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وزارة التعليم العالي والبحث العلمي
جامعة ٢١ سبتمبر للعلوم الطبية والتطبيقية
كلية الطب
الدفعة الاولى

Evaluation of risk Factors in young women diagnosed with Breast Cancer in Al-Amal Center, Sana'a, Yemen.

A Research project Submitted to Faculty of Medicine,21 September UMAs in partial fulfillment of requirement for MBBs.

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إهداء

تقديراً لوجودها العظيم، نَوَّدُ أن نُهدي بحثنا لتلك الجوهرة التي توجد في كل بيت، تمنحه الأمل الحنان والقوة.. لكل النساء عموماً وللمرأة اليمنية خصوصاً.. تتمنى من الله أن يمدكن بالصحة والعافية وأن يملئ قلوبكن الرضا والسعادة.

Dedication

In appreciation of her great presence, we would like to dedicate our research to whom is found in every Yemeni house, who gives us hope, affection and strength to the Yemeni woman. We pray Allah to provide you a health and a long life.

Abstract

Background: Breast cancer is a common public health problem and the main cause of cancer-related death worldwide. In Yemen, breast cancer is recorded as the most common cancer among women (30.3%) also the most common of all cancers (16.6%). Therefore, we aimed to evaluation of the known risk factors in young women aged between 20-30 years old diagnosed with breast cancer at Al-Amal Center and registered in the period between 2017-2022, in Sana'a, Yemen.

Subjects and Methods: Registered data of breast cancer patients were collected from the Al-Amal Center in Sana'a. Analysis of data was done by using the statistical package for social science (SPSS version 21).

Results: The study included a total of 67 female breast cancer cases that were registered in Al-Amal Center from 2017 to 2022. Their age between 20-30 years old, 78.1 % of them were married, 73.13 % have regular menstruation, and 32.80% were taking oral contraceptives. 64.2% have parity. 19.4% have first consanguinity.96% not do any screening test befor. 48.5% have a mass in the left breast and only 1.5% have a family history of breast cancer.

Conclusion: In this study, age, marital status, use of oral contraceptives, smoking, and chewing Khat were factors that increased breast cancer risk. Therefore, focusing on increasing awareness in the community such as a healthy diet, undergoing frequent breast cancer screening, and promoting breast self-examination is important for discovered the breast cancer and treatment in early stage that will reduce the increasing financial and healthy burden of patients.

Keywords: breast cancer, risk factors, women, Yemen.

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List of Abbreviations

AIs	Aromatase Inhibitors
AJCC	American Joint Committee On Cancer
ASCO	The American Society Of Clinical Oncology
BC	Breast Cancer
BHGI	Breast Health Global Initiative
BMI	Body Mass Index
CAD	Computer Aided Detection
CC	Craniocaudally
ER+	Estrogen Receptor Positive
ER-	Estrogen Receptor Negative
FNA	Fine-Needle Aspiration
HR+	Hormone Receptor-Positive
HR-	Hormone Receptor Negative
MET	Metabolic Equivalent of Task
MMP	Matrix Metalloproteinase
MLO	Medio Lateral Oblique
NCCN	National Comprehensive Cancer Network
NICE	National Institute of Health and Clinical Excellence
SPSS	Statistical Package for Social Science
%	Percent
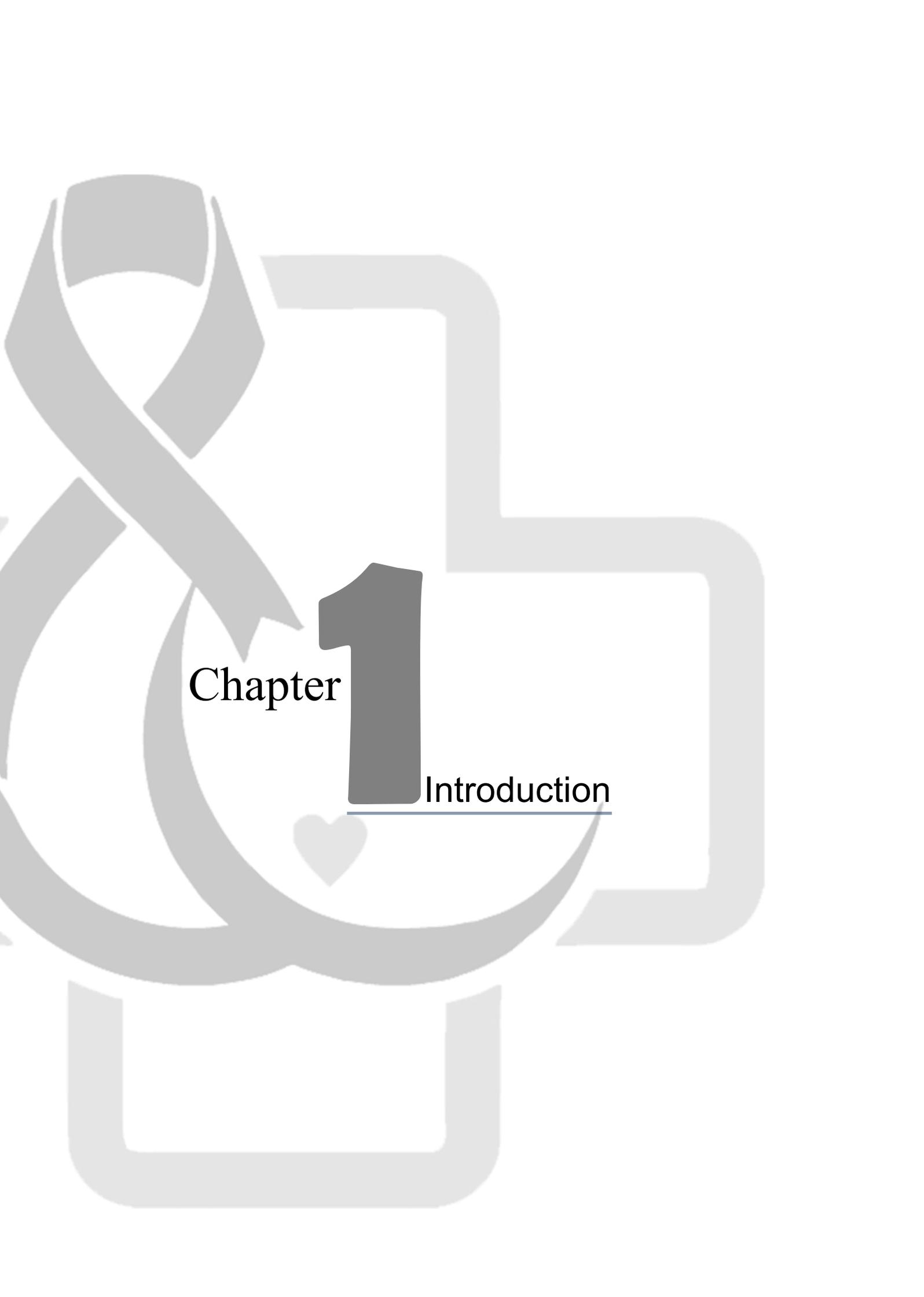
Chapter 1

Introduction

1.1. Introduction:

Breast cancer is a crucial health problem for women between the age of 40 and 50. Most cancers of the breast occur in the duct of the milk-secreting gland, while some originate in the gland itself. An early sign is usually the appearance of a lump in the breast that slowly enlarges with time. Seeking immediate medical advice is recommended should these signs are detected (Asha, Mondal, & Siddika, 2021). Breast cancer, with an incidence of more than one million cases and nearly 600,000 deaths per year, is the most common cancer among women worldwide. It is the second leading cause of cancer death after lung cancer (Rafeemanesh, Taghizadeh Kermani, Khajedaluee, & Ahmadi, 2018).

Breast cancer is currently one of the most prevalently diagnosed cancers and the 5th cause of cancer-related deaths with an estimated number of 2.3 million new cases worldwide according to the GLOBOCAN 2020 data. Deaths due to breast cancer are more prevalently reported (an incidence rate approximately 88% higher) in transitioning countries (Melanesia, Western Africa, Micronesia/Polynesia, and the Caribbean) compared to the transitioned ones (Australia/New Zealand, Western Europe, Northern America, and Northern Europe). Several procedures such as preventive behaviors in general as well as screening programs are crucial regarding a possible minimization of breast cancer incidence rate and the implementation of early treatment. Currently, it is the Breast Health Global Initiative (BHGI) is the responsible for the preparation of proper guidelines and approaches to provide the most sufficient breast cancer control worldwide (Łukasiewicz , 2021).

The incidence of breast cancer is on the rise in low- and middle-income countries as populations increasingly adopt western lifestyles. Mortality is disproportionately high in poor countries (mainly in Africa and Asia), where more than 60% of new breast cancer cases occur and 70% of the world's total deaths take place. In the Eastern Mediterranean Region, breast cancer is the most common malignancy, comprising 12%–30% of all cancer cases. In Yemen, breast cancer is the most common cancer among females and it constitutes about 21% of all cancer cases where the mean age at diagnosis is 47 years and about one-quarter of cases are diagnosed below the age of 40 years (Badr, Bourdeanu, Alatrash, & Bekarian, 2018).

1.1.1. Statement of the problem

Breast cancer is the most common malignancy in Yemen and the first leading cause of cancer death. In Yemen, breast cancer is recorded as the most common cancer among women (30.3%) and the most common of all cancers (16.6%) (Al-Naggar , 2021). In Sana'a-Yemen, the study of the pattern of malignancies among 1,491 patients found that breast cancer ranked first among Yemeni women and formed 8% of all cancers. (Alsanabani, Gilan, & Al Saadi, 2015).

Despite this trend in increase in breast cancer among women, most women do not understand the risk factors that contribute to breast cancer. More so, very few studies have been conducted on the topic therefore limited information about the risk factors for breast cancer among women. Therefore there is need to test the findings within Yemen. This study therefore sought to address this problem by investigating the risk factors for breast cancer among women patient in Al-Amal Center in Sana'a, Yemen.

1.1.2. Importance of study:

This study is importance as it might provide information on the risk factors associated with of breast cancer in Al-Amal Center, Sana'a, Yemen. In availing this information, the county government might able to come up with policies that will aim at encouraging residents to be screened and treated for breast cancer. The government might also provide policies and programmers that aim at avoiding risk factors that are avoidable to reduce the incidences of breast cancer in the county.

The findings may also benefit the residents of Sana'a city, Yemen be able to understand the risk factors of breast cancer. In doing so, they will be encouraged to avoid such behavioral practices that lead to breast cancer. They will also be encouraged to undergo regular breast cancer screening that aid in early detection of the disease. This will reduce the cost of breast cancer treatment if detected at an advanced stage.

1.1.3. Research questions

The research questions of the study were:

1) What are the socio demographic characteristics of respondents and how do they contribute to breast cancer among women in Al-Amal Center ,Sana'a, Yemen?

2) What reproductive factors contribute to breast cancer among women in Al-Amal Center ,Sana'a, Yemen?

3) What are the hormonal factors that contribute to breast cancer among women in Al-Amal Center ,Sana'a, Yemen?

