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Barriers and Facilitators to Breast Self-examination in Oman: A Qualitative Study of Primary Healthcare Workers' Perceptions

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ABSTRACT

Objectives: Given the increasing prevalence of breast cancer, understanding why women perform or do not perform breast self-examination (BSE) is essential to promote self-care. This study explored the perceptions of primary healthcare workers about barriers and facilitators to performing BSE in Oman and identified potential interventions to promote BSE. ***Methods***: A qualitative study using four focus group discussions was conducted with 30 healthcare workers (nurses, physicians, administrators, and radiographers) from primary healthcare centers in Muscat. Discussions were audio-recorded, transcribed, and analyzed thematically analyzed using constructs from the Health Belief Model. ***Results:*** Barriers to BSE included inadequate knowledge of correct BSE techniques (low self-efficacy), limited access to accurate information and professional recommendations (lack of cues to action), sociocultural stigma, fear of cancer (perceived barriers), and low motivation. Facilitators included higher educational level and personal exposure to breast cancer (perceived susceptibility), peer and family support, and positive healthcare experiences (perceived benefits). Religious beliefs played dual roles, acting both as fatalistic barriers and as motivators for self-care. Participants expressed uncertainty about the effectiveness of BSE compared to other screening methods but acknowledged its role in early detection and monitoring disease progression. Suggested strategies included introducing BSE into educational curricula, strengthening its role in clinical practice, engaging communities, and conducting public health awareness campaigns. ***Conclusions:*** BSE remains a useful tool for women to detect breast abnormalities. Enhanced efforts are recommended to integrate BSE education and practice across academic institutions, workplaces, healthcare facilities, and community services.

Breast cancer (BC) is the second leading cause of mortality among women worldwide.[1] In 2020, the World Health Organization (WHO) reported 2.3 million new BC diagnoses and 685 000 deaths.[2] In 2012, the Global Cancer Project reported BC as the most common cancer in women, accounting for 25.1% of all cancers.[3] The incidence was higher in developed countries, while the mortality rate was higher in developing countries.[3] By the end of 2020, ~ 7.8 million women diagnosed with BC within the preceding five years were alive, making BC the most prevalent cancer worldwide.[2]

Established risk factors for BC include family history, obesity, smoking, physical inactivity, hormonal replacement therapy, and early menarche.[4,5] In the US, a women's lifetime risk of developing BC is 12.9% (one in eight women).[6] In Africa, BC affects 116 per 100 000 women annually.[7] Across Asia, incidence rates vary, with 52/100 000 women in Japan and 34.9/100 000 in South Korea.[7] In the Middle East, incidence rates are ~ 21.3/100 000 in Jordan, ~ 21.4/100 000 in Iran, and ~ 24.1/100 000 in Turkey.[7,8] Among the Arabian Gulf countries, Qatar had the highest incidence of BC (~ 87.1/100 000), followed by Kuwait (~ 50.3/100 000) and Bahrain (~ 44.2/100 000).[9–12]

In many Arabic-speaking countries, BC is often diagnosed at younger ages and at more advanced stages.[11] In Oman, the prevalence of late-stage diagnosis leads

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to poorer prognoses, despite the availability of breast-conserving surgery and chemotherapy. Consequently, the 5-year survival rate for BC in Oman remains at 64%, which is lower than in other affluent countries.[12-14] The American Cancer Society has reported a 93–100% survival rate for BC detected early against 22–72% for those detected at advanced stages.[5]

Monthly breast self-examination (BSE) is a non-invasive, safe, affordable, and easily performed method for detecting potentially abnormal changes in the breast.[12–15] The American Cancer Society recommends initiating BSE from the age of 20 to detect breast changes.[5,16] Regular BSE enhances familiarity with normal breast structures and supports the early identification of anomalies, allowing timely reporting to healthcare services.[13,16] However, in some traditional cultures, adoption of BSE appears suboptimal. For example, a systematic analysis of 16 Ethiopian studies involving 5743 college students revealed low BSE uptake (0–26.4%).[13] Given the positive correlation between BSE practice and early BC diagnosis,[16] improving BSE adoption is crucial, particularly in demographics with limited BC awareness.[17–19]

