A review of knowledge, attitude, and practice of Breast and Cervical Cancer among Indian women

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ABSTRACT: Cancer is the second leading reason of mortality globally. In 2018, over 9.6 million deaths occurred, accounting for about one in six deaths worldwide. Breast cancer is recognized as a multi-factorial disease and is a foremost public health concern, threatening lives globally. About 70 % of breast cancers are detected at stages III and IV. Cervical cancer is a leading source of morbidity and mortality in India, accounting for almost 25 % of all deaths. Diagnosis tends to arise at later stages, which may be due to inadequate knowledge, poor practice, and a negative attitude. Therefore, effective awareness programs, educational interventions, promotion of free health checkups, as well as vaccination for cervical cancer, and organizing free breast self-examination training courses need to be conducted to enhance the knowledge and practice which will lead to a positive attitude among females regarding these two deadly cancers. This review briefly focuses on the risk factors, warning symptoms, barriers, knowledge, attitude, and practice of breast and cervical cancer.

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INTRODUCTION:

Cancer is an atypical growth of cells that primarily remains restricted; with time, it metastasizes, resulting in a malignant tumor [1]. Cancer is the second-leading reason for mortality globally. In 2018, over 9.6 million deaths occurred, accounting for about one in six deaths worldwide [1]. The World Health Organization (WHO) projects that the number of global cancer deaths will increase by 45 % between 2008 and 2030 [2].

About 70 % of deaths from cancer occur in low and middle-income countries [1]. Currently, cancer is one of the most crucial diseases threatening human life, and therefore global burnout is gradually increasing [3]. The growing burden of mortality from cancer is expected to be fivefold larger in the low-income nations than in recognized market economies [2]. It is anticipated that

1/3rd of all cancers can be prevented, and an additional third of all cancers may be cured if identified at an early stage [4]. Extensive cancer control involves prevention of disease, early detection followed by diagnosis and treatment, recovery, and palliative treatment [3]. A universal deficiency of awareness, ineffectual screening programs, and inadequate interest are given to women's well-being; altogether, influencing alarmingly high cancer rates [5].

Breast cancer is recognized as a multifactorial disease [6] and is a foremost public health concern, threatening lives globally [7]. It is malignant by nature, jeopardizes breast tissue, and may include either the tubules carrying milk or ducts that produce milk [7]. It can spread to remote areas or disrupt neighboring tissues [7]. Out of different types of cancers, breast cancer is the second most common cancer in the world, affecting over 1.67 million people every year [8]. According to the report of GLOBOCAN 2018, the global incidence of breast cancer is 2.08 million, and deaths because of breast cancer are 6.3 lakh [9]. In developing countries, above 70 % of breast cancers are detected at stages III and IV and the average survival following diagnosis is not more than five years [10].

Breast cancer is stigmatized because it involves a multi-symbolic female organ, may be fatal, and treatment (mastectomy) typically involves a body-mutilating procedure [11]. Therefore, breast cancer is encircled by strong myths, fears, and associations that are beyond the clinical understanding of the disease [11]. It is progressive in nature, as it slowly evolves into its risky as well as deadly form from a very minor injury, hence early detection and, consequently, initial management leads to a better prognosis, thus reducing death and illness [12].

In 2018, around 2.1 million women experienced breast cancer and 627,000 women died from it, ranking for 15 % of all cancer deaths. The degree of incidence, death, and survival of this cancer differ across nations [13]. The rate of incidence in developed countries is 89 per 100,000 women; however, it is below 40 in low-resource countries [13]. The five-year survival rate varies to a great magnitude globally, ranging from 80 % (in developed countries) to less than 40 % (in developing countries) [13]. Hence, the problem of breast cancer is chiefly underdetermined in low-resource countries [13]. In 2018, the World Health Organization reported that approximately 627,000 women died from breast cancer, representing 15 % of total cancer deaths among women [1]. One in 18 women acquired breast cancer in the middle of birth and at 79 years of age [10].

According to the site, breast cancer is divided into invasive and non-invasive breast cancer [14].

Invasive breast cancer:
Cancer cells can pass through the breast to different parts of the body through the immune system or the systemic circulation [14]. Invasive breast cancer that extends to different organs of the body is also recognized as metastatic breast cancer [14]. It includes infiltrating lobular carcinoma, infiltrating ductal carcinoma, medullary carcinoma, mucinous carcinoma, tubular carcinoma, and inflammatory breast cancer [14].

Non-invasive breast cancer:
It means cancer has not extended away from the lobule or duct where it is situated [14]. For instance: ductal carcinoma in situ. It appears when atypical cells form within the milk ducts, however, have not extended to close proximity of tissue or outside. It includes lobular Carcinoma *in-situ* and Ductal Carcinoma *in-situ* [14].

Paget's disease of the breast: An uncommon type of breast cancer that usually shows visible changes to the nipple of the breast. Symptoms include red, itchy rashes involving the nipple and they can spread to the normal skin [14].

Triple-negative breast cancer: Heterogeneous disorder, described by the deficiency of progesterone receptor, human epidermal growth factor receptor 2, and estrogen receptor expression [14]. It is mainly destructive and commonly observed in premenopausal women [14].