4) How do behavioral factors contribute to breast cancer among women in Al-Amal Center Sana'a, Yemen?
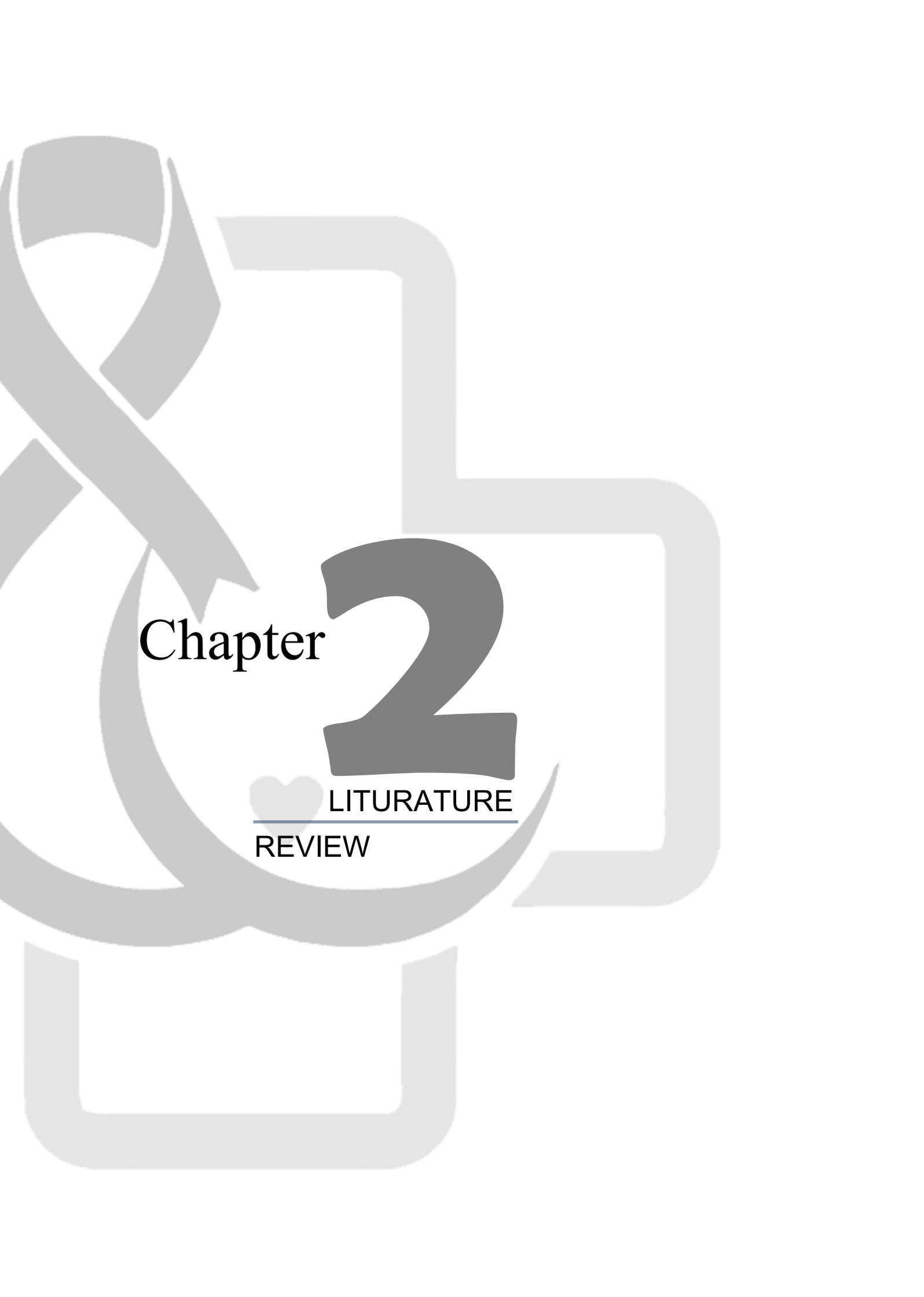
1.2. Objectives:

1.2.1 General objective:

To determine, the evaluation of risk factors in young women diagnosed with breast cancer at Al-Amal Center, Sana'a, Yemen.

1.2.2. Specific objectives:

1. To help to minimize as possible the rate of breast cancer incidence.
2. To encourage young women to do recurrent screening tests for breast cancer.

Chapter 2

LITURATURE REVIEW

2.1. Anatomy and Physiology of Breast:

The breasts or mammary glands are accessory glands of the female reproductive system. They exist also in the male but in only a rudimentary form. In females, the breasts are small and immature until puberty. Thereafter they grow and develop to their mature size under the influence of estrogen and progesterone. During pregnancy, these hormones stimulate further growth. After the baby is born the hormone prolactin from the anterior pituitary stimulates the production of milk, and oxytocin from the posterior pituitary stimulates the release of milk in response to the stimulation of the nipple by the sucking baby, by a positive feedback mechanism (Waugh & Grant, 2006).

The mammary glands consist of glandular tissue, fibrous tissue, and fatty tissue. Each breast consists of about 20 lobes of glandular tissue, each lobe is made up of several lobules that radiate around the nipple. The lobules consist of a cluster of alveoli that open into small ducts and these unite to form large excretory ducts, called lactiferous ducts. The lactiferous ducts converge towards the center of the breast where they form dilatations or reservoirs for milk. Leading from each dilatation, or lactiferous sinus is a narrow duct that opens onto the surface of the nipple. Fibrous tissue supports the glandular tissue and ducts, and fat covers the surface of the gland and is found between the lobes.

The nipple is a small conical eminence at the center of the breast surrounded by a pigmented area which is the areola. On the surface of the areola are numerous sebaceous glands (Montgomery's tubercles) that lubricate the nipple during lactation.

1. Chest wall
2. Pectoralis muscles
3. Lobules
4. Nipple
5. Areola (pigmented area)
6. Milk ducts
7. Fatty tissue
8. Skin

Figure 1. Anatomy of the female breast.

(Azam, 2020)
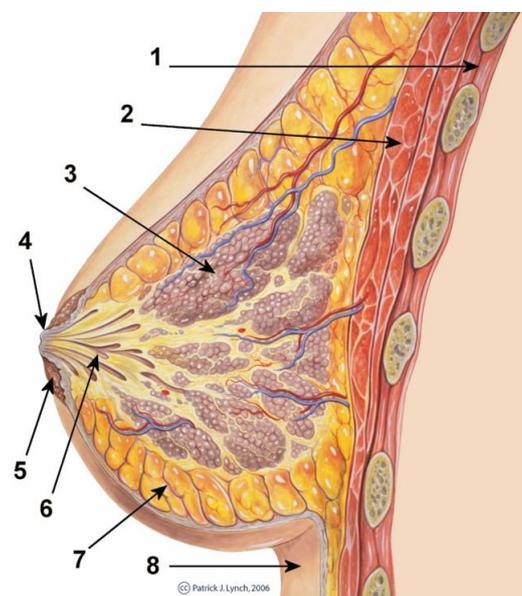
Blood supply, lymph drainage, and nerve supply:

Arterial blood supply. The breasts are supplied with blood from the thoracic branches of the axillary arteries, the internal mammary and intercostal arteries.

Venous drainage. This describes an anastomotic circle around the base of the nipple from which branches carry the venous blood to the circumference and ends in the axillary and mammary veins.

Lymph drainage. This is mainly in the axillary lymph vessels and nodes. Lymph may drain through the internal mammary nodes if the superficial route is obstructed.

Nerve supply. The breasts are supplied by branches from the 4th, 5th, and 6th thoracic nerves which contain sympathetic fibers. There are numerous somatic sensory nerve endings in the breast, especially around the nipple. When these touch receptors are stimulated by sucking, impulses pass to the hypothalamus and the flow of the hormone oxytocin is increased, promoting the release of milk (Waugh & Grant, 2006).

Before puberty, there are no discernible differences, functional or structural between the male and female breasts. At the histological level, the pre-pubertal breast both in males and in females consists of multiple rudimentary ducts arranged circumferentially and converging towards the nipple. At the blind end of each rudimentary duct are poorly-developed, but potentially secretory acini. With the onset of puberty, a striking sexual dimorphism becomes manifest as dramatic changes ensue in the morphology and function of the female breast. These changes are the result of the unique response of the breast to various normal hormonal influences. The following account of breast physiology pertains exclusively to the female breast (Ellis & Mahadevan, 2013).

The prime function of the female breast is lactation: a term that encompasses the synthesis, secretion, and ejection of milk. Additionally, the female breast is a prominent secondary sexual feature. The initial growth of the female breast at puberty is affected primarily by estrogen (estradiol) which induces proliferation and branching of the duct system, also maturation and prominence of the nipples. However, the development and proliferation of acini (alveoli) at the areolar ends of the ducts is the result of the combined and synergistic actions of estrogen and progesterone.

Within the breast tissue, there are several paracrine factors, some stimulatory and some inhibitory, which influence cell division and differentiation. These paracrine regulators include insulin-like growth factors, epidermal growth factors, and transforming growth factor β (Ellis & Mahadevan, 2013).

2.2. Epidemiology of breast cancer:

Breast cancer is the most frequently diagnosed non-cutaneous malignancy among women worldwide and accounted for 12% of all cancers and 25% of all female cancers in 2012. The incidence rates vary globally and are lowest in developing countries and highest in developed countries. It is estimated that > 1.9 million females will be diagnosed with breast cancer in 2020, an approximate 18.4% increase from 2012; with less developed countries, including those in the Middle East, expected to account for most of this increase (Albeshan, Mackey, Hossain, Alfuraih, & Brennan, 2018).

Breast cancer now occupies the number one position in all countries of the Arab world, even if absolute rates are relatively low. Cases tend to be young and almost half of the patients are below 50, with a median age of 49-52 years as compared to 63 in industrialized nations. A preponderance of relatively young individuals has been reported for Lebanon, Alexandria in Egypt, and Aden in Yemen (Salim et al., 2009).

Epidemiological findings point to the same risk factors as in the western world. A positive family history of breast cancer, young age at menarche, late age at last full-term pregnancy, and wide inter-birth interval were significant predictors for occurrence in Egypt. Postmenopausal obesity is a significant risk factor in Jordan, along with several pregnancies (more than 4). On the other hand, a longer period of breastfeeding (more than 24 months) decreases the risk. Risk factors in Kuwait include high BMI, lack of regular exercise, early age at menarche, late age at first pregnancy, hormonal therapy, and frequent consumption of carbohydrates, sweets, animal fat, and vegetable oil (margarine) with a low intake of fresh vegetables and olive oil. In Iraq, family history and oral contraceptive use were found to be associated. Parental consanguinity in Arabs, even when a marriage is between first cousins or double first cousins was not associated with an altered risk of breast cancer. Infertility and usage of infertility drugs in general are not associated with increased risk for breast cancer.

One analysis yielded an estimated 73% higher breast cancer incidence in the highest compared to the light at-night exposed communities. High-risk HPV infections are associated with human breast cancer progression in Syrian women. Locally advanced disease is very common in Egypt, Tunisia, Yemen, Saudi Arabia, Kuwait, Syria, Palestine, and others, and total mastectomy is the most commonly performed surgery (Salim et al., 2009).

In developed countries, approximately 50% of all women with newly diagnosed breast cancer are older than 63 years, while in many developing countries women with breast cancer are predominately younger than 50 years of age. This indicates that breast cancer presents a decade before among women in developing countries including Arab countries compared with women in developed countries. In situ breast cancer has become the most common cancer in developed countries, yet locally advanced and metastatic diseases at presentation remain common in developing countries (El-Zaemey, Nagi, Fritschi, & Heyworth, 2012).

In Yemen, breast cancer is recorded as the most common cancer among women (30.3%) and the most common of all cancers (16.6%) (Al-Naggar et al., 2021). In Sana'a-Yemen, the study of the pattern of malignancies among 1,491 patients found that breast cancer ranked first among Yemeni women and formed 8% of all cancers. On the other side, remote epidemiological studies about breast cancer in southeastern areas of Yemen reported breast cancer as the leading site of cancer among women in Aden city. Between January 2002 and December 2006, the population-based Aden Cancer Registry reported 334 cases of female breast cancer. This cancer was first-ranked cancer among overall cancer sites (16.6%) and female cancers (30.3%) (Alsanabani, Gilan, & Al Saadi, 2015).

2.3. Risk factors of breast cancer:

Various risk factors accounting for differences in prevalence rates are identified, including non-modifiable and modifiable risk factors:

2.3.1. Non-modifiable risk factors:

Non-modifiable risk factors include gender, age, genetic susceptibility, history of breast cancer, ethnicity, and menstrual history.

Being a woman is the main risk factor for developing breast cancer. The reason women develop more breast cancer is that their breast cells are constantly exposed to the growth-promoting effects of the female hormone estrogen and progesterone. The risk of breast cancer increases with age in women, but the risk of cancer development is highly dependent on the hormones associated with ovarian function. As aging is one of the prominent risk factors, rates are expected to be high in countries with larger populations of older people (Lehlasoa, 2011).

