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Original Article

Women's health belief levels towards breast cancer: Example of three countries

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A B S T R A C T

Objective: This research aims to compare the health belief levels of women towards breast cancer by country.

Material and Methods: This cross-sectional study was conducted with 431 women living in Turkey, Nigeria and India between December 2021 and April 2022 in order to examine the health belief levels of women towards breast cancer.

Results: In our study, the mean score of Sensitivity Perception of individuals was 7.10±3.30, Caring/seriousness perception 17.02±5.91, Health motivation 21.09±3.65, BSE self-efficacy 31.28±12.34, BSE benefits 15.40±4.07, BSE barriers 21.38±6.40, Mammography benefits 18.76±4.62, and Mammography Barriers was 29.15±9.65. A significant difference was found in all sub-dimensions of the participants in the study, except for the mammography barriers, which are among the sub-dimensions of health beliefs about breast cancer ($p<0.05$).

Conclusion: It was determined that all sub-dimensions of the participants in the study differed, except for the mammography barriers, which are among the sub-dimensions of health belief towards breast cancer. Longitudinal studies are recommended.

Keywords: breast cancer; model; health belief

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Introduction

All over the world, breast cancer is the most common type of cancer in women and is the most common cause of cancer-related deaths [1, 2]. According to the World Health Organization (WHO), approximately 2.3 million women get breast cancer every year and 685,000 women die [3]. By the end of 2020, 7.8 million women who were diagnosed with breast cancer in the last 5 years had survived. According to the data obtained, breast cancer has become the most common cancer in the world [3].

According to the 2020 data of the American Cancer Society, it is estimated that approximately 276,480 women in the United States were diagnosed with breast cancer and approximately 42,170 women died due to breast cancer [4]. Although the incidence of breast cancer has increased significantly worldwide in the last century, the mortality rate has decreased significantly with the increase in mammography screening programs, especially in developed countries [5, 6]. While the rate of new breast cancer cases is 39% in Asian countries, which make up 59% of the world's population, this rate is 15% in North America and 8% in African countries. Breast cancer-related mortality rates are 44% in Asian countries, 9% in North America, and 12% in Africa [7].

Environmental and personal factors play an important role in the emergence and progression of cancers. Studies on cancer epidemiology have revealed that socioeconomic status is associated with cancer incidence and disease progression [8].

It is stated in the literature that various factors affect breast cancer screening behaviors. Many factors affecting breast cancer screening behaviors such as low socio-economic level, education level, physician recommendation, lack of knowledge about breast cancer, clinical breast examination (CBE), breast self-examination (BSE) and mammography, family history of breast cancer and health beliefs [9, 10].

Mammography, CBE, and BSE are population-based screening methods recommended for early detection of breast cancer [11, 12]. Among these screening methods, mammography is the gold standard in the early diagnosis of breast cancer, but it is also very important for women to have regular clinical breast examinations and regular breast self-examinations in order to increase the effectiveness of mammography [13].

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Various national and international study reports on breast cancer point to the inadequacy of breast cancer screening behaviors [4]. There are many factors affecting breast cancer screening behaviors such as low socio-economic level and education level, marital status, age, lack of knowledge about breast cancer, BSE, CBE and mammography, family history of breast cancer, physician recommendation and health beliefs [9, 10, 14].

In recent years, one of the most frequently used models to examine the effect of health beliefs among the factors affecting breast cancer screening behaviors in women and to increase screening rates is the Health Belief Model (HBM). The model explains the beliefs and attitudes that affect the behavior of individuals [15, 16]. The health belief model (HBM) is a model based on studies aiming to increase breast cancer screening behaviors in women. Today, HBM is frequently used for public health research such as disease, health screening, disease role, and intervention in preventive behaviors [17, 18]. The most basic components of the model are the perception of susceptibility, the perception of seriousness, the perception of benefit and the perception of barrier. According to the model, a woman who feels predisposed to breast cancer and sees breast cancer as a serious disease will have a higher rate of BSE and CBE [19].

In this study, it was aimed to compare the health belief levels of women towards breast cancer by country. There is no similar study in the literature, and it is thought that this study will contribute to the literature.

Material and methods

This cross-sectional study was conducted to examine the health belief levels of women about breast cancer. In the reporting of this research paper, the STROBE guide were used [20].

This research was conducted with women in a province in Turkey, India and Nigeria between December 2021 and April 2022. The population of the study consisted of women from Agri province of Turkey, Bangalore province of India, and Oyo State province of Nigeria. All women who agreed to participate in the study by sampling the caropy in the study.

