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Awareness and Assessment of risk factors associated with breast cancer among Indian women: A questionnaire survey

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ABSTRACT
The number and severity of breast cancer is increasing in Maharashtra, India and all over the world. So, there is need of spreading awareness as well as risk factors of breast cancer amongst the women which will help in the reducing the number of the patients. The early detection which helps in the prevention of breast cancer is necessary to fight against the increasing number of patients. Considering breast cancer as most prevalent malignancy in Indian women, this study is carried out with the aim of creating awareness and analysing the knowledge about risk factors, signs and symptoms of breast cancer.The data was collected from both urban and rural regions of Maharashtra. A total 214 female participants have submitted their responses on an online self-administered questionnaire. Additionally, the participants also reported poor knowledge about the early detection techniques BSE and Mammography. Only 4% of the total female participants are aware of the mammography.This indicates the need of awareness about the early detection, risk factors and signs and symptoms of breast cancer.The signs and symptoms like painless and palpable breast lumps, painless mass under armpit and bleeding or discharge from the nipple were reported by 31.8%, 34.8% and 19% of the participant, respectively. This study has emphasized on the need of spreading awareness about breast cancer, its risk factors and early detection technique in single, married, unmarried female population of India.
Keywords: Breast cancer, BSE, mammography, awareness, risk factors

INTRODUCTION

Yearly, nearly 500,000 people die of cancer in India. Around 25-30 Lakhs cases are estimated at any point of time in India. 08 Lakhs new cases are detected in India every year.

Lung, Lip, Throat, Neck, and Oral cancers are the most common among men while women suffer more from Breast, Ovarian and Cervix cancers.

Breast cancer is a disease in which cells in the breast grow out of control. There are different kinds of breast cancer.[1] The kind of breast cancer depends on which cells in the breast turn into cancer.Breast cancer can begin in different parts of the breast. A breast is made up of three main parts: lobules, ducts, and connective tissue. The lobules are the glands that produce milk. The ducts are tubes that carry milk to the nipple. The connective tissue (which consists of fibrous and fatty tissue) surrounds and holds everything together. Most breast cancers begin in the ducts or lobules. Breast cancer can spread outside the breast through blood vessels and lymph vessels. When breast cancer spreads to other parts of the body, it is said to have metastasized. Breast cancer is the commonest malignancy among women globally.[11,12] From being fourth in the list of most common cancers in India during the 1990s, it has now become the first. An alternative hypothesis by Bernard Fisher states that, "Breast Cancer is a systemic disease in that tumours cells were likely to have been disseminated throughout the body by the time of diagnosis and that more expansive locoregional therapy was unlikely to improve survival." Owing to the lack of awareness of this disease and in absence of a breast cancer screening program, the majority of breast cancers are diagnosed at a relatively advanced stage. The quality of care available for breast cancer patients varies widely according to where the patient is treated. The aim of our study is to identify the present status of awareness about Breast Cancer prevention, early detection, symptoms, and management in urban and rural Indian women (medical, paramedical, and nonmedical) and to assess the adverse drug reactions of the chemotherapeutic agents used in the treatment of breast cancer.[14]Breast cancer has been considered rare in 20s or 30s. Only of all cases have been in this age group. Female breast

cancer is most frequently diagnosed in women ages. The median age at diagnosis is 63. More recent data also shows that breast cancer is actually the most common type of cancer among young adults ages 15 to 39, accounting for 30 percent of all cancers in this age group, according to a 2021 review.[1,12,13]
According to National Cancer Institute,
- In 30s, your risk of breast cancer is 1 in 204, or about 0.4 percent.
- By age 40, the risk is roughly 1 in 65, or about 1.5 percent.
- By age 60, the chance increases to 1 in 28, or 3.5 percent