The incidence of breast cancer increases rapidly with age during the reproductive years and then increases at a slower rate after about age 50 years, the average age at menopause. The cumulative incidence of breast cancer among women in Europe and North America is about 2.7% by age 55, about 5.0% by age 65, and about 7.7% by age 75 (Key, Verkasalo, & Banks, 2001).

Although several genetic factors contribute to the incidence of breast cancer, approximately 40% of hereditary breast cancer cases occur due to mutations in the BRCA1 and BRCA2 genes inherited through the dominant autosomal method. The results of a study show that 55%–65% of carriers of BRCA1 mutation and 45% of carriers of BRCA2 mutation develop breast cancer by the age of 70 years. Based on a prospective cohort study, the risk of cumulative breast cancer by the age of 80 years was 72% in the carriers of BRCA1 mutation (95% CI, 65%–79%), and this amount was 69% in the carriers of BRCA2 mutation (95% CI, 61%–77%). Changes in human interferon α-2b may be involved in the onset and progression of breast cancer in addition to other risk factors.

In case–control study, matrix metalloproteinase (MMP-2 c-735-T) polymorphisms were associated with an increased risk of developing breast cancer. Furthermore, the MMP-2c allele may also increase the risk of developing breast cancer at a younger age by 1.64-fold (OR, 1.64; 95% CI, 1.01–2.7) (Momenimovahed & Salehiniya, 2019).

History of breast cancer risk factors associated with the development of breast cancer includes family history and personal history of breast cancer. Having a first-degree relative with breast cancer increases the risk of developing the disease compared to women with no family history of the disease. The number of first-degree relatives having the disease increases the chances of developing the disease.

However, having a second-degree relative is still a risk factor. A personal history of breast cancer is associated with breast cancer development. Having cancer in one breast increases the risk of developing new cancer in the other breast or having a recurrence (Lehlasoa, 2011).

Race/ethnicity and age-specific incidence rates have been shown to increase continuously until 80 years in white women from the United States (US), but plateau or decrease after 50 years in Asian women. The greater absolute risk for all BC subtypes has been found in women from the US National Cancer Institute's Surveillance, Epidemiology. A further study demonstrated that, following adjustment for population structure, the median age of BC diagnosis was lower in China (50–54 years) than in the United States and European Union (55–59 years). The authors suggest that this is due to racial differences in genetics and lifestyle and that BC screening programs should be commenced at an earlier age for women (Youn & Han, 2020).

Menstrual history risk factors associated with the development of breast cancer include age at first menarche and age at menopause. Early menarche at around 12 years and late menopause at around later than 55 years increase the duration of exposure of the breast to the high levels of estradiol and progesterone of premenopausal women which influences the risk of cancer by the endogenous hormonal milieu. Late menarche leads to lower endogenous estrogen levels over time, thereby diminishing cumulative breast cancer risk (Lehlasoa, 2011).

2.3.2 Modifiable risk factors:

Modifiable risk factors include socio-demographic profiles, lifestyle behaviors, reproductive factors, anthropometric status, usual dietary intake, and Ionizing radiation.

Socio-demographic factors associated with breast cancer risk in women include marital status, place of residence, education level, and income. Single and nulliparous (without children) married women have a similar risk for breast cancer as compared with women of the same age, although married women with cancer have a reduced risk of 15% mortality compared to unmarried women. More affluent women typically reside in urban areas, and urban areas are frequently characterized by westernized behaviors and lifestyles which have an increased risk of breast cancer development. Women who attain higher education levels have an increased risk of breast cancer.

The considerable period spent in obtaining an education followed by building a career contributes to a delay in marriage, and a probable conception and childbirth at older ages, leading to an increased risk of breast cancer. Breast cancer is generally associated with affluence and is common in high socio-economic groups (Lehlasoa, 2011).

There are several important lifestyle factors related to the risk of breast cancer. Body mass index (BMI) which is defined as body weight in kilograms divided by the square of height in meters, is one of the most commonly used anthropometric measurements. The association between BMI and breast cancer risk has been studied extensively over the past years. An inverse association between BMI and the risk of breast cancer among premenopausal women was observed in the majority of studies. The increased incidence of breast cancer in lean women is found to be strongest among younger women. However, high BMI and obesity are significantly associated with an increased risk of breast cancer in postmenopausal women. The exact biological mechanism for the relationship between BMI and the risk of breast cancer among pre and postmenopausal women is not well understood. However, there are some potential hypotheses. Exposure to estrogen and progesterone elevates the risk of breast cancer. The positive association between BMI and breast cancer risk in postmenopausal women is speculated to be the result of the increased levels of estrogen derived from the conversion of androgenic precursors to estrogen through the peripheral aromatization in adipose tissue (Azam, 2020).

Prospective studies have investigated the association between physical activity and breast cancer risk. Overall, the results show regular physical activity lowers breast cancer risk by 10-20% and the benefit is seen most clearly among postmenopausal women and longer duration of physical activity provides the most benefits, and such activity need not be strenuous. The proposed biological mechanism by which physical activity exerts a protective effect against breast cancer, especially in postmenopausal women could be concerning the decrease in sex steroid hormones, decrease in adiposity, increase in immune system function, reduction in inflammatory markers, and reduction in levels of insulin-related factors (insulin-like growth factors). Assessment method of physical activity varies across studies including using the self-reported questionnaire, pedometers, and heart rate monitors.

However, in an attempt to improve the comparability of findings across studies on physical activity, the concept of the metabolic equivalent of task (MET) score was developed and introduced. MET is a unit that estimates the amount of energy used by the body during physical activity, as compared to resting metabolism. In other words, MET indicates the intensity of the activity, and one MET per hour is defined as 1kcal/kg/hour which it is approximately equal to the energy spent during one hour of quiet sitting (Azam, 2020).

Extensive epidemiological data have shown the association between alcohol consumption and the risk of breast cancer. A meta-analysis that combined the results of 98 studies found women who drank alcohol had an 11% higher risk of breast cancer than nondrinkers. Alcohol consumption is found to be related to the increase in estrogen levels and this may in turn be partially responsible for the association between alcohol consumption and the risk of breast cancer. Another hypothesis is that alcohol is considered a carcinogenic substance, meaning that alcohol metabolism can damage the DNA of the cells, thus inducing tumor development (Azam, 2020).

The carcinogenic potential of tobacco smoke concerning breast cancer is investigated. A large cohort study of 102,927 women aged 16 years and older from the United Kingdom showed that women who had ever smoked were 14% at higher risk of developing breast cancer than those who had never smoked. Interestingly, this study highlighted that women who started smoking at adolescent age before 17 years had a 24% increased risk of breast cancer while those who began smoking between the age of 17-19 years had a 15% increased risk of the disease. It has been suggested that at puberty, the breast is mainly consisting of undifferentiated ductal and lobular structures which makes it more sensitive to carcinogenesis chemical exposure. Other studies also found an increased risk of breast cancer when smoking started in adolescence or close to menarche. Finally, it is being also found that the relative risk of breast cancer associated with smoking is greater in women with a family history of breast cancer (Azam, 2020).

A study was conducted to determine the relationship between reproductive factors and breast cancer in Moroccan Women. This study found that early menarche and null parity significantly increased the risk of breast cancer while early age at first full-term pregnancy reduced the risk of breast cancer significantly (Opili, 2019**).**

Also investigated the reproductive risk factors for breast cancer. The study found that age at first childbirth, age at menarche, and age at menopause is associated with the risk of breast cancer. Reproductive factors are known risk factors for breast cancer that probably act early in life. They point toward endogenous estrogens as likely players in the initiation, progression, and promotion of breast cancer **(**Opili, 2019)**.**

Examined the relationship between reproductive factors and breast cancer subtypes. Older age at first full-term pregnancy, longer time between menarche and first full-term pregnancy, and older age at last pregnancy were associated with an increased risk of estrogen receptor-positive (ER+) tumors. Ever pregnant, having several childbirths, and having a history of breastfeeding were inversely associated with the risk of ER+ tumor. Older age at menarche and longer duration of breastfeeding were inversely associated with estrogen receptor-negative (ER-) tumors **(**Opili, 2019)**.**

Hormonal: The female hormones estrogen and progesterone are involved in the formation of breast cancer. For example, it is known that women who start to menstruate at an early age (before age 12 years), or who have late menopause (after age 55 years) have a higher risk of breast cancer than women who do not. It is also known that women taking oral contraceptives use and women who take hormone replacement therapy after menopause have an increased risk of breast cancer (Asha et al., 2021).

Pregnancy: Having a first child before age 35 and having a greater number of children is associated with decreased risk of HR+ breast cancer in contrast, there appears to be a transient increase in HR- breast cancer risk (lasting about 10 years) following a full-term pregnancy, particularly among women who are older at first birth sought to determine the reproductive for breast cancer risk in Kuala Lumpur, Malaysia and found that breast cancer was strongly related to parity and several live births (Opili, 2019).

Age at menarche: Breast cancer risk increases slightly for each year earlier menstruation begins (by about 5%) and for each year later menopause begins (by about 3%) (Collaborative Group on Hormonal Factors in Breast Cancer, 2012). For example, breast cancer risk is about 20% higher among girls who begin menstruating before age 11 compared to those who begin at age 13. Likewise, women who experience menopause at age 55 or older have about a 12% higher risk compared to those who are between ages 50-54. The increased risk may be due to longer lifetime exposure to reproductive hormones and has been more strongly linked to HR+ breast cancer than other subtypes (Opili, 2019).

Breastfeeding: Most studies suggest that breastfeeding for a year or more slightly reduces a woman's overall risk of breast cancer, with longer duration associated with greater risk reduction. In a review of 47 studies in 30 countries, the risk of breast cancer was reduced by 4% for every 12 months of breastfeeding (Collaborative Group on Hormonal Factors in Breast Cancer, 2014). One possible explanation for this effect may be that breastfeeding inhibits menstruation, thus reducing the lifetime number of menstrual cycles. Another possible explanation relates to structural changes that occur in the breast following lactation and weaning. The protective effect may be stronger for or even limited to triple-negative cancers (Opili, 2019).

Dietary factors associated with increased BC risk included intake of total n-6 polyunsaturated fatty acids (PUFA), vitamin D deficiency or insufficiency, high levels of serum cadmium, and high intake of salt, sugar, meat, and saturated fat and oils. In women with BC, trace elements, cadmium, magnesium, copper, cobalt, and lithium, were found in high levels. This suggests a possible association between serum levels of trace elements and breast cancer risk, however, this requires further investigation and if confirmed, the modulation of trace elements may help to reduce breast cancer risk (Youn & Han, 2020).

High intake of dietary fiber was associated with decreased BC risk along with high levels of α-carotene, β-carotene, β-cryptoxanthin, lutein/ zeaxanthin, and soy products or isoflavones. In addition, BC patients had significantly lower levels of manganese, aluminum, iron, and titanium than women who did not have BC. High consumption of fruit and vegetables has also been linked to a reduction in breast cancer risk in Asia (Youn & Han, 2020).

Extensive follow-up of several radiation-exposed populations has shown that the breast is among the tissues that are most sensitive to the effects of radiation. The effect of ionizing radiation on breast-cancer risk is well established for women exposed before age of 40 years, with relative risks ranging from 1.1 to 2.7 (Key et al., 2001).

Effects on breast-cancer risk have been fairly similar for a single exposure and for multiple exposures that result in equal total radiation dose. Uncertainties remain, however, about the effects of very low doses of radiation, including occupational and medical diagnostic exposures, and exposures later in life (after 40 years). However, one of the few occupational studies on women found high breast cancer mortality among US radiological technologists and especially among those who had qualified 30 or more years earlier and who had been employed before 1940, when the doses were likely to be highest. Overall, an estimated 1% of breast cancers in the USA may be attributable to diagnostic radiography (Key et al., 2001).

2.4. Diagnosis of breast cancer:

History and physical examination: The clinical history of patients with breast cancer is aimed at investigating cancer threats and demonstrating the occurrence or lack of manifestations indicative of breast illness. It must comprise age at menarche, menopausal condition, earlier pregnancies, and utilization of hormone replacement therapy after menopause or utilization of oral contraceptives. Personal history as well as family history should be carried out in detail. Personal history includes age at diagnosis of breast cancer, previous breast biopsies, and treatment of other cancer with the use of radiation. Family history includes a history of ovarian cancer and breast cancer in first-degree relatives. Patents should be examined for particular manifestations such as breast pain, weight loss, pain in the bone, tiredness, and nipple discharge (Akram, Iqbal, Daniyal, & Khan, 2017).

