

Breast self-examination among nurses in Poland and their reparation in this regard

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Abstract

Introduction and objective. Working at night and in shifts, as well as an unhealthy lifestyle, may increase the risk of breast cancer in nurses who therefore should frequently perform breast self-examination (BSE). The aim of the study was to investigate the performance of BSE among Polish nurses, its accuracy, sources of knowledge and skills, self-assessment of own competences and preparation to educate women about BSE.

Materials and method. A descriptive, cross-sectional study was conducted in a group of female nurses (N=1,242). An anonymous, self-administrated questionnaire was used for data collection. To properly assess the BSE a four-item scale was made of the type single best answer *multiple choice question*. Each item referred to one agreed principle of performing BSE.

Results. Regularly BSE was performed by 56.1% nurses, 67.3% pre-menopause nurses 2–3 days after cessation of menstruation and 30.4% post-menopause women on a chosen day of the month. About 98% examined visually and by palpation; 58.9% did so in two positions. In the accuracy scale of BSE, the average number of points was 2.8 out of 4. All (4 points) or almost all (3 points) recommendations of accurate BSE were met by 61.4% of the nurses. Self-assessment of knowledge and BSE practical skills were considered as good or very good by 93.5% and 88.8% nurses, respectively. The self-evaluation of nurses' knowledge and BSE skills was significantly correlated with the result on the accuracy scale or this BSE.

Conclusions. Many deficiencies concerning frequency, times and BSE techniques were revealed among Polish nurses. There is a discrepancy between the high self-assessment of competences and the accurate practice of BSE. Nurses' preparation in Poland in BSE is insufficient and requires improvement.

Key words

cancer, prevention, breast self-examination, nurses

INTRODUCTION

In Poland, similar to other European countries, breast cancer is a major cause of female mortality. In 2014, breast cancer was responsible for 21.7% of all cancer among women and 13.9% of cancer deaths [1]. In the last three decades the incidence rate for this cancer has more than doubled, and in the group of pre-menopausal women has increased about 1.7 times [2]. In comparison with the other countries of Europe, in Poland the incidence rate and mortality rate due to breast cancer is not high (respectively, 48.9 and 14.7 per 100,000 inhabitants) [3], but the 5-year net survival for patients diagnosed with breast cancer in Poland was the lowest in Europe (74%) [4, 5]. This is the consequence of late diagnosis of the disease.

For the detection of breast cancer in its earliest stages, regular screening of all women is recommended. There are three methods of screening: breast self-examination (BSE), clinical breast examination and mammography [6]. Mammography in Poland is free of charge for women aged 50–69, performed once every two years [7]. Participation rate in this screening test is among the lowest in the European Union (EU), and the percentage of women in Poland screened in 2013 (of the total number of women invited personally that

year) was 44%. The participation rate for this age group in the EU was 60.2%, with the highest in Denmark 83.5% [8].

Breast self-examination is an easy, economic, non-invasive method for all women aged over 20. The purpose of BSE is for a woman to learn the topography of her breast, know how her breast normally feels and to be able to identify changes in the breast should they occur in the future. BSE consists of two basic steps: visual examination in the standing position and tactile examination carried out lying down or standing up. This examination should be performed frequently by menstruating women, preferably 2–3 days after each menstruation, and by post-menopausal women once a month on a chosen day, e.g. on their birthday [9, 10].

BSE efficiency in the reduction of the number of deaths from cancer is currently a source of controversy [6, 9, 11, 12]. This method is considered adequate when performed at least once per month [13], and should be used in combination with mammography and clinical examination [9]. When performed, BSE increases breast cancer awareness which means knowledge of the personal/family history, risk factors for breast cancer, and anatomical structure and appearance of own breast [14]. When performing BSE, women have an opportunity to observe and feel their breast, to be familiar with the texture of their normal breast tissue, and how it changes at different times of the month and with age, report changes without delay, and attend for breast screening when aged 50 and over [11]. It was found that in the United Kingdom breast cancer awareness increased the uptake

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of BSE behaviours and the likelihood of the breast cancer screening attendance [15]. The American Cancer Society (2016) [16] no longer recommends that all women perform monthly BSE, but concluded that:

... all women should become familiar with both the appearance and feel of their breasts and report any changes promptly to their physician. Women who detect their own breast cancer usually find it outside of a structured BSE while bathing or getting dressed. If symptoms develop, women should contact a doctor immediately, even after a recent normal mammogram.