Introductory Information Form: It consists of questions created by researchers and containing the introductory characteristics of individuals.

Health Belief Model Scale (HBM): Based on the Victoria Champion Health Belief Model in the field of nursing, it developed the Health Belief Model Scale in breast cancer screenings in 1984 and renewed it in 1993, 1997 and 1999. For Turkish society, the scale adapted by Gözüm et al. was used. The scale, which consists of 52 questions, is a 5-point Likert type [21-23]. This scale, which evaluates women's beliefs about breast cancer, BSE and mammography within the framework of SIM, has been adapted to various country languages. In order to examine women's beliefs about breast cancer and screening behaviors in Turkey within the framework of a theoretical model and to make international comparisons with the results obtained, structured, valid and reliable data collection tools are needed. In our study, Sensitivity Perception was 0.75, Caring/seriousness perception was 0.73, Health motivation was 0.68, BSE self-efficacy was 0.94, BSE benefits were 0.81, BSE barriers were 0.67, Mammography benefits were 0.77, and Mammography Barriers were 0.84.

Introductory Information Form and Health Belief Model Scale were used to collect research data. After explaining the purpose of the study and obtaining consent from those who voluntarily agreed to participate in the study, the data were collected with the forms prepared by the researchers.

Statistical analysis

IBM SPSS V-25 program was used in the statistical analysis of the study.

Analyzed is made with SPSS-25 program installed in a university in Turkey. In the research, descriptive features are presented with number (n) and percentage (%). Continuous variables are specified with their mean, standard deviation, minimum and maximum values. Necessary normality tests were performed in the process of analyzing the data and it was understood that the data showed normal distribution (kurtosis and skewness -1.5 to +1.5) [24]. In paired comparisons of multiple groups, one of the post-hoc tests, Bonferroni test was used for homogeneous distribution and Games-Howell for non-homogeneous data. Pearson correlation test was used to determine the linear relationship between variables and severity of the relationship. P value of <0.05 was considered statistically significant.

Results

It was determined that 39.4% of the individuals participating in the study were Nigerian, 42.9% believed in Islam, 63.1% were single, 67.3% graduated from higher education, 66.6% had an income equal to their expenses, and the mean age was 33.60±15.25 (years) (Table 1).

Table 1. Descriptive characteristics of individuals (n=431)

Demographic features		n	%
Nationality	Turkey	154	35.7
	Nigeria	170	39.4
	India	107	24.8
Religious Beliefs	Islam	185	42.9
	Christian	181	42.0
	Hinduism	65	15.1
Marital status	Single	272	63.1
	Married	159	36.9
Educational status	Primary education	28	6.5
	Secondary education	113	26.2
	High education	290	67.3
Monthly income status	My income is less than my expenses	109	25.3
	My income is equal to my expenses	287	66.6
	My income is more than my expenses	35	8.1
$\overline{X}$ ±SD (Min-Max)			
Age	33.60±15.25 (18-67)		

In our study, it was found that the mean score of individuals' Sensitivity Perception was 7.10±3.30, Caring/seriousness perception 17.02±5.91, Health motivation 21.09±3.65, BSE self-efficacy 31.28±12.34, BSE benefits 15.40±4.07, BSE barriers 21.38±6.40, Mammography benefits 18.76±4.62, Mammography barriers 29.15±9.65 (Table 2).

A significant difference was found between the individuals' Sensitivity Perception mean score and their nationality, religious belief, marital status, and monthly income ($p<0.05$) (Table 3).

In the post-hoc (Games Howell) analysis performed to determine from which group caused the difference between Sensitivity Perception mean score and nationality, it was determined that Turkey's mean score was higher than the mean score of both groups.

In the post-hoc (Games Howell) analysis performed to determine which group caused the difference between Sensitivity Perception mean score and religious belief, it was determined that the mean score of those who believed in Islam was higher than the mean score of both groups.

Table 2. Individuals' breast cancer health belief scale sub-dimension scores mean (n=431)

Scales	$\overline{X}$ ±SD	Min	Max
Sensitivity Perception	7.10±3.30	3	15
Caring/seriousness perception	17.02±5.91	6	30
Health motivation	21.09±3.65	6	25
BSE self-efficacy	31.28±12.34	10	50
BSE benefits	15.40±4.07	5	25
BSE barriers	21.38±6.40	8	40
Mammography benefits	18.76±4.62	5	25
Mammography barriers	29.15±9.65	11	54

In the post-hoc (Bonferroni) analysis performed to determine from which group caused the difference between Sensitivity Perception score mean and monthly income status, it was determined that the mean score of those whose income was equivalent to their expenses was higher than the mean score of those whose income was higher than their expenses.