Physical examination includes inspection of breasts, the area around the neck and collarbone, and armpits (axillae) carried out by clinicians. Breasts are observed for any deformities such as lumps or other manifestations of breast cancer. Lymph nodes are also examined which are usually enlarged in patients with breast cancer (Akram et al., 2017).

Breast Awareness and Self-examination: Beginning in their 20s, women should be told about the benefits and limitations of this exam. Also women should be aware of how their breasts normally feel and if there is any new breast change should report it to a health professional as soon as they are found. Finding a breast change does not necessarily mean there is cancer (Asha et al., 2021).

The exam is done while lying down, not standing up. This is because when lying down, the breast tissue spreads evenly over the chest wall and it is thin as possible making it much easier to feel all the breast tissue (Asha et al., 2021).

Breast imaging:

Mammography: Mammography is known as the primary imaging technique for the diagnosis of breast cancer. Mammography could be used for screening (used for women who have no symptoms or signs of breast cancer) or diagnostics (used for women who have breast cancer symptoms or to evaluate abnormalities detected in a screening mammogram). It is a radiographic imaging of the breast which uses low-dose X-ray to detect asymptomatic cancers early when it is most treatable. For a long time, screen-film mammography has been used as the standard method for breast cancer screening programs and all important randomized controlled trials in population-based breast cancer screening programs were conducted using analog screen-film mammography. However, in recent years screen-film mammography has been replaced by full-filed digital mammography in most Western breast cancer screening programs since it first gained U.S. Food and Drug Administration (FDA) approval in 2000 **(**Azam, 2020**).**

Full-filed digital mammography offers several potential benefits as compared to screen-film mammography including better image quality and dose optimization, easier and more efficient archiving, image transfer capacities, improved diagnostic accuracy, especially for women with high mammographic density due to higher contrast resolution, and implementation of advanced technologies such as Computer Aided Detection (CAD). Additionally, full-field digital mammography shows improved image quality with higher reliability in characterizing microcalcifications compared with screen-film mammography. To increase the accuracy of mammography, the screening examination includes two views; a Medio lateral oblique (MLO) view in which the breast is compressed along an oblique line passing through the nipple towards the axillary region to follow the pectoral muscles and the glandular tissue and a craniocaudally (CC) view in which the breast is compressed horizontally **(**Azam, 2020**).**

Ultrasound: Ultrasound is an important diagnostic investigation to further characterize a clinically and/or mammographically suspicious breast lesion. It is also now routinely used to stage the regional lymph nodes It has very high sensitivity and specificity in experienced hands. There are several indications to perform a breast ultrasound: It has very high sensitivity and specificity in experienced hands. To characterize a solid mass or architectural distortion present on the mammogram. To identify cystic lesions of the breast and to distinguish simple cysts from complex cysts. In young women aged < 30, ultrasound is the primary imaging investigation. In most cases, an ultrasonically benign lesion is found and can be needle biopsied or simply followed up a few months later. In pregnant and lactating women, ultrasound is the primary imaging modality, followed by mammography with shielding only in suspicious cases. Breast inflammation/abscesses are another indication for ultrasound as it may facilitate drainage of pus, especially in complex multiloculated sepsis, or reveal an underlying malignancy in breast inflammation that does not respond to antibiotic treatment (Wyld, Markopoulos, Leidenius, & Senkus-Konefka, 2018).

Magnetic Resonance Imaging: MRI has a higher sensitivity in comparison to mammography for differentiation of post-treatment changes from recurrent disease and is reported as ranging from 86 to 100 %. However, there is a significant false-positive rate especially when an MRI is performed within 18 months of surgery. MRI may provide additional information and may clarify findings that have been seen on mammography or ultrasound. MRI is not routine for screening for cancer but may be recommended in special situations.

Stages of Breast Cancer:

The most common system used to describe the stages of cancer is the TNM system, developed by American Joint Committee on Cancer (AJCC). This staging system classified cancers based on their T, N, and M stages (Stages of Breast Cancer, 2006).

Stage I: - T1, N0, M0: The tumor is 2 cm (about 4/5 of an inch) or less in diameter and has not spread to lymph nodes or distant sites.

Stage II A: - T1, M0/ T1, N1, M0/ T2, N0, M0: No tumor is found in the breast, but it is in 1 to 3 axillary lymph nodes or found by sentinel node biopsy as a microscopic disease in internal mammary nodes or the tumor is larger than 5 cm and does not grow into the chest wall and has not spread to lymph nodes. Cancer hasn't spread to distant sites.

Stage IIB: T2, N1, M0/T3, N0, M0: The tumor is either larger than 2 centimeters, but not larger than 5 centimeters and has spread to the axillary lymph nodes or larger than 5 centimeters but has not spread to the axillary lymph nodes.

Stage IIIA: - T0 -2, N2, M0/ T3, N1-2, M0: The tumor is smaller than 5 cm in diameter and has spread to 4 to 9 axillary lymph nodes or found by imaging studies or clinical exam to have spread to internal mammary nodes, or the tumor is larger than 5 cm and has spread to 1 to 9 axillary nodes or internal mammary nodes. Cancer hasn't spread to distant sites.

Stage IIIB: T4, N0-2, M0: The tumor has grown into the chest wall or skin and may have spread to no lymph nodes or as many as 9 axillary nodes. It may or may not have spread to internal mammary nodes. Cancer hasn't spread to distant sites.

Stage IIIC: T0-4, N3, M0: The tumor is any size, and has spread to 10 or more nodes in the axilla or to 1 or more lymph nodes under the clavicle (infraclavicular) or above the clavicle (supraclavicular) or to internal mammary lymph nodes, which are enlarged because of cancer. All of these are on the same side as breast cancer. Cancer hasn't spread to distant sites.

Stage IV: T0-4, N0-3, M1: Cancer, regardless of its size, has spread to distant organs such as bone, liver, or lung or lymph nodes far from the breast (Stages of Breast Cancer, 2007, Stages of Breast Cancer, 2006 and The Square health bulletin, 2009) (Asha et al., 2021).

Biopsy of the breast: A breast biopsy is a test that removes tissue or sometimes fluid from the suspicious area. The removed cells are examined under a microscope and further tested to check for the presence of breast cancer. A biopsy is the only diagnostic procedure that can determine if the suspicious area is cancerous. Three types of biopsies exist fine-needle aspiration, core-needle biopsy, and surgical biopsy. In most cases, fine needle aspiration is chosen when the lump is likely to be filled with fluid. If the lump is easily accessible or if the doctor suspects that it may be a fluid-filled cystic lump, the doctor may choose to conduct a fine-needle aspiration (FNA). During this procedure, the lump should collapse once the fluid inside has been drawn and discarded. Core needle biopsy is the procedure to remove a small amount of suspicious tissue from the breast with a larger core (meaning hollow) needle. It is usually performed while the patient is under local anesthesia, meaning the breast is numbed. As with a core-needle biopsy, a surgical biopsy is done while the patient is under local anesthesia. Typically, this test is performed in a hospital setting where an IV and medications are administered to make the patient drowsy **(**Opili, 2019**).**

2.5. Treatment of breast cancer:

Surgery: The treatment of early-stage breast cancer includes surgery, radiotherapy, chemotherapy, endocrine therapy, and biotherapies. Breast-conserving surgery is now the standard of care for early breast cancer, which provides patients with better cosmetic results without compromising survival. Many cancers are now diagnosed earlier due to the introduction of screening, and many large tumors are treated with neoadjuvant therapy to reduce their size, allowing for breast-conserving surgery. However, careful selection of patients for breast conservation is paramount, as adequate surgical margins are essential to reduce the risk of ipsilateral breast tumor recurrences, which may affect cosmetic results (Meade & Dowling, 2012).

Radiotherapy: Radiotherapy continues to be an integral part of BC management, whether in the setting of early-stage breast cancer following breast-conserving surgery, locally advanced post-mastectomy radiotherapy, or even in the metastatic setting (Bashamakha, bin Sumait, Bashamakha, Al Serouri, & Khader, 2019). Access to radiotherapy is limited in Yemen and exclusive in Sana'a, with significant restrictions on accessing palliative care and low professional training for health care providers. Only one center in Yemen is responsible for implementing radiotherapy. However, it does not satisfy the long queue for patients who wait for a long time (up to more than 4 months). Many patients from the governorates prefer to travel to Egypt, Jordan, or India, where the patients suffer a lot. The Ministry of Public Health and Population agreed with the World Health Organization to equip an accelerated line for the Sana'a Oncology Center and another line for the Aden Oncology Center in 2022 and two radiotherapy centers in Taiz and Hadramout in 2024 (Hamid, 2022).

Systemic treatments: Historically, the management of breast cancer depended on the conventional prognostic and predictive factors. However, these parameters alone did not take into account the heterogeneous and phenotypical diversity of breast cancer, which resulted in many patients being over-treated with conventional chemotherapy. The development in recent years of gene expression profiling has identified distinct biological classes of tumors that can help to predict breast cancer outcomes and response to treatment based on gene expression patterns and DNA copy number alterations. Three prognostic tests have been approved for clinical use; Oncotype DX, Mamma print, and H/I. These tests are used to predict the risk of recurrence in patients with newly diagnosed node-negative estrogen-positive breast cancer and to select those patients most likely to benefit from adjuvant systemic chemotherapy (Benson et al, 2009). A low recurrence score indicates that patients are more likely to benefit from

endocrine therapy and would not need adjuvant chemotherapy. A high recurrence score indicates that these patients would require the addition of adjuvant systemic chemotherapy to endocrine therapy. In Ireland, the Oncotype DX is available to node-negative breast cancer patients under the public health system; in the USA, the test is covered by Medicare and private insurance; and in the UK, recent draft guidance from the National Institute of Health and Clinical Excellence (NICE) stated that more evidence is needed on these tests before they can be recommended for use within the NHS **(**Meade & Dowling, 2012**).**

Adjuvant chemotherapy: Adjuvant systemic therapies consist of chemotherapy, endocrine therapy, and human epidermal growth factor receptor 2-directed therapies. Adjuvant chemotherapy is administered to eradicate micrometastases and aims to reduce relapse rates and increase overall survival. Many studies have demonstrated the benefits of adjuvant chemotherapy. However, controversies around it do exist. For example, many commentators still advocate adjuvant chemotherapy for breast cancer patients with the node-positive disease even if they fall into the Luminal A subcategory of breast cancer where benefits from chemotherapy are low. Many patients do not need or will not respond to chemotherapy and the new molecular testing will help in predicting benefits for these patients (Meade & Dowling, 2012).

Hormone manipulation: Breast cancers with estrogen-positive and/or progesterone-positive disease provide a unique treatment option. Tamoxifen has been the drug of choice for many years and is used in both pre and post-menopausal women (Benson et al, 2009). This antiestrogen has been shown to benefit patients with estrogen-positive disease but no benefit has been shown seen in the estrogen-negative disease. The standard duration of therapy is 5 years and this is associated with a reduction in mortality of 26% and up to 47% reduction in local recurrence at a 10-year follow-up (Meade & Dowling, 2012).

