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# Breast cancer screening motivation among women: an application of self-determination theory

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## Abstract

**Background** Breast cancer is a major health concern worldwide, especially in Vietnam. This study aimed to explore women's motivation for and factors related to breast cancer screening.

**Methods** A mixed-methods study was conducted in Danang, Vietnam, using a convergent parallel approach. This study utilized both quantitative and qualitative methods to gather the data. The quantitative approach involved surveys to assess motivation levels and related factors, including demographic information and experience with breast cancer screening. In-depth qualitative interviews were used to gain deeper insights into participants' perspectives and experiences related to breast cancer screening.

**Results** The average motivation score for breast cancer screening was moderate ( $3.55 \pm 0.55$ ). Ethnicity, regular health check-ups, family history of breast cancer, receiving information about breast cancer, and women's health issues have direct relationships with breast cancer screening motivation. According to the qualitative data, three categories emerged: intrinsic motivation, external motivation/internalization, and amotivation. The individual, and sociocultural environmental factors impacted screening motivation.

**Conclusions** This study highlights the motivations behind breast cancer screening among women. Healthcare providers could use these findings to improve screening policies and guidelines and encourage more women to undergo regular screening, ultimately reducing the incidence of breast cancer in the community.

**Keywords** Motivation, Breast cancer screening, Women, Mixed methods

## Introduction

Motivation plays a crucial role in influencing people's behavior and autonomous decision-making. It assists individuals in overcoming obstacles and challenges that might arise while pursuing their goals over time. Furthermore, the motivation for breast cancer screening lies in the numerous benefits it offers for individuals' health and well-being [1–4]. Early detection, improved treatment options, enhanced quality of life, and reduced healthcare costs were among the positive outcomes motivating screening for individuals and the broader community [4, 5].

In Vietnam, breast cancer was the most common cancer, accounting for 11.8% of all new cancer cases

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and 124.65 per 100,000 of 5-year incidence among survivors in 2020 [6]. Although the Ministry of Health proposed the National Cancer Control Programme, the implementation of breast cancer screening was uncommon and highlighted some of the obstacles faced in healthcare systems [7]. Continued efforts to increase awareness, promote early detection, and provide effective treatment and support for individuals affected by breast cancer are vital for improving outcomes and reducing the impact of this disease. However, previous studies highlighted that there was no awareness of the importance of early detection or the availability of breast cancer screening programs [8, 9]. Thus, motivation for screening is essential for raising awareness about the benefits of screening, encouraging individuals to initiate the screening process, and helping individuals make a broader commitment to a healthy lifestyle.

Moreover, motivation for breast cancer screening was not only an observable phenomenon but also focused on effective factors and outcomes [10]. Several reasons for low screening motivation have been identified, such as age, educational background, absence of family history, poor access to screening, fear, belief about cancer, maintaining health, and illness monitoring [1, 11, 12]. Thus, understanding the reasons behind the lack of motivation for screening and implementing strategies to address these factors could lead to increased participation in crucial healthcare screening programs.

To explore the motivations behind breast cancer screening, self-determination theory was utilized as an explanatory model. This theory focuses on understanding human motivation and the factors that influence individuals' behaviors and decisions. There are three types of motivation: intrinsic motivation, external motivation, and amotivation [13]. This theory has been widely applied and provides insights into how to create environments to support individuals' natural tendencies, ultimately enhancing overall motivation and well-being.

To tailor affordable and sustainable lifestyle interventions to individuals, it is crucial to fully understand the motivation for breast cancer screening. Consequently, the purpose of this study was to investigate the levels of motivation and related factors among Vietnamese women in relation to breast cancer screening. The findings from this study may provide some information that enhances healthcare providers' understanding of women's motivations for breast cancer screening and encourages and exacerbates screening practices.

## Methods

### Study design

A convergent parallel design was used to determine the motivations behind breast cancer screening among Vietnamese women. This approach allowed for a thorough exploration of women's perceptions. The research methodology involved a two-stage data collection and analysis process initiated by the quantitative data and followed by the qualitative data. Qualitative data were then combined with quantitative data to provide a holistic view of the drivers behind breast cancer screening participation in Vietnamese women.