There was a significant difference between the individuals' caring/seriousness perception mean score and their nationality and religious belief ($p<0.05$) (Table 3).

In the post-hoc (Games Howell) analysis performed to determine from which group caused the difference between caring/seriousness perception mean score and nationality, it was determined that Turkey's mean score was higher than India's.

In the post-hoc (Games Howell) analysis performed to determine from which group caused the difference between the caring/seriousness perception mean score and their religious belief, it was determined that the mean score of those who believed in Islam was higher than the mean score of both groups.

There was a significant difference between the motivation score mean of the individuals and their nationality, marital status and monthly income ($p<0.05$) (Table 3).

In the post-hoc (Games Howell) analysis performed to determine which group caused the difference between the motivation score mean and nationality, it was determined that Nigeria's mean score was higher than the mean score of both groups.

In the post-hoc (Bonferroni) analysis performed to determine which group caused the difference between the motivation score mean and the monthly income, it was determined that the mean score of those whose income was higher than their expenses was higher than the mean score of both groups.

A significant difference was found between individuals' BSE self-efficacy mean scores and their nationality, religious belief, marital status and monthly income ($p<0.05$) (Table 3).

In the post-hoc (Games Howell) analysis performed to determine which group caused the difference between BSE self-efficacy score mean and nationality, it was determined that Nigeria's mean score was higher than the mean score of both groups. It was determined that Turkey's mean score was also significantly higher than India's mean score.

In the post-hoc (Games Howell) analysis performed to determine from which group caused the difference between BSE self-efficacy score mean and religious belief, it was determined that the mean score of those who believed in Christianity was higher than the mean score of both groups. It was determined that the mean score of those who believed in Islam was also significantly higher than the mean score of those who believed in Hinduism.

In the post-hoc (Bonferroni) analysis performed to determine which group caused the difference between BSE self-efficacy score mean and monthly income, it was determined that the mean score of those whose income was higher than their expenses was higher than the mean score of both groups.

There was a significant difference between the individuals' BSE benefit mean scores and their nationality and monthly income ($p<0.05$) (Table 3).

In the post-hoc (Games Howell) analysis performed to determine which group caused the difference between BSE benefit mean score and nationality, it was determined that the mean score of India was lower than the mean score of both groups.

In the post-hoc (Bonferroni) analysis performed to determine which group caused the difference between BSE benefit score mean and monthly income, it was determined that the mean score of those whose income was higher than their expenses was higher than the mean score of both groups.

A significant difference was found between the BSE barriers score mean of individuals and their nationality, religious belief, marital status, education level and monthly income ($p<0.05$) (Table 3).

In the post-hoc (Games Howell) analysis performed to determine which group caused the difference between BSE barriers score mean and nationality, it was determined that Nigeria's mean score was higher than the mean score of both groups.

In the post-hoc (Bonferroni) analysis performed to determine from which group caused the difference between BSE barriers score mean and religious belief, it was determined that the mean score of the Christians was higher than the mean score of both groups.

In the post-hoc (Bonferroni) analysis performed to determine from which group caused the difference between BSE barriers score mean and educational status, it was determined that the mean score of those who graduated from higher education was lower than the mean score of those who graduated from secondary education.

In the post-hoc (Bonferroni) analysis performed to determine from which group caused the difference between BSE barriers score mean and monthly income status, it was determined that the mean score of those whose income is more than their expenses was higher than the mean score of those whose income is equivalent to their expenses.

A significant difference was found between the mammography benefit mean score of individuals and their nationality, religious belief, marital status and monthly income ($p<0.05$) (Table 3).

In the post-hoc (Games Howell) analysis performed to determine which group caused the difference between the mammography benefit mean score and nationality, it was determined that the mean score of Nigeria was higher than the mean score of both groups. It was determined that Turkey's mean score was also significantly higher than India's mean score.