Reported barriers to BSE include lack of privacy, fear of BC diagnosis, and embarrassment.[13,20] Studies from the Middle East indicate that both lack of knowledge and absence of overt symptoms as deterrents to BSE.[14,21] Cultural barriers also affected screening behaviors among older Chinese-American women,[22] while Vietnamese women with low health literacy were less likely to perform BSE regularly.[23]

In Oman, knowledge of BC risk factors, symptoms, and screening methods generally remains low among women,[14] including female teachers.[24] While many studies have recommended BSE practices globally, there is still limited understanding of the specific barriers and facilitators of BSE among Omani primary healthcare (PHC) providers, despite their central role in community education and early detection. Accordingly, this qualitative study aimed to explore the barriers and facilitators to BSE, based on their own practices and experiences with patients. The study also sought to identify strategies to promote BSE among Omani women.

METHODS

The research team for this qualitative study comprised senior nurses and a physician with expertise in PHC, public health, and qualitative research methodologies. An interpretative phenomenological approach (IPA) was used to explore PHC workers' perceptions of BSE, using purposeful sampling.[24] IPA was initially chosen because of its emphasis on lived experiences and its interpretive orientation. However, we used thematic analysis to better accommodate group data. The study followed the Standards for Reporting Qualitative Research (SRQR).[25] Focus group discussions (FGDs) were chosen over in-depth interviews, because the research team favored of dynamic group interactions within the FGDs and variable insights across disciplines, particularly with sensitive topics, such as BC.

Based on the Theory of Planned Behavior, we designed a semi-structured topic guide to elicit participants' perceptions on barriers and facilitators to performing BSE in a traditional Arabic-speaking population as in Oman.[26–27] The guide included questions designed to address the gap in knowledge about BSE practice [Table 1]. The final version was reviewed and approved by a consultant health psychologist (MM).

Ethical permission for the study was obtained from the Regional Research Ethical Committee, Directorate General of Health Services, Muscat (Ref MH/DGHS/P&S/2/2025).

Participants were recruited from PHC facilities within the Directorate General of Health Services in Muscat region. Eligible participants had ≥ 2 years of primary care experience. Heterogeneous sampling ensured representation from nursing, pharmacy, health administration, and general practice. Participants were invited through primary care managers through purposeful sampling. The aim was to recruit between six and 10 participants per FGD. Potential participants were approached and invited through phone calls by a director of nursing, who provided information about the aims, expected outcomes, and proposed date and venue of the FGDs. Although Arabic was the mother tongue for all participants, the interviews were conducted in English, the working language of Oman's health sector.

The topic guide was initially reviewed by the research team and piloted in a mixed group of health workers. Revision were made to ensure common understanding and effective dynamic discussions.

The Health Belief Model (HBM) was used to guide discussions and the analysis of the data generated. The constructs in the current HBM included: perceived susceptibility (refers to perceptions of the risk of contracting a health condition), perceived severity

Table 1: Topic guide questions for semi-structured focus group discussion.

Phase	Guiding questions
Opening	1. Are you performing breast self-examination? Why? 2. Can you explain your role in promoting BSE? 3. What activities/functions are you taking to perform BSE?
Transition	1. What are your thoughts regarding promoting BSE in PHC and the community?
Main interview	1. What are the barriers to BSE? 2. What are the facilitators to BSE? 3. What are your perceptions around? ▪ Susceptibility (risk/chances of contracting BC) ▪ Severity (seriousness of consequences of BC) ▪ Benefits (effectiveness of BSE as a self-screening tool for BC) ▪ Barriers (reasons for not performing or recommending BSE) ▪ Cues to action (readiness for a positive change and willingness to perform BSE) ▪ Self-efficacy (confidence in performing BSE) 4. What is the role of primary healthcare in BSE?
Ending	5. Is there anything else you would like to add?

BC: breast cancer; BSE: breast self-examination; PHC: primary healthcare center.

(perceptions of the seriousness of the consequences of contracting a disease), perceived benefit (beliefs in the efficacy of the advised action to reduce risk), perceived barriers (factors hindering the application of the advised action), cues to action (strategies to activate readiness for taking an action), and self-efficacy (confidence in one's ability to take action).[27]

FGDs were conducted by an all-female research team from December 2024 to January 2025. No member of the research team had direct administrative or supervisory authority over the study participants. Four FGDs were conducted with an average duration of 65 minutes (range = 60–90 min).