### Population and sample

Participants were selected from a quantitative study using the convenience sampling method. To be included in the study, participants had to be 18 years or older; able to read, write and speak Vietnamese; and have access to a smartphone or a computer with internet connectivity. Women with a history of breast cancer were excluded from the study. Participants were recruited from February to September 2022 from women living in Danang city, Vietnam, through a Google form.

The present research study employed purposive sampling to select participants for in-depth interviews. The interviews were conducted at convenient locations such as the office of the Vietnam Women's Union or the People's Committee of the District. These settings were chosen to ensure participants felt comfortable and safe during the interview process. This approach also facilitated access to participants who were already familiar with these venues, contributing to a more relaxed and open interview environment. Inclusion criteria required participants to be 18 years of age or older and willing to report their personal experiences, regardless of their place of residence or marital and educational statuses. To meet the principle of sample saturation, a total of 15 women were selected for participation.

A sample size calculation was used to determine the sample size [14]. We chose an acceptable error level of 0.6%, and the estimated standard deviation of the scale from our pilot study was 0.75. At the 5% Type I error rate, the sample size is 601. In the case that some samples are inadequate or unfinished the survey, we add 20% of the initial sample; therefore, the final needed sample is 721. After nine months of study completion, 1041 women met the inclusion criteria and completed the Google Form. After removing duplicate and unfit cases, 649 official responses remained.

## Instrument

### *Quantitative measures*

Participants provided demographic information, including age, ethnicity, educational level, marital status, monthly income, family history related to breast cancer, and experience with breast cancer screening. The Treatment Self-Regulation Questionnaire [15], which originally assesses motivation for health behaviors such as tobacco use, diet, and exercise, was adapted by researchers to focus on breast cancer screening. The questionnaire was translated from English to Vietnamese using a rigorous back-translation process [16]. Each item was carefully revised to ensure its relevance to breast cancer screening, and the modified questionnaire was validated through consultations with four experts to accurately assess women's motivation for undergoing breast cancer screening.

We conducted cognitive interviews with participants from the target population, asking them to verbalize their thoughts as they responded to each item. This process allowed to observe how respondents interpreted and understood the questions, supporting to identify any confusion or misinterpretation. We focused on ensuring that the language was clear, culturally relevant, and that the response categories were interpreted consistently. Based on the insights gained from these interviews, the revisions improved the clarity and appropriateness of the items. Additionally, we incorporated feedback from linguistic and subject matter experts, who reviewed the translated questionnaire for both linguistic accuracy and cultural relevance. Their input was instrumental in refining technical terminology and addressing potential cultural sensitivities. After incorporating this expert feedback, we conducted further cognitive interviews to confirm that the revisions successfully addressed the identified issues. This iterative process ensured that the final version of the questionnaire was clear, culturally appropriate, and aligned with the intended meaning of the original instrument. Finally, the instrument is composed of 15 items related to continuous motivation, including amotivation, external motivation, introjection, and autonomous motivation. These items were responded to on a five-point Likert-type scale ranging from 1 (not at all true) to 5 (very true). The Content Validity Index of the items ranged from 0.67–1.00, and a total content validity index of 0.93 indicated a high level of content validity for this scale. In the pilot study, we administered the questionnaire to 65 women in a community setting. The participants had an average age of 46.8 years, and all were part of the King group. The primary goal of the pilot test was to assess the initial reliability of the questionnaire and gather input on its clarity and relevance. The findings revealed a strong internal

consistency among the questionnaire items, with a Cronbach's alpha coefficient of 0.91. Taking into account the feedback and the reliability outcomes, we made several adjustments to improve the questionnaire. This pilot testing process was instrumental in ensuring that the final version of the questionnaire was not only reliable but also tailored to effectively measure motivation for breast cancer screening.

### *Qualitative measures*

The data were collected either face-to-face or via video calling interviews during follow-up. The interviews were conducted using a semi-structured interview guide developed by the research team. During the interviews, patients' tone, appearance, facial expressions and other nonverbal messages were recorded and analysed.

