Assessment of breast cancer awareness and breast self-examination practice of rural women at Hai Duong district, Vietnam

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ABSTRACT

Background: Breast cancer is one of the leading causes of cancer death in women. Assessing the impact of disease awareness on breast self-examination practices can improve health decisions and provide a basis for designing effective educational interventions.

Objectives: This study aimed to identify breast cancer awareness and breast self-examination practices among rural women.

Methods: A quasi-experimental study was conducted on 204 rural women in Hai Duong province, Vietnam. 99 women received direct education while 105 women joined indirect education through documents. The study questionnaire included breast cancer awareness based on the Health Belief Model scale and women's breast self-examination practice by nurse observation checklist. Data were analysed using descriptive statistics and the paired-sample t-test with the significance level set at $P<0.05$.

Results: The study found that both direct and indirect groups increased of breast cancer awareness and practicing breast self-examination with passed result after 3 and 6 months of intervention. The proportion breast cancer awareness in the direct group was higher than that in the indirect group ($P<0.05$); the direct educational helped 88.9% of women practice breast self-examination after 3 months, and to 94.9% after 6 months.

Conclusion: After educational program, breast cancer awareness and breast self-examination practice of rural women increased significantly. Therefore, educational programs emphasizing the importance of raising awareness and practicing early detection of breast cancer should be enhanced to bring about the desired change among rural women living in poor areas.

Keywords: Breast cancer awareness, Breast self-examination, Health Belief Model, Rural women, Vietnam

1. Introduction

Breast cancer is the most common cancer and one of the leading causes of cancer death in women worldwide [1, 2]. In 2020, an estimated 4.4 million women died of cancer, of which breast cancer accounted for nearly 25% [3]. In Vietnam, breast cancer is also a public health problem because it is the most common cancer in women, with an average of more than 15.230 newly diagnosed women and more than 6.100 deaths each year [4]. According to the shift in population structure, Vietnam is showing an aging trend, along with changes in lifestyle, breast cancer is predicted to be the cancer with the highest incidence in women by 2025 [5].

Breast cancer survival varies between countries, with nearly 80% of deaths occurring in low- and middle-income countries [6]. Most women with breast cancer in Vietnam are diagnosed at a late stage, about 49.5% [7]. The 5-year survival rate of breast cancer patients is lowest in the late stage, but if detected and treated early, the cost is only about 20% compared to the late stage and nearly 100% of patients have a survival time of more than 5 years[8].

The Health Belief Model was developed by Champion et al. in 1984 and modified in 1993 to assess health beliefs related to breast self-examination [9]. The model focuses primarily on two aspects: first, threat perceptions (perceived susceptibility to disease and disease severity) and second, behavioural evaluations based on two distinct sets of beliefs (beliefs related to the benefits or effectiveness of the recommended health behaviour and beliefs related to barriers to performing the behaviour). In addition, the model proposes that action cues can trigger health behaviours [10]. The model was developed to show that a person's response to their own health problems is directly related to their perceptions of the actual threat to their health and to whether any action they take regarding those problems is worthwhile and will benefit them [9].

The Health Belief Model is one of the behavioural science theories used to investigate health-related issues. At the same time, according to the results of many previous intervention studies, an educational program based on the health belief model is indeed effective in raising awareness of breast cancer and promoting breast self-examination behaviour in women [11]. In Hai Duong province, northern Vietnam, the incidence of breast cancer is 16.4% and is classified as quite high compared to other localities [12]. Most localities in the province

are purely agricultural districts, with women aged 20-59 accounting for about 30% of the population.

According to the recommendations of the Vietnamese Ministry of Health, the application of regular breast self-examination, clinical breast examination, and serial mammography can detect breast cancer early [7]. Although the effectiveness of breast self-examination is controversial, breast awareness and breast self-examination are still recommended by the American Cancer Society as an option for early detection of breast cancer [13]. Specifically, breast self-examination helps women become familiar with both the appearance and feel of their breasts and detect any changes in their breasts as early as possible, thereby making breast self-examination more "breast aware", which may lead to earlier diagnosis of breast cancer [14]. On the other hand, mammography is considered an accurate method of diagnosing breast cancer with high cost therefore this method cannot be widely implemented in many poor countries [15]. Therefore, breast self-examination is still considered an effective support method in breast cancer screening for women in rural areas with low income and limited medical conditions [16]. This is a safe technique, simple to perform,

does not take time, and does not depend on medical staff. Notably, up to 90% of breast cancer cases were detected through monthly breast self-examination [17]. However, in Vietnam, most women do not perform or perform breast self-examination infrequently, the percentage of women who perform breast self-examination correctly is very low [18]. With the focus of breast cancer prevention programs focusing on early detection and screening to reduce mortality, a special centre of attention is placed on breast self-examination practices. This study was conducted to compare breast cancer awareness and breast self-examination practices among rural women before and after participating in health education program based on Health Belief Model.