The stage or the anatomical extent of the disease is based on primary tumour extent and size (T_{1-4}), the extent of lymph involvement (N_{1-3}), and the presence or absence of distant metastasis (M_{0-1}). The stage of breast cancer is usually expressed as a number on a scale of 0-4 and is given as; Early Breast Cancer: Stage 0 (Non-invasive breast cancer), Stage 1 (small primary invasive tumour without lymph node involvement), Stage 2 (involvement of regional lymph nodes). Locally Advanced Breast Cancer: Stage III (Usually a large tutor, with extensive nodal involvement in which the node or tumour is fixed to the chest wall, also includes inflammatory breast cancer which is rapidly progressive). Advanced Or **Metastatic Breast Cancer:**

Stage IV (Metastases in organs distant from the primary tumour):
Presently, breast cancer spread is recognized to be reaching a widespread scale [6]. It has been the most

important public health challenge that adversely affects the life quality of millions of patients and their families globally, economic problems, healthcare organizations, and the whole society [6]. The occurrence of breast cancer is growing in the evolving world due to better life expectancy, increased urbanization, and the adoption of western standards of living [3]. The frequency of breast cancer in more advanced nations is high, but the death rate in less developed countries is high due to diagnosis in late stages and lack access to healthcare services [15]. The incidence of breast cancer is much lower in developing countries in contrast to developed countries, but the mortality rate is high due to late appearance [9].

In most women, a painless lump is the first sign of breast cancer. The characteristic malignant mass is solitary, unilateral, solid, hard, irregular, and non-mobile [16]. Signs and symptoms of breast cancer include breast lump, change in the size of the breast, pain in the breast or armpit, bloody or fluid nipple discharge, redness in breast skin, changes in the nipple, lump in the armpit, rash or ulcer on nipple [4].

As suggested by the "World Cancer Research Fund/American Institute for Cancer Research", regular consumption of vegetables, daily physical activity, and limited intake of red meat and alcoholic beverages reduce the risk of cancer development. Therefore, there is a possibility of cancer prevention by behavioral change [17]. Certainly, awareness movements are vital in cancer prevention programs. Moreover, knowledge of cancer risk factors is a determinant element in the process of behavioral change [17].

The breast contains an unsymmetrical connective tissue that goes through a chain of modifications from childbearing years to old age. Typical breast architecture contains a stratified epithelium which is bordered by a basement membrane and secured in an arrangement of blood vessels, lymphatic, and stromal cells. In the regular breast, the stratified epithelium incorporates two dissimilar cell populations, myoepithelial and epithelial. Neoplastic cells differ from normal body cells. Normal tissues of the body have restricted growth, development, and modulation, which aids in preserving the structure and functions. However, tumorous cells have extended and chronic multiplied devoid of any external stimuli. Cancer cells overpower the tumour suppressor genes. Damage to the DNA and inherited variations can cause breast cancer. Certain patients receive errors in the DNA as well as genes like the P53, BRCA1, and BRCA2, amongst others. The immune system typically attempts to discover cancer cells and cells with damaged DNA and destroy them. Breast cancer could be the consequence of the failure of such a convenient immune defence and supervision. It usually arises due to a link between genetic as well as environmental factors. RAS/MEK/ERK pathway and PI3K/AKT pathway protects normal cells from cell apoptosis. After alterations occur in genes in defensive pathways, the cells become unable to carry out apoptosis which then leads to the progression of cancer. These mutations were connected with estrogen exposure. Greater expression of leptin in breast adipose tissue heightens the multiplication of cells and cancer. In cancer cells, the enzyme telomerase alters chromosomal shortening and permits the widespread duplication of cells. Tumour cells acquire their nutrients and oxygen supply by angiogenesis. Cancer cells disrupt their limitations and can penetrate into the blood, lymphatic tissues, and other tissues to create a secondary tumour [14].

Risk factors for breast cancer:

The main risk factors for breast cancer include inheritance, nulliparity, late age at first full-term pregnancy, late age at lactation; [18] occupational exposure, smoking, alcohol use, and physical activity, [6] family history, use of contraceptives, chest radiation, hormone replacement therapy, aging, high-fat foodstuffs, and being obese (Fig 1 and 2) [4,19].
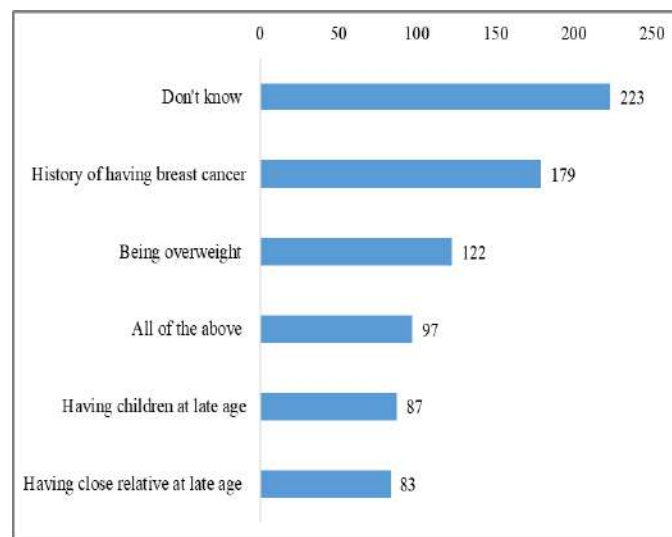
Fig 1. Knowledge of risk factors of breast cancer.