The open-closed questions included the following: Please tell me your experience examining breast cancer screening? Which motivation for breast cancer screening? Do you have any other comments about your experience promoting breast cancer screening? Which factors impact the motivations behind breast cancer screening? All interviews were audio recorded and professionally transcribed.

### *Data collection*

During the data collection process, we worked closely with the Vietnam Women's Union to connect with women in the community who were willing to participate in the study. The Vietnam Women's Union holds frequent meetings in the community, and their staff helped with collecting data. We obtained consent forms either during the meetings or by visiting participants at their homes. Afterwards, we provided the consenting participants with a personalized, secure link to the study questionnaire via email or social media. We also sent three periodic reminders to encourage completion of the questionnaires and/or scheduling of a phone interview. Before collecting any data, we made sure to obtain explicit written consent from all participants. Additionally, both the research personnel and the staff of the Vietnam Women's Union carefully checked the participant roster and consent documentation.

A subset of participants was chosen to be interviewed over the phone to schedule an appointment for a face-to-face interview. The interviews took place at community locations and lasted approximately 60 min. Each interview was audio-recorded and transcribed verbatim, and the transcripts were cross-checked against the audio recordings to ensure accuracy. At the end of the interview, we provided a gift to each participant as compensation for their transportation.

### Statistical analysis

We analysed both the quantitative and qualitative data for each outcome. Quantitative analyses were conducted with SPSS 26.0 software (SPSS, Inc., Chicago, USA). Descriptive statistics and multivariable linear regression were employed to analyze the data and describe the characteristics of the participants.

Responses from open-ended questions assessing women's reports of motivation for breast cancer screening were entered into ATLAS.ti version 9.0. All the recorded visits were transcribed verbatim for analysis. A content analysis approach was used to analyse the qualitative data of Elo and Kyngäs [17]. To ensure the accuracy and consistency of the analysis, we followed the guidelines of Graneheim and Lundman (2004) and Elo et al. [18]. These included having two independent authors read and code the response data and utilizing trustworthiness methods such as interviews, observations, and field notes. The qualitative coding process followed a structured and systematic approach, beginning with the development of preliminary codes based on research questions and emerging data themes. These codes were then formalized into a comprehensive codebook containing detailed definitions, inclusion criteria, and illustrative examples for clarity and consistency. To prevent overlaps, a code dictionary was established to provide specific definitions and guidelines for each code's application. The researchers independently applied the codes to data subsets, with regular meetings held to compare results, discuss any discrepancies, and reach consensus on coding decisions.

Inter-coder reliability was assessed to ensure consistency, and any coding differences were resolved through discussion and adjustments to the codebook. This iterative and collaborative approach ensured a rigorous and reliable coding process, leading to a nuanced and accurate analysis of the qualitative data.

## Results

### Quantitative results

Overall, 649 patients completed the questionnaire. According to the study findings, the research subjects were mainly middle-aged individuals who were identified as Kinh and did not follow any religion. Notably, women with a high school education constituted a significant portion of the study population, with more than half of the participants falling under this category and earning an average income of more than 5 million VND. Of the patients, half had previously undergone breast cancer screening. Most of them did not have relatives who had breast cancer (84.9%) (Table 1).

### Breast cancer screening motivation

Table 2 showed that the mean breast cancer screening motivation score observed among participants was  $3.55 \pm 0.55$ . In particular, the average scores for external regulation, autonomous regulation, and introjected regulation were  $3.71 \pm 0.56$ ,  $3.56 \pm 0.59$ , and  $3.52 \pm 0.73$ , respectively. Women had a lower average score for introjected regulation ( $3.2 \pm 0.69$ ).

