	2.238	6.581	28.955

Component	Latent Variable	Name of Variables	No of Variables	Cronbach's Alpha	Eigen Value	% variance Explained	Cumulative variance %
4	Regardless effect of age & gender	-male or female should take BSE -Men have possibility of suffering Breast Cancer. -Both male and female need to do BSE monthly -Breast Cancer can regardless effect of age and gender -perform regular BSE	5	.697	1.930	5.678	34.633
5	Health Seeking Behaviour	-discuss with your friends -to learn BSE from your parents -to learn BSE from your friends -how to test BSE from health-staff -perform BSE at least once in 6 months	5	.613	1.799	5.292	39.924

(Source-Author's Computation Based on Survey Data, 2019)

Finally, the study identifies through the factor analysis, 29 variables were clearly found out key main factors outcome, it was Risk Factors , Preventive Measures , Right Ways of Technique, Age & Gender , and Health Seeking Behaviors . In the next sections, conclusion of the study discussion and recommendation were described.

CHAPTER V

CONCLUSION

Breast Cancer is a health problem for both males and females. The health knowledge of Breast Cancer and Breast Self-Examination is important to prevent and control the possible causes of this disease. Nurses should provide adequate health information to the public about Breast Cancer's etiology, risk factors, signs and symptoms, preventive measures, complications and Breast Self-Examination right techniques. It can be seen clearly that nurses should be qualified and professional in detecting Breast Cancer and performing Breast Self-Examination techniques. Therefore, nurses need to collaborate with other health-care related professions, public health authority, local authorized people, community residents and the media to conduct planned health programs such as health education program and early screening activities to improve optimal quality of life among people.

The Study "Breast Cancer and Breast Self-Examination knowledge and attitude among diploma nursing students at Yangon region study" was conducted at Yangon Nursing Training School, Nursing Training School (North Okkalapa), Nursing Training School (East), Nursing Related Field Practice Training School and Thanlyin Nursing Training School. Stratified random sampling method was done by using Neyman sample size calculation procedure and after that, data were collected by self-administered questionnaire. Descriptive Statistics and Multivariate Factor Analysis Model using SPSS (version 22.0) were analyze used to data. The summary of this study would be presented in this chapter by dividing two portions such as discussion and recommendations.

5.1 Discussion

Out of 920 Diploma-Nursing students in Yangon Region, 500 students were analyzed with a response rate of 100%. Among the respondents, 489 (97.8%) had no problem in the breast and eight (1.6 %) had cyst with breast and three (0.6 %) had other problems in the breast. According to this study, 428(85.6 %) were females and

72 (14.4 %) males. The number of females was more than males because of the policy of the diploma nursing entrance system by Ministry of Health and Sports. Nearly (85%) of all respondents were Myanmar and Buddhists and 415 (83%) respondents were under 20 years and 85 (17%) respondents were above 20 years old. The minimum age is 17 years old , maximum age is 33 years . Mean age is 19.53 (SD \pm 2.085) years. The respondents over 20 years were in service students who are Midwife Diploma holders so they were older than others were. According to the survey, it can be clearly seen that the knowledge level of YNTS students is found to be highest among all Nursing Training Schools. The second highest one is ENTS, the third one is NNTS and NRFTS and Thanlyin NTS are followed as the fourth and the fifth. General knowledge on Breast Cancer and BSE results of all respondents was found to be low level in 198 (39.6%), moderate level of knowledge was found in 300 (60 %) respondents and two (0.4 %) respondents had high level of knowledge because some students had misconceptions and did not understand the question properly. The moderate level of knowledge is found in (60%) respondents so it is clearly higher than the others. Therefore, it was clearly discovered that Breast Cancer knowledge level of all respondents is at moderate level of knowledge.

The Yangon General Hospital is a major public hospital in Myanmar. 2,000-bedded tertiary hospital consists of four medical wards, three surgical wards, one trauma and orthopedic wards, and 28 specialist departments for inpatient care. The incidence rate of Breast Cancer was increasing from 2014 to 2018 according to the YGH hospital's statistics. According to this study, the incidence rate of the patients studying in YGH from 2014 to 2018 was increasing year by year.