Informed consent was taken from all participants by the principal investigator, and demographic information was collected at the start of FGD. Recruitment and FGDs continued until saturation were reached (themes repeated, no new ideas emerging by the 4th FGD). The conversations were audio recorded and then literally transcribed. Transcripts were verified against audio recordings for accuracy.

The study ensured rigor by addressing transferability, credibility, dependability, and reflexivity. Transferability was supported through detailed context and background so that the findings could be applied elsewhere. Credibility came from careful participant recruitment and thorough data review. Dependability was maintained by clearly describing the methods for future tracking.[28,29] Reflexivity was ensured by researchers reflecting on their biases and confirming findings with participants.[30]

Thematic analysis, guided by constructs from the HBM, included data familiarization, code generation, theme searching, reviewing, theme identification, and finding summarization.[31] One researcher reviewed the transcript files and developed the original coding structure. Initial codes were assigned and reviewed by the research team. To ensure coherence of the themes, all data were deductively coded with in respect to the domains of the interview guide, and the researcher thus became familiar with the data. Discrepancies were resolved through discussion among the members, and AH. All authors reviewed the results and approved the final report.

RESULTS

All participants (N = 30) were women aged 28–45 years with work experience of 9–13 years. The majority were nurses (n = 17), followed by doctors (n = 6), administrators (n = 5), one dietician, and one radiographer [Table 2].

Only two participants confirmed that they performed BSE regularly, despite demonstrating adequate knowledge of BSE, having it recommended to them, and acknowledging its benefits.

Common themes identified from the participants of the four FGDs regarding barriers to BSE included: (a) lack of knowledge about BSE techniques; (b) limited access to information; (c) limited recommendations for BSE by healthcare providers; (c) socio-cultural factors;

Table 2: The demographic characteristics of the participants.

Variables	FGD1 (n = 6)	FGD2 (n = 7)	FGD3 (n = 7)	FGD4 (n = 10)
Age, years, mean ± SD	43.0 ± 2.0	45.0 ± 2.0	40.0 ± 2.0	28.0 ± 4.0
Experience, years, mean ± SD	10.0 ± 4.0	13.0 ± 3.0	9.0 ± 5.0	12.0 ± 4.0
Profession				
Nurse	4	5	5	3
Administrator	2	1	-	2
Physician	-	1	-	5
Radiographer		-	1	-
Dietician	-	-	1	-

FGD: focus group discussion.

and (e) lack of motivation. Participants expressed uncertainty about BSE techniques and requested that more training should be provided in different languages to accommodate diverse backgrounds (non-native speakers). Other barriers to performing BSE included making excuse, fear of finding a mass, and the low prioritization of BSE.

Barriers to BSE

Lack of knowledge of BSE techniques

"I hear about it, but don't know how to do it properly." N3 (FGD1)

"No one taught us exactly how to do it. I mean to perform it correctly." R1 (FGD3)

"Even if we read about it, we are still not confident about performing the self-examination" Dt (FGD3)

"Breast masses may not be harmful." N1 (FGD3)

Limited access to information

"I don't know where to go to ask for proper training." A1 (FGD1)

"Language barriers especially for foreigners or non-Arabic speakers." D3 (FGD4)

Limited recommendations for BSE in PHC

"Healthcare providers are not recommending BSE." A2 (FGD4)

"They are too busy in the health centers they don't have time to talk about BSE." N1 (FGD3)

Socio-cultural factors

"Women maybe stigmatized following the diagnosis." N4 (FGD1)

"Discussing or examining the breasts can be embarrassing and shameful." R1 (FGD3)

"Finding a mass is scary." N3 (FGD2)

"I have no time, as all I think about is my family." Dt (FGD3)

Lack of motivation

"Honestly, many times I forget to do it." D2 (FGD4)

"I don't have time, busy all the time." N3 (FGD2)

"Some women don't see it as a priority; they have other family responsibilities." N4 (FGD2)

Facilitators of BSE

Several facilitators for performing BSE were identified as themes within the FGDs. Participants emphasized the positive effect of higher education, exposure to BSE, family history of BC, and peer support. Good experiences with PHC were viewed as important in promoting BSE practice.