Newer agents, aromatase inhibitors (AIs), when compared with Tamoxifen have shown improved disease-free survival among post-menopausal women, improved survival after initial treatment with Tamoxifen, and reduced risk of recurrence, especially at distant sites. AIs are

not used in premenopausal women, as estrogen is produced in the ovaries until menopause and by the adrenal glands after menopause. AIs target the adrenal gland-induced estrogens so would have no benefit pre-menopause. The American Society of Clinical Oncology (ASCO) and the National Comprehensive Cancer Network (NCCN) now recommend that aromatase inhibitors are used in postmenopausal women in the adjuvant setting either as upfront therapy or as a sequential treatment after Tamoxifen. Estrogen receptor-positive patients remain at chronic risk of relapse. Patients currently receive 5 years of adjuvant endocrine therapy. However, the optimal duration of therapy is still not established but studies are ongoing (Meade & Dowling, 2012).
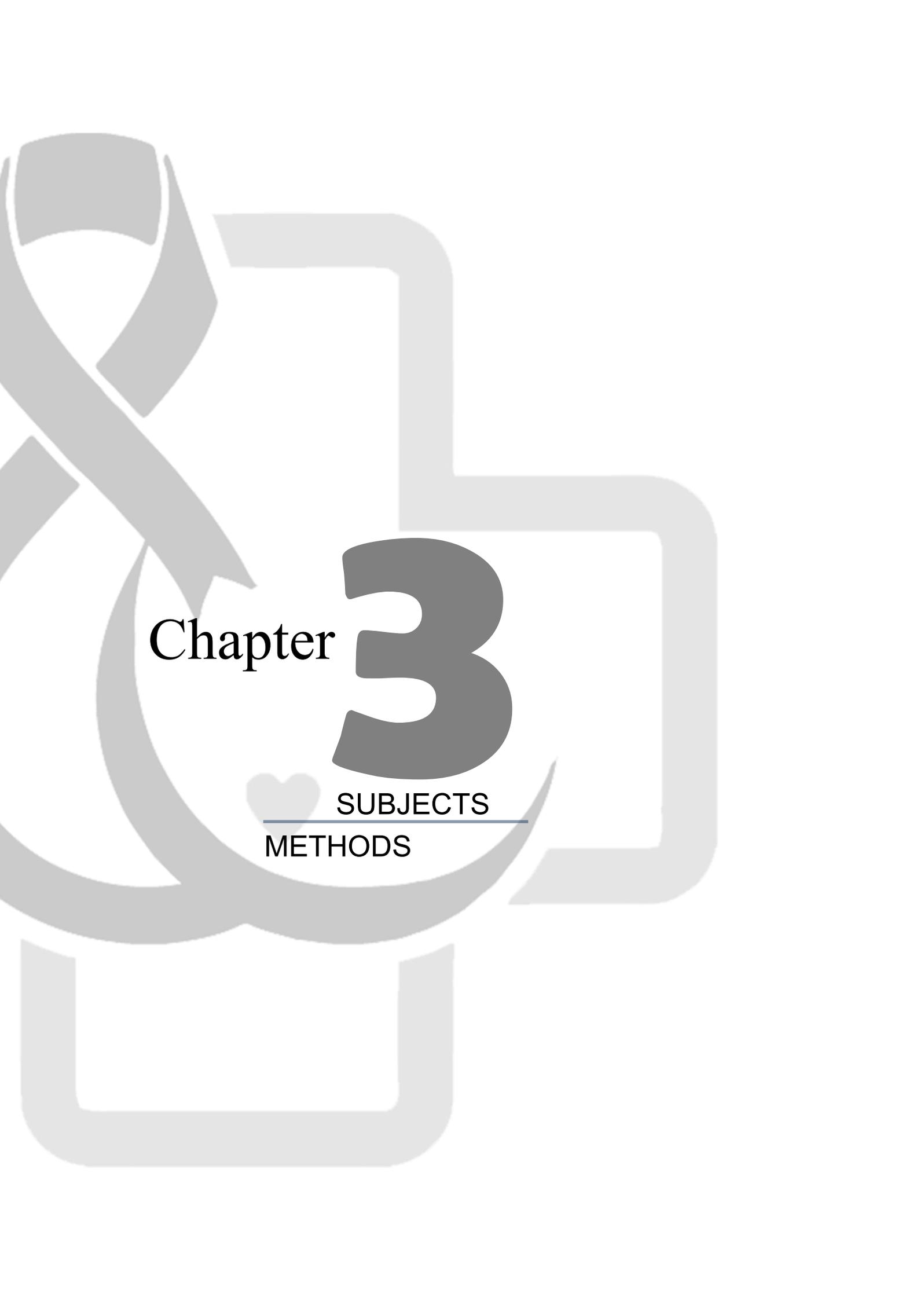
Chapter 3

SUBJECTS
METHODS

3. Subjects & methods:

3.1. Study design

Cross-section study was conducted in order to evaluation of the known risk factors as reported in the literature in women diagnosed with breast cancer by using secondary data of women patients registered with breast cancer between 20-30 year old at Al-Amal Center from 2017 to 2022.

3.2. Time and area of study

The study was performed at Al-Amal Center, Sana'a, Yemen in the period from August 2022 to December 2022.

3.3. Inclusion criteria

Women patients registered with breast cancer between 20-30 years old at Al-Amal Center, Sana'a, Yemen from 2017 to 2022.

3.4. Exclusion criteria

Women patients registered with breast cancer at Al-Amal Center are less than 20 or more than 30 years old.

3.5. Sample size

Exhaustive sampling method, where all women patients with breast cancer met inclusion criteria has been involved in this study, which was 67 women patients.

3.6. Data collection

Data collected by questionnaires that taking from the Al-Amal Center checklist, written in English language, information collected for each accord included (age, marital status, obstetrical history, parity, occupation, menstrual history, hormonal use, breastfeeding, and family history…etc. The questionnaires was filled from files of patients registered in the center.

3.7. Statistical analysis

Analysis of the data was done by using frequencies, percentages, graphical and tabular presentations were done by the statistical package for social science (SPSS version 21).

3.8. Ethical consideration

The study protocol was endorsed by the Deanship of Graduate Studies and Scientific Research on 21 September University of Medical and Applied Sciences, this study was explained and consent was obtained from the Al-Amal Center.
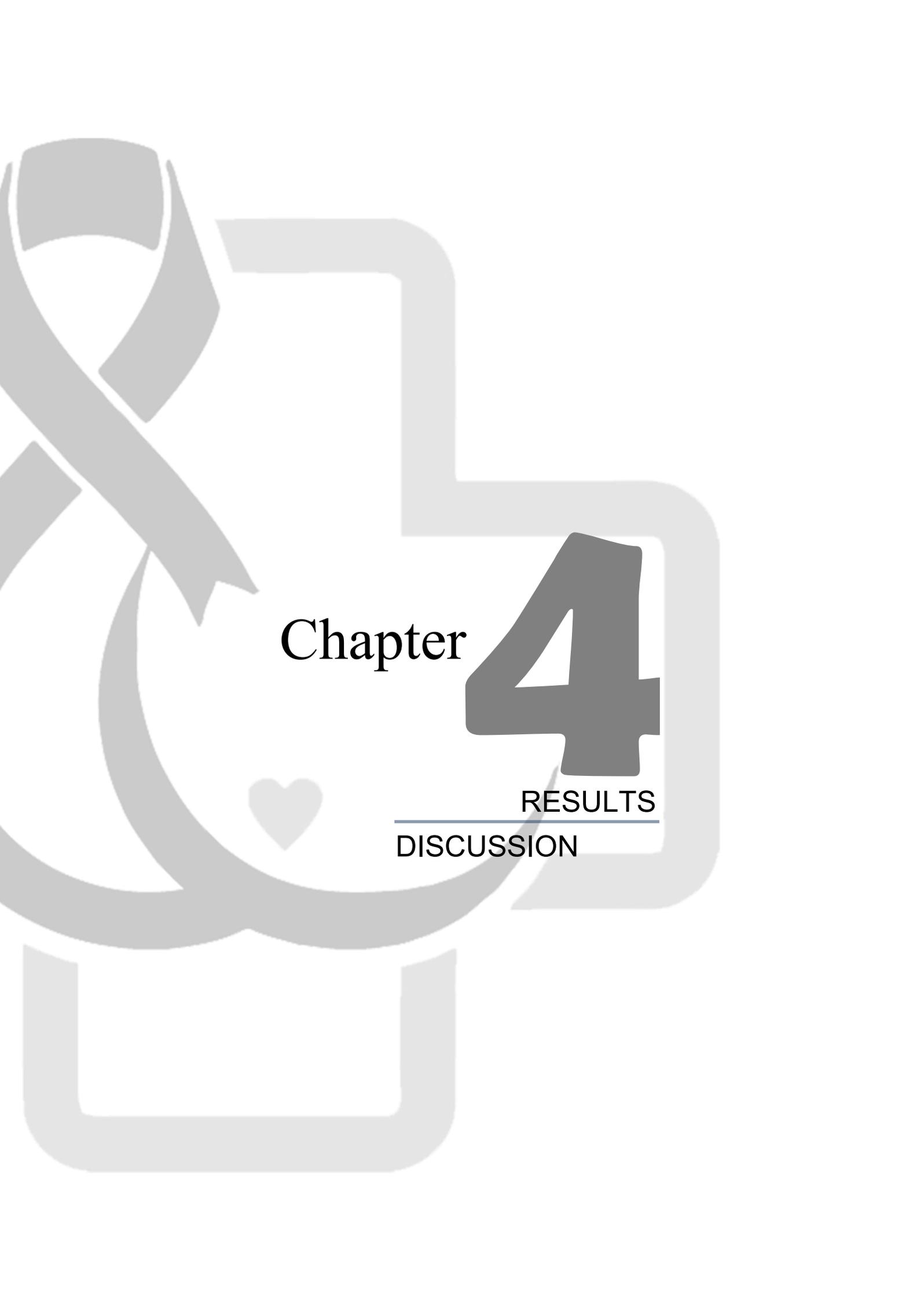
Chapter 4

RESULTS

DISCUSSION

1. Result & Discussion:

4.1 Result

The results of the study regarding the prevalence of non-modifiable and modifiable risk factors for breast cancer, clinical presentation in patients and awareness of patients about breast cancer screening and self-examination will be described in this chapter.

4.1.1. Risk factors

✓ **Non-modifiable risk factors**

❖ A total of 67 women participated in the study. Respondents were 20-30 years of age (Mean age=27.65(SD:2.98)).**Table 4.1**

Table: 4.1. The age of women patients.

	N	%	Mean (SD)
20-25 years	17	25.4%	27.65 (2.98)
26-30 years	50	74.6%	

❖ The consanguinity between the parents among study sample was as follow: 19.4% reported first consanguinity between the parents, 6% reported second degree consanguinity between the parents while 67.2% reported no consanguinity. **Figure 4.1.**

Figure 4.1: The consanguinity between the parents among study sample.
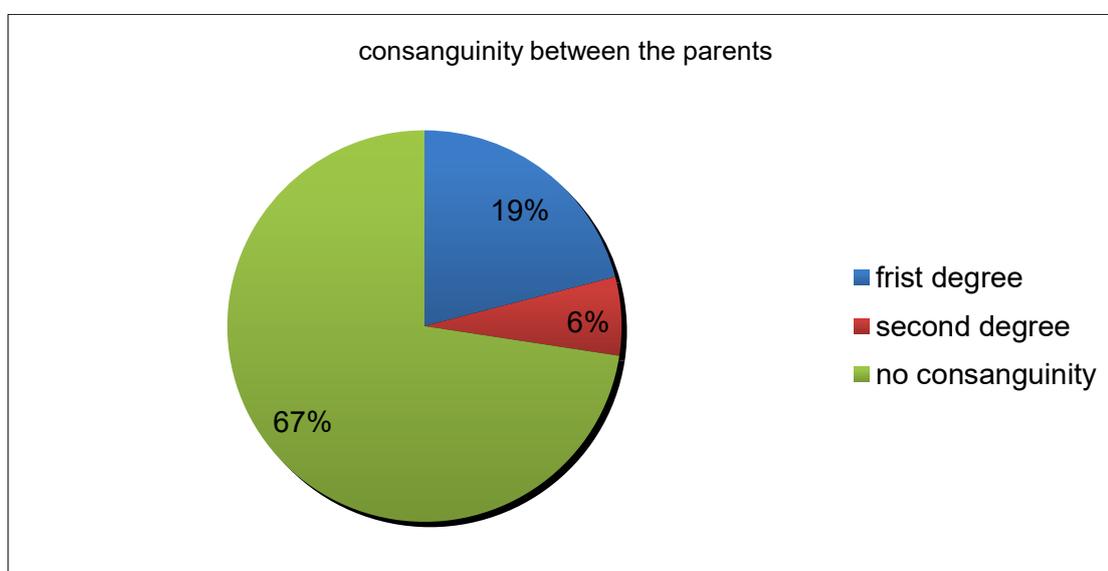
❖ Personal history of benign breast tumor among study sample was only 1.5% of the patients have history of benign breast tumor. **Table 4.2**

Personal history of another cancer among study sample was none of them reported having cancer in uterus, colon, lymphoma, ovary or thyroid.