According to the survey, 34 variable communalities were more than 0.5, it is acceptable and the amount of total variance explained is 61.353 %.The result is found to be suitable.A sample of 500 respondents was surveyed to identify the important factors among their attitude on Breast Cancer and Breast Self -Examination. Eleven factor components: The amount of total variance explained is 61.353 %. 5 factor components; The amount of total variance explained is 39.924 %. The factor analysis results described that five factors out of eleven were found to be important by the factor A sample of 500 Diploma Nursing students were surveyed to identify the important factors among their knowledge and attitude. The factor analysis results

described that five factors out of eleven were found the important factor (1): Risk factors, factor (2): Preventive Measures, factor (3): Right Ways of Technique, factor (4): Age and Gender, factor (5): health seeking behaviors. These five factors solutions were in line with the Velicer's Minimum Average partial (MAP) Test.

5.2 Recommendations

This study aimed to study on knowledge and attitude of Breast Cancer and Breast Self –Examination among Diploma Nursing students in Yangon Region and to find out their knowledge and attitude of Breast Cancer and Breast Self- Examination. Therefore, stratified random sampling method was applied to use for required sample, Descriptive Statistics and Multivariate Factor analysis model was used to identify the knowledge and attitude of diploma nursing students at Yangon Region. In conclusion, this study found that they have moderate level of knowledge and positive attitude. This study showed that although awareness of breast cancer is considerable, there are still many misconceptions such as “Breast Cancer cannot occur in men”, “breast engorgement is one of the warning signs of Breast Cancer”, “nipple retraction is not a sign of Breast Cancer”’s. The additional researches were highly recommended to identify on Breast Cancer and Breast Self-Examination research in other regions and other states by using a similar method. Based on the research findings, researchers would like to make recommendation as;

- (1) Lecture program of Breast Cancer and BSE should be given to all students from Nursing Training Schools and the student nurses will be more familiar and will have adequate knowledge about Breast Cancer and BSE .
- (2) BSE techniques should be demonstrated in all NTS with the aid of Female Breast Dummy and Posters. The teachers should check the re-demonstration of BSE techniques by students in case if they are doing wrong.
- (3) About Breast Cancer knowledge should be emphasized among males and females in the community to reduce morbidity and mortality of Breast Cancer.
- (4) About the information of early diagnosis of Breast Cancer, especially (e.g. Breast Self-Examination (BSE), Clinical Breast Examination (CBE) and Mammography) need to be given among the public.
- (5) Health Education about Breast Cancer knowledge should be explained to the public to avoid or delete misconceptions like this cancer could not occur in

men, breast engorgement is one of the warning signs of Breast Cancer; nipple retraction is not a sign of Breast Cancer.

- (6) Health education program of Breast Cancer should be expanded by using pamphlets, TV, Radio and Social media (Face Book) to enhance knowledge of people.
- (7) Mammography is the best screening method, but it is resource is scarce in our developing countries. BSE technique is low cost method & an important tool in our developing country where most of the people cannot afford to get Mammograms or Clinical Breast Examination.
- (8) Other Regions and States in Myanmar need further study to achieve the better information and to reconfirm the findings of this study.

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Appendix (1)

Yangon University of Economics

Department of Statistics

Part (A): Informed Consent Form

Title of Research: Knowledge and Attitude of Breast Cancer and Breast Self - Examination among Diploma Nursing Students in Yangon Region”

Principle Investigator: Ma Ni Ni Lwin
Candidate of Master of Applied Statistics
Yangon University of Economics

Organization: Research and Ethical Committee
Yangon University of Economics

This research paper is a requirement to fulfill Master Degree of Master of Applied Statistics. The permission and approval of Research and Ethical Committee and Rector from Yangon University of Economics and the respective authoritative persons from the Principals (Assistant director) and Principals of all Nursing Training Schools Yangon Region have been taken. I am going to give you information and invite you to be part of this research. Before you decide, you can talk to anyone you feel comfortable with about the research. The purpose of the research is to study “Knowledge and attitude of Breast Cancer and Breast Self -Examination among Diploma Nursing Students in Yangon Region”.

This research is a quantitative descriptive and multivariate factor analysis model study . Inclusion criteria are respondents who are willing to participate in this study and who can read and write. Moreover, those who can understand English language and both females and males will be included. Respondents who are not willing to participate in this study will be excluded from the study.