**Table 1** Participant characteristics,  $N = 649$

Variables		Frequency	Percentage
Age	20 – 40	257	39.60
	41 – 60	297	39.60
	> 60	95	14.64
Ethnicity	Kinh	643	99.08
	Other	06	0.92
Religion	No religion	527	81.20
	Have religion	122	18.80
Educational level	High school and below	275	42.37
	College/University/Postgraduation	374	57.63
Monthly income	< = 5 million VND	319	49.15
	> 5 million VND	330	50.85
Marital status	Married	517	79.66
	Single	132	20.34
Having breast cancer screening	Yes	318	49
Having regular health check-up	Yes	354	54.55
Family history of breast cancer	Yes	98	15.10
Regularly provided information about breast cancer	Yes	514	79.20
Having women's health issues in the past	Yes	170	26.19

**Table 2** Mean values of the motivation scores on the breast cancer screening subscales,  $N=649$ 

Variables	Mean (SD)	Min—Max
Breast cancer screening motivation score	3.55 (0.55)	1.87 – 5.00
Autonomous	3.56 (0.59)	1.83 – 5.00
Introjected regulation	3.21 (0.69)	1.50 – 5.00
External regulation	3.71 (0.56)	1.25 – 5.00
Amotivation	3.52 (0.73)	1.67 – 5.00

### Multiple linear regression

Table 3 presents the results of a multivariate linear regression model that was performed to identify factors associated with breast cancer screening motivation and subscale scores. According to the parameters of the multiple linear regression model, breast cancer screening motivation was explained significantly by ethnicity, having regular health check-ups, a family history of breast cancer, regularly receiving information about breast cancer, and having a woman's health issues in the past, with a direct relationship between these variables. Ethnicity, religion, regular health check-ups, and having a woman's health issues were positively associated with autonomy. Having relatives who had breast cancer and having a history of women's health issues were positively associated with introjected regulation ( $p < 0.05$ ). Ethnicity, having regular health check-ups, a family history of breast cancer, and regularly providing information about breast cancer were strongly associated with external regulation ( $p < 0.05$ ). Amotivation was related to having relatives who had breast cancer and having a history of women's health issues.

### Qualitative results

This study highlights the importance of breast cancer screening for women in Vietnam. Table 4 highlighted that participants were between 25 and 75 years old, and the mean age was 45 years. Over 60% of the participants held high-level degrees, while the rest either finished high school or had not yet graduated. Most of the women were married and employed as homemaker.

After conducting a thorough analysis, authors identified three categories of motivation based on self-determination theory: amotivation, intrinsic motivation, and extrinsic motivation. Factors that impact an individual's motivation for screening were categorized into two groups: individual and sociocultural factors. In addition, the following factors influenced the motivation for breast cancer screening, as shown in Fig. 1.

### Motivation for breast cancer screening

#### Intrinsic motivation

Participants exhibited their innate motivation to maintain their well-being by regularly undergoing breast cancer screening, which reflected their intrinsic motivation. This practice was not contingent on external demands, as women may even unconsciously engage in it. According to the participants' experiences, this screening was often conducted individually or integrated with other self-care activities, such as bathing or massaging. This intrinsic motivation was typically more evident in the case of breast self-examination than in the case of other screening methods.

Participants shared that *"I do it every day, I check it when taking shower"* (ID10, 52 years old, Bachelor's degree) and *"I have been doing it for a long time, it is like it is my lifestyle, well... and it is also regular"* (ID08, 36 years old, Bachelor's degree).

#### Extrinsic motivation

A variety of extrinsic motivations for breast cancer screening, including external, introjection, identification, and integration, emerged from the data. The extent of volition increased from external to integration regulation and became closer to intrinsic motivation. The present discourse expounds on the phenomenon whereby volition transitions from external regulation to integration regulation and attains proximity to intrinsic motivation. The detailed information is described below.

#### External

Providing favorable screening conditions such as insurance or agency and organizational support has proven to be essential in facilitating women's access to screening services. Furthermore, government-supported screening programmes play a crucial role in encouraging women to undergo screening by giving them opportunities to do so. Women who might not have considered screening earlier, who participate in the program when they receive support and who are free. Although there could be other factors that influence their decision, in general, they did not feel the intention to undergo screening until they were offered support. Alternatively, they might undergo screening under pressure from those around them. Participants highlighted, *"My insurance covered 100 percent, so why do not I go see a doctor? It will not cost you money"* (D12, 41 years old, High school diploma); *"If the doctor tells me to stay at home, I need to check it from time to time, so I will just do it"* (D11, 48 years old, Bachelor's degree); *My mother, she often worries, also often tells her*