Table 4.2: Personal history of benign breast tumor among women patients in Al-Amal Center 2017-2022**.**

	N	%
No	66	98.5
Yes	1	1.5
Total	67	100.0

❖ Family history of cancer among study sample was only 1.5% reported having family history of breast cancer and she stated that it was her mother at the age of 30. However, none reported that one of her family have ovarian or prostate cancer. **Table 4.3**

Table 4.3: family history of women patients in Al-Amal Center, 2017-2022.

	Yes		No	
	N	%	N	%
Family history of breast cancer (mother, sister, daughter, grandmother, aunt, cousin..)	1	1.5%	66	98.5%
Family history of ovarian cancer (mother, sister, daughter, grandmother, aunt, cousin ..)	0	0.0%	67	100%
Family history of prostates cancer(father, brother, son, grandfather, uncle,)	0	0.0%	67	100%

❖ Menstruation cycle among study sample was as follow: 73.13% of the study sample has regular menstruation and 23.87% has iirigular menestruation . However , only 3% reported having absent menustratuion due to hyserctormy. **Table 4.4**

History of early menarche among study sample was only 9% of the patients had early menarch.

Table 4.4: Menstruation cycle among women patients in Al-Amal Center 2017-2022**.**

	N	%
Regular menstruation	49	73.13%
Hysterectomy	2	3%
Irregular menstruation	16	23.87%

✓ **Modifiable risk factors**

❖ Description of marital status was distributed as follows:(78.1%) of subjects were married, (20.3%) of subjects were single and (1.6%) of subjects were widow. **Figure 4.2**

Figure: 4.2. Marital status of women patients in Al-Amal Center, 2017-2022.
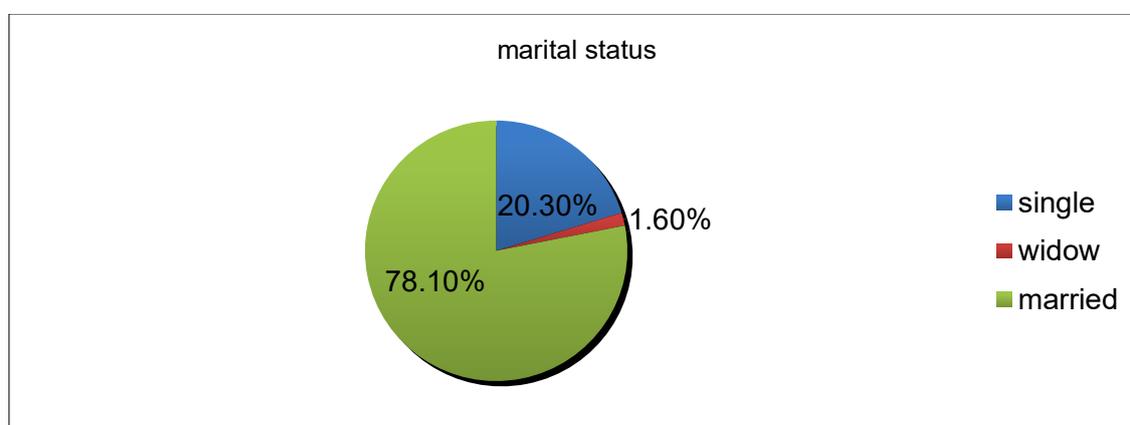
❖ Body Mass index among study sample, descriptive statistics of Body Mass Index (Azam, 2020), of the study sample. Normal body mass index was 61.2 %, underweight 19.4%, Overweight 17.9 % and Obese 1.5%. **Table 4.5**

Table 4.5: Body Mass index among women patients in Al-Amal Center, 2017-2022.

Body Mass index (Kg/m^2)	N	%
Underweight (<18.5)	13	19.4
Normal (18.5 -24.9)	41	61.2
Overweight (25 – 29.9)	12	17.9
Obese (>30)	1	1.5

❖ Working outside home among study sample was 20.9% of the patients work outside home.

   Most of them work in farms as farmers**. Table 4.6**

Table 4.6: Working outside home among women patients in Al-Amal Center, 2017-2022**.**

	N	%
No	53	79.1
Yes	14	20.9
Total	67	100.0

❖ Smoking habits among study sample was as follow: 32.4% of them stated they are smokers

   while 57.4% of them stated they don't smoke. 10.3% of them did not respond. **Table 4.7**

Table 4.7: Smoking habits among women patients in Al-Amal Center ,2017-2022**.**

	N	%
Yes	22	32.4%
No	39	57.4%
Missing	6	10.3%

History of smoking among study sample was as follow: out of 22 patients smoking ,40.90%

of them smoke sometimes, 40.90% rarely smoke,9.10% usually smoke, 4.60% often smoke,

and 4.50% always smoke. **Figure 4.3**

Figure 4.3: History of smoking among women patients in Al-Amal Center, 2017-2022**.**
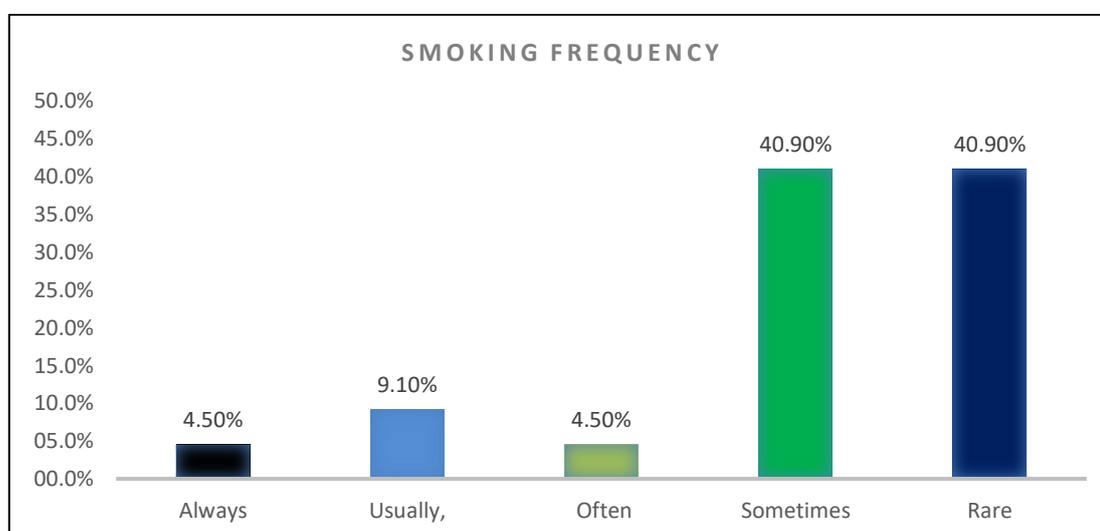
❖ History of chewing Khat among study sample was as follow: out of 39 respondents stated chewing Khat, 51.3% sometimes do it, 17.9% always do it, 12.8% often do it, 10.3% rarely do it, and 7.7% of them do it usually. **Figure 4.4**

Figure 4.4: History of chewing Khat among women patients in Al-Amal Center, 2017-2022**.**
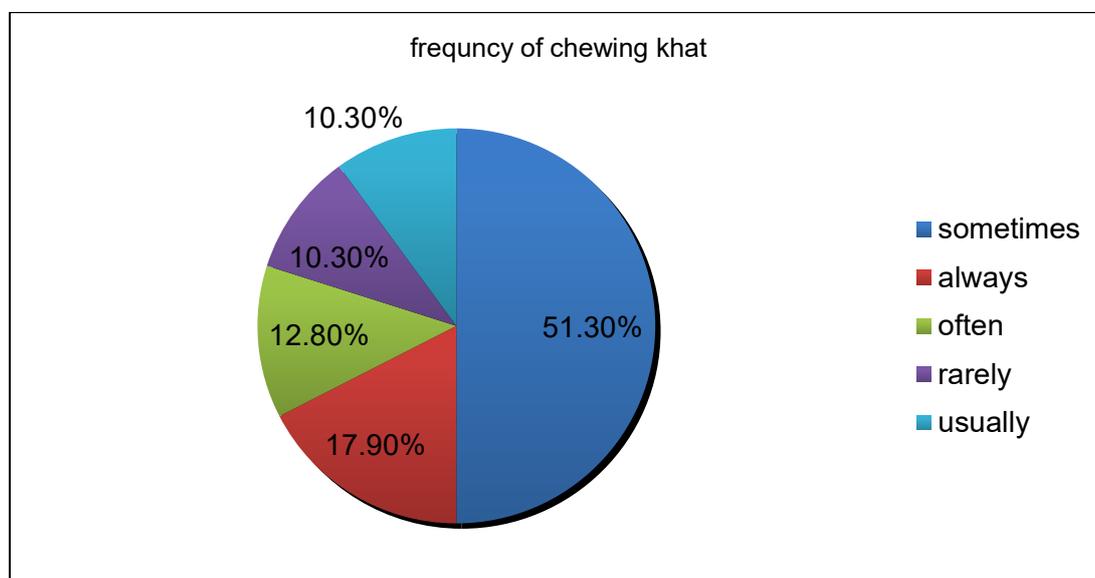
❖ Hormonal contraceptive use among study sample was as follow: out of 67 patients, 32.8% take OCP, 6% take injection, and 1.5% take implantation, while 59.7% not use any hormonal contraceptive. **Table 4.8**

Table 4.8: Hormonal contraceptive use among women patients in Al-Amal Center, 2017-2022**.**

Hormonal contraceptive use:	N	%
OCP	22	32.8%
Injection	4	6.0%
Implantation	1	1.5%
Not use hormonal contraceptive	40	59.7%

❖ Radiotherapy for chest region among study sample was only 1.5% of the patient underwent radiotherapy of the chest region. **Table 4.9**

Table 4.9: Radiotherapy for chest region among women patients Al-Amal Center, 2017-2022**.**

	N	%
No	66	98.5
Yes	1	1.5
Total	67	100.0

❖ Parity among study sample was as follow: 64.2% reported having parity while 35.8% reported not having any parity. **Table 4.10**

Table 4.10: Parity among study sample.

	N	%
No	24	35.8
Yes	43	64.2
Total	67	100.0

❖ Pregnancy among study sample was as follow: it was found that average of pregnancy was 4 (SD=2.5). the average age at first pregnancy was (21.13) SD=4.345). The average number of children lactating was 3 (SD=1.6). Average duration of natural lactation per month was about 16 times with SD of 5.9). **Table 4.11**

Table 4.11: Pregnancy among women patients in Al-Amal Center, 2017-2022**.**

	Mean	SD
number of pregnant women	4.00	2.52627
age at first pregnancy	20.1395	4.34567
number of lactating women	3.2051	1.68865
Average duration of natural lactation per month	15.8974	5.94623

4.1.2 Awareness of patients about screening and self-examination

❖ Attitude and practice towards breast cancer of the participants were assessed. Among those patients 64(95.5%) had never performed breast self-examination, 62 (92.5%) did not go to a doctor for breast examination, 64 (95.5%) did not participate in any breast cancer screening program.

As noticed out of 67 patients, only 7.46% of them underwent mammography, 11.94% performed clinical examination of the breast, 4.4% of them did self-examination of the breast, and 4.48% attended a lecture about breast cancer. **Table 4.12**.

These lectures were from books, internet and school, which suggest the need for a national cancer detection programme involving public education promotion of breast self-examination, simple screening procedures, and the early detection of breast cancer by Ultrasound or mammography and fine needle aspiration.

Table 4.12: Screening of women patients in Al-Amal Center, 2017-2022.