Effect of education

"I believe highly educated women especially those who are exposed to health issues have a tendency to be more committed to BSE." N3 (FGD4)

"When I speak about BSE, those who are educated understand better." N5 (FGD2)

Family history of cancer

"Women with family history of BC are more aware and committed to BSE." N2 (FGD3)

"I trust that women who have gone through any type of cancer would take BSE seriously." D1 (FGD2)

Peer support

"Having a close friend who performs BSE helps." A1 (FGD4)

"Role of an educated spouse is important." N1 (FGD4)

POSITIVE EXPERIENCE IN PRIMARY CARE

"Women who feel welcomed in the primary care health center by nurses and BSE is offered to them tend to do it at home." N2 (FGD2)

"During my postnatal clinic I was examined and asked by the nurse in the health center to perform BSE." Dt (FGD3)

"In my visit to the diabetic clinic, the doctor once examined me and asked me to do it regularly." R1 (FGD3)

CONTROVERSIAL FACTORS

Some Omani women's views on religion made it potentially controversial to recommend BSE in clinical settings. Religion itself appeared to act as a barrier to BSE for some and a facilitator for others. Most participants believed that religion was a strong incentive to self-care including BSE. However, they reported that some women assumed a fatalistic interpretation of the Islamic concept of *qadar* (divine predestination). This belief caused them to relinquish personal agency and avoid pursuing preventative actions including BSE.

"Some women believe that God would help them in going through the treatment and in recovering if they are ever diagnosed with cancer." N3 (FGD4)

"It is God's will and responsibility to take care of women with cancer. We don't have to worry it's the qadar." A1 (FGD4)

"Our religion asks us to take care of our body and for this BSE is mandatory." D1 (FGD4)

Participants—only two of whom regularly practiced BSE—raised concerns that despite working in the medical field, healthcare workers may not be committed to perform BSE for themselves or to recommend it within their routine practice in clinical settings. This hesitancy was linked to a perception of lack of solid evidence on the effectiveness of BSE on health outcomes and the availability of other screening tools (mammography and clinical breast examinations). However, all participants agreed on the importance of maintaining healthy practices, such as BSE, to early detect breast abnormalities and adhere to breast disease management plans.

"We as healthcare workers are aware of the importance of BSE but not sure if we are committed to do it or to teach it." N3 (FGD3)

"Despite knowledge of the importance of BSE, healthcare workers may rely on other existing screening tools." N3 (FGD1)

"If mammograms are available, I don't think we need to make BSE mandatory." D2 (FGD4)

EFFECTIVE INTERVENTIONS TO ENCOURAGE BSE

Many participants recommended integrating BSE education into schools and university curricula so young women can learn about it from an early age. They also believed that healthcare workers should lead by example and that there is a need for guidelines to ensure HCPs recommend BSE when appropriate. Furthermore, there was a strong opinion that local communities and public health campaigns should be involved in making BSE a widely understood and practiced health behavior.

"There has to be early BSE education in schools and universities." N3 (FGD3)

"Empowering healthcare providers to recommend BSE in their clinics." R1 (FGD3)

"Conduct community awareness campaigns for BSE." N3 (FGD1)

DISCUSSION

The barriers and facilitators to performing BSE identified by PHC healthcare workers in this study align with findings from previous studies across different cultural settings.[30–34] In many Arab Muslim contexts, the lack of accessible, valid, and multi-lingual educational resources contributes significantly to poor BSE practice. Consequently, many women do not receive adequate information about BC risk factors, prevention strategies, or correct techniques for self-examination.[35,36]

Sociocultural constructs of femininity may further discourage open discussions of breast health.[37] Women may experience discomfort in seeking information or medical assistance due to a perception that breast-related issues may be inappropriate or shameful. This represents a substantial barrier to participate in BSE practices, especially if BSE is not routinely recommended in clinical practice.[38,39] Such

sociocultural and health system constraints not only inhibit discussions and information seeking, but also reduce regular BSE practice. This cultural hesitation eventually contributes to late diagnosis of BC and poorer outcomes.