Internal and external risk factors include altered socio-demographic factors like occupational exposure, rotating shift work, specific environmental factors (increased pollution, environmental toxicity, changed dietary habits, quality, and composition of meals), as well as inevitably shifted and /or adapted biological factors such as lower

age at menarche, late age at first full-term pregnancy, if any, shorter periods of breastfeeding and delay in menopause [6] The carriers of germline mutations in breast cancer genes 1 and 2 are predisposed to breast cancer [20]. Breast cancer affects more reproductive women (aged 15 to 49 years) in low-resource countries (23 % of new cases) than in developed countries (10 % of new cases) [13].
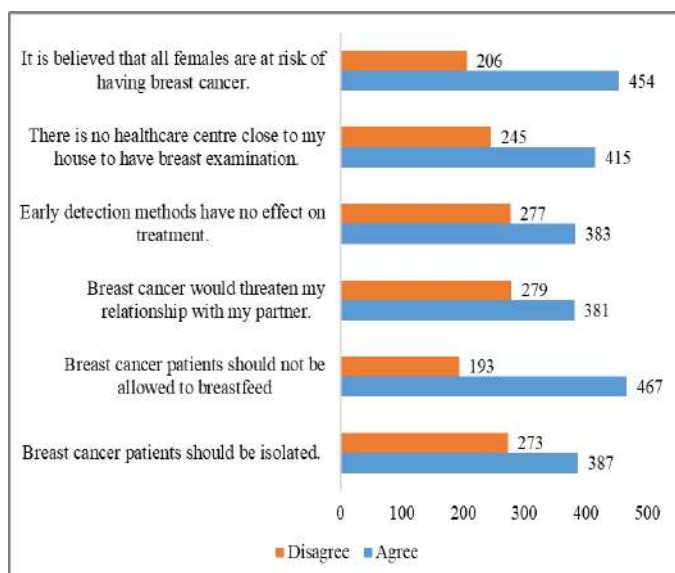

Fig 2: Attitude regarding breast cancer.

Around 50 % of all breast cancer cases may be possibly prevented by regulation of modifiable risk factors such as lifestyle and weight control, regular physical activity, and minimization of alcohol consumption [6]. Risk assessment models like Gail and Tyrer-Cuzick assess possible breast cancer predispositions, in common; though, they are not capable of predicting the disease symptoms independently [6]. Current deficiencies in risk assessment and effective breast cancer prevention are as follows: gaps in risk estimation, precautionary treatment, lifestyle prevention, understanding of the biology of breast cancer risks, and implementation of known preventive measures [6].

As per the National Cancer Institute, estimated new cases of female breast cancer in 2019 were 268, 600 which is 15.2 % of all fresh cancer cases in the US [21]. India, being a multilingual and multi-ethnic nation, has reported breast cancer as the most frequent cancer in urban Indian females, and it is subsequently frequent among rural Indian women [17]. According to the ICMR PBCR data, breast cancer is the most widespread cancer among women in urban record offices of Delhi, Mumbai, Ahmadabad, Kolkata, and Trivandrum, which sums to > 30 % of all cancers in women [17]. The

mortality rate of breast cancer in Indian women is 12.7 / 1, 00000 women. The incidence rates are higher in most of the metropolitan cities like Delhi, Chennai, Mumbai, Bangalore, etc [22]. Breast cancer is the most frequently diagnosed cancer in women corporeal in Gulf Cooperation Council countries (GCCCs) [23].

Beliefs play an important part in determining exactly how women understand and explain breast cancer, and this understanding may have a solid impact on activities related to breast cancer screening methods [11]. In this sense, understanding the beliefs about breast cancer and related factors from a cultural perspective is vital, particularly in culturally mixed populations, such as the Indians [11]. Barriers like embarrassment, family relationships, fatalism, undergoing consultation with traditional healers, fear of breast cancer, and lack of knowledge regarding screening programs prevent the screening of breast cancer (Fig 3) [15, 19]. When people are afraid of being detected with breast cancer, they may decide not to go for screening [15]. Psychosocial fear damages one's intellectual behaviour; it leads to denial and confusion causing a reduction in the logical decision-making capacity [15].

Fig 3. Barriers to breast cancer screening.