	Yes		No	
	N	%	N	%
Undergoing mammography	5	7.46%	62	92.54%
Do clinical examination of the breast	8	11.94%	59	88.06%
Do practice self-examination for breast	3	4.48%	64	95.52%
Have ever attended a lecture about breast cancer	3	4.48%	64	95.52%

4.1.3. Clinical presentation of breast cancer in patients

❖ The complaint among study sample was as follows: none of the patients complained of change of skin in both breasts. 3.% of them have shape and size change in the right breast and only 1.5% of them reported change of shape and size in the left one. Only 1.5% reported change in right nipple. 49.5% reported presence of mass in the right breast while 48.5% reported having mass in the left breast. 10.4% reported having pain the right breast in comparison to 7.5% in the left breast. None of them reported having right axillary mass in

comparison to 1.5% having mass in the left axillary. 1.5% reported having itch in both

breasts.3% reported having discharge in the right breast in comparison to none in the left

breast. **Table 4.13**

Table 4.13: The complaint among women patients in Al-Amal Center, 2017-2022.

Complaint	N	%
Change of skin of right breast	0	0.0%
change of skin of left breast	0	0.0%
change of shape and size of right breast	2	3.0%
change of shape and size of left breast	1	1.5%
change in right nipple	1	1.5%
change in left nipple	0	0.0%
presence of mass in the right breast	33	49.5%
presence of mass in the left breast	32	48.5%
presence of pain in the right breast	7	10.4%
presence of pain in the left breast	5	7.5%
axillary right breast mass	0	0.0%
axillary left breast mass	1	1.5%
presence of itch in the right breast	1	1.5%
presence of itch in the left breast	1	1.5%
nipple discharge right breast	2	3.0%
nipple discharge left breast	0	0.0%

❖ Previous Breast Surgery among study sample was as follow: only 1.5% of the sample

reported undergoing Mastectomy, 6% reported undergoing Lobectomy. However, none of

them underwent abscess drainage, breast reconstruction, or any other operations. **Table 4.14**

Table 4.14: Previous Breast Surgery among women patients in Al-Amal Center, 2017-2022.

	Yes		No	
	N	%	N	%
Mastectomy	1	1.5%	66	98.5%
Lobectomy	4	6.0%	63	94%
Abscess drainage	0	0.0%	67	100%
Breast reconstruction	0	0.0%	67	100%
Others	0	0.0%	67	100%

❖ Some patients had Previous biopsy of breast or FNAC and was as follow: only 10 cases underwent previous biopsy or FNAC, of which 40% did FNAC, 20% did biopsy, and 40% did open biopsy. **Table 4.15**

Table 4.15: Previous biopsy of breast or FNAC among women patients in Al-Amal Center, 2017-2022.

|	Yes		No	
	N	%	N	%
FNAC	4	5.97%	63	94.0%
Biopsy	2	2.99%	65	97.0%
Open Biopsy	4	5.97%	63	94.0%
Total	10	14.93%	57	85.1%

4.1.4. Summary

Finally, We assessed the main risk factors for the development of female breast cancer and summarized as follow: A total of 22 (32.4%) patients had smoking history, 6 (9%) patients had early menarche, 27 (40.3%) patients had positive history of hormonal contraceptive use, 1 (1.5%) had been repeatedly exposed to radiations and 1 (1.5%) had family history of breast cancer,13 (19.4%) patients were underweight and 39 (58.2%) had history of Qat chewing which place them in risk group for developing breast cancer. Furthermore, 17 (25.4%) patients also had consanguinity between parents. Participants' risk factors of breast cancer found in our study are summarized in **Figure 3.5**.

. **Figure 3.5:**percentage of participants risk factors for breast cancer in women patients in Al-Amal Center, 2017-2022.
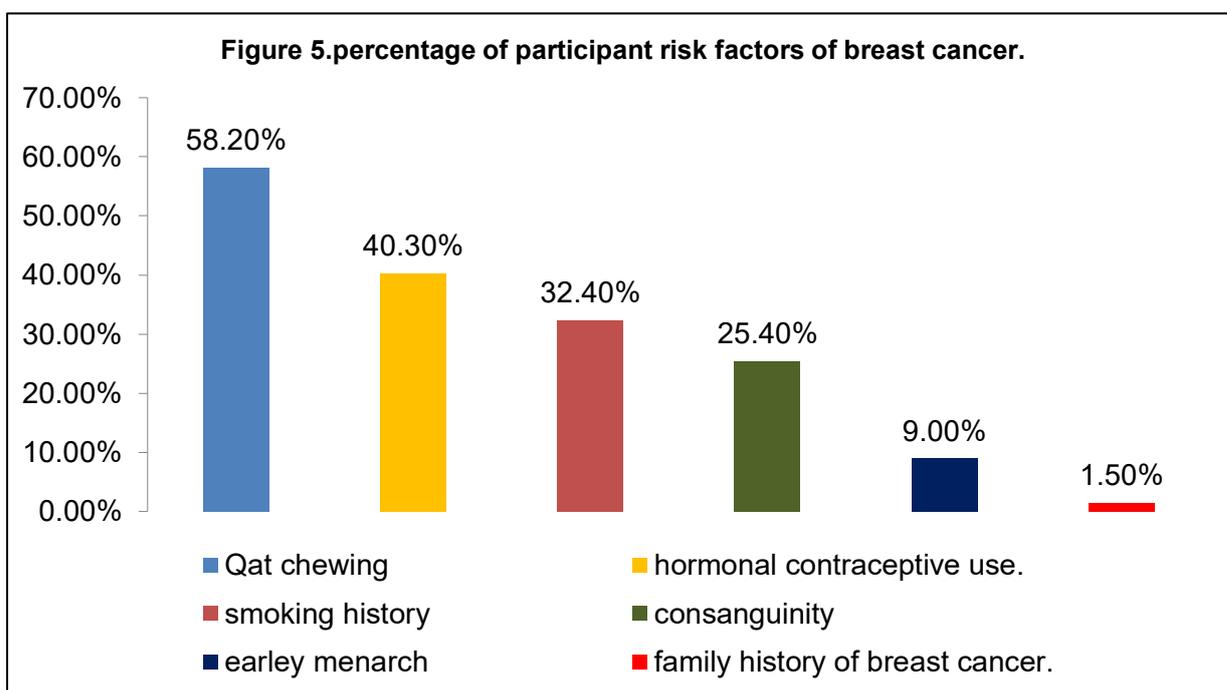
We also assessed factors which protect against female breast cancer development and it was found that a total of 16 (24%) females had irregular menstrual cycles and no any patients used to perform regular exercise. We also cumulated various risk factors present in each individual respondent. It was found that a total of 28 (41.3%) patients had four risk factors, 23 patients (34.9%) had three and 14 (21.2%) patients had two risk factors, 2 (2.6%) were having only one positive risk factor for breast cancer development. Sum of various risk factors found in individual respondents are shown in **Figure 4.6**

. **Figure 4.6:** Sum of participants risk factors for breast cancer in women patients in Al-Amal

Center, 2017-2022

Figure 6.Sum of Risk facors found in individual Respondent.
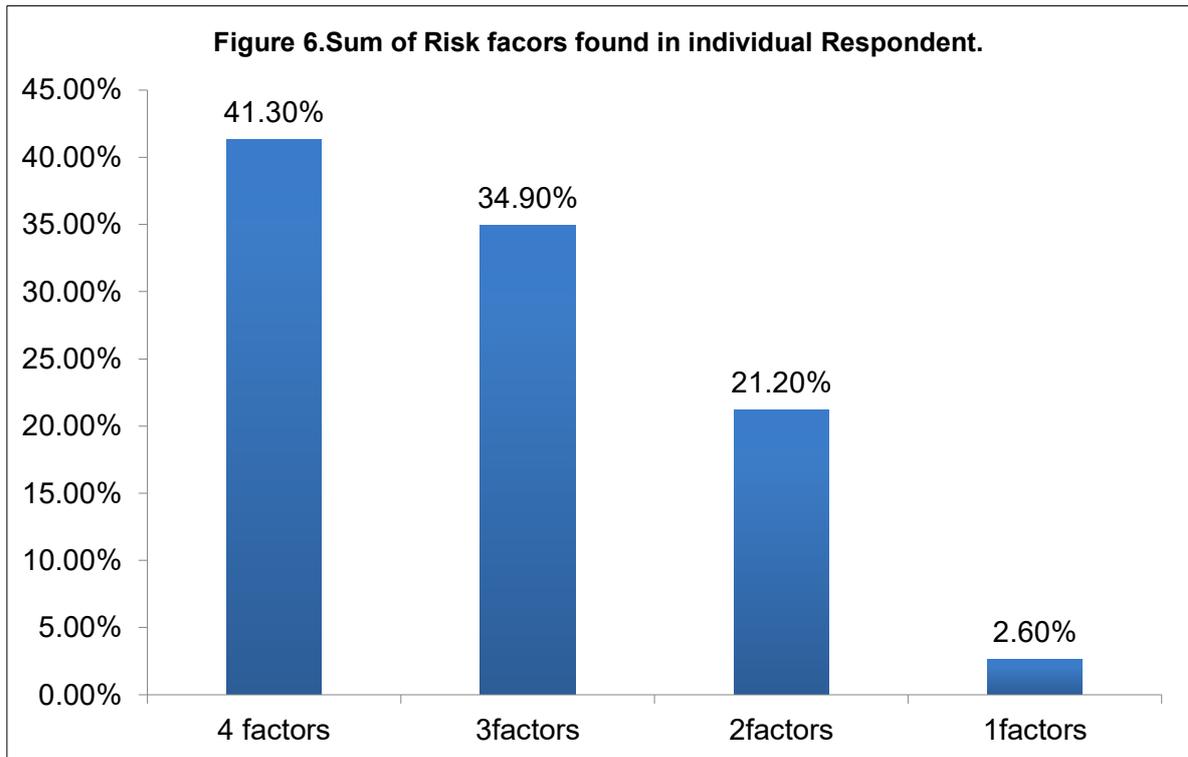
4.2. Discussion

Breast cancer is the most common malignancy in Yemen and the first leading cause of cancer death. Breast cancer data from Yemen's main cancer registries Aden, Taiz, Mukalla, Sayoun, and Shabwah showed a variation in the number of cases reported by each registry and ranged between 13.8% to 22% according to oncology centers reports. Although the incidence of breast cancer in Yemen is lower than that in industrialized nations. (Hamid, 2022)

This study to determine, the evaluation of the known risk factors of breast cancer. A total of 67 Patients women between 20 to 30 years participated in this study.

The study found that most of the study participants were aged 26 years to 30 years, while those aged between 20-25 years were the least. Secondly, the majority of the participants were married while single were the least and the widow had the least percentage. On the relationship between the demographic characteristics and the Presence of Breast Cancer among women in Iraq County,(Hashim, Abed, Tareq, & Ra'id, 2018). First, the study found that age had a statistically significant relationship with breast cancer.

This implied that the risk of breast cancer increased with an increase in age. The older one becomes, the higher the chances of suffering from breast cancer.

The current study showed that family history is not associated with breast cancer, this result agrees with another study done among Yemen women in Hadramout Valley and Desert which also showed that family history is not a strong risk factor for breast cancer. (Bashamakha et al., 2019). Also, this finding is different from the finding of a case-control study done among Iraq women in Baghdad which found that a family history of breast cancer indicates a strong association with the risk of developing breast cancer(Isa, Lafta, & Saeed, 2013), which may be due to the small sample size in the current study.

The current results showed that the consanguinity between the parents among the study sample was as follows: 19.4% reported first consanguinity between the parents, 6% reported second-degree consanguinity between the parents and 67.2% reported no consanguinity, this finding is different from the finding of a case-control study done among Palestine women which

found that consanguinity between the parents of breast cancer indicates a strong association with risk of developing breast cancer. (El Sharif & Khatib, 2021)

The current results showed Women that not undergoing mammography and not practicing self-examination for breast were associated with breast cancer risk.

There are several important lifestyle factors related to the risk of breast cancer. Body mass index (BMI) which is defined as body weight in kilograms divided by the square of height in meters, is one of the most commonly used anthropometric measurements. The association between BMI and breast cancer risk has been studied extensively over the past years. (Azam, 2020). In the current study, the normal body mass index was 61.2%, underweight 19.4%, overweight 17.9 %, and Obese 1.5%. This finding is different from the finding of a case-control study done among Iraq women in Baghdad which found that body mass index (BMI) indicates a strong association with the risk of developing breast cancer(Isa et al., 2013)**,** which may be due to the small sample size in the current study.