In Poland, all women aged 20 and older are recommended to perform BSE frequently as an important element in the early detection of breast cancer [10].

Undertaking research of the practice of BSE by nurses and their preparation in this regard was justified by several reasons. For many years, the majority of nurses perform night shift work which may be related to an increased risk of development of breast cancer. An association between rotating night work and breast cancer and a positive trend between cancer risk and duration of night work and number of consecutive night shifts were found in American nurses [17, 18] and in Norwegian nurses [19,20]. Exposure to light at night has been hypothesized to influence this cancer risk among persons with night work, as a result of a decrease in of the secretion hormone melatonin, and a subsequent increase in estrogens [21–23]. The International Agency for Research on Cancer decided that shift work involving circadian disruption is probably carcinogenic for human [24]. In Denmark, breast cancer has been recognized as an occupational disease [25]. Further meta-analyses of epidemiological studies concluded that there is limited evidence for a causal association between night-shift work and breast cancer risk [26–29]. Despite these concerns nurses should be aware of the risk related to this type of work, frequently perform BSE, systematically attend mammography if over 50 years of age, and limit other factors which influence the risk of breast cancer. Such factors also include the deficits in the health behaviour of nurses, including low physical activity, poor dietary quality, smoking, and excessive consumption of alcohol [30–33].

Nurses should play an important role in educating women about cancer. Therefore, the experience and knowledge of nurses with BSE are essential for reducing the mortality of breast cancer. Furthermore, nurses' beliefs and confidence in the importance of BSE would make a difference while teaching the BSE method and encouraging women to perform it.

The literature offers relatively few papers about performing BSE by nurses. The available papers concern nurses and female health care workers in Asia, i.e. Turkey [34], Iran [35, 36], Pakistan [37], India [38], and the United Arab Emirates [39]. The number of examined persons in these countries was small (from 119 to 410). In these countries research was conducted also among nursing students on performing BSE and knowledge about factors which affect breast cancer [40, 41, 42, 43]. In these countries, breast cancer is becoming an increasing problem, but mammography services are almost non-existent. In the literature, no publication was found on performing BSE by nurses and their preparation to prevention of breast cancer in Europe. Only one paper on BSE by nursing students in Cyprus [44] was found.

OBJECTIVE

The aim of this study is to present the results of the research concerning the following: 1) performing BSE by nurses, proper examination and sources of knowledge and skills in this respect; 2) self-evaluation of the knowledge, skills of performing BSE and the relationship between self-evaluation and accuracy of BSE, as well as self-evaluation of nurses' preparation to educate women in this respect.

MATERIALS AND METHOD

A descriptive, cross-sectional study was conducted in a group of female nurses participating in a national specialist examination. Inclusion criteria: female, right to practice the profession, professional activity in nursing, at least two years of work experience, completed specialist training.

Calculation of the sample size was performed by taking into account the following criteria: size of the population – 240,000 (number of registered nurses in Poland), confidence level – 95%, response distribution – 0.50, and margin of error – 3%. The optimal sample size was 1,250 (15% surplus was included).

There were 1,242 properly filled out questionnaires (interest in survey return was 49.7% of all participants in the examination). Analysis included the information from the questionnaire where respondents gave complete answers according to the instruction. The surveyed nurses were attempting to obtain different nursing specialities. Average age – 43.2 ± 7.05 (median: 44.0, min 25.0 and max 61.0), which was representative of the participating population ($t = 0.419$, $df = 1241$, $P = 0.675$). Analyses divided the respondents into two age categories – younger nurses up to 44 and older 45 or more years (663 vs. 579, $\chi^2 = 5.68$, $P = 0.017$). The majority (68%) of nurses had higher education (master or licentiate degree), and the percentage of higher education respondents was significantly higher in the group of younger nurses than in the older ones (73.9% vs. 60.3%, $\chi^2 = 26.20$; $P < 0.001$). Shift work was performed by 81.1% of younger nurses and 71.1% of older ones ($\chi^2 = 17.71$; $P < 0.001$). Socio-demographic characteristics of the study sample are shown in Table 1.