Conversely, social and peer support emerged as important facilitators of health behaviors related to BSE. Our findings reflect existing evidence indicating that marital and family support positively influences women's decisions to perform BSE and other screening practices.[40] Religious perspectives varied, as some reported a commitment in protecting the body from harm, which encouraged BSE, while others reported a more fatalistic view, specifically reported by some women attending BSE counseling PHC clinics, that God would take care of BC. These findings highlight the need for interventions that promote proactive health behaviors while respecting religious beliefs promoting a proactive approach to health enabling women, encouraging them to actively participate in their healthcare.[2,41]

Notably, a gap in the practice of BSE was observed among healthcare workers themselves, both in personal routines and in patient recommendations. This represents a missed opportunity: as women, many healthcare workers are in the position to effectively model and advocate for BSE. By promoting this simple and affordable method, healthcare workers can significantly contribute to the early detection of breast abnormalities.[42]

A major takeaway for our participants was a reaffirmation that, irrespective of the individual and cultural barriers to BSE,[43] Omani women should be encouraged to practice it. The concept of breast awareness is paramount in the early BC detection and should be an integral part of general breast health education.[44,45]

This study's application of the HBM helped generate valuable understanding into perceived barriers to BSE among participants and identify ways to empower healthcare workers in Oman to perform and recommend BSE in clinical settings. The first step towards this is to build confidence in them to make BSE part of their routine clinical practice.[46] Several systematic reviews demonstrate that culturally sensitive educational workshops tailored to the needs of women, significantly enhance knowledge of BSE and other screening practices.[47,48] Accordingly, we recommend integrating breast health education in community-centered initiatives, addressing sociocultural barriers, and encouraging BSE practices within clinical settings to facilitate the early detection of breast abnormalities among Omani women.

Although this study benefited from multi-disciplinary perspectives on BSE, its qualitative approach did not capture the views of patients or non-medical individuals. Future research could focus on women from diverse social and educational backgrounds.

CONCLUSION

This qualitative study reveals that despite general awareness of BSE, PHC workers in Oman encounter multiple barriers, including limited technical knowledge, inadequate clinical recommendations, sociocultural stigma, and ambivalent religious beliefs. These factors have reduced consistent BSE practice among healthcare workers, affecting their motivation and ability to counsel patients about BSE. Facilitators identified included educational attainment, family and peer support, and positive healthcare experiences. The application of the HBM elucidated how perceptions of susceptibility, severity, benefits, and barriers influence BSE behaviors.

Comprehensive strategies are urgently needed, including embedding culturally sensitive BSE education in schools and universities, developing clear clinical guidelines empowering healthcare workers to recommend BSE with confidence and conviction, and launching community awareness campaigns. These initiatives can foster a culture of breast health awareness, enhance self-care practices, and contribute to earlier BC detection and improved health outcomes in Oman.

Disclosure

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REFERENCES

1. Wilkinson L, Gathani T. Understanding breast cancer as a global health concern. Br J Radiol 2022 Feb;95(1130):20211033.
2. Arnold M, Morgan E, Rumgay H, Mafra A, Singh D, Laversanne M, et al. Current and future burden of breast cancer: global statistics for 2020 and 2040. Breast 2022 Dec;66:15-23.

