



# Evaluation of Arab Cultural Barriers That Influence Muslim Arab Iraqi Women's Breast Cancer Screening Behavior

Shadan Shukur Azeez, Işıl Işık Andsoy

Department of Nursing, Karabük University Faculty of Health Sciences, Karabük, Turkey

## ABSTRACT

**Objective:** Little is known about Iraqi women's practice towards breast cancer screening (BCS), breast self-examination (BSE), clinical breast examination (CBE) and mammography, and the influence of Arab culture. The aim of this study was to assess women's behavior towards BCS, and to explain the influence of specific Arab culture barriers.

**Materials and Methods:** This descriptive study was carried out with 1,066 women. Three structured questionnaires were used in the data collection. Descriptive statistics and multivariable logistic regression were used for data evaluation.

**Results:** Many Iraqi women did not practice regular BSE, CBE, and mammography. The most common reason was "not having a breast complaint". Specific Arab cultural barriers such as exposure [odds ratio (OR) = 0.545; 95% confidence interval (CI) = 0.440 to 0.674;  $p < 0.001$ ], environment (OR = 0.571; 95% CI = 0.464 to 0.703;  $p < 0.001$ ) and uneasiness barriers (OR = 0.736; 95% CI = 0.557 to 0.974;  $p = 0.032$ ) were predictors for BSE while exposure (OR = 0.553; 95% CI = 0.447 to 0.684;  $p < 0.001$ ), and environment barriers (OR = 0.585; 95% CI = 0.474 to 0.772;  $p < 0.001$ ) was predictor for CBE. Additionally, exposure (OR = 0.324; 95% CI = 0.251 to 0.419;  $p < 0.001$ ), environment (OR = 0.636; 95% CI = 0.500 to 0.809;  $p < 0.001$ ), and uneasiness barriers (OR = 0.644; 95% CI = 0.464 to 0.893;  $p = 0.008$ ) were predictors for mammography screening of Iraqi women.

**Conclusion:** Arab specific cultural barriers may be one of the key obstacles to BSC uptake in Iraq. Health education, including cultural education, may have the potential to increase BCS awareness and down-staging of the disease at presentation.

**Keywords:** Arab culture; barriers; breast cancer screening behaviors; Muslim Arab Iraqi women

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## Key Points

- Breast cancer is the most common type of cancer in Iraqi women and breast cancer screenings are very crucial for early detection.
- Cultural specific barriers may effect women's breast cancer screening behaviors.
- Culturally specific barriers of women that might prevent breast cancer screening need to be determined by health professionals.

## Introduction

Breast cancer (BC) is the most common cause of cancer-related mortality among women, particularly in low-and medium-income countries (1, 2). It is believed that high death rates in low-income countries is due to low awareness and poorer knowledge about BC and screening, insufficient diagnostic tools, and difficulties in accessing treatment (1, 3). However, early diagnosis programs are effective in increasing survival rate by early detection through screening methods, such as breast self-examination (BSE), clinical breast examination (CBE), and mammography (2).

In Iraq, the main causes of morbidity and mortality are cardiovascular diseases in the general population and BC among women (2, 4). After the destruction of the Iraqi regime in 2003, a rapid lifestyle change affected all the Iraqi population, which also affected the patterns and levels of cancer trends in Iraq. In the following years, the persistent effects of biological and chemical war have had a major negative impact, with high levels of uranium and radiation across many areas of the country. Furthermore, widespread bombing had significant impacts on infrastructure, including

accessing medical care and increased environmental pollution. All of these negative environmental and societal impacts have increased cancer incidence. Younger women have been particularly affected, and the persistent effects of warfare have become a significant additional hazard for all women's health in Iraq in the past two decades (5, 6). Unfortunately, there are no exact statistics on BC in Iraq and only the data of GLOBOCAN is taken into consideration. In Iraq, there is a national program for early detection of BC, which was established in 2001. In the Iraqi provinces, there are mammography units in some medical centers, particular clinics, and hospitals for early detection of BC where diagnostic mammography services are provided. In 2012, a preliminary, opportunistic BC screening trial was begun at the primary referral center for cancer early detection in Bagdat Medical City Teaching Hospital. In Iraq, nationwide programs for BC screening are inadequate, especially for high-risk women. Therefore, applying opportunistic screening may markedly increase the early detection rate of BC and improve awareness of BC in Iraq. Moreover, the Iraqi National Breast Cancer Research Program recommends that Iraqi women should start screening by mammography after the age of 40 years, preceded by annual CBE together with performing monthly BSE (7).