Breast cancer has now surpassed lung cancer as the leading cause of global cancer incidence in 2020, with an estimated 2.3 million new cases, representing 11.7% of all cancer cases.Epidemiological studies have shown that the global burden of BC is expected to cross almost 2 million by the year 2030.[3,10]
Breast self-examination (**BSE**) is a screening method used in an attempt to detect early breast cancer. The method involves the woman herself looking at and feeling each breast for possible lumps, distortions or swelling.[5]
Mammography: - A mammogram is an X-ray of the breast. Mammograms are commonly used to screen for breast cancer. If an abnormality is detected on a screening mammogram, your doctor may recommend a diagnostic mammogram to further evaluate that abnormality.[13]
Aim: To assess and analyze the awareness of risk factors of breast cancer among Indian women.
Objective:
1) To assess the awareness regarding breast cancer risk factors.
2) To study the knowledge regarding the risk factors that are contributing to breast cancer.
3) To identify and analyse the data regarding the early detection and signs and symptoms of breast cancer.

MATERIAL AND METHODS
Study design and participants
A cross sectional approach was used in the current study. Most of the respondents belongs to students, housewives and working women. Majority of participants belongs to Maharashtra. The details of the demographic characteristics are seen in Table no 1.Most of the participants were unaware of the risk factors as well as BSE (Breast Self-Examination) of breast cancer and mammography.[4, 13]
Study instrument
A self-administered questionnaire was developed. The questionnaire was composed of two parts. The first part comprised of demographic questions including age, education level, family member having history of breast cancer, past medication history, past medical history, awareness about breast self-examination and mammography. While the second part comprised of questions regarding breast cancer risk factors, signs and symptoms and the best time for breast examination. The part which included the risk factors were further divided into 3 domains namely,
1) The risk factors related to demographic characteristics
2) The risk factors related to lifestyle.
3) Signs and symptoms of breast cancer
Data Collection
A total of 214 respondents have completed the survey belonging to different occupation including university students, women working and few housewives.The survey was completed through an online survey i.e Google forms. A pre tested questionnaire was designed and the link was shared with the participant via social media platforms (WhatsApp, Email etc.). Participant confidentiality was maintained throughout the study.

RESULTS
A total of 214 participants participated in the study. The participants reported poor knowledge about the risk factors and signs and symptoms of the breast cancer. Regarding the breast cancer risk factors, most of the participants were unaware of the risk factors associated with breast cancer. Only a small portion of the respondents were known to the risk factors.

| Participants knowledge of breast cancer and demographic characteristics		Overall frequency	Percentage
Marital status	Married	57	26.7
	Unmarried	157	73.3
Level of education	Undergraduate	166	77.8
	Postgraduate	48	22.2
Are you aware of breast self examination?	Yes	140	65.7
	No	74	34.3
Have you ever done sonography?	Yes	89	41.7
	No	125	58.2
Have you ever visited gynecologist?	Yes	113	52.4
	No	101	47.5
Are you aware of mammography?	Yes	8	3.9
	No	206	96.1

Table no 1: Demographic characteristics of Breast cancer patients

Are you aware of breast self-examination?
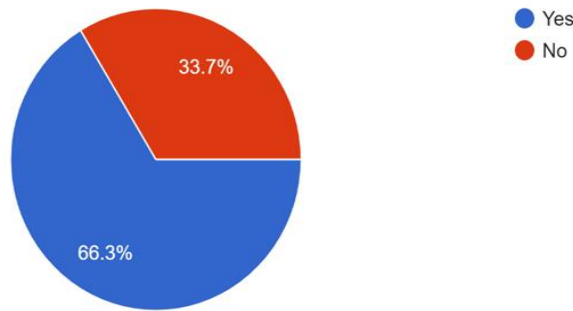
The pie chart shows positive response among the participants about the BSE (breast self-examination) awareness.Maximum of the females are aware about the BSE i.e. about 66.3% whereas 33.7% females are still unknown about the BSE. [Table.1]