3. Huang J, Chan PS, Lok V, Chen X, Ding H, Jin Y, et al. Global incidence and mortality of breast cancer: a trend analysis. Aging (Albany NY) 2021 Feb;13(4):5748-5803.
4. Łukasiewicz S, Czeczelewski M, Forma A, Baj J, Sitarz R, Stanisławek A. Breast cancer-epidemiology, risk factors, classification, prognostic markers, and current treatment strategies-an updated review. Cancers (Basel) 2021 Aug;13(17):4287.
5. American Cancer Society. Key statistics for breast cancer. [cited 2025 Dec]. Available from: https://www.cancer.org/cancer/types/breast-cancer/about/how-common-is-breast-cancer.html.
6. Giaquinto AN, Sung H, Miller KD, Kramer JL, Newman LA, Minihan A, et al. Breast cancer statistics, 2022. CA Cancer J Clin 2022 Nov;72(6):524-541.
7. Anyigba CA, Awandare GA, Paemka L. Breast cancer in sub-Saharan Africa: the current state and uncertain future. Exp Biol Med (Maywood) 2021 Jun;246(12):1377-1387.
8. Akhtari-Zavare M, Juni MH, Ismail IZ, Said SM, Latiff LA. Barriers to breast self examination practice among Malaysian female students: a cross sectional study. Springerplus 2015 Nov;4:692.
9. Tanner LT, Cheung KL. Correlation between breast cancer and lifestyle within the gulf cooperation council countries: a systematic review. World J Clin Oncol 2020 Apr;11(4):217-242.
10. Al-Shamsi HO, Abdelwahed N, Abyad A, Abu-Gheida I, Afrit M, Abu ElFuol T, et al. Breast cancer in the Arabian Gulf Countries. Cancers 2023;15(22):5398.
11. Donnelly TT, Khater AH, Al-Bader SB, Al Kuwari MG, Malik M, Al-Meer N, et al. Factors that influence awareness of breast cancer screening among Arab women in Qatar: results from a cross sectional survey. Asian Pac J Cancer Prev 2014;15(23):10157-10164.
12. Mohanmmed Wali Shakhman L, Arulappan J. Prediction of breast self-examination behavior among Omani undergraduate students using champion's health belief model. SAGE Open Nurs 2023 Jun;9:23779608231179531.
13. Al-Moundhri M, Al-Bahrani B, Pervez I, Ganguly SS, Nirmala V, Al-Madhani A, et al. The outcome of treatment of breast cancer in a developing country–Oman. Breast 2004 Apr;13(2):139-145.
14. Birhane K, Alemayehu M, Anawte B, Gebremariyam G, Daniel R, Addis S, et al. Practices of breast self-examination and associated factors among female Debre Berhan university students. Int J Breast Cancer 2017;2017:8026297.
15. Kassie AM, Abate BB, Kassaw MW, Shiferaw WS. Breast self-examination practice among female university students in Ethiopia: a systematic review and meta-analysis. Cancer Control 2021;28:10732748211019137.
16. Zare Marzouni H, Lavasani Z, Shalilian M, Najibpour R, Saadat Fakhr M, Nazarzadeh R, et al. Women's awareness and attitude toward breast self-examination in Dezful City, Iran, 2013. Iran Red Crescent Med J 2014 Dec;17(1):e17829.
17. Chowdhury R, David N, Bogale A, Nandy S, Habtemariam T, Tameru B. Assessing the key attributes of low utilization of mammography screening and breast-self exam among African-American women. J Cancer 2016 Feb;7(5):532-537.
18. Nde FP, Assob JC, Kwenti TE, Njunda AL, Tainenbe TR. Knowledge, attitude and practice of breast self-examination among female undergraduate students in the University of Buea. BMC Res Notes 2015 Feb;8:43.
19. Abolfotouh MA, BaniMustafa AA, Mahfouz AA, Al-Assiri MH, Al-Juhani AF, Alaskar AS. Using the health belief model to predict breast self examination among Saudi women. BMC Public Health 2015 Nov;15:1163.
20. Francks L, Murray A, Wilson E. Barriers and facilitators to breast self-examination in women under 50 in an international context: a qualitative systematic review. Int J Health Promot Educ 2025 May;63(3):129-146.
21. Tang TS, Solomon LJ, McCracken LM. Cultural barriers to mammography, clinical breast exam, and breast self-exam among Chinese-American women 60 and older. Prev Med 2000 Nov;31(5):575-583.
22. Armin J, Torres CH, Vivian J, Vergara C, Shaw SJ. Breast self-examination beliefs and practices, ethnicity, and health literacy: implications for health education to reduce disparities. Health Educ J 2014 May;73(3):274-284.
23. Al-Ismaili Z, Al-Nasri K, Al-Yaqoobi A, Al-Shukaili A. Awareness of breast cancer risk factors, symptoms and breast self-examination among Omani female teachers: a cross-sectional study. Sultan Qaboos Univ Med J 2020 May;20(2):e194-e201.
24. Smith JA, Larkin M, Flowers P. Interpretative phenomenological analysis: theory, method and research. 2021.
25. Gill P, Baillie J. Interviews and focus groups in qualitative research: an update for the digital age. Br Dent J 2018 Oc ;225(7):668-672.
26. Norman P, Hoyle S. The theory of planned behavior and breast self-examination: distinguishing between perceived control and self-efficacy. J Appl Soc Psychol 2004;34(4):694-708.
27. Moreira CB, Dahinten VS, Howard AF, Fernandes AF. The revised champion's health belief model scale: predictive validity among Brazilian women. SAGE Open Nurs 2020 Jul;6:2377960820940551.
28. Cypress BS. Rigor or reliability and validity in qualitative research: perspectives, strategies, reconceptualization, and recommendations. Dimens Crit Care Nurs 2017;36(4):253-263.
29. Maher C, Hadfield M, Hutchings M, De Eyto A. Ensuring rigor in qualitative data analysis: a design research approach to coding combining nvivo with traditional material methods. Int J Qual Methods 2018;17(1):1609406918786362.
30. Olmos-Vega FM, Stalmeijer RE, Varpio L, Kahlke R. A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. Med Teach 2022 Apr;45:1-11.
31. Kiger ME, Varpio L. Thematic analysis of qualitative data: AMEE guide No. 131. Med Teach 2020 Aug;42(8):846-854.
32. Khiyali Z, Aliyan F, Kashfi SH, Mansourian M, Khani Jeihooni A. Educational intervention on breast self-examination behavior in women referred to health centers: application of health belief model. Asian Pac J Cancer Prev 2017 Oct;18(10):2833-2838.
33. Al-Marzouqi ZKD, Al-Surihi NS. Knowledge, attitude and practice of Omani women on breast self-examination in Oman: a grounded theory. Journal of Medical and Pharmaceutical Sciences 2023;7(3):52-62.
34. Al-Azri M, Al-Rubaie K, Al-Ghafri S, Al-Hinai M, Murthi Panchatcharam S. Barriers and attitudes toward breast cancer screening among Omani women. Asian Pac J Cancer Prev 2020 May;21(5):1339-1347.
35. Hussein D, Oyato BT, Gashaw K, Geleta TA, Tufa DG, Geleta LA. Practice of breast self-examination and associated factors among women of reproductive age in the North Shoa Zone, Oromia, Ethiopia, 2022: a convergent mixed-methods study. BMJ Open 2024 May;14(5):e073951.
36. Racine L, Isik Andsoy I. Barriers and facilitators influencing Arab Muslim immigrant and refugee women's breast cancer screening: a narrative review. J Transcult Nurs 2022 Jul;33(4):542-549.
37. Alatrash M. Determinants of breast cancer screening in three Arab American women subgroups. J Transcult Nurs 2021 Nov;32(6):749-756.
38. Muhanna AM, Brown PN, Pratt S. An investigation of radiographers' and radiologists' perceptions and attitudes in Kuwait towards extending radiographers'