Cultural factors may influence Muslim Arab women's decisions concerning BC and screening behavior (8-10). Positive or negative factors related to health behavior are learned by experience and shaped by the influence of culture. These behaviors may not be evaluated directly. On the other hand, behavior can be predicted by measuring the behavior of a sample of individuals' behavior, as it may be difficult to evaluate attitudes by simply observing individual behavior or by examining individual physiological responses. Thus, there are some scales for measuring behavior, beliefs, or attitudes. To our knowledge, no study has been published which investigated the influence of the Arab culture-specific barriers on women's BC screening behavior in Iraq.

The elucidation of information about BC, risk factors and screening behavior of Iraqi women will both guide the country's cancer screening programs and improve BC awareness in women which may, in turn, result in improved participation in screening programs (7). Furthermore, survival rates in Iraq are lower because of the delay in detection, leading to much poorer prognosis at presentation when BC is often incurable. Survival rates are further impacted by lack of early detection programs coupled with inadequate diagnostic and treatment facilities, low socioeconomic status, and low levels of knowledge and incorrect beliefs about BC prevention (6, 7).

## Materials and Methods

### Design, Setting and Sample Size

A cross-sectional study was conducted in Sulaymaniyah city in the North of Iraq during the period from 3<sup>rd</sup> February 2019 to the 3<sup>rd</sup> of February 2021. Sulaymaniyah, a governorate located in the North of Iraq, Sulaymaniyah city is bordered in the east by Iran and the Iraqi provinces of Erbil, Kirkuk, Salah Al-Din, and Diyala to the North, West, and South, respectively. The Iraqi population consists of ethnic Sunni Muslim Arabs, Kurds, Shiites, and Chaldean Christians (11). The population of Iraq was 40,800,438, based on Worldometer detailing of the latest United Nations data in 2021. The total population of Sulaymaniyah city is 723,170 based on Worldometer elaboration of the latest United Nations data of Iraq Population in 2021. In Iraq, women make up 20,562,885 of the total Iraqi population according

to Countrymeters estimates, based on the latest United Nations data in 2021. The population of women between the ages of 20 to 70 in Sulaymaniyah city according to 2012 data is 464,259. The inclusion criteria were female gender, being between 20–70 years of age, and being able to read and write. Exclusion criteria were being  $\leq 20$  years or  $\geq 70$  years of age and having difficulty in communication. The sample size was calculated that at least 295 women, between the ages of 20 and 70, with a known population ( $n = 464,259$ ). In this study, 1,066 Iraqi women were included (12).

### Data Collection and Tools

Research data were collected through face-to-face interviews with women using a self-questionnaire. The questionnaire consists of three parts and total 59 items. These questionnaire parts are detailed below.

**Part 1. Socio-demographic characteristics (21 items):** This part was designed by the researcher according to literature (1-3, 7) for determining women's socio-demographic characteristics and BC/screening related questions including age, occupation, marital status, presence of children, economic status, age of first birth, breastfeeding status, contraceptive use, age first menstrual period, previous breast problems, heard about BC and screening, having a family history of BC, performing, or having BSE, having a CBE, having a mammogram.

**Part 2. Participants breast cancer screening practices:** This part was created with reference to relevant literature (1-3, 7). It included 17 items with nominal and binomial (Yes/No) answers and was divided into three sections, BSE (seven questions), CBE (five questions) and mammography (five questions).