The current results showed that patients complained of change such as the presence of a mass in the left breast and the presence of pain in the right breast, these results showed that Complaint was associated with breast cancer. This result agrees with the results of a study done in Yemen, in 2021 that shows that the more common breast affected with cancer is the left breast, with 1005 patients affected. Comparatively, 787 patients were affected in the right breast. Only 26 patients were affected in both breasts. (Al-Naggar et al., 2021**).** Several publications have supported these findings. The possible explanation is not clear, however, as different sizes of breasts, nurses favoring examination of the left breast, and greater convenience for a woman to check her left breast compared to her right breast.

The current results showed that Hormonal intake was associated with the risk of breast cancer. These findings are in agreement with the findings of another study done among women in Iraq County, (Hashim et al., 2018), which supports the association between breast cancer and Hormonal intake such as oral contraceptives that were found to be associated with breast cancer.

The current results showed that parity and breastfeeding were associated with breast cancer risk. This result disagrees with the results of a study among Women in Trans-Nzoia County, Kenya, 2019 showed that null parity was associated with an increased risk of breast

cancer. (Opili, 2019). The current results disagree with the results of a study among Iraq women in Baghdad which found that parous women had a lower risk for breast cancer. (Isa et al., 2013)

The current results showed that the smoking and chewing Khat habit was associated with breast cancer risk. This result agrees with the results of a study done by the West and the East,2018 which showed that active smoking was associated with an increase in breast cancer risk among postmenopausal women also there was an association between passive smoking and an increased risk of breast cancer, this study supports the association between breast cancer and chewing Khat, but no found previous studies to support the association between breast cancer and chewing Khat.

One of the limitations of this study is that the findings might not be generalizable to the whole population of Yemen. Another important limitation is the small sample size which may have affected the power to detect significant differences.
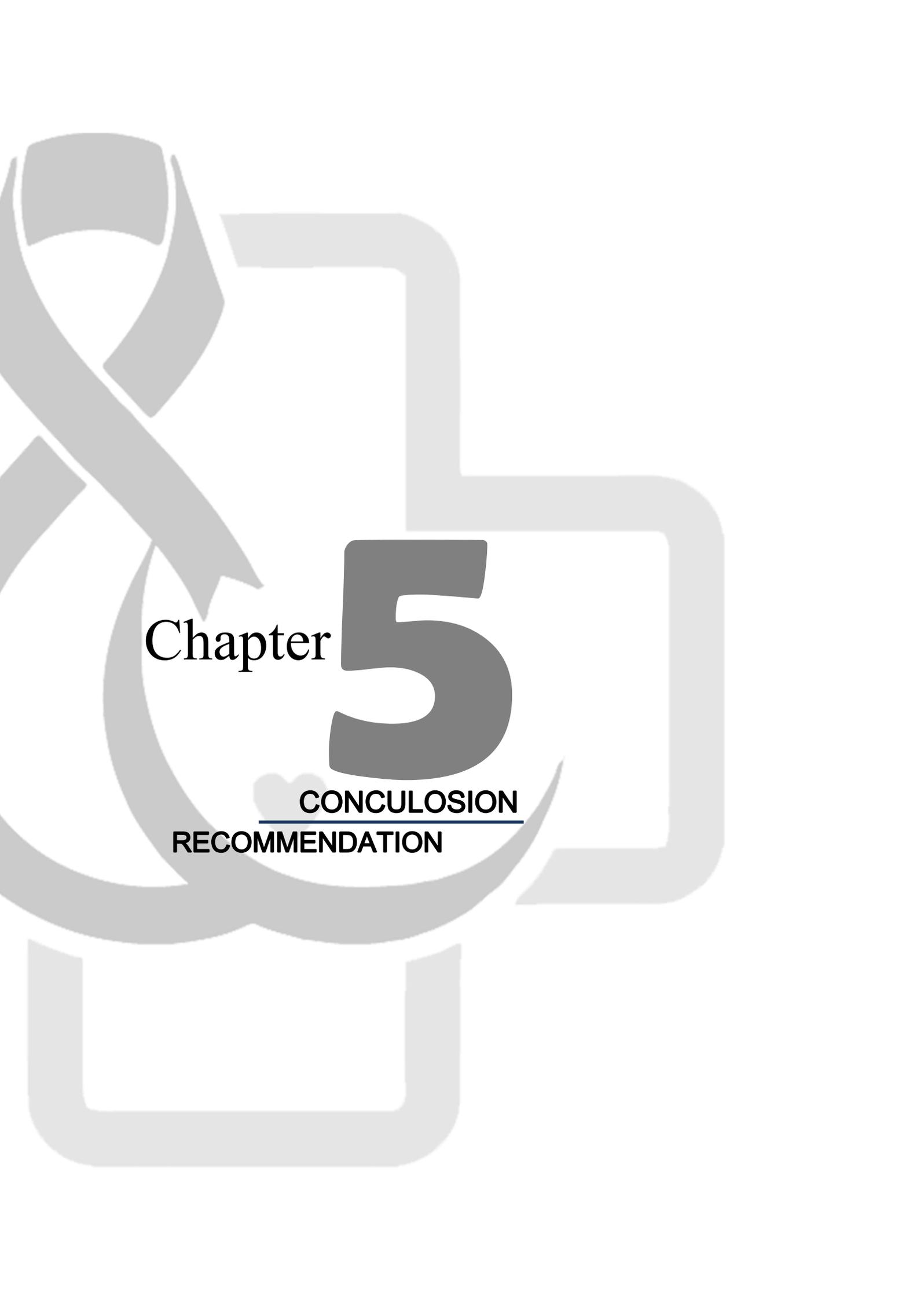
Chapter **5**

CONCULOSION
RECOMMENDATION

5.Conclusion & Recommendation

5.1. Conclusion

From the study findings, we concluded the following:

❖ the socio-demographic characteristics: Age has a statistical association with the risk of breast cancer, the older a woman gets the more the risk of breast cancer. Marital status has a statistical association with the risk of breast cancer, a married woman gets a more risk of breast cancer.

❖ Hormonal factors: The use of oral contraceptives has a statistical association with the risk of breast cancer.

❖ Behavioral factors: smoking and chewing Khat have a statistical association with the risk of breast cancer.

5.2 Recommendation

From the study findings, we recommend the following:

1. Women are encouraged to do periodic screening for breast cancer and breastfeed their children for at least 6 months, Women should also avoid smoking and chewing Khat and be encouraged to do some form of physical exercise.

2. The study recommends the Yemen Country Government health officials have programs for raising awareness of the risk factors associated with breast cancer among women and encouraged them to go routine breast cancer screening. They should also encourage women with close families having breast cancer to seek medical attention.

3. The study also recommends Country government of Yemen make breast cancer services affordable and accessible for purposes of breast cancer screening and treatment. This can be done by setting up cancer awareness and treatment and palliative centers in each of the county constituencies which will ensure that women have ease accessing these services and encourage more women to be screened for breast cancer.

4. This study recommends future studies could also examine other risk factors associated with breast cancer among women such as stress, anxiety, chewing khat ...etc.

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Appendices

Appendix

Questionnaire

<u>Personal data:</u>

File number................................ .... Date:20 ..../......./.......

Marital state: 1. single   2. married   3. divorced   4. widow

Patient's Age: 1. (20-25 years)   2. (25-30years)

Patient's Address: .... Occupation................................

Did she practice self-examination for the breast?   Yes   No

Did she do Clinical Examination of the breast?   Yes   No

Did she do mammography of breast?   Yes   No

Risk factors:

Family history of breast cancer (mother, sister, daughter…)	Yes	No
There is ....at any age........................		
Personal history of cancer: If yes, what is? 1. Breast 2. Uterus 3. Colon 4. Lymphoma 5. Ovary 6. Thyroid	Yes	No
Personal history of benign breast tumor	Yes	No
Previous biopsy of breast or FNAC 1. FNAC. 2. Biopsy. 3. Open Biopsy.	Yes	No
Previous breast operation	Yes	No
If yes, What it was? 1. Mastectomy 2. Lumpectomy 3. Abscess drainage 4. Breast reconstruction 5. Others		
Menarche before 12 years old	yes	No
Radiotherapy for chest region	yes	No
Parity	yes	No

Number of pregnancies			
Age at first pregnancy....................			
Children who naturally lactated ( )			
Average duration of natural lactation .... months			
Are you working outside the home?	Yes	No	What? ( )
You have any regular exercise?	Yes	No	What? ( )
If yes .... how many hours per week..................			
Smoking history		yes	No
If yes: - X-smoking before .... years duration .... years Continuous: a-always b-usually C-often d-sometimes e-rare			
Chewing Qat		yes	No
If yes: - X-chewing before................. years duration .... years Continuous: a-always b-usually c-often d-sometimes e-rare			
Shama uses		yes	No
BMI............			

Hormonal factors now: -

Regular menstruation	Yes	No
Regular menstruation	Amenorrhea	Hysterectomy
Hormonal intake	Yes	No
If yes:	Total duration ( )	
If yes: 1. Birth control: a-OCP b-Injection c-Implantation		
Hormonal Replacement	Yes	No
If yes :	Total duration ( )	

الخلاصة

هذه الورقة البحثية أوضحت تقييم عوامل الخطر الرئيسية بين المصابات بسرطان الثدي، حيث أن سرطان الثدي مشكلة صحية شائعة ويعتبر السبب الرئيسي للوفاة بالسرطان في جميع أنحاء العالم. في اليمن ، يعتبر سرطان الثدي أكثر أنواع السرطانات انتشارا بين النساء ويمثل (٣٠,٣٪) والأكثر شيوعاً بين جميع أنواع مرض السرطان (١٦,٦٪). لذلك ، هدفنا هو تقييم عوامل الخطر الرئيسية لسرطان الثدي بين المريضات اللاتي تتراوح أعمارهن بين ٢٠-٣٠ سنة والتي سجلت في مركز الأمل في الفترة ما بين ٢٠١٧-٢٠٢٢ ، في صنعاء ، اليمن. حيث تم جمع البيانات المسجلة للمصابات بسرطان الثدي من مركز الأمل في صنعاء. وتم تحليل البيانات باستخدام الحزم الإحصائية للعلوم الاجتماعية (SPSS الإصدار ٢١). فكانت الدراسة على إجمالي ٦٧ حالة سرطان ثدي تم تسجيلها في مركز الحياة من العام ٢٠١٧ إلى ٢٠٢٢ ؛ تراوحت أعمارهن بين ٢٠-٣٠ سنة. أظهرت الدراسة أن مضغ القات واستخدام موانع الحمل الفموية والتدخين والحيض المبكر والقرابة الأولى من عوامل خطر الإصابة بسرطان الثدي التي وجدت لدى هؤلاء المصابات وايضا اظهرت ان نسبة ٩٦٪ من المصابات لم يخضعن للفحص المبكر من قبل . لذلك ، فإن التركيز على زيادة الوعي في المجتمع مثل اتباع نظام غذائي صحي، والخضوع لفحوصات الكشف المبكر عن سرطان الثدي ، وتعزيز الفحص الذاتي للثدي أمر مهم للكشف عن سرطان الثدي ومعالجته في مراحله الاولى والحد من العبء الصحي والمالي المتزايد لسرطان الثدي على المصابات.

تقييم عوامل الخطر في الشابات المصابات بسرطان الثدي في مركز الأمل -صنعاء- اليمن

البحث مقدم لكلية الطب والعلوم الصحية لمشروع تخرج درجة البكالوريوس

المشرفين//

د/ أمل العريقي

استاذ مساعد بقسم الاشعة لدى كلية الطب البشري بجامعة ٢١ سبتمبر للعلوم الطبية

د. محمد علي قيران

ماجستير في علوم الاوبئة والامراض

إعداد//

عبدالاله علي مصلح	**تسبيح عبدالله الزرقة**
عبدالرحمن عبدالله ناجي	**خولة محمود الشرعبي**
عبدالله عبدالسلام العسالي	**سندس غالب الجرموزي**
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