In the post-hoc (Bonferroni) analysis performed to determine which group caused the difference between the mammography benefit mean score and their religious

Table 3: Comparison of women's breast cancer health belief model scale sub-dimension mean scores by socio-demographical characteristics (n=431)

			Sensitivity Perception		Caring/seriousness perception		Health Motivation		BSE self-efficacy	
		n	$\overline{X}$ ±SD	Test and Significance	$\overline{X}$ ±SD	Test and Significance	$\overline{X}$ ±SD	Test and Significance	$\overline{X}$ ±SD	Test and Significance
Nationality	Turkey	154	8.77±2.33	F=36.357 p=.001	18.27±4.59	F=7.665 p=.001	20.68±3.86	F=12.848 p=.001	30.04±8.84	F=26.128 p=.001
	Nigeria	170	5.98±3.75		16.89±7.26		22.12±3.02		35.88±15.11	
	India	107	6.47±2.75		15.42±4.72		20.03±3.86		25.73±8.58	
Religious Beliefs	Islam	185	8.44±2.61	F=30.939 p=.001	18.15±5.04	F=6.445 p=.002	20.88±3.75	F=2.633 p=.073	30.40±9.59	F=10.036 p=.001
	Christian	181	5.96±3.62		16.37±6.88		21.53±3.55		33.92±15.03	
	Hinduism	65	6.47±2.73		15.61±4.67		20.46±3.54		26.43±8.83	
Marital status	Single	272	7.47±3.08	t=3.098 p=.002	16.49±5.24	t=-2.449 p=.015	20.65±3.90	t=-3.267 p=.001	29.59±10.52	t=-3.763 p=.001
	Married	159	6.46±3.57		17..93±6.83		21.83±3.04		34.16±14.54	
Educational status	Primary education	28	7.57±3.37	F=2.212 p=.111	16.42±5.59	F=0.223 p=.800	19.85±3.41	F=1.735 p=.178	32.92±12.41	F=0.735 p=.480
	Secondary education	113	6.55±3.41		16.88±6.06		21.23±3.53		30.21±13.88	
	High education	290	7.27±3.24		17.13±5.90		21.15±3.70		31.53±11.70	
Monthly income status	Less than expenses	109	6.89±2.97	F=4.648 p=.010	16.80±5.59	F=0.352 p=.704	20.50±3.32	F=6.804 p=.001	28.39±10.47	F=13.174 p=.001
	Equal to expenses	287	7.36±3.36		17.01±6.01		21.07±3.81		31.26±12.43	
	More than expenses	35	5.62±3.49		17.77±6.23		23.08±2.46		40.37±12.93	

Table 4: Comparison of women's breast cancer health belief model scale sub-dimension mean scores by socio-demographical characteristics (n=431)

Variables			BSE Benefits		BSE Barriers		Mammography Benefits		Mammography Barriers	
		n	$\overline{X}$ ±SD	Test and Significance	$\overline{X}$ ±SD	Test and Significance	$\overline{X}$ ±SD	Test and Significance	$\overline{X}$ ±SD	Test and Significance
Nationality	Turkey	154	15.35±3.40	F=8.697 p=.001	19.83±5.33	F=22.946 p=.001	18.77±3.37	F=29.389 p=.001	28.77±8.10	F=1.681 p=.187
	Nigeria	170	16.23±4.68		23.85±7.16		20.34±5.09		30.18±11.55	
	India	107	14.17±3.59		19.71±5.23		16.23±4.30		28.80±8.20	
Religious Beliefs	Islam	185	15.37±3.46	F=1.717 p=.181	20.11±5.70	F=14.133 p=.001	18.77±3.78	F=7.995 p=.001	28.55±8.29	F=0.896 p=.409
	Christian	181	15.71±4.65		23.25±6.88		19.44±5.33		29.87±11.04	
	Hinduism	65	14.63±3.89		19.80±5.62		16.81±4.19		28.87±9.11	
Marital status	Single	272	15.13±3.69	t=-1.795 p=.073	20.22±5.77	t=-5.056 p=.001	18.14±4.22	t=-3.692 p=.001	27.93±8.91	t=-3.476 p=.001
	Married	159	15.86±4.63		23.37±6.93		19.82±5.08		31.24±10.51	
Educational status	Primary education	28	15.46±4.07	F=0.118 p=.888	23.01±6.98	F=5.439 p=.005	19.03±4.61	F=0.092 p=.912	30.96±7.43	F=4.436 p=.012
	secondary education	113	15.24±4.26		22.78±7.19		18.84±4.84		31.16±10.44	
	High education	290	15.46±4.01		20.68±5.90		18.70±4.55		28.00±9.40	
Monthly income status	Less than expenses	109	14.89±3.77	F=5.023 p=.007	22.22±6.63	F=4.678 p=.010	17.74±4.09	F=6.713 p=.001	31.95±9.55	F=6.297 p=.002
	Equal to expenses	287	15.36±4.15		20.78±6.21		18.88±4.67		28.25±9.48	
	More than expenses	35	17.37±3.81		23.74±6.53		20.91±5.01		27.85±9.92	