**Part 3. Arab culture-specific barriers to breast cancer questionnaire (ACSB) was used these section:** Permission was obtained from the authors to utilize the scales. The Arab Culture-Specific Barriers to Breast Cancer Questionnaire (ACSB) was developed by Cohen and Azaiza in 2008 (13). The ACSB has been tested and validated with Sunni Muslims, Druze, and Christian Arab women in Israel and the Palestinian Authority. This tool is composed of 21 items and five sub-scales (exposure barriers, social barriers, religious beliefs concerning cancer, environmental barriers, and uneasiness with own body). All items have five response choices ranging from strongly agree (1 point) to strongly disagree (5 points). A low score indicates a high level of cultural obstacles related to BC screening behavior. It was reported that Cronbach's alpha for this tool ranged from 0.76 to 0.90 (13). In the present study, Cronbach's alpha ranged from 0.86 to 0.96.

### Data Collection

Data collection was conducted during six months, from February to July in 2021. After explaining the study objectives and assuring confidentiality and privacy of the data, verbal and written informed consent was obtained from each woman. All documents, including surveys and consent forms were made available in English and Arabic. A researcher translated the English materials into Arabic and checked the translations for accuracy. Data were collected by the researcher in real-time interviews. Data collection lasted about 25 minutes per woman.

### Statistical Analysis

Data were analyzed using SPSS, version 21 (SPSS Inc., Chicago, IL, USA). Descriptive statistics (percentage, mean, and standard deviation) were calculated to find the distribution of the socio-demographic characteristics of the women, practices about breast

health, and Arab culture-specific BC screening barriers. A backward stepwise (conditional) regression method was used. The significance of each independent variable in the bivariate model was assessed by a Wald-type chi-square test. The statistical significance was set at  $p < 0.05$  for all analyses.

### Ethics of Research

Approval was obtained from the ethical committee in Karabuk University with the project-wide variety (77192459-050.01.04-E.11637) on 05/03/2020. Formal administrative approval was obtained from the Sulaymaniyah Planning and Health Research Department of the General Directorate of Health with the project number (12006 on 09/12/2020), for conducting this study. All women gave written

informed consent before participation. The participants were assured of anonymity and confidentiality. The participants were assured that they were not obliged to participate in the study, and they had the right to withdraw from the study at any time.

### Results

There was a total of 1,066 participants. Of the participants, 619 (58.1%) did not practice BSE and 447 (41.9%) did (Table 1). Among those who practiced BSE, 303 (67.6%) were regular. The reasons given for not performing BSE were: not having a breast complaint (69.7%); fear of discovering a tumor (22.8%); not having time (4.8%); and lack of information (2.7%).

Table 1. Practice of women towards breast cancer screening (n = 1,066)

Practices and attitudes	Yes, n (%)	No, n (%)
Practicing of BSE	447 (41.9)	619 (58.1)
If yes (n = 447)		
Regular	302 (67.6)	
As I think about it	145 (32.4)	
If no, reason (n = 619)		
I'm afraid to discover a tumor.	141 (22.8)	
I do not have a breast complaint.	431 (69.7)	
I do not have the time.	30 (4.8)	
I don't have enough information.	17 (2.7)	
CBE		
Had a clinical breast examination	400 (37.5)	666 (62.5)
When (n = 400)		
In the last 2 years	291 (72.7)	
I do not remember	109 (27.3)	
If no, reason (n = 666)		
I have never heard of it.	19 (2.8)	
I am afraid of the procedure and the bad results.	124 (18.7)	
I did not find it necessary.	40 (6.0)	
I did not have any complaints.	443 (66.5)	
I was afraid of pain and discomfort.	14 (2.1)	
Ashamed	26 (3.9)	
Mammography		
Had a mammography	374 (35.1)	692 (64.9)
If yes, when (n = 374)		
In the last 2 years	286 (76.5)	
I do not remember.	88 (23.5)	
If no, reason (n = 692)		
Mammography cannot be accessed	23 (3.3)	
I am afraid of the procedure and the bad results.	116 (16.8)	
I did not find it necessary.	53 (7.7)	
I did not have any complaints.	491 (70.9)	
Ashamed	9 (1.3)	

BSE: breast self-examination; CBE: clinical breast examination

Only 400 (37.5%) of this cohort had ever had CBE and 72.7% of examinations were in the last two years. The reasons women did not have CBE were: not having breast complaints (66.5%); fear of the procedure and/or bad results (18.7%); being ashamed (3.9%); not being advised to (1.9%); and having never heard of it (0.9%).