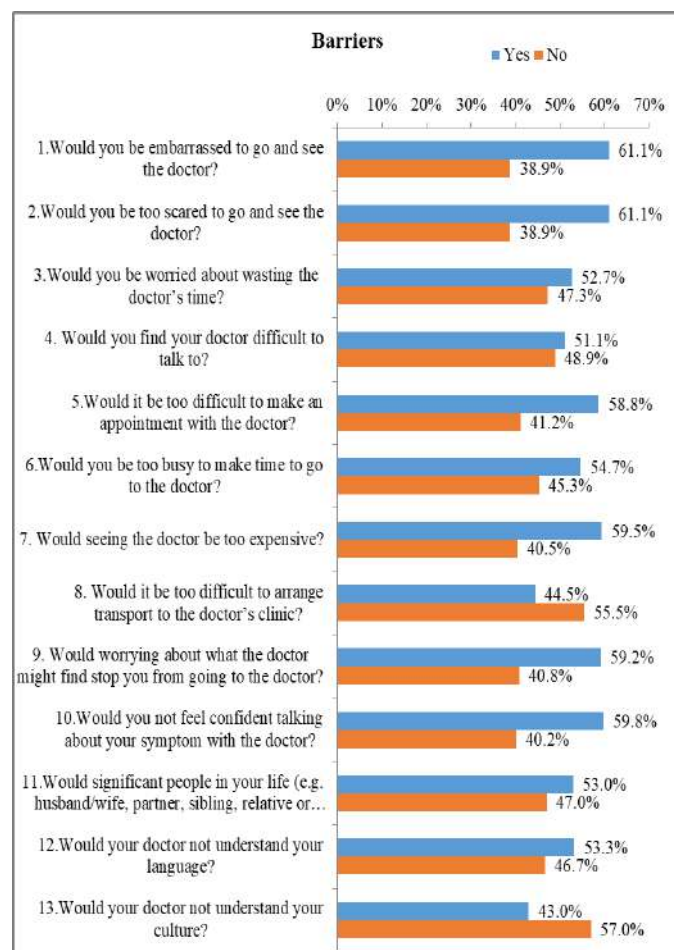Psychosocial fear damages one's intellectual behaviour; it leads to denial and confusion causing a reduction in the logical decision-making capacity [15]. Unfortunately, in developing countries, women pursue medical care when cancer has already extended to an advanced stage [15]. Incomplete knowledge and lack of awareness of the significance of cancer screening measures are the regularly reported causes of ignoring screening measures [15]. Unfortunately, in developing countries, women pursue medical care when cancer has already extended to an advanced stage [15]. Incomplete knowledge and lack of awareness of the significance of cancer screening measures are the regularly reported causes of ignoring screening measures [15].

Diagnosis of breast cancer:
Three-fourths of the breast cancer cases get diagnosed at stage I or II, in developed countries, the opposite is seen in most the low-and middle-income countries (LMICs) [24]. It is widely accepted that health workers play an important role in establishing healthy behaviours as they are in a position to educate people about breast cancer risk factors and types of screening practices and to influence behaviours that will reduce the risk of morbidity and mortality [3]. They may also play an important role in health education by assisting people to develop healthy behaviours, including breast self-examination [3]. Early cancer detection at the primary care level is crucial for the effectiveness of primary diagnosis because more than 90 % of patient associates within any healthcare system on the globe occur at the primary care level in primary health centres (PHCs), dispensaries, and sub-centres [25]. Millions of people co-operate with primary care service providers daily, providing a highly beneficial platform within health services to improve population awareness of breast cancer, deliver modest screening tests and clinically suspect patients for diagnosis and treatment in the secondary/tertiary care levels, and provided health workers at the primary care level are knowledgeable about breast cancer risk factors and the importance of early detection [25].

Early detection can enhance survival and improve the quality of life [24]. The World Health Organization recommends Clinical Breast Examination (CBE) and Mammography as primary diagnostic tools and BSE as a secondary tool in absence of CBE [24]. Despite this, breast self-examination is quite valuable to improve awareness and detect any abnormal changes in the breast. The initial discovery of breast cancer can be achieved through a combination of monthly breast self-examination (BSE), regular clinical breast examinations, and yearly mammography starting at the age of 40 years, which are the finest means to limit breast cancer mortality and morbidity [26].

Breast self-examination (BSE), clinical breast examination, and mammography are the most commonly recommended screening methods that are used to detect early breast cancer [4]. It is a screening technique for detecting early breast cancer that can be performed by women at home [4]. It is a simple, inexpensive, easy, and effective technique that allows women to examine their breast tissue for any physical or visible changes [4]. BSE is an option for women starting in their 20's [3]. It increases women's chances of treatment, thereby increasing the survival rate women [4]. BSE can help screen for tumours, cysts, and other abnormalities in the breasts [4]. The American Cancer Society (ACS) endorses BSE for early detection of breast cancer as it assists women to become more familiar with the appearance and sense of their breasts, and helps them to notice any abnormalities in their breasts as soon as possible [4]. If discovered early, breast cancer can be treated in the early stages of the disease, meaning BSE is something all women should prioritize [4]. However, if it is done inadequately, there might be false positives or negative discoveries related to poor BSE [7]. Women should, however, remember that these breast changes may not be an indicator of cancer most of the time. Organizations concerned with breast health education recommend that all women should start practicing BSE frequently as soon as their breasts are fully developed [4]. For example, the Maurer Foundation recommends BSE should be performed at least once a month from the age of 18 years [4]. Awareness of breast cancer is an important factor that has a major influence on the incidence and outcomes of the disease [4].

Factors for participation in breast cancer survey:
Factors that can convey participation in breast-conserving surgery (BCS) services contrast in different countries' settings [13]. Socioeconomic factors (such as age distribution, marital status, and socioeconomic group) are found to be the leading driving force behind utilizing BCS services in low-resource countries [13]. In addition, screening behaviours, prior knowledge, and lack of access to a physician are more likely to influence women's participation in BCS services. Important

factors responsible for the lesser use of BCS amenities are religion, cultural beliefs, social barriers, and ethnicity-related factors [13].