belief, it was determined that the mean score of the Christian was lower than the mean score of both groups.
In the post-hoc (Bonferroni) analysis performed to determine which group caused the difference between the mammography benefit mean score and the monthly income, it was determined that the mean score of those whose income is more than their expenses was higher than the mean score of both groups.
A significant difference was found between the mammography barriers mean score of individuals and their marital status, education level and monthly income ($p<0.05$) (Table 3).
In the post-hoc (Bonferroni) analysis performed to determine which group caused the difference between the mean score of mammography barriers and educational status, it was determined that the mean score of those who graduated from higher education was lower than the mean score of those who graduated from secondary education.
In the post-hoc (Bonferroni) analysis performed to determine from which group caused the difference between the mean score of mammography barriers and monthly income status, it was determined that the mean score of those whose income was lower than their expenses was higher than the mean score of those whose income was equivalent to their expenses.

Discussion

In this section, the findings are discussed in the light of the literature.
People's health is significantly affected by their health-related beliefs and behaviors. Health belief is the expression of a person's thoughts and behaviors towards the state of being healthy or the state of illness. As a result of these beliefs, people's behaviors towards their health are shaped and as a result, they affect their health positively or negatively [25, 26]. It is important to determine the health belief levels in different countries and to carry out education programs in order to reveal breast cancer risks, identify risk groups, disseminate screening programs and increase social awareness. In this section, the findings are discussed in the light of the literature. In the Health Belief Model Scale we used, there are 52 questions and 8 sub-dimensions in total, including sensitivity, seriousness and health motivation sub-dimensions that evaluate the belief of the person about breast cancer and general health, barriers, benefits and self-efficacy for BSE, and benefits and barriers for mammography.. The scale does not have a total score. The total score of each subscale is evaluated separately [27]. In our study, it was found that the mean score of individuals' Sensitivity Perception was 7.10±3.30, Caring/seriousness perception 17.02±5.91, Health motivation 21.09±3.65, BSE self-efficacy 31.28±12.34, BSE benefits 15.40±4.07, BSE barriers 21.38±6.40, Mammography benefits 18.76±4.62, Mammography barriers was 29.15±9.65.
A significant difference was found between the individuals' Sensitivity Perception mean score and their nationality, religious belief, marital status, and monthly income ($p<0.05$). Sensitivity perception: Personal risk or sensitivity is an important perception in individuals' health-related behavior. The more risk a person feels, the more he will reduce his risky behavior. It is reported in the literature that the number of women undergoing mammography increases as the mean sensitivity perception score increases [28, 29]. It is stated that women who have had mammography have a higher risk of developing cancer [30]. In our study, it was determined that the mean score of Turkey was higher than the mean score of both groups. It can be said that the health and education policies of countries have an impact on social and individual sensitivity.
It was determined that the mean score of those who believed in Islam was higher than the mean score of both groups. A study by Silbermann et al. in 2011 shows that societies that believe in Islam differ in their attitudes towards cancer compared to western societies [31].
It was determined that the mean score of those whose income is equal to their expenses is higher than the mean score of those whose income is more than their expenses. It is known that the diagnosis of breast cancer is higher than the population in countries with high income levels [32]. In addition, it is stated in the literature that as the income level increases, the level of knowledge increases and the number of women who undergo mammography increases [33, 34]. The result obtained in our study strengthens the possibility that there may be different determinants in the perception of sensitivity. It is recommended that more studies be conducted on the perception of sensitivity and the effect of socio-economic level.
There was a significant difference between the individuals' caring/seriousness perception mean score and their nationality and religious belief ($p<0.05$). In the analysis, it was determined that the mean score of those who believed in Islam was higher than the mean score of both groups. In the analysis, it was determined that Turkey's average score was higher than India's average score. It is in line with the literature that the widespread use of mammography increases the perception of caring/seriousness [35, 36]. As with the perception of sensitivity, it can be said that the caring/seriousness score can be affected by factors such as low socioeconomic status, low education level, lack of health professionals and doctors in the area where they live, lack of health insurance, having a family history of breast cancer, and lack of knowledge of breast cancer [37-40].
There was a significant difference between the motivation score mean of the individuals and their nationality, marital status and monthly income ($p<0.05$). The mean score of Nigeria was found to be higher than the mean score of both groups.
A significant difference was found between the BSE self-efficacy mean scores of individuals and their nationality, religious belief, marital status, and monthly income ($p<0.05$). The mean score of Nigeria was found to be higher than the mean score of both groups. It was determined that Turkey's mean score was also significantly higher than India's mean score. It was determined that the mean score of those who believed in Christianity was higher than the mean score of both groups.
It was determined that the mean score of those who believed in Islam was also significantly higher than the mean score of those who believed in Hinduism. In the study, it was determined that the mean score of those with more income than their expenses was higher than the mean score of both groups. A study by Hajian-Tilaki & Auladi in Iran in 2014 found that only about 10% of women perform BSE in northern Iran and regions south of the Caspian Sea [29]. Socio-demographic characteristics and especially education level affect breast cancer awareness and thus subsequent attitude [41]. Our findings show parallelism with the literature.
A significant difference was found between the BSE benefit score average and the nationality and monthly income status of the individuals ($p<0.05$). It was determined that the mean score of India was lower than the mean score of both groups. It was determined that the mean score of those with more income than their expenses was higher than the mean score of both groups. In their study published in 2021, Firouzbakht et al found the mean BSE benefit score of women in Iran to be 3.53 [42]. In a study by Cronan et al. in the USA in 2008 in different ethnic groups, the mean BSE benefit score was found to be 3.93 [43]. Canbulat and Uzun reported that among female healthcare professionals, the perceived