Similarly, only 374 (35.1%) of these Iraqi women had undergone mammography, again the majority of whom had in the last two years. The reasons given for not having mammography were: Not having breast complaints (70.9%), fear of the procedure and/or bad results (16.8%); not believing it necessary (7.7%); being unable to access mammography (3.3%); and being ashamed (1.35%).

Table 2 shows the barriers and facilitators for BCS practices. In the present study, exposure barriers, environment barriers, and uneasiness barriers were significant in attitudes to BSE. When exposure [odds ratio (OR) = 0.545, confidence interval (CI) = 0.440 to 0.674], environment (OR = 0.571, CI = 0.464 to 0.703), and uneasiness barriers (OR = 0.736, CI = 0.557 to 0.974) increased, the tendency of women to perform BSE decreased. In contrast, there were no significant relationships between social and religious barriers and performance of BSE. In terms of CBE, exposure, and environment barriers were significant. When exposure (OR = 0.553, CI = 0.447 to 0.684) and environment barriers (OR = 0.585, CI = 0.474 to 0.722) increased, the odds of them using CBE decreased. For CBE, there were no significant effects found for social, religious or uneasiness barriers. Similarly, barriers related to exposure, environment, and uneasiness

with own body were found to have a significant effect on the likelihood of undergoing mammography. Once again, when exposure (OR = 0.324; CI = 0.251 to 0.419), environment (OR = 0.636, CI = 0.500 to 0.809), and uneasiness barriers (OR = 0.644, CI = 0.464 to 0.893) increased, women become less likely to have a mammogram.

### Discussion and Conclusion

In Iraq, BC is the main cause of cancer-related deaths among women (7). BCS is known to be effective for early BC diagnosis and survival among women. However, we believe that Iraqi national BC screening programs are inadequate and to the best of our knowledge, there are no studies about the effect of Arab culture specifically in regard to the behavior of Iraqi women and BCS.

In the present study, just over forty percent of Iraqi women performed BSE and of these more than two-thirds performed BSE regularly. In previous studies from Iraq, it was indicated that practice of BSE, both regularly or irregularly, among Iraqi women was low (14, 15). Similar rates have been reported from other Muslim countries, such as Saudi Arabia, and Qatar (16, 17). Therefore, future research should focus on strategic plans, training programs or organizational change to improve participation in BC screening, such as BSE, amongst Muslim women.

The reasons given for not performing BSE were no breast complaint, fear of cancer diagnosis, no time, and lack of information in our study. In parallel, a previous study conducted in Iraq found that the most