**Table 3** Results of the multivariable linear regression analysis model of breast cancer screening motivation, N= 649

Variables	Autonomous		Introjected		External		Amotivation		Motivation of breast cancer screening	
	$\beta$	t	$\beta$	t	$\beta$	t	$\beta$	t	$\beta$	t
Predicted factor										
Ethnicity	0.09	2.45*	0.01	0.35	0.08	2.25*	0.07	1.70	0.08	2.18*
Religion	0.08	2.02	0.09	2.36*	0.02	0.42	0.05	1.20	0.06	1.69
Breast cancer screening	0.02	0.45	-0.03	-0.62	0.06	1.43	-0.03	-0.61	0.01	0.32
Having regular health check-ups	0.18	4.24**	0.07	1.72	0.11	2.62**	0.08	1.96	0.14	3.35**
Family history of breast cancer	0.18	4.37	0.25	6.12**	0.15	3.68**	0.12	2.83**	0.19	4.67**
Regularly absorb information about breast cancer	0.07	1.68	0.03	0.69	0.14	3.31**	0.05	1.28	0.09	2.09*
Having women's health issues in the past	0.11	2.64**	0.11	2.67**	0.08	1.90	0.18	4.39**	0.13	3.28**
	F = 14.67		F = 12.61		F = 11.85		F = 8.74		F = 14.64	
	p = 0.000		p = 0.000		p = 0.000		p = 0.000		p = 0.000	
	R <sup>2</sup> = 0.14		R <sup>2</sup> = 0.12		R <sup>2</sup> = 0.12		R <sup>2</sup> = 0.087		R <sup>2</sup> = 0.14	
	R <sup>2</sup> Adjusted = 0.13		R <sup>2</sup> Adjusted = 0.11		R <sup>2</sup> Adjusted = 0.11		R <sup>2</sup> Adjusted = 0.08		R <sup>2</sup> Adjusted = 0.13	

\*  $p < 0.05$ ; \*\*  $p < 0.01$

**Table 4** Characteristics of qualitative participants, N= 15

Variables	Frequency	Percentage
Age		
Mean age (years) 45.2 (25–75)		
Marital status		
Married	12	80
Single	3	20
Educational level		
High school diploma	5	33
Bachelor's degree	10	67
Occupation		
Homemaker	10	67
Employed outside home	5	33
Experienced breast cancer screening		
Monthly Self-examination	15	100
Regular mammography	5	33
Check-up clinical examination	6	40

children, as women, to check this and that. Sometimes, she asks, "I told you so, have you gone to check yet?" (D13, 38 years old, High school diploma).

**Introjection**

Introjection occurred when the participant felt a danger or problem that was personally relevant and began to change from within. Breast cancer is increasingly common, and the risk of cancer is very high. In addition,

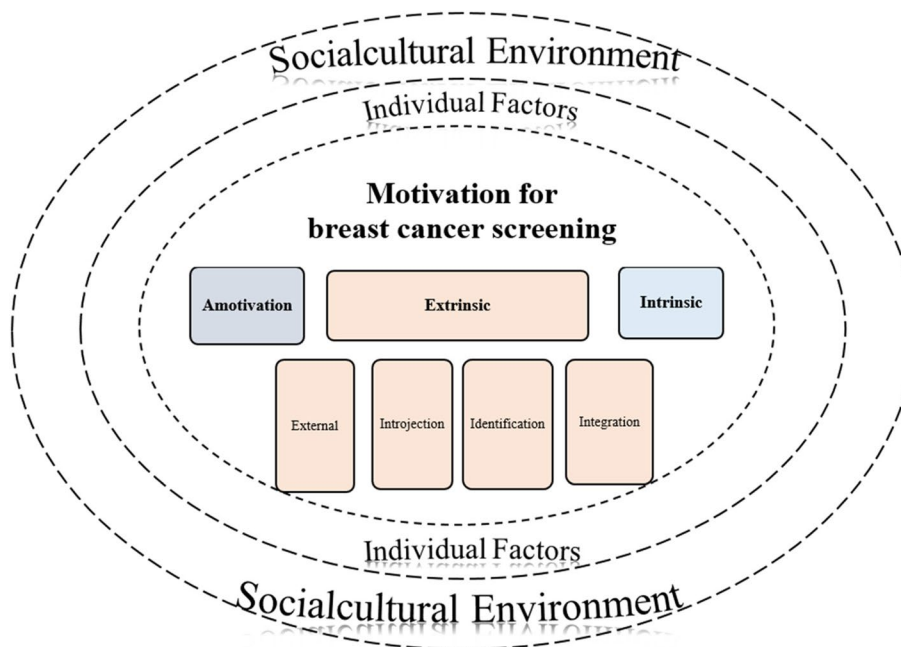
some participants shared that they had experience with breast cancer and its consequences. Therefore, they started doing screening consciously and intentionally. Some women shared, "I feel cancer is getting more common among younger adults, not like in the past, only a few people got it" (D03, 35 years old, High school diploma).