benefit of BSE in the group who previously performed BSE was significantly higher than those who did not do BSE [44].

There was a significant difference between the BSE barriers score mean of the individuals and their nationality, religious belief, marital status, education level and monthly income ($p<0.05$). It was determined that the mean score of Nigeria was higher than the mean score of both groups. It was determined that the mean score of the Christians was higher than the mean score of both groups. It was determined that the mean score of those who graduated from higher education was lower than the mean score of those who graduated from secondary education. It was determined that the mean score of those whose income is more than their expenses is higher than the mean score of those whose income is equal to their expenses. The mean BSE barriers score of women in Iran was 3.53, 1.77 in the USA, and 1.01 in Japan [42, 43, 45]. Differences may be due to socio-economic, cultural and religious differences.

There was a significant difference between individuals' mammography benefit mean score and nationality, religious belief, marital status and monthly income ($p<0.05$). It was determined that Nigeria's mean score was higher than the mean score of both groups. It was determined that Turkey's mean score was also significantly higher than India's mean score. In the study, it was determined that the mean score of the Christians was lower than the mean score of both groups. It was determined that the mean score of those with more income than their expenses was higher than the mean score of both groups. A significant difference was found between the mean mammography barriers score of individuals and their marital status, education level and monthly income ($p<0.05$). It was determined that the mean score of those who graduated from higher education was lower than the mean of those who graduated from secondary education. It was determined that the mean score of those whose income is lower than their expenses is higher than the mean score of those whose income is equal to their expenses. Our findings show parallelism with the literature [37]. In their study, Pruitt et al. reported that the use of breast cancer screening is associated with income level and education level [49]. Van Ness et al., on the other hand, stated that the white population is more involved in breast examination than the African-American population, and that conservative people use mammography at a lower level [46].

Conclusion

According to the results of the research, it was found that women in Turkey, Nigeria and India have different health beliefs about breast cancer. It has been found that sociodemographic and cultural characteristics of women affect their health beliefs about breast cancer. Every country can train women on breast cancer awareness with a culture-based model.

Disclosure

Authors have no potential conflicts of interest to disclose.

Ethical Principles

Before starting the research, approval was obtained from the Scientific Research Ethics Committee. The principle of voluntariness was taken as the basis for the determination of the individuals to participate in the research. The ethical principles of 'Informed Consent' by explaining the purpose of the research to the individuals, 'Confidentiality and Protection of Confidentiality' by stating that the obtained information will be kept confidential, 'Respect for Autonomy' and generally 'Do No Harm/Provide Benefit' by recruiting those who want to participate voluntarily were fulfilled. Since individual rights should be protected in the research, the Helsinki Declaration of Human Rights was adhered to throughout the study.

References

[1] Angahar L. An overview of breast cancer epidemiology, risk factors, pathophysiology, and cancer risks reduction. MOJ Biol Med. 2017;1(4):92-6.

[2] DeSantis CE, Ma J, Gaudet MM, Newman LA, Miller KD, Goding Sauer A, et al. Breast cancer statistics, 2019. CA: a cancer journal for clinicians. 2019;69(6):438-51.