Are you aware of mammography?
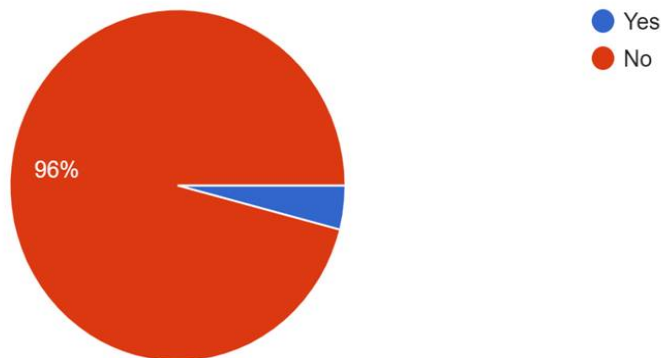
The pie chart diagram shows poor response of the participants about the awareness of mammography.Only 4% of the total female participants are aware of the mammography.This indicates the need of awareness about the early detection, risk factors and signs and symptoms of breast cancer. [Table.1]

The above table comprises of the first part of the survey that includes the demographic characters of the participants. Maximum of the respondents were unmarried/single.Majority of the participants were aware about the breast self-examination (65.7%).To the contrast most of the patients were not aware about the mammography (96.1%). [Table.1]

| Following are the risk factors of breast cancer?		Overall frequency %	Level of education	
			Undergraduate	Postgraduate
Started menstruating before age 12	Yes	151(70.6)	120(56)	27(12.6)
	No	63(29.4)	49(22.8)	18(8.4)
Late menopause(after age 55)	Yes	38(17.6)	22(10.3)	8(3.7)
	No	176(82.4)	147(68.7)	37(17.3)
Giving birth for the first time after age 30	Yes	49(22.8)	30(14.1)	17(7.9)
	No	165(77.2)	139(64.9)	28(13.1)
Not having child birth experience	Yes	101(47)	79(36.9)	22(10.2)
	No	113(53)	90(42.7)	23(10.7)

Table no 2: Risk factors related to demographic characteristics.

The current study was conducted to assess the knowledge and understanding of females about Breast Cancer. The participants reported overall poor knowledge regarding breast cancer risk factors, signs and symptoms.Additionally, the participants also reported poor knowledge regarding best time for examination of breast cancer. Regarding the breast cancer risk factors most of the females were unaware of risk factors associated with breast cancer.Only a small percent of respondents were known to the risk factors. Out of the females that enrolled in undergraduate program, 56% females considered early menstruation (i.e. age 12) as a risk factor of breast cancer while 22.8% females did not considered it as a risk factor for breast cancer.Whereas 12.6% of postgraduate females considered early menstruation as a risk factor while 8.4% did not. A small number of participants considered late menopause (after age 55) 17.6%, giving birth for the first time (after age 30) 22.8% and not having childbirth experience 47% as a risk factor for breast cancer. [table.2]

Following are the risk factors of breast cancer?		Overall frequency %	Level of education	
			Undergraduate	Postgraduate
Low physical activity	Yes	98(45.7)	76(33.6)	20(9.3)
	No	116(54.2)	88(41.1)	30(11.7)
Overweight and obesity	Yes	77(35.9)	56(27.1)	16(7.4)
	No	137(64.1)	102(47.7)	41(19.1)
Age over 40 years	Yes	39(18.3)	25(12.6)	22(10.2)
	No	175(81.7)	130(60.7)	40(16.3)
Lack of breastfeeding	Yes	63(29.4)	56(26.1)	16(7.4)
	No	151(70.6)	109(48.6)	34(13.5)

| Following are the risk factors of breast cancer?		Overall frequency	Percentage	
			Undergraduate	Postgraduate
Smoking and alcohol consumption in the past or present	Yes	53(24.8)	49(21.9)	15(5.6)
	No	161(75.2)	117(54.6)	33(15.4)
Stress	Yes	119(55.5)	93(43.4)	26(12.1)
	No	97(44.5)	67(31.3)	19(8.8)
High consumption of non veg	Yes	39(18.3)	9(4.2)	33(15.4)
	No	175(81.7)	36(16.8)	127(59.3)
Low consumption of green leafy vegetables and fruits	Yes	112(52.6)	80(37.3)	23(10.7)
	No	101(47.4)	79(36.9)	22(10.2)
High consumption of fatty foods	Yes	105(49.3)	79(36.9)	22(10.2)
	No	108(50.7)	81(37.8)	23(10.7)