Firstly, the data will be collected by using questionnaire if you agree to participate. Questionnaire on Knowledge and attitude of Breast Cancer and Breast Self -Examination will be answered in the second phase. It will be used for the research data analysis. Your name need not be described in questionnaire if you participate in the study. You will not be encountered with any problem by

participation in this study. The data in questionnaires will be kept confidentially and not be able to be seen by anyone except the researcher and supervisor. At the end of the research project, the record will be locked in the office of the Register, Yangon University of Economics.

The result of the study will be described in the dissertation, journals, and magazines, and presented at conferences with anonymity of your name. There will be no direct benefit to you, but your participation is likely to help us in future planning for Breast Self-Examination. You can withdraw from the participation at any time before data analysis without threatening you. Thank you very much for your participation in the study. If you have any questions concerning with the research, you may contact and ask to the following address any time.

Ma Ni Ni Lwin

Candidate of Master of Applied Statistics

Yangon University of Economics

Ph – 09450001930

Email adress: dawninilwin68@gmail.com

Part (B): Respondent Consent Form

I have read this consent form. I have already discussed about it with the investigator to my satisfaction. I understand that my permission is voluntary. I know enough about the purpose, methods, risks and possible benefits of the study. I know that I can contact with the investigator if I have any questions. I have a chance to ask questions. I feel that all of my questions have been answered satisfactorily. I permit to use the data relating to this study voluntarily after understanding the above conditions.

Signature of the guardian

Signature of the respondent

Name -----

Name -----

Rank -----

Ph No -----

Department-----

N.T.S -----

Signature -----

Signature-----

Investigator Statement

In addition to the information in this consent form, I have offered an opportunity for further explanation of the risks and discomforts, which are or may be associated with this study. I also answered any further questions relating to it.

Signature of the investigator

Name -----

Hand phone -----

Email -----@gmail.com

Appendix (2)

Questionnaires for ‘Breast Self -Examination among Diploma Nursing Students at Yangon Region’

This questionnaire is based on “Breast Cancer & Breast Self-Examination (BSE) technique”. The purpose of this study is to explore the knowledge and attitude of Breast Cancer and Breast Self-Examination technique in Diploma Nursing students. Completion of this questionnaire should take approximately 25 minutes.

Part (A) Demographic Characteristics

1. Year _____
2. School _____
3. Gender _____
4. Complete age _____
5. Religious _____
6. Race _____
7. Marital Status _____
8. Any problems of your Breast
 - (a.)No problem
 - (b.) Cyst or fibrosis
 - (c.)Discharge from nipple
 - (d.) Skin color changes
 - (e.) Other

Part (B) Breast Cancer and Breast Self-Examination Knowledge Questionnaire

Instructions: Please read the following multiple choices questions carefully and choose the best one of them.

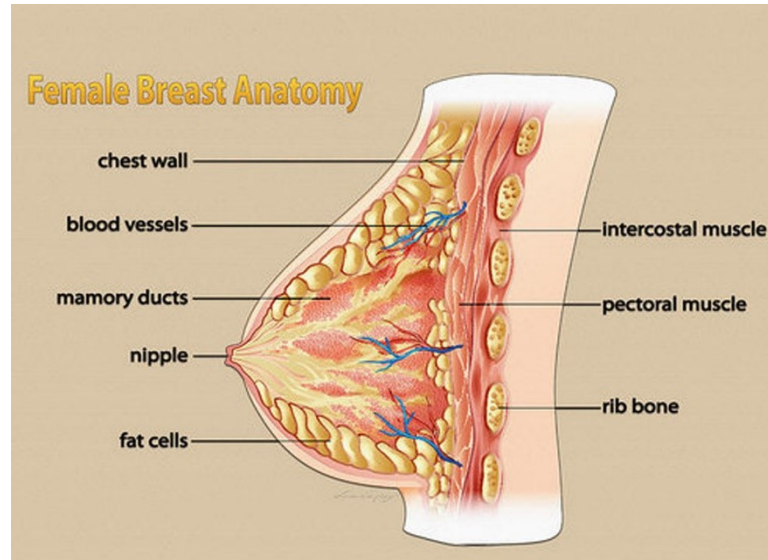
1. Which assessment finding should be reported to the physician?
 - a. breast tenderness prior to menses
 - b. dimpling of the breast skin
 - c. one breast slightly larger than the other
2. When does the female perform Breast Self-Examination regular test?
 - a. every other months