[3] Organization WH. Breast Cancer 2021 [Available from: https://www.who.int/news-room/fact-sheets/detail/breast-cancer.

[4] Viale PH. The American Cancer Society's facts & figures: 2020 edition. Journal of the Advanced Practitioner in Oncology. 2020;11(2):135.

[5] Trichopoulos D, Adami HO, Ekbom A, Hsieh CC, Lagiou P. Early life events and conditions and breast cancer risk: From epidemiology to etiology. International Journal of Cancer. 2008;122(3):481-5.

[6] Vondeling G, Menezes G, Dvortsin E, Jansman F, Konings I, Postma M, et al. Burden of early, advanced and metastatic breast cancer in The Netherlands. BMC Cancer. 2018;18(1):1-11.

[7] DeSantis CE, Bray F, Ferlay J, Lortet-Tieulent J, Anderson BO, Jemal A. International variation in female breast cancer incidence and mortality ratesinternational variation in female breast cancer rates. Cancer Epidemiology, Biomarkers & Prevention. 2015;24(10):1495-506.

[8] Lundqvist A, Andersson E, Ahlberg I, Nilbert M, Gerdtham U. Socioeconomic inequalities in breast cancer incidence and mortality in Europe—a systematic review and meta-analysis. The European Journal of Public Health. 2016;26(5):804-13.

[9] Açıkgöz A, Çehreli R, Ellidokuz H. Hastanede Çalışan Kadınların Meme Kanseri Konusunda Erken Tanı Yöntemlerine Yönelik Bilgi ve Davranışlarının Belirlenmesi, Uygulanan Planlı Eğitimin Etkinliğinin İncelenmesi. Meme Sagligi Dergisi/Journal of Breast Health. 2015;11(1).

[10] Çevik C, Güneş S, Hattatoğlu TD, Asım Satıcı B, Şahin C, Kocataş M, et al. Knowledge, attitude and behaviors of women between the ages of 40-69 on early detection of breast cancer. Turkish Journal of Family Medicine and Primary Care. 2019;13(2):119-28.

[11] Olsen O, Gøtzsche PC. Screening for breast cancer with mammography. Cochrane Database of Systematic Reviews. 2001(4).

[12] Berg WA, Blume JD, Cormack JB, Mendelson EB, Lehrer D, Böhm-Vélez M, et al. Combined screening with ultrasound and mammography vs mammography alone in women at elevated risk of breast cancer. JAMA. 2008;299(18):2151-63.

[13] Elmore JG, Armstrong K, Lehman CD, Fletcher SW. Screening for breast cancer. JAMA. 2005;293(10):1245-56.

[14] Joy JE, Penhoet EE, Petitti DB. Saving women's lives: Strategies for improving breast cancer detection and diagnosis: National Academies Press Washington, DC; 2005.

[15] Rosenstock IM. Why people use health services. The Milbank Quarterly. 2005;83(4).

[16] Mikhail B. The health belief model: A review and critical evaluation of the model, research, and practice. Advances in Nursing Science. 1981;4(1):65-82.

[17] Kartal A, Özsoy SA. Validity and reliability study of the Turkish version of Health Belief Model Scale in diabetic patients. International Journal of Nursing Studies. 2007;44(8):1447-58.

[18] Jones CL, Jensen JD, Scherr CL, Brown NR, Christy K, Weaver J. The health belief model as an explanatory framework in communication research: Exploring parallel,