Table no 3: Risk factors related to lifestyle.
Is stress a major risk factor for breast cancer?
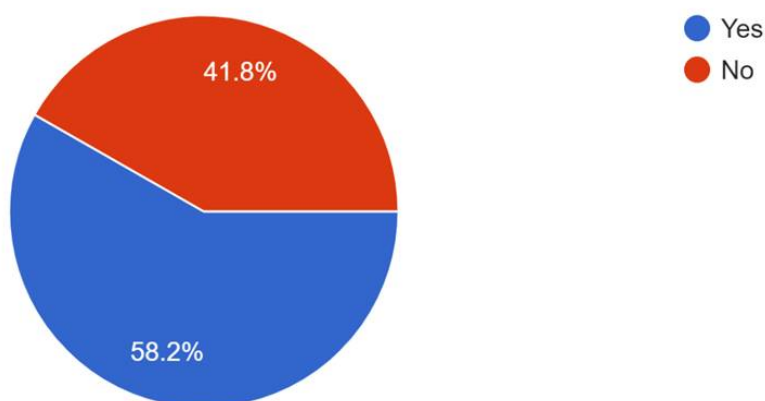
The pie chart diagram shows that most of the females consider stress as the major factor for breast cancer i.e., 58.2%. A data was collected on risk factors of breast cancer considering low physical activity, overweight and obesity, age, lack of breastfeeding, smoking or alcohol consumption in the past or present, stress and high consumption of non veg, fatty acids and low consumption of green leafy vegetables.Most of the participants considered stress as the major risk factor of breast cancer. Whereas Age above 40 and High consumption of Non veg were not considered majorly as a risk factor for breast cancer. About 55.5% of females considered stress as the major risk for breast cancer. To the contrast only 18.3% females considered Age above 40 and High consumption of Non veg as the risk factor. A moderate number of females considered low physical activity (45.7%) and obesity (35.9%) as the risk factor of breast cancer.According to the data reported majority of the females do not consider Lack of Breastfeeding (29.4%) and Smoking /alcohol consumption (24.8%). Participants knowledge of breast cancer risk factors related to physical activity and lifestyle can be seen in the above table. [Table.3]
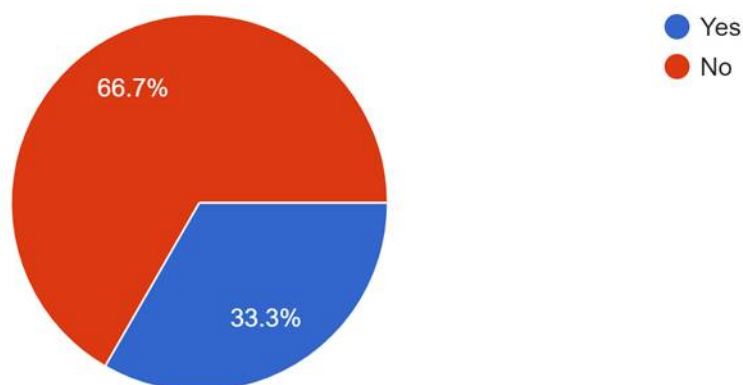
Following are the signs and symptoms of breast cancer?		Overall frequency %	Level of education	
			Undergraduate	Postgraduate
Painless and palpable breast lump	Yes	81(38.1)	61(28.5)	17(13.4)
	No	132(61.9)	99(78.0)	28(22.0)
Painless mass under armpit	Yes	74(34.8)	59(46.5)	16(12.6)
	No	139(65.2)	102(80.4)	28(22.0)
Bleeding and discharge from nipple	Yes	41(19)	35(16.3)	10(4.6)
	No	173(81)	124(57.9)	35(16.3)
Pulling of nipple inward	Yes	41(19.2)	32(14.9)	9(4.2)
	No	172(80.8)	128(59.8)	36(16.8)
Following are the signs and symptoms of breast cancer?		Overall frequency %	Level of education	
			Undergraduate	Postgraduate
Wound around the nipple	Yes	48(22.3)	35(16.3)	10(4.6)
	No	166(77.7)	124(57.9)	35(16.3)
Redness around the breast skin	Yes	53(25)	46(21.4)	13(6.07)
	No	160(75)	113(52.8)	31(14.4)
Abrupt changes in the size of the breast	Yes	73(34.2)	53(24.7)	15(7.0)
	No	141(65.8)	107(50)	30(14.1)
Abrupt changes in the shape of the breast	Yes	72(33.5)	53(24.7)	15(7.0)
	No	142(66.5)	107(50)	30(14.1)