- b. every month during menstruation period
 - c. every month after menstruation
 - d. weekly at the same time of the day
3. Which client has the highest risk for breast cancer?
- a. 65-years-old female with history of a prior episode of Breast Cancer
 - b. 40-years-old female whose father had Colon Cancer
 - c. 45-years-old male with gynecomastia
 - d. 50-years-old male whose mother had Ovarian Cancer
4. When you are palpating breast which area are tumors most commonly found?
- a. lower inner quadrant
 - b. lower outer quadrant
 - c. upper inner quadrant
 - d. upper outer quadrant
5. Breast Self-Examination can be done by
- a. Pre menstruation period
 - b. anytime
6. It can test Breast Self-Examination following position.
- a. In front of mirror.
 - b. Sitting position
 - c. Supine position
 - d. All of above
7. Do you know which one to use when you doing Breast Self-Examination?
- a. Finger tips
 - b. middle part of finger
 - c. Palm
 - d. don't know
8. Performing Breast Self-Examination can detect one of the early signs of Breast Cancer, Swelling of the Axillary Lymph nodes.
- a. True
 - b. False
9. Breast Cancer can be cause by long-term use of contraception.
- a. True
 - b. False
10. Performing Breast Self-Examination can detect one of the early signs of Breast Cancer, Nipple Retraction.
- a. True
 - b. False
11. Breast Cancer is second Leading cause of cancer death for women all over the world.
- a. True
 - b. False
12. Every person can get Breast Cancer regardless of age and gender.
- a. True
 - b. False

8	By detecting breast changes by self- early, it can improve the chances of saving breast by avoiding mastectomy and may reduce the need for chemotherapy.					
9	BSE is a low cost method of detecting early Breast Cancer.					
10	I agree that, Breast cancer can be prevented by breast feeding to the baby					
11	Women may suffer Breast Cancer than Men.					
12	To detect early breast cancer, correct BSE is needed					
13	I think if I had no family history, BSE practice is not necessary for me.					
14	I think if I take mammogram, BSES is not needed to perform.					
15	When any abnormality in Breast is identified during Breast Self- Examination, you should consult with health personnel.					
16	Doing Breast Self -Examination prevents me from future having problems related with breast.					
17	I really care about my Breast Self- Examination by right technique.					
18	Always search for information regarding Breast Self- Examination from the Internet, Magazine and Newspaper					
19	I don't perform Breast Self -Examination due to fear for being diagnosed as Breast Cancer.					
20	Doing Breast Self- Examination is waste time for me.					
21	When any abnormality in Breast is identified during Breast Self-Examination, it must be treated with Home remedies.					

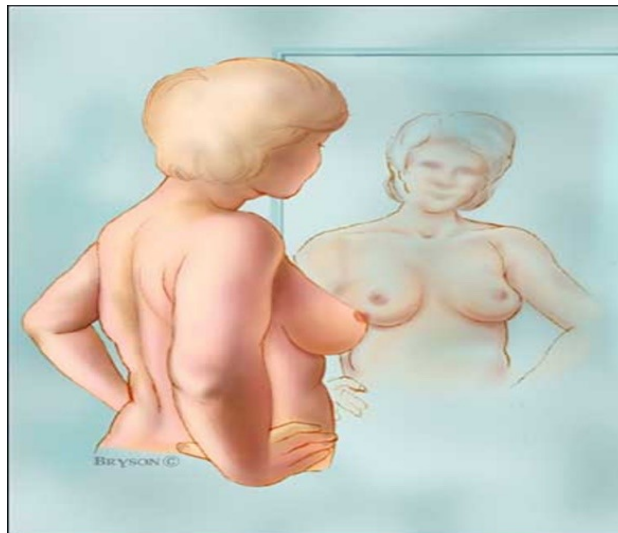
22	I don't perform Breast Self-Examination as I don't have enough privacy to do Breast Self-Examination.					
23	I don't perform Breast Self-Examination as I think it is time consuming.					
24	If I perform regular Breast Self-Examination, it can help me to be familiar with the characteristics of the breast.					
25	Completing Breast Self-Examination each month may help me to detect early breast lump and any changes in breast					
26	Frequent exposure to radiation is the risk factors of breast cancer.					
27	Every person can suffer Breast Cancer regardless of age and gender					
28	Both male and female should have to do Breast Self-Examination monthly.					
29	Men should take Breast Self-Examination since they have possibility of suffering Breast Cancer.					
30	Everyone male or female should take Breast Self-Examination as there is Breast Cancer possibility.					
31	Obesity is closely related to incidence of Breast Cancer.					
32	Aging is closely related to incidence of Breast Cancer.					
33	Ethnicity is closely related to incidence of Breast Cancer..					
34	Socioeconomic status is closely related to incidence of Breast Cancer.					