serial, and moderated mediation. Health Communication. 2015;30(6):566-76.
[19] Abraham C, Sheeran P. The health belief model. Predicting health behaviour: Research and practice with social cognition models. 2015;2:30-55.
[20] Vandenbroucke JP, von Elm E, Altman DG, Gøtzsche PC, Mulrow CD, Pocock SJ, et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration. PLoS Med. 2007;4(10):e297.
[21] Champion VL. The relationship of breast self-examination to health belief model variables. Res Nurs Health. 1987;10(6):375-82.
[22] Champion V, Menon U. Predicting mammography and breast self-examination in African American women. Cancer Nurs. 1997;20(5):315-22.
[23] Gözüm, S., Karayurt, Ö., & Aydin, İ. (2004). Meme Kanseri Taramalarinda Champion'un Sağlik İnanç Modeli Ölçeğinin Türkçe Uyarlamlarina İlişkin Sonuçlar. Hemşirelikte Araştırma Geliştirme Dergisi, 6(1), 71-85.
[24] Tabachnick BG, Fidell LS, Ullman JB. Using multivariate statistics: Pearson Boston, MA; 2007.
[25] Kozan R, Tokgöz VY. Türkiye'de meme kanseri farkındalığı ve tarama programı. Acıbadem Üniversitesi Sağlık Bilimleri Dergisi. 2016(4):185-8.
[26] Sadiç E. Kadınların meme kanseri erken tanı, bilgi ve davranışları ile meme kanseri korkusu arasındaki ilişki. Unpublished master thesis. On Dokuz Mayis University; 2019.
[27] Secginli S. Mammography self-efficacy scale and breast cancer fear scale: psychometric testing of the Turkish versions. Cancer Nursing. 2012;35(5):365-73.
[28] Kwok C, Cant R, Sullivan G. Factors associated with mammographic decisions of Chinese-Australian women. Health Educ Res. 2005;20(6):739-47.
[29] Hajian-Tilaki K, Auladi S. Health belief model and practice of breast self-examination and breast cancer screening in Iranian women. Breast Cancer. 2014;21(4):429-34.
[30] Shiryazdi SM, Kholasehzadeh G, Neamatzadeh H, Kargar S. Health beliefs and breast cancer screening behaviors among Iranian female health workers. Asian Pac J Cancer Prev. 2014;15(22):9817-22.
[31] Silbermann M, Hassan EA. Cultural perspectives in cancer care: impact of Islamic traditions and practices in Middle Eastern countries. J Pediatr Hematol Oncol. 2011;33 Suppl 2:S81-6.
[32] Chagpar A, Coccia M. Breast cancer and socio-economic factors. Breast Cancer Res Treat (2013) 141:225–229.
[33] Parsa P, Kandiah M, Abdul Rahman H, Zulkefli NM. Barriers for breast cancer screening among Asian women: A mini literature review. Asian Pac J Cancer Prev. 2006;7(4):509-14.
[34] Huang Y, Zhou K, Li H, Wang A, Li J, Pang Y, et al. Knowledge, attitudes, and behaviour regarding breast cancer screening among women from different socio-economic regions in southwest China: A cross-sectional study. Asian Pac J Cancer Prev. 2011;12(1):203-9.
[35] Bener A, Honein G, Carter AO, Da'ar Z, Miller C, Dunn EV. The determinants of breast cancer screening behavior: a focus group study of women in the United Arab Emirates. Oncol Nurs Forum. 2002;29(9):E91-8.
[36] Champion V. Relationship of age to mammography compliance. Cancer. 1994;74(1 Suppl):329-35.
[37] Champion VL. Revised susceptibility, benefits, and barriers scale for mammography screening. Res Nurs Health. 1999;22(4):341-8.
[38] Han Y, Williams RD, Harrison RA. Breast cancer screening knowledge, attitudes, and practices among Korean American women. Oncol Nurs Forum. 2000;27(10):1585-91.
[39] Miedema B, MacDonald I, Tatemichi S. Cancer follow-up care. Patients' perspectives. Can Fam Physician. 2003;49:890-5.
[40] Miller AM, Champion VL. Mammography in older women: one-time and three-year adherence to guidelines. Nurs Res. 1996;45(4):239-45.
[41] Ma GX, Fang C, Wang MQ, Shive SE, Ma XS. Pathways of Breast Cancer Screening Among Chinese American Women. J Community Med Health Educ. 2013;3(209).
[42] Firouzbakht M, Hajian-Tilaki K, Bakhtiari A. Comparison of competitive cognitive models in explanation of women breast cancer screening behaviours using structural equation modelling: Health belief model and theory of reasoned action. Eur J Cancer Care (Engl). 2021;30(1):e13328.
[43] Cronan TA, Villalta I, Gottfried E, Vaden Y, Ribas M, Conway TL. Predictors of mammography screening among ethnically diverse low-income women. J Womens Health (Larchmt). 2008;17(4):527-37.
[44] Canbulat N, Uzun O. Health beliefs and breast cancer screening behaviors among female health workers in Turkey. Eur J Oncol Nurs. 2008;12(2):148-56.
[45] Tsunematsu M, Kawasaki H, Masuoka Y, Kakehashi M. Factors affecting breast cancer screening behavior in Japan--assessment using the health belief model and conjoint analysis. Asian Pac J Cancer Prev. 2013;14(10):6041-8.
[46] Van Ness PH, Kasl SV, Jones BA. Religion, race, and breast cancer survival. Int J Psychiatry Med. 2003;33(4):357-75.
1-8.