2. Methods

2.1 Study Area

Hai Dương province located in the north area of Vietnam. In 2022, the population of Hai Duong province reached nearly 2 million, of which the number of people aged 19-59 accounts for 60.3%, and over 50% were women, living mainly in rural areas with a low average income. Currently, there are 15 hospitals in the province responsible for medical examination and treatment for

people, however, there are only two private medical facilities located in the city centre equipped with 02 mammography machines and only used for cases requiring diagnosis of breast cancer. Therefore, the implementation of breast cancer screening for women in rural areas using the current mammography method is not feasible.

2.2 Study Design

A quasi-experimental study was conducted in two rural areas in Hai Duong province, Vietnam from October 2021 to December 2022. This study was conducted in accordance to the JBI Critical appraisal Checklist for Quasi-Experimental Studies checklist (https://jbi.global/critical-appraisal-tools).

2.3 Sample Size and Sampling

We estimated a proportion, with p = 0.158, and ε = 0.33 [16]. Therefore, minimum sample size calculated by the formula was 188 women where the number of women in each group was 94. However, to prevent cases of dropping out of the study or emigrating and some getting sick during the study period and unable to continue participating. Therefore, the sample size for

each group is expected to be 105 for each group (Figure 1).

Inclusion criteria included rural women aged around 20–59 years old; not pregnant and not breastfeeding; able to speak, read, listen, and understand Vietnamese; and volunteer to participate in the study. Exclusion criteria included women diagnosed with breast cancer (including benign tumours) or were in the advanced stages of the disease.

The education program included a direct group and an indirect group.

For the direct group, all rural women received documents and participated in 01 direct theoretical lecture providing knowledge about breast cancer to help increase awareness of the sensitivity and severity of breast cancer, combined with watching videos and being guided to practice breast self-examination on breast models for about 200 minutes. At the end of the consultation session, participants were followed up periodically every 2 months with each group at women's clubs and folk-dance clubs to guide and adjust unsatisfactory practice behaviours in the breast self-examination process and at the same time urge and remind women to maintain regular practice, monthly. Results were evaluated after 3 and 6 months.