Table 2. Predictors of Iraqi women’s breast cancer screening practices

Variables	B (S.E.)	p	Wald	OR	95% CI	-2 Log Likelihood	Cox & Snell R <sup>2</sup>
<b>Breast Self-Examination</b>							
Exposure. B	0.109	<b>≤0.001</b>	31.164	0.545	0.440–0.674	1007.527 <sup>a</sup>	0.353
Social. B	0.150	0.809	0.058	1.037	0.773–1.390		
Religious. B	0.128	0.372	0.796	0.892	0.694–1.147		
Environment. B	0.106	<b>≤0.001</b>	27.911	0.571	0.464–0.703		
Uneasiness. B	0.143	<b>0.032</b>	4.603	0.736	0.557–0.974		
X <sup>2</sup> = 95.794 df. 8 p<0.001							
<b>Clinical Breast Examination</b>							
Exposure. B	0.109	<b>≤0.001</b>	29.613	0.553	0.447–0.684	1015.929 <sup>a</sup>	0.342
Social. B	0.152	0.773	0.083	0.957	0.710–1.290		
Religious. B	0.127	0.442	0.591	0.907	0.706–1.164		
Environment. B	0.107	<b>≤0.001</b>	24.918	0.585	0.474–0.722		
Uneasiness. B	0.145	0.086	2.941	0.780	0.587–1.036		
X <sup>2</sup> = 94.765 df. 8 p<0.001							
<b>Mammography</b>							
Exposure. B	0.131	<b>≤0.001</b>	74.411	0.324	0.251–0.419	893.249 <sup>a</sup>	0.367
Social. B	0.175	0.291	1.115	1.203	0.854–1.694		
Religious. B	0.136	0.270	1.215	1.162	0.890–1.516		
Environmental. B	0.123	<b>≤0.001</b>	13.588	0.636	0.500–0.809		
Uneasiness. B	0.167	<b>0.008</b>	6.963	0.644	0.464–0.893		
X <sup>2</sup> = 105.536.765 df. 8 p<0.001							

B: barriers; S: standard error; OR: odds ratio; CI: confidence interval

common reasons were lack of confidence, timidity, lack of time, and fear of discovering cancer (14). Other studies from different Muslim countries indicated that the reasons were believing it not to be necessary and not knowing how to do BSE (16-18). Despite many Iraqi women practicing of BSE, women in our sample appeared to have misconceptions about BSE and therefore, wider information and education may be beneficial in changing attitudes.

We found less than forty percent of women did not have CBE, a similar rate reported from other Muslim countries (19, 20). Interestingly, the rate of women undergoing CBE in the last two years (76.5%) was higher compared to an earlier study which reported the rate of CBE examination among Iraqi women (21). Besides, the most common reason given for not undergoing CBE was not having a breast complaint, as was the case with BSE. Other studies have shown that most common reasons given for not using BCS were not having a breast complaint, followed by fear of bad results, lack of knowledge, and not believing it necessary (19, 20). Despite many Iraqi women practicing CBE, women in our sample appeared to be unaware of the importance of CBE and have misconception about CBE.

Our results indicated that many women did not undergo mammography. Two previous studies carried out by Elobaid et al. (19) and Al-Mulhim et al. (22) reported similar findings. The reasons for not having a mammography were not having a breast complaint, fear of the procedure and fear of negative results, believing it unnecessary, lack of access to mammography services, and being ashamed; similar findings reported by other studies conducted in Iraq and other Muslim countries (22-25).

We found that exposure, environment, and uneasiness barriers were predictors for Iraqi women's performing BSE. Although studies that examine the cultural factors affecting Iraqi women's BSE are scarce, in two studies conducted in Iraq, it was found that women's BSE practices were negatively affected by a lack of knowledge and awareness (15, 21). Moreover, culture may be crucial for women and societies when considering its impact on performance and perceptions of screening for early detection of BC. Previous studies indicated that uneasiness about one's own body can create barriers, such as embarrassment at looking and touching their body and not having enough privacy to examine their body were the most important barriers to not practicing BSE (10, 26). Cultural-based BSE educational programs, including exploring Islamic mandates on prevention and individual responsibility in health promotion and cultural related beliefs toward BSE, health education, BSE training, and follow-up have demonstrated that cultural-based BSE educational programs are effective in enhancing BSE self-efficacy in Muslim populations (27). Thus, health care professionals may have a key role to create awareness and to promote culturally sensitive educational programs.