Table no 4: Signs and symptoms of Breast cancer
Painless mass under armpit ?
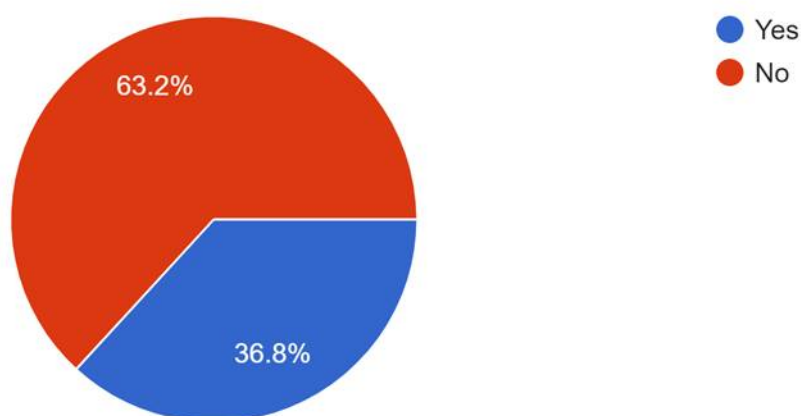
Painless mass under armpit is actually a sign and symptom of breast cancer.According to the data collected only 36.8% of the females are aware that painless mass under the armpit is actually a symptom for breast cancer.

Abrupt changes in the size and shape of the breast?

Legend: ● Yes ● No

66.7%

33.3%

DISCUSSION
According to the responded data, female participants reported very poor knowledge about the signs and symptoms of breast cancer.Surprisingly, only 33.3% of the females think that abrupt changes in the size and shape of the breast is a symptom of breast cancer breast cancer and 66.7% are unaware.Whereas it is detectable symptoms of the breast cancer.

Most of the female participants were unknown to the signs and symptoms of breast cancer.The signs and symptoms like painless and palpable breast lumps, painless mass under armpit and bleeding or discharge from the nipple were reported by 31.8%, 34.8% and 19% of the participant, respectively. In addition, inward pulled nipple, wound around the nipple and abrupt changes in the breast size were considered as signs and symptoms by 19.2%,22.32% and 34.2% of the participant, respectively.There was a significant difference between the undergraduate and post graduate female participants regarding painless and palpable breast lumps (UG: 28.5% vs PG: 13.4%) and painless mass under armpit (UG: 45.5% vs PG: 12.6%). [table.4]

CONCLUSION AND RECOMMENDATIONS
In the present study, Indian women reported poor knowledge about risk factors of breast cancer.Most of the females are unaware about signs and symptoms of breast cancer and detection technique mammography.The early diagnosis increases the chance of recovery and also improves surveillance rate of breast cancer patients. Therefore, the Government health administration and other related medical bodies should play an important role in awareness regarding risk factors and early diagnosis of breast cancer by arranging health campaigns, street plays, seminars, media etc.