In the indirect group, participants received educational documents and were required to read, understand, and practice breast self-examination according to the steps in the documents. During the post-intervention assessment, women in the indirect intervention group did not receive any additional support activities.
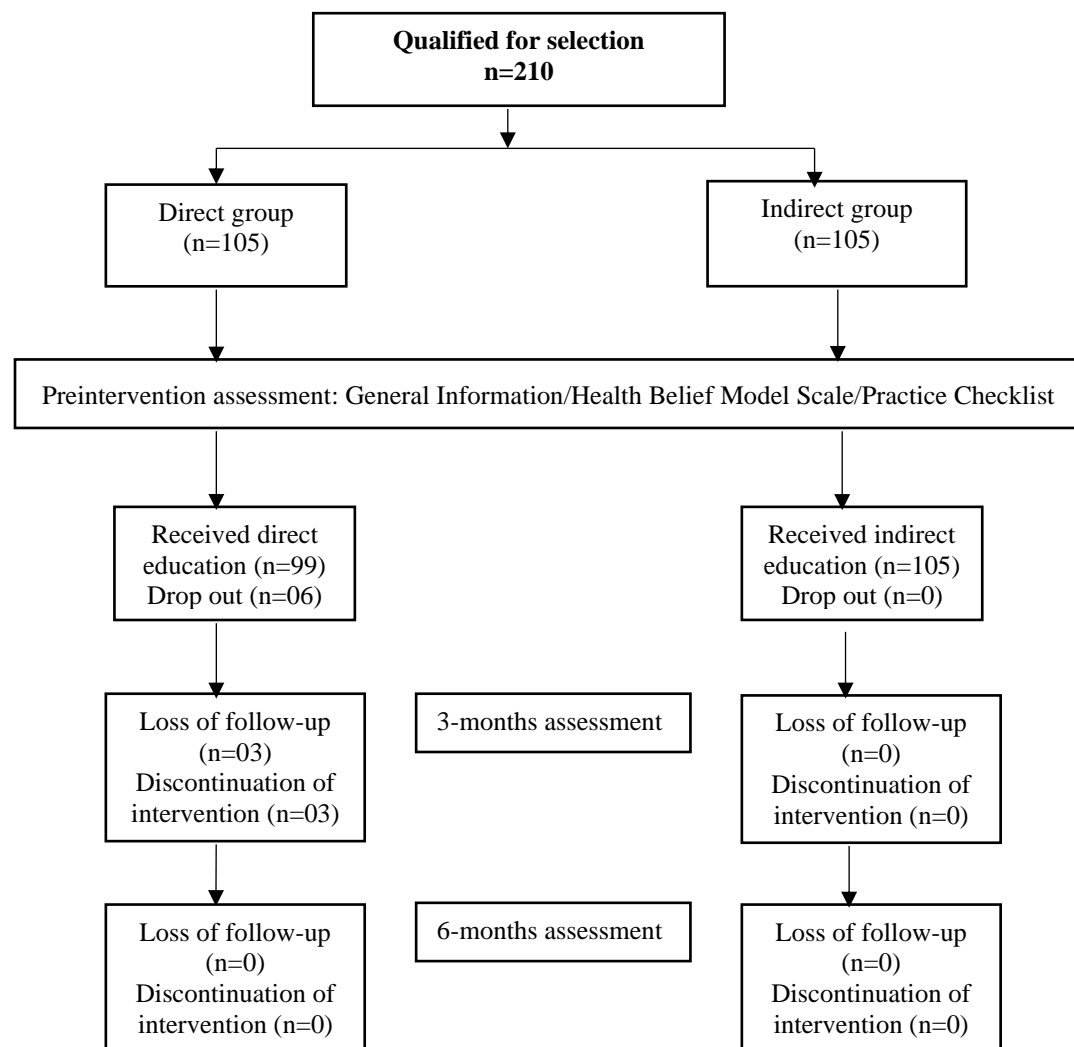

Figure 1:   Participant's selection

2.4 Data Collection

The questionnaire included three parts.

Part 1: Demographic information of the participants included age, education level, marital and occupational status, family history of breast cancer and other cancers. In addition, four items related to breast cancer screening/mammography, and frequency of

breast self-examination was evaluated. **Part 2:** Breast cancer awareness was measured by the Health Belief Model scale developed by *Champion V* [19]. The scale consisted of 6 subscales with a total of 42 items, including Perceived susceptibility to breast cancer (5 items); Perceived seriousness to breast cancer (7 items); Perceived benefits of breast self-examination (6 items); Perceived barriers to breast self-examination (6 items); Health motivation behind breast self-examination behaviour (7 items); and Self-efficacy behind breast self-examination behaviour (11 items). All items were based on a 5-point Likert scale with "5 - Strongly agree" to "1 - Strongly disagree", then the total score of each subscale was counted. All participants were invited into a large meeting room of the health station, where they were given a paper questionnaire and had 20 minutes to complete it. The distance between each person was one meter to limit the communication which could affect the survey results. The final result of each subscale was divided to "Yes" if the total score of Perceived susceptibility to breast cancer ≥15 points; Perceived seriousness to breast cancer ≥21 points; Perceived benefits of breast self-examination ≥18 points; Perceived barriers to breast self-examination ≥18 points; Health motivation behind breast self-examination

behaviour ≥21 points; and self-efficacy behind breast self-examination behaviour ≥33; while "No" for under those scores. *Champion* was the first author to conduct studies on the reliability and validity of this scale with Cronbach's α coefficients reaching from 0.69-0.9 for the sub-scales. The results of the repeated test after 2 weeks showed statistical significance >0.7 [19]. For the Vietnamese version used in this study, we conducted a pilot test with 60 women and 5 experts. The results showed that the scale had good content validity, with the score (I-CVI) for all 42 items being >0.79. The internal consistency with Cronbach's alpha for the 6 subscales ranged from 0.72 to 0.86.