Breast cancer management and Treatments:

In patients who have been recognized with breast tumor, different strategies of management are used such as targeted therapy, radiation therapy, and surgery [14]. Treatment of breast cancer with antiestrogens such as Tamoxifen or Raloxifene might prevent breast cancer in individuals who are at increased danger of developing it. Dihydropyrimidines are more potent than pyrimidines, which have antibacterial, anticancer, antiviral, antitumor, and anti-inflammatory effects [27]. Surgery of both breasts is an additional preventative measure in the likelihood of developing cancer in females. In individuals with distant metastasis, managements are typically aimed at improving life quality and survival rate [14].

CERVICAL CANCER:

Cervical cancer is the unusual growth of cells in the cervix [28]. The cervix is covered by glandular cells on the endocervix (means towards the uterus) and squamous cells on the ectocervix (towards the vagina) [28]. The place where both these cells meet is known as the Transformation Zone-the commonest site for cervical cancer origin [28]. It is a sexually transmitted disease caused by the human papillomavirus (HPV), mostly HPV 16 and HPV 18 whereas low-risk HPV of 6 and 11 genotypes are predominantly involved in the development of genital bulges [29, 30].

The two types of cervical cancer include squamous tumours and glandular tumours.

➢ Squamous Tumours: It is the most frequent type, accounting for 70 to 80 % of cases. It starts with thin and fat cells.

➢ Glandular tumours (Adenocarcinoma): It accounts for 20 to 25 % of cancer. It overpowers the cervical cells that make mucus and other fluids [28].

Cervical cancer is the second most common cancer among women worldwide, after breast cancer [31]. Nearly, half a million women are recently diagnosed with invasive cervical cancer every year. About 25 % of all cervical cancer deaths occur in India, where the incidence is very high among women in rural areas and with low socio-economic status [31]. Cervical cancer is a major cause of morbidity and mortality in resource-poor settings where access to cervical cancer screening and vaccination is limited [32].

WHO Recommendation:

The World Health Organization (WHO) recommends that the involvement of all health care providers is vital in cervical cancer prevention. Primary prevention involves: avoiding exposure to HPV infection and also vaccination against HPV, and secondary prevention involves screening [33]. To attain this goal, it is essential to make certain that healthcare providers have proper knowledge and attitudes about cervical cancer and its prevention (Fig 4). They should be able to communicate the value and mode of preventive methods for cervical cancer to diverse communities in an impartial way [33].
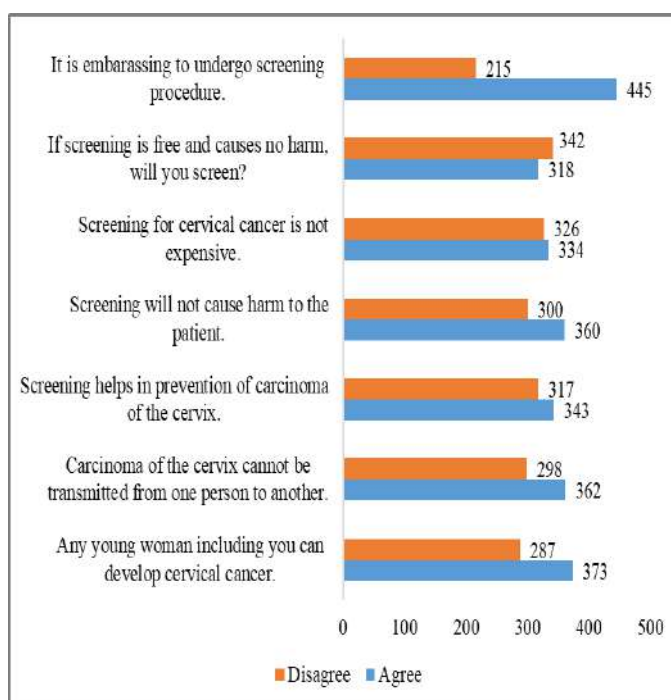

Fig 4. Attitude regarding screening and transmission of cervical cancer.

Empowerment of women, education, earlier screening by affordable technology, and treatment of pre-cancers are the most hopeful interventions to minimize the burden of cervical cancer [34]. Prognosis can be improved if screening is embraced and widely employed [35].

In India, more than 132,000 females are diagnosed with cervical cancer and about 74,000 dies from the disease annually [31, 36]. The peak age for cervical cancer incidence in India is 55 to 59 years [31]. Hence, India ranks highest in the age-standardized incidence of cervical cancer in South Asia [38]. The higher rate of mortality in India is due to a lack of awareness about its symptoms, risk factors, screening programs, and preventive measures [32]. It is known that cervical cancer is caused by a particular type of virus, which is the Human Papilloma Virus [30].

Although cervical cancer is considered one of the preventable cancers, most women who look for help for cancer-associated illness generally do so when the disease has advanced and is not treatable [38]. HPV infection is most common in women in their teens, 20, or 30s. The other risk factors include early age at first childbirth, multiple sexual partners, HIV infection, family history, early sexual activity, lack of regular Pap smear testing, smoking, multiple abortions, and prolonged use of oral contraceptives (Fig 5) [36, 38]. The risk of cervical cancer remains high due to the lack of awareness regarding HPV infection or the inefficiency of existing prevention programs [30, 31].