In regard to CBE, exposure and environment barriers were also significant in Iraqi women undergoing these procedures. Some studies have reported that exposure barriers were the most important barriers to women not having CBE including embarrassment due to modesty regarding an exam by a male physician, refusing to expose their breasts, and need to cover their body or breasts (10, 26, 28). Furthermore, Kawar (26) indicated that environment barriers were also important, for example not understanding medical terminology, distance and accessibility of clinics, and financial issues. We found that religious and social barriers were not barriers to CBE, similar to an earlier study by Al-Attar et al. (23). Other studies have highlighted

Muslim women's misconception about BCS are more important than religious and social barriers in accessing BCS (7, 23). Abdel-Aziz et al. (28) showed that the social stigma of BC turned about a failure of BC understanding, afraid of BC screening participation, especially CBE, that may lead to getting the illness and bring embarrassment to the family. However, Islam emphasizes the importance of health. Although gender and cultural norms are influential in the Muslim religion, it also emphasizes the importance of improving the health of women, and imams or female religious leaders play a critical role in this regard (10).

We also found that as exposure, environment, and uneasiness barriers increased, women were less likely to have mammography screening. Similarly, previous studies have emphasized environmental barriers, such as transportation problems, inaccessibility of the mammography facility, cost of examination, difficulty reaching the center, and insufficient health insurance, were factors affecting if women have mammography. Religious barriers were not found to be a predictor, but some studies indicated that religion is crucial in affecting if Muslim women undergo mammography (26, 29). In a study from Ghana, it was shown that Muslim females had low participation in BC screening compared to Christian females, which highlights how religious belief plays a significant role in access to services concerning breast health and the need to consider how religious and cultural habits in subpopulations may influence a female's consultation for breast health and BCS participation (30). For mammography, religious concerns may be more influential, such as encountering a male doctor. Even if something relates to an illness, religious concerns may override and the circumstances may be haram (a term used to mention to any act that is forbidden by God). However, Islamic faith is facilitative of women's health practices, such as cancer screening, rather than being an obstacle. Islam also promotes the importance of preventing illness by edicts that suggest care of the body (9). Apart from issues around religious beliefs, it is still of great importance to educate women about BC screening methods.

The strength of this study was that we used appropriate sampling method and a large sample size. The current study is the first comprehensive study which evaluate the knowledge of women and explains the influence of Arab culture-specific barriers on women's BCS behavior in Iraq. However, data were obtained from participants in Erbil, Iraq, so this cannot be generalized to other regions of Iraq or even wider afield. During the data collection period, the COVID-19 pandemic was affecting Iraq. There were difficulties communicating with people because of the virus risk. Nevertheless, we achieved data collection with an excellent response rate. The study also has several limitations that need to be mentioned. We acknowledge that this type of study, using a self-administered questionnaire, has its limitations. Additionally, women sometimes respond in a socially desirable manner when answering questions about screening behavior and cultural items, and there was no way to independently validate the accuracy of the information provided.

Our study provided an insight into Arab culture-specific barriers affecting women's BCS behavior in a region of Iraq. We identified Arab-specific cultural barriers were one of the key obstacles to BSC uptake in this cohort. In order to provide the care consistent with Iraqi women's barriers and problems related to culture, obstacles to accessing BCS should be minimized by a number of routes, including through the actions of health care professionals by providing culturally acceptable environments for participation in BCS. We sincerely hope

that this study will provide a stimulus to minimizing Iraqi women's cultural barriers to BCS by improvement and promotion of Iraqi health policy and by reducing and abolishing misconceptions or unawareness of BCS by wider and effective education of Iraqi women.

**Ethics Committee Approval:** Approval was obtained from the ethical committee in Karabuk University with the project-wide variety (77192459-050.01.04-E.11637) on 05/03/2020.

**Informed Consent:** All women gave written informed consent before participation.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Concept: S.S.A., I.I.A.; Design: S.S.A., I.I.A.; Data Collection and/or Processing: S.S.A., I.I.A.; Analysis and/or Interpretation: S.S.A., I.I.A.; Literature Search: S.S.A., I.I.A.; Writing: S.S.A., I.I.A.