Part 3: The checklist for assessing women's breast self-examination practices (under direct observation by 12 obstetric nurses who attended two separate training sessions by obstetrician on the procedure and how to assess patients' breast self-examination skills) was developed based on the cancer communication document of the Vietnamese Ministry of Health [20]. The checklist consisted 9 items, specifically, from the items 1 to 8 to evaluate the implementation technique, while item 9 records the participants' self-examination results. Step 9 was used to compare with the doctor's clinical

examination results and was not counted in the total practice score. Each correct practice step awarded 1 point and 0 point for incorrect. Accordingly, the results of practice level classification were "Passed" if the total score was over 8.5 points (of which, good practice was 12-17 points; average practice was 8.5 - 12 points), and "Failed" with under 8.5 points. After completing the assessment checklist, research team asked for comments from 5 experts in the clinical and training fields in developing the practice process checklist and received high consensus.

2.5 Data Analysis

SPSS 20.0 software was used to collect and analyse data. Descriptive statistics were used to describe variables. Additionally, the Chi-square test was used to test the difference between variables in breast cancer awareness and breast self-examination practice of rural women. The significance level with P<0.05 was considered to have a difference/relationship between variables.

3. Results

3.1 General Characteristics and Breast Cancer Screening Status of Rural Women

There were no differences in age group, education level, marital status, and history of breast cancer between the direct and indirect groups.

Table 1: General characteristic of rural women

Contents	Groups		P-value
	Direct group (n=99) n (%)	Indirect group (n=106) n (%)	
Age group			0.07
≤40	18 (18.2)	34 (32.4)	
>40	81 (81.8)	71 (67.6)	
Education level			0.25
Under high school	76 (76.8)	73 (69.5)	
Equal or upper high school	23 (23.2)	32 (30.5)	
Monthly income			0.32
< 80 USD	26 (26.3)	37 (35.2)	
≥80 USD	73 (73.7)	68 (64.8)	
Family history of breast cancer			0.99
Yes	4 (4.0)	4 (3.8)	
No	95 (96.0)	101 (96.2)	

3.2. Changes in breast cancer awareness between direct and indirect groups at 3- and 6-month post-education program

The results of Table 2 show that both direct and indirect groups increased breast cancer awareness in all six constructs of the Health Belief Model. The proportion of breast

cancer awareness in the direct group was higher than that in the indirect group. Specifically, most participants in the direct group perceived barrier to breast self-examination practice (87.9%), while in the indirect group was 75.8% (P<0.05); awareness of benefits of breast self-

examination in the direct group was 89.9% while 78.2% for the indirect group (P<0.05). Perception of severity, susceptibility to breast cancer, and motivation to act showed similar results, the difference was statistically significant between the 2 groups (P<0.05).

Table 2: Changes in breast cancer awareness between direct and indirect groups after 3-months of education program

Breast cancer awareness based on Health Belief Model	Indirect group (n=106)		Direct group (n=99)		P-value
	n	%	n	%	
Perceived susceptibility to breast cancer					0.002*
Yes (≥15 points)	82	78.8	91	93.8	
No (<15 points)	22	21.2	6	6.2	
Perceived seriousness to breast cancer					<0.001**
Yes (≥21 points)	72	72.0	91	93.8	
No (<21 points)	28	28.0	6	6.2	
Perceived benefits of breast self-examination					0.026*
Yes (≥18 points)	79	78.2	88	89.8	
No (<18 points)	22	21.8	10	10.2	
Perceived barriers to breast self-examination					0.027*
Yes (≥18 points)	24	24.2	12	12.1	
No (<18 points)	75	75.8	87	87.9	
Health motivation behind breast self-examination behavior					<0.001*
Yes (≥21 points)	80	76.9	93	95.9	
No (<21 points)	24	23.1	4	4.1	
Self-efficacy behind breast self-examination behavior					0.018*
Yes (≥33 points)	88	84.6	92	94.8	
No (<33 points)	16	15.4	5	5.2	

*P < 0.05; ** P <0.001

After 6 months, the percentage of rural women with motivation to promote breast self-examination behaviour increased significantly in both direct and indirect groups, respectively 96.9% and 94.4% (P>0.05). However, the remaining 5

structures of the Health Belief Model continued to increase higher in the direct group than in the indirect group (P<0.05) (Table 3).