The study was approved by the Bioethics Committee of the Medical University of Warsaw (AKBE\169\16).

Data collection. The data were gathered in the entire group on the date and at the place of the specialist examination in Warsaw by the Centre for Postgraduate Education for Nurses and Midwives from September – November 2016. The survey participants worked at various health care centres in different regions of Poland. Participation in the survey was voluntary. An anonymous, self-administrated, pre-tested, structured, close ended questionnaire was used for data collection.

Questionnaire. The questionnaire contained the following areas: 1) socio-demographic characteristics of the study subjects; 2) their practice of breast self-examination (BSE) (age at first examination; regularity of examination, time of its performance in the menstrual cycle (in pre-menopausal nurses or in the month in post-menopausal women, examination position and technique of performing the examination); 3) self-assessment of their knowledge and practical skills concerning BSE, their sources, self-assessment

Table 1. Socio-demographic characteristics of the study sample

	<45 years (N = 663)	≥45 years (N = 579)	Total (1,242)
Place of residence			
Countryside	189 (28.5)	170 (29.3)	359 (28.9)
Village (population up to 50 thousand)	149 (22.4)	120 (20.8)	269 (21.7)
Small town (51–200 thousand inhabitants)	157 (23.7)	112 (19.4)	269 (21.7)
Large town (201–500 thousand inhabitants)	87 (13.1)	87 (15.0)	174 (14.0)
City >500 thousand inhabitants	81 (12.3)	90 (15.5)	171 (13.7)
Education			
Secondary medical	169 (25.5)	223 (38.5)	392 (31.6)
Bachelor's degree	241 (36.4)	197 (34.0)	438 (35.3)
Master's degree	249 (37.5)	152 (26.3)	401 (32.3)
Ph.D.	4 (0.6)	7 (1.2)	11 (0.8)
Specialisation			
Surgical nursing	135 (20.3)	113 (19.5)	248 (20.0)
Anaesthesiological nursing	125 (18.8)	98 (17.0)	223 (18.0)
Conservative nursing	92 (13.9)	76 (13.1)	168 (13.5)
Geriatric nursing	67 (10.1)	66 (11.5)	133 (10.7)
Oncology nursing	58 (8.8)	50 (8.7)	108 (8.7)
Cardiological nursing	38 (5.8)	32 (5.5)	70 (5.6)
Long-term nursing	37 (5.7)	25 (4.3)	62 (5.0)
Operating room nursing	32 (4.8)	23 (3.9)	55 (4.4)
Palliative care nursing	14 (2.1)	17 (3.0)	31 (2.5)
Neonatal nursing	13 (2.0)	13 (2.3)	26 (2.1)
Other	52 (7.7)	66 (11.2)	118 (9.5)
Shift work			
Yes	538 (81.1)	412 (71.1)	950 (76.5)
No	125 (18.9)	167 (28.9)	292 (23.5)

of their professional preparation for the education of other women, and the need to increase their knowledge and skills in this field.

For the proper assessment of performing BSE by nurses, a four-item scale was drawn up of the type single best answer *multiple choice question*. Each item referred to one principle of the proper performance of BSE [9, 10]: regular performance (once a month); examination 2–3 days after the end of menarche in pre-menopausal women and on a chosen day of the month in postmenopausal women; using both visual and palpation technique; examination in standing and lying position. Meeting each principle was awarded with one point to the respondent; total maximum number of points was 4. The differentiating power of specific items was between 0.12 – 0.25.

Statistical Analysis. In the comparative analysis, in the case of nominal variables the Pearson's chi-squared test was applied and in case of unfulfilled Cochran's rule – Fisher-Freeman-Halton exact test [45]. Student's t-test was used to evaluate the differences for quantitative variables. To assess the effect of size the following were used, depending on the type of used variables: odds ratio (for two nominal variables) and Cohen's *d* (e standardised difference between two means) with 95% confidence intervals [46]. Correlation was assessed with the rho-Spearman coefficient. P-values <0.05 were considered to be statistically significant. All of the statistical analyses were performed using STATISTICA 13.1 (StatSoft®, Inc.) under the Medical University of Warsaw licence.