Anatomy of the Female Breast Figure & BSE Technique

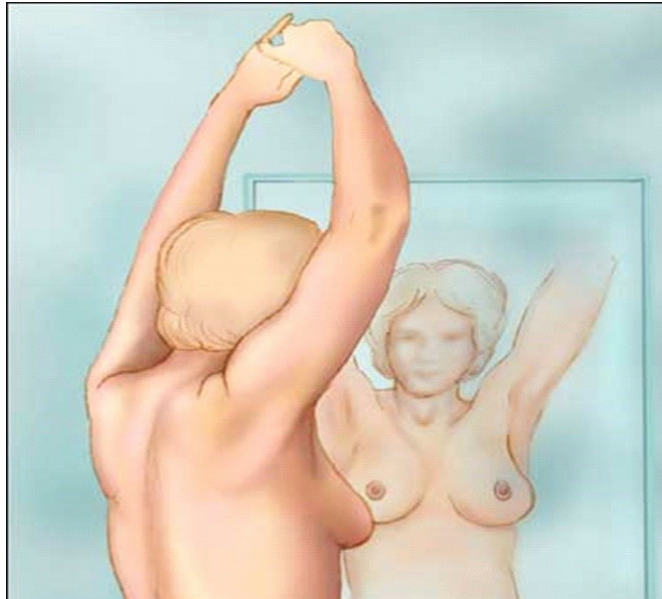


(Source-Internet)

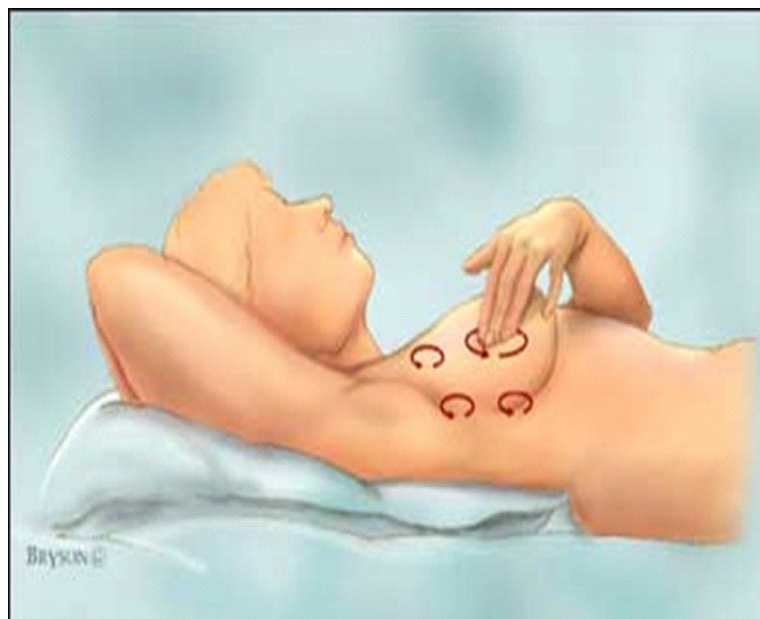
According to the ([Carol Boyer, RN, MSN, APN, CBPN-IC, AOCNS](#) for Summit Medical Group) Breast Self –Examination (5) steps are following,



Step 1: Stand before a mirror with your shoulders straight and your arms on your hips and Look at your breasts to become familiar with their size, shape, and color. Note and tell your doctor if you see changes in your breasts, including: (Dimpling, puckering, or bulging skin, A nipple that is inverted or has changed position, Redness, a rash, or swelling, Soreness).



Step 3: While you are at the mirror, look for any signs of fluid coming out of one or both nipples (this could be a watery, milky, or yellow fluid or blood). Note whether and tell your doctor if you have watery, milky, yellowish, or bloody fluid from either or both nipples.