Table 3: Changes in breast cancer awareness between direct and indirect groups after 6-months of education program

Breast cancer awareness based on Health Belief Model	Indirect group (n=106)		Direct group (n=99)		P-value
	n	%	n	%	
Perceived susceptibility to breast cancer					0.001*
Yes (≥15 points)	79	79.8	91	95.8	
No (<15 points)	20	20.2	4	4.2	
Perceived seriousness to breast cancer					0.004*
Yes (≥21 points)	72	84.7	92	96.8	
No (<21 points)	13	15.3	3	3.2	
Perceived benefits of breast self-examination					0.002*
Yes (≥18 points)	69	78.4	93	93.9	
No (<18 points)	19	21.6	6	6.1	
Perceived barriers to breast self-examination					<0.001**
Yes (≥18 points)	22	22.2	2	2.0	
No (<18 points)	77	77.8	97	98.0	
Health motivation behind breast self-examination behavior					0.485
Yes (≥21 points)	85	94.4	94	96.9	
No (<21 points)	5	5.6	3	3.1	
Self-efficacy behind breast self-examination behavior					0.023*
Yes (≥33 points)	90	86.5	91	95.8	
No (<33 points)	14	13.5	4	4.2	

*P < 0.05; **P <0.001

3.3 Changes in Breast Self-Examination Practices Between the Direct and Indirect Groups At 3- and 6-Months Post-Education Program

Table 4 shows that there is a statistically significant difference in the rate of rural women practicing breast self-examination with passed results between the direct and indirect intervention groups (P<0.05). Which, direct education helped 88.9% of women practice breast self-examination that meets the requirements, while the indirect group only achieved 52.4%.

Table 4: Increasing of breast self-examination practice between both groups after 3 months (according to the checklist observed by health workers)

Groups	Indirect group (n=106)		Direct group (n=99)		P-value
	n	%	n	%	
Practice breast self-examination					<0.001**
Passed (≥8.5 points)	55	52.4	88	88.9	
Failed (<8.5 points)	50	47.6	11	11.1	

**P <0.001

After 6 months, the direct educational group indicated 94.9% of women practiced breast self-examination with pass results, while the indirect group only achieved 62.9% (P<0.001) (Table 5).

Table 5: Increasing of breast self-examination practice between both groups after 6 months (according to the checklist observed by health workers)

Groups	Indirect group (n=106)		Direct group (n=99)		P-value
	n	**%**	**n**	**%**	
Practice breast self-examination					<0.001**
Passed (≥8.5 points)	66	62.9	94	94.9	
Failed (<8.5 points)	39	37.1	5	5.1	

**P <0.001

4. Discussion

4.1 Changes in Breast Cancer Awareness Between Direct and Indirect Intervention Groups After 3 and 6 Months of Intervention

In our setting, the Health Belief Model revealed that individuals who believe they are very likely to contract a disease, perceive the disease as serious, recognize the benefits of a preventive health behaviour, perceive low barriers to action, have high motivation, and possess strong self-efficacy are more likely to perform that health behaviour [21]. The study revealed that the direct intervention removes the barriers to breast self-examination practice with a rate of 87.9%, while the indirect intervention was 75.8% (P<0.05); the rate of people with perceived benefits of breast self-examination in the direct intervention group was 89.9% while the indirect intervention was 78.2% (P<0.05). Perceived severity, susceptibility to breast cancer, and motivation to act showed similar results (P<0.05). After 6 months of intervention, the rate of women motivated to self-examine their breasts increased significantly in both the direct and indirect intervention groups, with rates of 96.9% and 94.4%, respectively (P>0.05). With the remaining 5 structures of the Health Belief Model, the rate increased higher in the direct intervention group than in the indirect intervention group (P<0.05).

The design of the intervention program content based on six constructs of the Health Belief Model along with the use of a combination of teaching methods increased the mean scores and the percentage of women with awareness at 3 and 6 months (P<0.05). This result was similar to most previous intervention studies [11, 22, 23]. At the same time, it was also consistent with the results of the literature review by *Myint et al.* (2019)

that the educational program based on the Health Belief Model improved breast cancer awareness and breast self-examination practice beliefs, and the intervention effect was maintained at 3 months and 6 months [24]. However, the difference in this study was that we compared the effectiveness of the impact on changing awareness between 2 intervention methods: direct and indirect education through distributing documents. The results showed that at 3 months after the intervention, both methods increased the mean cognitive scores of the 6 constructs in the Health Belief Model, in which the direct education method was more effective except for the perception of motivation to promote behaviour, which did not differ between the 2 methods. This result was similar to the study of *Gursoy et al.* (2009) who compared the impact of three training methods: face-to-face counselling, group training, and training through distributing materials to improve women's knowledge and beliefs about breast self-examination practice. The authors found that although all three interventions had a significant impact on awareness of breast cancer and screening methods, the group teaching training method was the most effective [25].