RESULTS

Performance of breast self-examination by nurses and its accuracy. All surveyed nurses declared to have performed BSE in their life, including 41.1% who stated that they had performed it at the age of 20 or earlier. Regular breast examination was performed only by 56.7% of the nurses (Tab. 2). In menstruating women (N=1,058) in the recommended time (2–3 days after the cessation of menstruation), the practice was among 67.3% nurses, others in different stages of the menstrual cycle). In women after menopause (N=184) on a chosen day, specific day, the examination was performed only by 30.4%. Nearly all respondents (ca. 98% of participants performing BSE) applied both visual and palpation techniques, but only 58.9% did so in two positions: standing up and lying. Age related differences in the analysed indicators of proper performance of the self-examination were statistically important only in the case of the first examination, as by the age of 20 the procedure was performed by twice as many women by the age 44 than at 45 or more (OR = 2.82, 95%CI [2.23–3.57], P<0.001) (Table 2).

The average number of points in the BSE accuracy scale, taking all four into consideration, was 2.8. All (4 points) or almost all (3 points) recommendations concerning the proper BSE were obtained by 61.4% of the nurses, and almost every tenth nurse followed no or only one of these recommendations (Tab. 2).

Table 2. Performance and technique of breast self-examination (BSE) by nurses and assessment of self-examination (%)

	Total (N=1242)	Age		P-value
		<44 years (N=663)	≥45 years (N=579)	
Age when first BSE was performed				
At 20 or earlier	41.1	52.5	28.2	<0.001**
21–29 years	30.0	32.6	26.9	
30 years and over	28.9	14.9	44.9	
Frequency of BSE				
Once a month	56.7	56.4	57.0	NS**
Once every quarter	25.7	25.8	25.6	
Once every six months	11.5	11.8	11.2	
Once a year	3.5	3.0	4.2	
Less often than once a year	2.6	3.0	2.0	
Type of examination				
Visual and palpation	97.8	98.2	97.2	NS*
Only palpation	1.5	1.1	2.1	
Only visual	0.7	0.7	0.7	
Position during examination				
Standing and lying position	58.9	58.2	59.6	NS*
Only standing position	40.3	40.9	39.7	
Only lying position	0.8	0.9	0.7	
Accuracy of examination scale				
4 points (completely accurate)	27.5	28.8	25.9	NS**
3 points	33.9	33.9	33.9	
2 points	25.8	25.6	26.1	
1 point	11.9	11.2	12.8	
0 points (inaccurate)	0.9	0.5	1.4	
Total score (M±SD)	2.8±1.01	2.8±1.00	2.7±1.03	NS***

* Fisher-Freeman-Halton exact test

** Pearson's chi-squared test *** Student's t-test

NS – non-statistical significance

M – mean

SD – standard deviation

Information sources and skills of nurses in breast self-examination. Almost all nurses (91.1%) declared having

received information on the need and rules of breast self-examination. Over half of the respondents stated their gynaecologist (58.8%) and lecturer in their nursing education course (51.5%) as the source of information. A small percentage of respondents obtained such information from nurses and midwives, and a very few from their general practitioner (7.2%). The percentage of analysed information sources in both age groups was similar, except for mothers who statistically significantly more frequently provided information to younger than older nurses (19.6% vs. 14.5%, OR=1.44, 95%CI [1.05–1.98]; $P = 0.030$). A fairly frequent source of information was the media, most often books/specialist periodicals and leaflets. Younger nurses more often mentioned the Internet (40.3% vs. 31.2%, OR=1.72, 95%CI [1.31–2.24]; $P < 0.001$), and less often women's magazines (25.0% vs. 32.5%, OR=0.70, 95%CI [0.53–0.92]; $P = 0.012$) (Tab. 3).

Only 77.8% of the nurses stated that they had received instruction (demonstration) on how BSE should be performed. The instructors, as in the case of knowledge, were most often lecturers in the professional education programme (53.3%) and gynaecologists (44.3%). Equally rare, as in the case of knowledge, the instructors were nurses (more often in younger persons, OR=1.43, 95%CI [0.99–2.05]; $P = 0.024$), midwives (more often in older persons, OR=0.64, 95%CI [0.44–0.95]; $P = 0.050$) and mothers (statistically insignificant differences) (Tab. 3).