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### References

- Bellanger M, Zeinomar N, Tehranifar P, Terry M. Are global breast cancer incidence and mortality patterns related to country-specific economic development and prevention strategies? *J Glob Oncol* 2018; 4: 1-16. (PMID: 30085889) [\[Crossref\]](#)
- GLOBOCAN 2020: New Global Cancer Data | UICC. 2021. Retrieved 14 March 2021, Available from URL: <https://www.uicc.org/news/globocan-2020-new-global-cancer-data>. (Accessed 2 April 2020). [\[Crossref\]](#)
- Alawad A. Management of breast cancer in developing countries. *Austin J Surg* 2018; 5: 1138. [\[Crossref\]](#)
- Hussain AM, Lafta RK. Cancer trends in Iraq 2000-2016. *Oman Med J* 2021; 36: 219. (PMID: 33552559) [\[Crossref\]](#)
- Aldujaily E, Duabil A, Kussay MAZ, Fatlawi HK, Al-Behadili, A, Al Saabery E, et al. Pattern and distribution of cancers in areas of Iraq exposed to depleted uranium. *European Journal of Molecular & Clinical Medicine* 2020; 7: 867-877. [\[Crossref\]](#)
- Ahmed HA, Ruanduzi LA, Yousif PH. Breast cancer among women of Erbil. IraqQ's kurdistan region. *Int J Adv Res* 2016; 214-221. [\[Crossref\]](#)
- Al Alwan NAS. Establishing national guidelines for early detection of breast cancer in Iraq: Clinical implications and perspectives. *Int J Adv Res* 2015; 3: 539-555. [\[Crossref\]](#)
- Petro-Nustas W, Norton ME, Vilhauer RP, Connelly AD. Health beliefs associated with breast cancer screening among Arab women in the Northeastern United States. *Int J Health Promot Educ* 2012; 50: 273-277. [\[Crossref\]](#)
- Saadi A, Bond B, Percac-Lima S. Perspectives on preventive health care and barriers to breast cancer screening among Iraqi women refugees. *J Immigr Minor Health* 2012; 14: 633-639. (PMID: 21901446) [\[Crossref\]](#)
- Racine L, Andsoy I, Maposa S, Vatanparast H, Fowler-Kerry S. Examination of breast cancer screening knowledge, attitudes, and beliefs among Syrian refugee women in a western Canadian Province. *Can J Nurs Res* 2021;54: 177-189. (PMID: 34038264) [\[Crossref\]](#)
- <https://gco.iarc.fr/today/data/factsheets/populations/368-iraq-fact-sheets.pdf> 2021. (Accessed 17 March 2021). [\[Crossref\]](#)
- Majid RA, Hassan HA, Muhealdeen DN, Mohammed HA, Hughson MD. Breast cancer in Iraq is associated with a unimodally distributed predominance of luminal type b over luminal type a surrogate from young to old age. *BMC Women's Health* 2017; 17: 27. (PMID: 28388952) [\[Crossref\]](#)
- Cohen M, Azaiza F. Developing and testing an instrument for identifying culture-specific barriers to breast cancer screening in Israeli Arab women. *Acta Oncol* 2008; 47: 1570-1577. (PMID: 18607884) [\[Crossref\]](#)
- Alwan NA, Al-Attar WM, Eliessa RA, Madfaie ZA, Tawfeeq FN. Knowledge, attitude and practice regarding breast cancer and breast self-examination among a sample of the educated population in Iraq. *East Mediterr Health J* 2012; 18: 337-345. (PMID: 22768695) [\[Crossref\]](#)
- Galary KM, Abdullah RY, Majid RA. Practicing breast self-examination related knowledge among women at general hospitals in Duhok city. *Mosul Journal of Nursing* 2010; 8: 89-97. [\[Crossref\]](#)
- Abdullah Nasser Alomair AN, Felemban DG, Felemban MS, Awadain JA, Altowairqi AS, Alfawzan NF, et al. Knowledge, attitude, and practice of breast self-examination toward breast cancer among female students at King Saud University in Riyadh, Saudi Arabia. *International Journal of Medicine in Developing Countries* 2020; 4:429-434. [\[Crossref\]](#)