role in mammography. Radiography (Lond) 2022 May;28(2):325-332.

39. Pakseresht S, Tavakolinia S, Leili EK. Determination of the association between perceived stigma and delay in help-seeking behavior of women with breast cancer. Maedica (Bucur) 2021 Sep;16(3):458-462.
40. Kandasamy G, Almaghaslah D, Almanasef M, Alamri RD. Knowledge, attitude, and practice towards breast self-examination among women: a web based community study. Front Public Health 2024 Oct;12:1450082.
41. Alatrash M, Alkrisat S. Knowledge, age, and perceived social barriers regarding mammography screening among immigrant Arab women in the United States: a predictive and associative analysis. J Womens Health (Larchmt) 2024 Oct;33(10):1385-1392.
42. Pippin MM, Boyd R. Breast self-examination. Treasure Island (FL): StatPearls Publishing; 2025.
43. Mac Bride MB, Pruthi S, Bevers T. The evolution of breast self-examination to breast awareness. Breast J 2012;18(6):641-643.
44. Hussen A, Kumbi M, Bedewi J, Lette A, Nuriye S. Breast self-examination practice and associated factors among women of reproductive age in southeast Ethiopia. Front Oncol 2023 Jun;13:1176022.
45. Manaf RA, Mahmud A, Ntr A, Saad SR. A qualitative study of governance predicament on dengue prevention and control in Malaysia: the elite experience. BMC Public Health 2021 May;21(1):876.
46. Elsawy MM, Mohamed HS, Mousa KM. Effect of utilizing health belief model on knowledge, beliefs and behaviour of visually impaired women toward breast self-examination. Open Nurs J 2023 Jan;17(1).
47. Racine L, D'Souza MS, Tinampay C. Effectiveness of breast cancer screening interventions in improving screening rates and preventive activities in Muslim refugee and immigrant women: a systematic review and meta-analysis. J Nurs Scholarsh 2023 Jan;55(1):329-344.
48. Tavakoli B, Feizi A, Zamani-Alavijeh F, Shahnazi H. Factors influencing breast cancer screening practices among women worldwide: a systematic review of observational and qualitative studies. BMC Womens Health 2024 Apr;24(1):268.