The stages of cervical cancer are given as follows:
Stage I: Cancer is limited to the cervix and does not spread to nearby tissues [28].
Stage II: Cancer includes the cervix and vagina but hasn't spread to the pelvic side wall or lower portion of the vagina [28].
Stage III: Cancer has spread to nearby organs (metastasise) such as lungs, liver, or bones [28].

The most familiar symptoms of cervical cancer are abdominal pain, before and after intercourse bleeding, persistent lower back pain, urinary urgency, smelly vagina, vaginal discharge, contact bleeding, and, in many cases, women with cervical cancer do not show any of the above symptoms [35, 36].

Diagnosis and detection of cervical cancer:
Early detection greatly improves the chances of successful treatment and can prevent any early cervical cell changes from becoming cancer [39]. The tests for cervical cancer screening are the HPV test and the Pap test. The HPV test is most commonly used in two situations. The American Cancer Society recommends the primary HPV test as the favoured test for cervical cancer screening for people 25 to 65 years of age. Some HPV tests are accepted only as part of a co-test when the HPV test and the Pap test are done at the same time to screen for cervical cancer [39]. The Pap test is a procedure in which a small brush or a cotton-tipped swab is inserted into the opening of the cervix to take a sample from the endocervix [39]. Different screening techniques are available including cytology, HPV tests, Visual Inspection with Acetic Acid (VIA), and Visual Inspection with Lugol's Iodine (VILI) [39]. The other diagnostic tests that are used include colposcopy (with biopsy), endocervical scraping, and cone biopsies [39].

HPV16 genome can be an unintegrated small DNA molecule addition known as episome and consequences in benign and precancerous lesions of the cervix. HPV16 can integrate its genome into the host genome, which in flip can lead to the improvement of cervical carcinoma and cervical intraepithelial neoplastic grade III [16]. There are many types of HPV, which are known to be associated with cancerous diseases. HPV16 is the most carcinogenic HPV type, and 50% of all cervical cancers are related to HPV16. In HPV16-positive cells, E6 and E7 viral genes are retained, integrated into the host genome, and expressed. E6/E7 has been shown to decontrol miRNA linked to carcinogenesis. Recent research has proposed that HPV E6, E7, and E5 oncoproteins regulate the host miRNA profile. The attachment of E6 to these proteins leads to inactivation and degradation. Examples - Workable tumour suppressors such as Dlg and MAGI-1 [16].

The epigenetic manipulation of viral and host gene expression plays an important position in carcinogenesis by involving modifications in DNA methylation, changes of histones, and noncoding RNA profile. Cervical carcinogenesis is strongly associated with continual HPV infection that can similarly have an effect on both the host genome and the viral genome methylation [16]. E6 and E7 have been shown to bind DNA methyltransferase (DNMT), which impairs their endeavor, leading to hypermethylation of CpG islands, which can subsequently lead to possible silencing of host tumour suppressors. Some studies confirmed decreased methylation of the upstream regulatory region (URR) in the cervical cancer cells in contrast with normal cells [16].

Three therapeutic modalities are used, which include surgery, radiotherapy, and hormone chemotherapy. Surgery as a standalone and solely therapeutic approach is used in pre-invasive (Ca in situ) and micro-invasive stages (stage I a) of cervical cancer. Surgery and radiation are combined in I b and II stages, and solely radiation is in II b, III a, III b, and IV stages. In stage IV b, (cervical most cancers and distant metastases) are used for chemo and loco regional radiotherapy [40].

Surgical cure first consisted of transvaginal hysterectomy and then of trans-abdominal removal of the uterus (via laparotomy). At the beginning of the twentieth century, surgical procedure was once radicalized. Each adnexectomy (removal of the ovaries and fallopian tubes), colpotomy of top and center 1/3

vagina, lymphadenectomy of local lymph nodes, and ectomy parameters on both facets are modern Wertheim-Meigs operations [40].

Radiotherapy is a chance component for both cancer-specific survival (CSS) and overall survival (OS) in cervical cancer. The response to radiotherapy might vary relying on the distinctive scientific characteristics [41]. All the medications used to treat cervical cancer are given intravenously (IV). IV chemotherapy is either injected directly into a vein or given over a thin tube called a catheter. The side effects of chemotherapy depend on the individual and the dose used [41].

CONCLUSION:

Cancer is the second leading root of mortality globally. A universal deficiency of awareness, ineffectual screening programs, and inadequate interest are given to women's well-being, altogether influencing alarmingly high cancer rates. About 70 % of breast cancers are detected at stages III and IV, and the average survival following diagnosis is not more than five years. Cervical cancer is one of the leading causes of death among gynecological cancers worldwide, particularly in developing countries.

This review highlights the data on knowledge, attitude, and practice on breast and cervical cancer based on a recent study among 660 participants. It provides data on knowledge about breast and cervical cancer. The majority of the women were aware of the signs and symptoms of breast and cervical cancer but on the other hand, knowledge about risk factors was found to be poor. Most of the women had poor attitudes and practices related to screening for breast and cervical cancer.

Therefore, there is a need for more effective awareness programs about cervical cancer and breast cancer screening. It is essential to develop customized educational interventions using various approaches such as social media, circulation of leaflets, television/radio broadcasts, and proper counseling as tools for improving knowledge and insight into the breast and cervical cancer.