In addition, the study also found that at 6 months after the intervention, the proportion of women with breast cancer awareness and belief in practicing breast self-examination through the Health Belief Model scale hardly increased in the intervention group distributing sensitive materials from 78.8% after 3 months, to 79.8% after 6 months; perceived benefits did not change after 6 months, perceived barriers and self-efficacy also showed similar results with insignificant changes between 3 months and 6 months, with perceived motivation to promote behaviour continuing to increase after 6 months 94.4% compared to 76.9% 3 months after the intervention, while the direct education intervention group continued to grow in all constructs of the model (P<0.05). This can be inferred that the direct education method is more effective and maintains its effectiveness after the intervention than the document distribution method. This is also the reason why most studies evaluating the effectiveness of educational interventions use the direct communication education method combining theory and practice, such as the studies of *Zavare et al.* (2016) [26]; *Ashtarian et al.* (2020) [27]; *Parsa et al.* (2016) [22]; *Yılmaz et al.* (2017) [28]. However, this new finding in our study also partly suggests that health education service

providers consider the effectiveness of indirect education methods by distributing documents to localities with limited economic resources, or places far from the centre that do not have enough funding and resources to conduct direct education sessions.

4.2 Changes in Breast Self-Examination Practices Between the Direct and Indirect Intervention Groups at 3- and 6-Months Post-Intervention

The results of the study showed that the direct educational intervention helped 88.9% of rural women practice breast self-examination to meet the requirements, while the indirect group only achieved 52.4% after 3 months of intervention, the difference was statistically significant ($P<0.05$). Similarly, after 6 months of intervention, the direct educational intervention helped 94.9% of the study subjects practice breast self-examination to meet the assessment according to the checklist observed by nurses, while the indirect intervention group only achieved 62.9% ($P<0.001$), our study results are similar to many other studies [11, 23, 29]. This result further proves that the educational intervention program in our study is appropriate and effective in improving breast self-examination practices for women. Our

direct health education intervention program not only provided the benefits of breast self-examination, but also showed a demonstration video and finally provided guidance and support in performing the technique on a silicone breast model with normal and cancerous tumours implanted. The results of this study demonstrated that the design of theoretical lecture content combined with practical training and the coordination of many educational methods suitable for the participants, was effective in improving the rate of breast self-examination practice among participating women.

A limitation of this study was that it was only applied within the framework of the Health Belief Model structure, so it only focuses on examining the cognitive factors and personal beliefs that affect changes in breast self-examination behaviour, while some other social factors such as policies, resources, human resources, and facilities and equipment have not been fully considered. At the same time, the Health Belief Model is intuitive in nature, so it is widely used in community interventions targeting low-educated groups, this study only focused on women in rural areas and had not extended to women with higher education in urban or city areas. In addition, participants of the two

groups were not randomly selected, and both the participants and the research team knew which group they belonged to, so the research results could be biased by the researcher.

5. Conclusion

After the educational program, breast cancer awareness and breast self-examination practices of rural women increased significantly. This study was the basis for health care providers and community educators, especially community nurses, to develop and implement health education programs based on the Health Belief Model to raise awareness, remove barriers, and increase the rate of breast self-examination at home for rural women. In addition, the results were also the basis for professionals to integrate and proactively mention breast self-examination methods for women when they go for gynaecological examinations and breast examinations at medical facilities. In terms of nursing training, the content of the Health Belief Model and the importance of breast self-examination should be included in the curriculum to help nursing students understand and support the community to effectively implement it.

Author contributions

NTH: Conceptualization, data curation, formal analysis, methodology, writing original draft, writing review and editing. TNV: Methodology, supervision, writing original draft, writing review and editing. TTTH: Conceptualization, supervision, writing original draft, writing review and editing. DTH: Methodology, supervision, writing review and editing. NTTT: Conceptualization, supervision, writing original draft, writing review and editing. NTTN: Conceptualization, methodology, supervision, writing original draft, writing review and editing. LTT: Conceptualization, methodology, supervision, writing original draft, writing review and editing.

Declaration

Ethics approval and consent to participate

The study was reviewed and approved by the Scientific and Ethics Council of Nam Dinh University of Nursing in Decision No. 2675/GCN-HDDD dated 22nd October 2021. All participants were informed about the

purpose and content of the study; and if they agreed, they were asked to sign a consent form before accessing the questionnaire. They have the right to withdraw from the study whenever they want. The study does not interfere with the health or life of the participants.

Competing interests

The authors declare no competing interests.

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