**Identification**

Women were motivated to undergo breast cancer screening not only for their health but also for the sake of their behavior and well-being. The emphasis was on their own values, awareness of the effectiveness of screening, and a desire to take proactive steps in ensuring a healthy and worry-free future. This type of motivation reflects a self-driven commitment to maintaining good health and enjoying life without the burden of potential diseases such as breast cancer. One woman mentioned, "Then, I think about my health. Now health is gold. If I live for myself, I have motivation." (D13, 38 years old, High school diploma): "In the past, breast cancer was an incurable disease, but now, if detected early, it can be cured, so we have to regularly screen for it" (ID08, 36 years old, Bachelor's degree).

**Integration**

Participants might initially be motivated by external factors; however, through a process of internalization, they begin to adopt these motivations on their own. This could result in a motivation that was unified with intrinsic



**Fig. 1** Motivation for breast cancer screening and its factors

motivation, meaning that the individual now engages in the behavior because they truly value and identify with it. Therefore, this approach leads to a sense of autonomy and self-awareness in individuals' pursuit of behavior. Those women believed that they were screened because of their role as mothers or wives in the family; because of their support for their children; because of setting examples for other women; or because they want/have to be proactive and independent in life as well as because they comply with personal principles. In addition, they are people with a special interest in health care, not only for themselves but also for those around them. In particular, when they strongly believe in the effectiveness of screening and screening because of the spiritual value it brings. Women who engaged in behavior for reasons that went beyond the actual benefits of the behavior and related to what is most about themselves or their lives. Some women shared their story: *"It (screening) brings two different spiritual values. When I have done my best, but it does not work, I'm satisfied. If I do not do anything, I feel regretful. because I have not done it yet"* (D09, 60 years old, Bachelor's degree); *"I am the main breadwinner for the family... but... (now) I only have 3 children left, and if something happens to me, my children will suffer."* (D12, 41 years old, High school diploma).

#### **Amotivation**

Amotivation is a phenomenon characterized by a lack of motivation among women to undergo cancer screening or even express an intention to do so. This lack of motivation could be due to their strong belief in their own good health, which led them to ignore the importance of screening. Additionally, being overly subjective about the potential results or consequences of a breast cancer diagnosis could also contribute to amotivation. A 35-year-old woman said, *"I am still young, I don't care (breast cancer screening) because sometimes I am also confident about my health"* (D03, 35 years old, High school diploma).

#### **Factors influencing breast cancer screening motivation**

The importance of women's motivation for their ability to undergo the screening process and maintain it over time. The factors impacting motivation included individual, and sociocultural factors.

*Individual factors*, including emotions, and personal experiences could influence women's motivations and decisions regarding breast cancer screening. Emotional states could play a significant role in shaping attitudes and behaviors, including a range of emotions such as anxiety, shyness, curiosity, optimism, and even phobias related to breast cancer and a willingness to undergo screening. Personal experiences related to breast cancer and

diseases, such as age, menopause status, previous experiences with screening, in general, could impact screening decisions. Discomfort or pain during mammography may discourage women from screening, leading to avoidance of early detection benefits. The inconvenience and potential delays associated with crowded public hospitals could contribute to a decline in motivation to prioritize screening. Furthermore, previous health experiences could shape an individual's perspective and attitude toward healthcare practices. These challenges create barriers that discourage women from accessing essential screening services, impacting overall screening rates and potentially resulting in delayed diagnosis and treatment.