- Hwang JJ, Donnelly TT, Ewashen C, McKiel E, Raffin S, Kinch J. Sociocultural influences on Arab women's participation in breast cancer screening in Qatar. *Qual Health Res* 2016; 27: 714-726. (PMID: 26631675) [\[Crossref\]](#)
- Gemici Akdoğan A, Tokgöz Özal S, Şen E, Hocaoglu E, Inci E. Evaluation of information and practices about breast cancer screening performed in women presented to a university hospital in Istanbul. *Med J Bakirkoy* 2010; 16: 174-181. [\[Crossref\]](#)
- Elobaid YE, Aw TC, Grivna M, Nagelkerke N. Breast cancer screening awareness, knowledge, and practice among Arab women in The United Arab Emirates: A cross-sectional survey. *Plos ONE* 2014; 9: e105783. (PMID: 25265385) [\[Crossref\]](#)
- Alharbi NA, Alshammari MS, Almutairi BM, Makkboul G, El-Shazly M. Knowledge, awareness, and practices concerning breast cancer among Kuwaiti female school teachers. *Alexandria J Med* 2012; 48: 75-82. [\[Crossref\]](#)
- Amin BA, Babakir-Mina M, Mohialdeen FA, Gubari MIM. Knowledge, attitude, and practice toward breast cancer among Kurdish women in Suleimani governorate/ Iraq. *Kurd J Appl* 2017; 2: 20-28. [\[Crossref\]](#)
- Al-Mulhim F, Bakr R, Almedallah D, Alkaltham N, Alotaibi A, Alnoaim S. Screening mammography and breast self-examination: attitudes and practices of women in the eastern province of Saudi Arabia. *Saudi J Med Sci* 2018; 7: 89-100. [\[Crossref\]](#)
- Al-Attar W, Abdul Sattar S, Al Mallah N, Wardia WI. Factors influencing mammography participation in Iraqi women. *IOSR Journal of Nursing and Health Science* 2016; 5: 43-49. [\[Crossref\]](#)
- Taher TM, Al Hilfi T, Ghazi HF. Knowledge, attitude, and practice regarding mammography among women in Baghdad City, Iraq. *Iraqi National Journal of Medicine* 2012; 3: 80-89. [\[Crossref\]](#)
- Özmen T, Yüce S, Güler T, Ulun C, Özyaydin N, Pruthi S, et al. Barriers against mammographic screening in a socioeconomically underdeveloped population: A population-based, cross-sectional study. *J Breast Health* 2016; 12: 72-77. (PMID: 28331737) [\[Crossref\]](#)
- Kawar LN. Barriers to breast cancer screening participation among Jordanian and Palestinian American women. *Eur J Oncol Nurs* 2013; 17: 88-94. (PMID: 22459258) [\[Crossref\]](#)
- Juanita J, Jittanon P, Boonyasopun U. Effect of cultural-based breast self-examination educational program on BSE self-efficacy among nursing student, Indonesia. *Int J Trop Vet Biomed Res* 2020; 5: 29-39. [\[Crossref\]](#)

28. Abdel-Aziz SB, Amin TT, Al-Gadeeb MB, Alhassar AI, Al-Ramadan A, Al-Helal M, et al. Perceived barriers to breast cancer screening among Saudi women at primary care setting. *Asian Pac J Cancer Prev* 2017; 18: 2409-2417. (PMID: 28950697) [\[Crossref\]](#)
29. Azaiza F, Cohen M, Awad M, Daoud F. Factors associated with low screening for breast cancer in the Palestinian authority: Relations of availability, environmental barriers, and cancer-related fatalism. *Cancer* 2010; 116: 4646-4655. (PMID: 20589933) [\[Crossref\]](#)
30. Gyedu A, Gaskill CE, Boakye G, Abdulai AR, Anderson BO, Stewart B. Differences in perception of breast cancer among Muslim and Christian women in Ghana. *J Glob Oncol* 2018; 4: 1-9. (PMID: 30241158) [\[Crossref\]](#)