REFERENCES
1. CDC. What Is Breast Cancer? 2020 [cited 2021 4 April]. What Is Breast Cancer? | CDC
2. Sun YS, Zhao Z, Yang ZN, Xu F, Lu HJ, Zhu ZY, Shi W, Jiang J, Yao PP, Zhu HP.(2017). Risk Factors and Preventions of Breast Cancer. Int J Biol Sci; 13(11):1387-1397. doi:10.7150/ijbs.21635. https://www.ijbs. com/v13p1387.htm
3. Noreen M, Murad S, Furqan M, Sultan A, Bloodsworth P. (2013). Knowledge and awareness about breast cancer and its early symptoms among medical and non-medical students of Southern Punjab, Pakistan. https://doi.org/10.7314/APJCP.2015.16.3.979
4. Alshareef B, Yaseen W, Jawa W, Barnawe Y, Alshehry W, Alqethami H, et al. (2020). Breast Cancer Awareness among Female School Teachers in Saudi Arabia: A Population Based Survey. Asian Pacific journal of cancer prevention:10.31557/APJCP.2020.21.12.3639
5. Rahman SA, Al-Marzouki A, Otim M, Khalil Khayat NEH, Yousuf R, Rahman P. (2019). 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. 20(6):1901–8. 10.31557/APJCP.2019.20.6.1901
6. Banning M, Hassan M, Faisal S, Hafeez H. (2010). Cultural interrelationships and the lived experience of Pakistani breast cancer patients. European Journal of Oncology Nursing. 14(4):304–9.Cultural interrelationships and the lived experience of Pakistani breast cancer patients-European Journal of Oncology Nursing (ejoncologynursing.com)
7. Gebresillassie BM, Gebreyohannes EA, Belachew SA, Emiru YK. (2018). Evaluation of Knowledge, Perception, and Risk Awareness About Breast Cancer and Its Treatment Outcome Among University of Gondar Students, Northwest Ethiopia. Frontiers in oncology. 8:501-. Frontiers | Evaluation of Knowledge, Perception, and Risk

Awareness About Breast Cancer and Its Treatment Outcome Among University of Gondar Students, Northwest Ethiopia (frontiersin.org)

8. Eysenbach G. (2012). Correction: improving the Quality of web surveys: the Checklist for Reporting results of internet E-Surveys (CHERRIES). Journal of medical Internet research. 14(1): e8.
9. Cuschieri S. (2019). The STROBE guidelines. Saudi J Anaesth. 13(Suppl 1):S31–S4. The STROBE guidelines : Saudi Journal of Anaesthesia (lww.com)
10. WHO. (2021). Breast cancer [cited 2021 4 April]. Breast cancer (who.int)
11. ACS. What Is Breast Cancer? 2019 [cited 2021 4 April]. What Is Breast Cancer? | American Cancer Society
12. Liu J, Wang J. (2017). Disability-Adjusted Life-Years (DALYs) for Breast Cancer and Risk Factors in 195 countries: Findings from Global Burden of Disease Study. Med Rxiv.2020:2020. 04.02. 20050534.doi**:** https://doi.org/ 10.1101/2020.04.02.20050534
13. Hussain I, Majeed A, Masood I, Ashraf W, Imran I, Saeed H, et al. (2022) A national survey to assess breast cancer awareness among the female university students of Pakistan. PLoS ONE 17(1): e0262030. https://doi.org/10.1371/journal. pone.0262030
14. Britt KL, Cuzick J, Phillips K-A. (2020). Key steps for effective breast cancer prevention. Nature Reviews Cancer. 2020; 20(8):417–36. Key steps for effective breast cancer prevention | Nature Reviews Cancer.