Step 4: Lie down and use your right hand to feel your left breast; use your left hand to feel your right and Straighten and keep your first 3 fingers together , be sure your touch is firm, but smooth, with (Light pressure for the skin and tissue just beneath it

,medium pressure for tissue in the middle of the breast) Firm pressure for deep tissue at the back of the breast down to the ribcage ,Use a circular motion about the size of a quarter to examine your entire breast ,Be sure to feel the entire breast, from top to bottom and side to side ,Use a pattern like that of mowing a lawn to ensure that you don't miss any areas and Start at your collarbone and work to the top of your abdomen and from your armpit to your cleavage.



Step 5: Stand or sit to examine your breasts (examining your breasts in the shower with wet hands and breasts can make it easier to feel abnormalities) ,Straighten and keep your first 3 fingers together ,Be sure your touch is firm, but smooth, with; (Light pressure for the skin and tissue just beneath it , Medium pressure for tissue in the middle of the breast ,Firm pressure for deep tissue at the back of the breast down to the ribcage ,Use a circular motion about the size of a quarter to examine your entire breast ,Be sure to feel the entire breast, from top to bottom and side to side ,Use a pattern like that of mowing a lawn to ensure that you don't miss any areas ,Start at your collarbone and work to the top of your abdomen and from your armpit to your cleavage).(Boyer, Summit Medical Group)

Table (4.18) Communalities

Communalities	Initial	Extraction
b1 Do you agree you should learn the correct method of Breast Self-Examination?	1.000	.590
b2 It is very good to learn Breast Self-Examination form your parents.	1.000	.644
b3 It is very good to learn Breast Self-Examination form your friends.	1.000	.666
b4 You should discuss with your friends about Breast Self-Examination properly.	1.000	.636
b5 You should learn how to test Breast Self-Examination from health-stuff.	1.000	.676
b6 you notice any abnormality, directly go to public health center.	1.000	.698
b7 You should perform Breast Self-Examination at least once in 6 months.	1.000	.502
b8 By detecting breast changes by self- early, it can improve the chances of saving breast by avoiding mastectomy and may reduce the need for chemotherapy.	1.000	.597
b9 Breast Self- Examination is a low cost method of detecting early Breast Cancer.	1.000	.530
b10 I agree that,Breast cancer can be prevented by breast feeding to the baby	1.000	.637
b11 Women may occur Breast Cancer than Men.	1.000	.943
b12 To detect early breast cancer, correct Breast Self -Examination is needed	1.000	.595
b13 I think if I had no family history, Breast Self- Examination practice is not necessary for me.	1.000	.562
b14 I think if I take mammogram, Breast Self- Examination is not needed to perform.	1.000	.562
b15 When any abnormality in Breast is identified during Breast Self Examination, you should consult with health personnel.	1.000	.650
b16 Doing Breast Self -Examination prevents me from future having problems related with breast.	1.000	.465
b17 I really care about my Breast Self- Examination Technique.	1.000	.469
b18 Always search for information regarding Breast Self- Examination from the Internet, Magazine and Newspaper	1.000	.607
b19 I don't perform Breast Self -Examination due to fear for being diagnosed as Breast Cancer.	1.000	.543
b20 Doing Breast Self- Examination is waste time for me.	1.000	.525
b21 When any abnormality in Breast is identified during Breast Self- Examination, it must be treated with Home remedies.	1.000	.611
b22 I don't perform Breast Self-Examination as I don't have enough privacy to do Breast Self-Examination.	1.000	.640
b23 I don't perform Breast Self-Examination as I think it is time consuming.	1.000	.477
b24 If I perform regular Breast Self-Examination, it can help me to be familiar with the characteristics of the breast.	1.000	.598
b25 Completing Breast Self-Examination each month may help me to detect early breast lump and any changes in breast	1.000	.616
b26 Frequent exposure to radiation is the risk factors of breast cancer.	1.000	.943
b27 Every person can get Breast Cancer regardless of age and gender	1.000	.426
b28 Both male and female should have to do Breast Self –Examination monthly.	1.000	.609
b29 Men should take Breast Self-Examination since they have possibility of suffering Breast Cancer.	1.000	.640
b30 Everyone male or female should take Breast Self-Examination as there is Breast Cancer possibility.	1.000	.575
b31 Obesity is closely related to incidence of Breast Cancer.	1.000	.928
b32 Aging is closely related to incidence of Breast Cancer.	1.000	.949
b33 Ethnicity is closely related to incidence of Breast Cancer..	1.000	.928
b34 Socioeconomic status is closely related to incidence of Breast Cancer.	1.000	.949

Extraction Method: Principal Component Analysis.