Table 3. Sources of knowledge and practical skills in breast self-examination in nurses (%)

	Total	Age		P-value*
		<44 years (N=663)	≥45 years (N=579)	
Information sources on need and rules for BSE				
Gynaecologist	58.8	58.4	59.3	NS
Lecturer in nursing college	51.5	53.5	49.1	NS
Friend	24.1	22.9	25.6	NS
Mother	17.2	19.6	14.5	0.030
Nurse	14.2	15.6	12.6	NS
Midwife	11.6	11.3	11.9	NS
General Practitioner	7.2	6.1	8.4	NS
Received information about BSE from				
Books/specialist periodicals	41.5	38.8	44.6	NS
Information leaflets	40.9	38.8	31.2	NS
Internet	36.1	40.3	31.2	<0.001
Women's magazines	28.5	25.0	32.5	0.012
Television	24.0	22.4	25.8	NS
BSE instructors				
Lecturer in nursing college	53.3	54.5	51.9	NS
Gynaecologist	44.3	44.4	44.2	NS
Nurse	14.4	16.5	11.9	0.024
Midwife	11.9	9.7	14.3	0.050
Friend	7.8	6.2	9.5	NS
Mother	6.7	8.0	5.3	NS
General Practitioner	3.1	2.1	4.2	NS

* Pearson's chi-squared test
NS – non-statistical significance

Self-assessment of knowledge, skills of breast self-examination and preparation of nurses to educate women in this regard. Nearly all the nurses (93.5%) stated that their knowledge of BSE was good or very good, fewer respondents (88.8%) assessed so high their practical skills. The average self-assessment from the aspect of knowledge ($d = -0.18$,

95%CI [-0.30–0.00]; $P = 0.003$) and skills ($d = -0.23$, 95%CI [-0.35–(-0.12)], $P < 0.001$) was lower in younger nurses in comparison with older ones (Table 4).

Less than half (42.9%) of the surveyed nurses declared to have educated women in BSE in their professional work. The majority of respondents (69.3%) considered themselves prepared for this work, but only 7.7% answered 'definitely yes'. The average self-assessment in the nurses' preparation for such education was lower in the case of younger nurses, compared with older ones ($d = -0.26$, 95%CI [-0.37–(-0.14)]; $P < 0.001$). The need to increase knowledge and skills in BSE was reported by 42.7% nurses (Tab. 4).

Table 4. Self-assessment of knowledge, skills of breast self-examination, nurses' preparation to educate women in this regard (%)

	Total (N=1242)	Age		P-value
		<44 years (N=663)	≥45 years (N=579)	
Self-assessment of BSE knowledge				
Very good	27.5	24.9	30.6	
Good	66.0	67.1	64.8	0.013*
Satisfactory	6.4	7.8	4.7	0.003***
Unsatisfactory	0.1	0.2	0.0	
M±SD	4.2±0.55	4.2±0.55	4.3±0.53	
Self-assessment of BSE practical skills				
Very good	19.0	16.1	22.3	
Good	69.8	69.7	69.9	<0.001*
Satisfactory	10.6	13.6	7.3	<0.001***
Unsatisfactory	0.6	0.6	0.5	
M±SD	4.01±0.56	4.0±0.57	4.1±0.54	
Self-assessment of preparation to educate women about				
Definitely yes	7.7	4.9	10.9	
Rather yes	61.6	60.3	63.1	<0.001**
Rather not	28.1	32.0	23.7	<0.001***
Definitely no	2.6	2.9	2.3	
M±SD	3.7±0.63	3.7±0.61	3.8±0.64	

* Fisher-Freeman-Halton exact test; ** Pearson's chi-squared test; *** Student's t-test
M – mean; SD – standard deviation

Relationship between self-assessment of knowledge and skills in breast self-examination and its accuracy. The self-assessment of nurses in BSE was significantly correlated with the result in the accuracy scale of the examination. The relationship concerned both the self-assessment from the aspect of knowledge and skills (rho 0.165 and 0.191, respectively). Moreover, a similar relationship was observed, but with lower intensity in the group performing BSE frequently, i.e. once a month (rho 0.118 and 0.109, respectively).