Some stated *"I am old and need to pay more attention to my health as it can impact my children and grandchildren if I get sick."* (D14, 63 years old, High school diploma); and *"when I go for a genital or breast exam, I don't want to go to the doctor because I'm shy, really embarrassed."* (D02, 32 years old, High school diploma).

The sociocultural environment encompasses a range of beliefs, attitudes, and societal pressures that could shape women's motivations for breast cancer screening. Societal perceptions and beliefs regarding diseases are specific to women and girls; folk beliefs, such as those related to "trái chàm"; beliefs about abnormalities and visiting the doctor; acceptance of fate and perception that having cancer means inevitable death; and modern life with myriad pressure that contributes to hesitation or avoidance of screening. In contrast, the widespread availability of online information could empower women to make informed decisions about their health and remind them about breast cancer and screening. Some mentioned: *"I believe that when Heaven appoints, man must obey"* (D12, 41 years old, High school diploma); *"The old ladies said that if you have "trái chàm", you will easily get cancer"* (D09, 60 years old, Bachelor's degree).

#### **Discussion**

The present study used a mixed methods approach to explore the motivations for breast cancer screening and the underlying factors in Vietnamese women. The results of the present study showed that overall, women's cancer screening motivation was moderate. They described their incentives for cancer screening through amotivation and extrinsic and intrinsic motivation. Breast cancer screening should be a priority for women seeking effective early detection and prevention. Although there might be some degree of motivation to undergo screening, it is imperative to ensure that the level of motivation is sufficient to have a meaningful impact. Our findings are consistent with research conducted by Talley et al. that investigated the associations between motivation, clinical breast



exam results, and clinical breast exam screening results [3]. Observing the varying levels of motivation for breast cancer screening among individuals with diverse ethnic backgrounds underscores the significance of factoring one's ethnicity when evaluating one's breast cancer risk and promoting screening. Access to essential resources and knowledge is crucial to guarantee that everyone can make informed decisions regarding their health. Women's health issues, regular health examinations, and family history of breast cancer encompass a wide range of conditions. Individuals experiencing such health issues may be more motivated to undergo cancer screening as part of their overall health management.

This study also showed that autonomous forms of motivation had moderate effects on self-esteem and the role of other factors in autonomy. The results of our study showed that cultural and personal factors influenced autonomous motivation. In addition, our research showed that women are primarily self-motivated to undergo breast cancer screening. Research conducted by Haley and his colleagues has shed light on the motivations behind rural women's prioritization of their health and participation in breast cancer screenings [19]. Their findings indicate that women who recognize and embrace their independence are more inclined to undergo screening and take proactive measures to safeguard their health. Our own observations support this, underscoring the importance of self-reliance as a motivating factor. Notably, this sense of independence also leads to heightened self-confidence in breast cancer screening [20].

Motivation is not necessarily based on women's own intentions or desires to undergo screening. The screening of women for breast cancer is often a result of external regulation, such as demands from family members, directives from healthcare professionals, or opportunities provided by government agencies, unions, or other entities. The research findings show that women are acutely aware of their vital role in their families and are thus more attuned to healthcare practices that promote the health and safety of their loved ones, particularly their children. Notably, a significant number of women reported apprehension about their children's well-being and worried that a breast cancer diagnosis would limit their time together. Even though they accept illness as inevitable, their primary concern is the welfare of their loved ones rather than their own challenges.

Hassan et al. reported that the guidance of physicians could be a significant motivating factor for women in this regard [21]. Similarly, the support and encouragement of family members, particularly husbands, also play a role in motivating women to undergo breast cancer screening. These findings are consistent with the findings of the study conducted by Safizadeh et al., who also suggested

that healthcare professionals provide guidance to women regarding the significance of various breast cancer screening methods for the early detection of breast cancer [22].