Organizing free BSE training courses may also be an effective way to raise awareness and address the gaps in knowledge and practice. The promotion of free regular health check-ups, as well as vaccination for cervical cancer among the general population, will increase awareness and further decrease the disease burden.

REFERENCES:

1. Amin MN, Uddin G, Uddin N, Rahaman Z, Siddique SA, Hossain S, et al. A hospital-based survey to evaluate knowledge, awareness and perceived barriers regarding breast cancer screening among females in Bangladesh. Heliyon, 2020; 6(4): e03753.

2. Erdem O, Toktaş I. Knowledge, Attitudes, and Behaviors about Breast Self-Examination and Mammography among Female Primary Healthcare Workers in Diyarbakır, Turkey. Bio Med Res Int, 2016; 2016: 6490156.

3. Rahman SA, Al–Marzouki A, Otim M, Rahaman P, Yousuf R. Awareness about Breast Cancer and Breast Self-Examination among Female Students at the University of Sharjah: A Cross-Sectional Study. Asian Pac J Cancer Prev, 2019; 20(6): 1901-1908.

4. Golubnitschaja O, Debald M, Kuhn W, Pesta M, Grech G, et al. Breast cancer epidemic in the early twenty-first century: evaluation of risk factors, cumulative questionnaires and recommendations for preventive measures. Tumor Biol, 2016; 37(10): 12941-12957.

5. Nayak BS, Nayak UK. Lamivudine loaded microspheres for oral use: design, development, and establishment of In vivo – In vitro correlation. Asian J Pharm Clin Res, 2009; 2(1): 55-60.

6. Abda N, Najdi A, Fakir SA, Tachfouti N, Berraho M, Nejjari C, et al. Knowledge, Attitudes, and Preventive Practice towards Breast Cancer among General Practitioner Health Professionals in Morocco. Asian Pac J Cancer Prev. 2017; 18(4): 963-968.

7. Schilling MPR, Da Silva IF, Opitz SP, Borges DSO, Koifman RJ, Koifman S. Beliefs about Breast Cancer among Women in the Western Amazon: A Population-Based Study. Asian Pac J Cancer Prev, 2019; 20(2): 469-478.

8. Khalid A, Hassnain S, Gakhar H, Khalid B. Breast cancer among young girls: a KAP study conducted

in Lahore. Int J Sci Rep, 2018; 4(6): 166-171.

9. Mahumud R, Gow J, Keramat SA, March S, Dunn J, Alam K, Renzaho AMN. Distribution and predictors associated with the use of breast cancer screening services among women in 14 low-resource countries. BMC Public Health. 2020; 20(1):1467.

10. Akram M, Iqbal M, Daniyal M, Khan AU. Awareness and current knowledge of breast cancer. Biol Res. 2017; 50(1):33-55.

11. Ghahramanian A, Rahmani A, et al. Relationships of Fear of Breast Cancer and Fatalism with Screening Behavior in Women Referred to Health Centers of Tabriz in Iran. Asian Pac J Cancer Prev. 2016;17(9):4427-4432.

12. Well BG, DiPiro JT, Schwinghammer TL, DiPiro CV. Pharmacotherapy Handbook. 9th ed. New York: Mc Graw Hill; 2009.

13. Shankar A, Roy S, Rath GK, Chakraborty A, Kamal VK, Biswas AS. Impact of Cancer Awareness Drive on Generating Understanding and Improving Screening Practices for Breast Cancer: A Study on College Teachers in India. Asian Pac J Cancer Prev. 2017; 18(7): 1985-1990.

14. Kadian L, Gulshan G, Sharma S, Kumari I, Yadav C, Nanda S, *et al*. A Study on Knowledge and Awareness of Cervical Cancer Among Females of Rural and Urban Areas of Haryana, North India. J Cancer Educ. 2020; 36(4): 844-849.

15. Fathima N, Ashna S, Babu BG, Roy CM, Thejaswini B. KAP survey of breast cancer among Indian women using BCAM toolkit: A cross sectional study. JXSU, 2022; 18(2): 91-113.

16. Lee H, Han W. Unique Features of Young Age Breast Cancer and Its Management. J Breast Cancer, 2014; 17(4): 301-307.

17. Prakash A, Sardar M, Shaikh N, Inkollu S, Danish M, Sharon DJ, *et al*. The Perspective of a Breast Cancer Patient: A Survey Study Assessing Needs and Expectations. Cureus, 2020; 12(7): e9171.

18. Nayak BS, Roy HK. Formulation and Design of Sustained Release Matrix Tablets of Lamivudine: Combination of Chitosan and HPMC. Am J Pharmacy Health Res, 2017; 5(2): 1-10.

19. Roy H, Nayak BS, Nandi S. Chitosan Anchored Nanoparticles in Current Drug Development Utilizing Computer-Aided Pharmacokinetic Modeling: Case Studies for Target Specific Cancer Treatment and Future Prospective. Curr Pharm Design, 2020; 26(46): 1666-16675.

20. Panda S, Sahu A, Mohanty B, Nayak BS, Mishra B. Formulation and *In vitro* characterization of Lamivudine embedded natural resin microspheres using olibanum as drug carriers. Res Jof Pharmacy Life Sci, 2020; 1(2): 1-10.