DISCUSSION

The presented results of the cross-sectional study, carried out in a large group (N=1,242) of Polish nurses concern the performance of BSE, its accuracy and self-assessment of knowledge and skills in this aspect. The undertaking of this study was justified by the unfavourable epidemiological situation regarding breast cancer in Poland (increasing incidence rate, low 5-year survival for patients diagnosed with breast cancer, low participation rate in the screening

programme in population aged 50–69 years), an increased risk of this cancer in nurses (shift work, unhealthy lifestyle), and the need for their participation in patient education in the prevention of breast cancer.

In the group of Polish nurses who were specialists in different nursing areas, many inconsistencies were found in the frequency, times, and technique of BSE. Only 56.7% of the nurses performed BSE regularly, i.e. monthly. The percentage was lower in Poland, in the United Arab Emirates (61.5%) [39] and much higher than in India (15.6%) [38]. Among the surveyed female health care workers, nurses among them, in Turkey 17% [34], Iran 6% [35] and 39.5% regularly practised BSE [36]. In Poland, on the recommended or chosen date, BSE was performed by 67.3% nurses with regular menstruation, and by only 30.4% post-menopausal respondents. Almost all surveyed nurses used visual and tactile examination, while only 58.9% performed the examination both in the standing and lying position.

Most often, the information and rules of BSE, as well as the instructions, were provided by gynaecologists and lecturers as part of the education in preparing for the nursing profession. However, it seems an alarming fact that only half of the respondents received information and instruction from their lecturers during their education. This indicates insufficient education about BSE in Polish nursing colleges. A similar situation was described in Saudi Arabia [40], Turkey [41] and Iraq [47]. Positive correlations between nursing students BSE practice and their academic experience in nursing college were found in Saudi Arabia [40]. Among the surveyed nurses in Poland, nurses, midwives and mothers were rarely a source of practical skills. Information from different media, including books and professional periodicals, was obtained by 24–41% respondents.

Considering the four items recommended as proper BSE it was found that only 61.4% of nurses met all or almost all recommendations (obtained 3 – 4 points in the accuracy scale). Simultaneously, 93.5% of surveyed nurses assessed their knowledge about BSE, and 88.8% their practical skills as good or very good. This suggests that differences exist between nurses' statements regarding their knowledge and skills, and their application in BSE. The level of self-assessment of knowledge and BSE skills were significantly correlated with the proper performance of this examination.

Analysis of the results with consideration of age, demonstrates that younger nurses (<44 years), when compared with older ones (≥ 45 years), statistically significantly earlier started BSE at the age of 20 or before, received information about BSE from mothers, the Internet and women's magazines, or were instructed by nurses and midwives. This may result from their greater awareness as young adults and through their mothers, better skills at using information technology, as well as the availability of women's magazines with information on various aspects of health. Older nurses assessed their knowledge and skills, together with the preparation to educate women in BSE, as better than the younger ones. No significant age related differences were found in the accuracy of performing BSE.

Only 42.9% of nurses educated women in BSE in their present professional practice, nearly three times more than they had been educated in the past by nurses (only 14% of respondents nurses were sources of information on the need and rules of BSE, and played the role of instructors). It may be assumed that the nurses' participation in women's

education in breast cancer prevention has increased in Poland. Further research is needed to confirm this hypothesis. Most nurses (69.3%) considered themselves to be prepared to educate women and 42.7% wish to increase their competences in BSE.

A limitation of the this study is its performance in a non-representative group. The surveyed nurses undertook action to improve their qualifications and it may be concluded that the obtained results are more positive than in an average nurse group in Poland. The questionnaire enquired only about BSE, no other methods of screening were taken into account. It may be assumed that some nurses attended mammography and believed it was not obligatory to practice BSE. This issue also requires further research.

CONCLUSIONS

The presented results of this survey indicate that Polish nurses highly value their knowledge and skill in BSE skills which are one of the commonly available and recommended techniques for breast cancer prevention. However, a significant percentage of nurses still fail to perform BSE, or to follow the agreed rules. Only half of the nurses received BSE information and instruction from their lecturers in the course of education in preparation for the nursing profession. This shows the need to include these issues in the nurses' pre-diploma and post-diploma education, and also within the framework of workplace training. This is essential from the point of view of breast cancer prevention among nurses themselves and their bigger involvement in the education of women, patients, and increasing the effectiveness of this education.

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