Intrinsic motivation in research is the result of the internalization process that turns screening into a habit and daily lifestyle. In comparison to the findings of Nur et al. [23], our study has shown a lower proportion of women who possess intrinsic motivation [23]. Compared with the findings of previous studies on the types of motivation to change lifestyles in individuals with newly diagnosed diabetes, the intrinsic motivation reported for this behavior is similar to the results of our study [24]. Low levels of intrinsic motivation can cause women to exhibit indifference toward screening, as they lack the willingness and readiness to undergo the process. In addition, breast cancer screening behavior does not involve intrinsic motivation. Nevertheless, women who engage in breast cancer screening out of a sense of secondary intrinsic motivation still achieve positive outcomes and exhibit advanced screening techniques, indicating a sense of efficacy and knowledge of best practices.

A recent study revealed that individuals who possess self-confidence in their health and exhibit a subjective perception of illness are more prone to experiencing amotivation. A lack of motivation has been identified as a contributing factor to women's reluctance to undergo breast cancer screening [25]. According to self-determination theory, a deficiency in motivation is a powerful negative predictor of health-related behaviors [26]. The results of our study are similar to those of Umami's study, in which individuals who perceived themselves to be in good health and displayed no symptoms of illness were less inclined to undergo cancer screenings [27]. Furthermore, our findings showed that amotivation was related to a family history of breast cancer and was not associated with women's health issues. This finding underscores the importance of understanding and addressing various psychological and emotional barriers that can impede individuals from seeking necessary medical care. Efforts to promote awareness and education related to breast cancer screening are crucial. Addressing the root causes of low motivation ensures that individuals have access to the care they need to maintain optimal health and well-being.

The quantitative findings revealed that culture, regular health check-ups, a family history of breast cancer, regularly provided information about breast cancer, and having a woman's health issues were related to breast cancer screening motivation. In addition, participants highlighted that individual factors, and sociocultural environment were factors that impacted their motivation for having breast cancer. Previous studies have

indicated that lack of familiarity with breast examination techniques, insufficient access to screening services, and financial constraints serve as barriers preventing women from engaging in breast self-examination [28–30]. In our study, women who regularly received information related to breast cancer also had greater motivation for breast cancer screening than did those who were not regularly exposed. It has been found that providing more information about breast cancer screening can increase confidence in screening, as highlighted by participants in a study conducted in Iran [22]. As identified by Umami et al., women who have a history of breast disease are also motivated to undergo breast cancer screening, in addition to their knowledge of disease and the availability of related services [27]. In line with the Health Belief Model and Protection Motivation Theory, threat perception plays a crucial role in motivating behavior.

This study has several limitations. First, because of its cross-sectional design, no longitudinal studies could be inferred to be needed to further confirm our findings. Second, this study included only respondents from Danang, so the results cannot be generalized to other regions in Vietnam, a country with diverse socioeconomic and cultural backgrounds. Future research should include larger samples and replicate and expand this work in urban settings.

## Conclusion

The motivation for breast cancer screening varies and continues to increase from amotivation to intrinsic motivation. In our quantitative study, the extent of motivation for breast cancer screening was average, while the qualitative study exhaustively evaluated kinds of motivation. The internalization process and factors influencing motivation are categorized into individual, and sociocultural environment factors. Understanding the various motivations for breast cancer screening is essential for effective healthcare strategies and interventions.

### Author's contributions

TTTH, SK, and CTD were responsible for conceptualization and methodology. CTD and TTNN collected the data. TTTH, TTNN, and CTD, validated the data. CTD and TTNN performed the formal analysis with contributions of TTTH. TTTH, SK, TTNN, and CTD wrote the original draft and edited the original draft. TTTH and SK was responsible for the research activity planning and execution, including mentorship external to the core team. All authors read and approved the final manuscript.

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### Availability of data and materials

The datasets utilized and/or analyzed during the present study are accessible from the corresponding authors upon a reasonable request.

## Declarations

### Ethics approval and consent to participate

This research followed the Declaration of Helsinki, and the Ethics Committee of Hue University of Medicine and Pharmacy approved the protocol (No. H2021/258). The researcher disseminated pertinent information to participants, including the objectives and goals of the study. Written consent was obtained from all participants prior to the collection of data. Confidentiality and anonymity were upheld throughout the study, and participants were given the freedom to withdraw from the study at any juncture.

### Consent for publication

Not applicable.

### Competing interests

The authors declare no competing interests.

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