21. Suleiman A. Awareness and attitudes regarding breast cancer and breast self-examination among female Jordanian students. J Basic Clin Pharm. 2014; 5(3): 74-78.

22. Ashokkumar N, Umarani G. Green synthesis, characterization, in silico molecular docking and in vitro anticancer activity of 1, 2, 3-triazolyl dihydropyrimidine-2-thione hybrids. J Pharm Adv Res, 2018; 1(4): 229-235.

23. Pandya M, Mukhi S. Knowledge and awareness about cervical cancer amongst Physiotherapist of Ahmedabad - An Observational Study. Int J Health Sci Res. 2020; 10(9): 424-430.

24. Al-Darwish AA, Al-Naim AF, Al-Mulhim KS, Al-Otaibi NK, Morsi MS, Aleem AM. Knowledge about cervical cancer early warning signs and symptoms, risk factors and vaccination among students at a medical school in Al-Ahsa, Kingdom of Saudi Arabia. Asian Pac J Cancer Prev. 2014; 15(6): 2529-2532.

25. Krishnaveni K, Roy P, Sambathkumar R. Knowledge, attitude and practice related to cervical cancer and screening among women: community based cross-sectional study. Int J Pharm Sci Res. 2018; 9(2):722-729.

26. Niyonzima JP, Matabelle LB, Ntasumbumuyange D, Rulisa S. Cervical Cancer Prevention Knowledge and Attitudes: Survey of Midwives and Nurses in Rwanda. Int J Cancer Tremnt. 2018; 1(1):30-34.

27. Eshete M, Abdulwuhab Atta M, Yeshita H. Cervical cancer screening acceptance among women in dabat district, Northwest Ethiopia, 2017: An institution-based cross-sectional study. Obstet Gynecol Int, 2020; (1): 1-7.

28. Durrani S, AlFayyad I, Riaz M, Tabasim R, Parvez G, Abu-Shaheen A. Knowledge, Attitudes, and Practices towards Cervical Cancer and Screening amongst Female Healthcare Professionals: A Cross-Sectional Study. J Oncol, 2019; (1): 1-9.

29. Nemenqani DM, Abdelmaqsoud SH, Al-Malki AA, Oraija AA, Al-Otaibi FM. Knowledge, attitude and practice of breast self-examination and breast cancer among female medical students in Taif, Saudi Arabia. O J Prev Med. 2014; 4(2): 69-77.

30. Khargekar N, Khanna D, Budukh A. Knowledge, attitude, and practice about cervical cancer and its screening among community healthcare workers of Varanasi district, Uttar Pradesh, India. J Family Med Prim Car, 2019; 8(5): 1715-1719.

31. Mutambara J, Mutandwa P, Mahapa M, Chirasha V, Nkiwane S, Shangahaidonhi T. Knowledge, attitudes and practices of cervical cancer screening among women who attend traditional churches in Zimbabwe. J Cancer Res Prac, 2017; 4(2): 53-58.

32. Roy H, Nayak BS, Nandi S. Chitosan Anchored Nanoparticles in Current Drug Development Utilizing Computer-Aided Pharmacokinetic Modeling: Case Studies for Target Specific Cancer Treatment and Future Prospective. Curr Pharm Design, 2020; 26(46): 1666-16675.

33. Sarenac T and Mikov M. Cervical cancer, different treatments and importance of bile acids as therapeutic agents in this disease. Front Pharmacol, 2019; 10: 1-29.

34. Yang J, Cai H, Xiao ZX, Wang H, Wang P. Effect of radiotherapy on the survival of cervical cancer patients. Medicine, 2019; 98(30): e16421.

35. Htay M, Donnelly M, Schliemann D, Su TT, Dahlui M, Loh SY, *et al*. Translation and Validation of the Breast Cancer awareness measurement tool in Malaysia (B-CAM-M). Asian Pac J Cancer Prev, 2020; 21(1): 217-223.

36. Gangane N, Ng N, Sebastian M. Women's Knowledge, Attitudes, and Practices about Breast Cancer in a Rural District of Central India. Asian Pac J Cancer Prev, 2015; 16(16): 6863-6870.

37. Masood I, Saleem A, Hassan A, Sadeeqa S, Akbar J. A quantitative study to assess breast cancer awareness among females in Bahawalpur Pakistan. Cogent Med, 2016; 3(1): 1236479.

38. Lee H, Han W. Unique Features of Young Age Breast Cancer and Its Management. J Breast Cancer, 2014; 17(4): 301-307.

39. Kathrikolly TR, Shetty RS, Nair S. Opportunities and Barriers to Breast Cancer Screening in a Rural Community in Coastal Karnataka, India: A Qualitative Analysis. Asian Pac J Cancer Prev. 2020; 21(9): 2569-2575.

40. Sherpa AT, Karki BS, Sundby, J, Nygard M, Franceschii S, Clifford G. Population-Based Study of Cervical Cancer Screening in Bharatpur, Nepal. J Manmohan Memorial Inst Health Sci. 2015; 1(4):3-8.

41. Kumar HH, Tanya S. A Study on Knowledge and Screening for Cervical Cancer among Women in Mangalore City. Ann Med Health Sci Res. 2014; 4(5):751-756.