Chapter 10

The relationship between self-efficacy and health behaviours and the level of knowledge of breast cancer prevention among professional nurses

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Abstract
Introduction: Breast cancer is the most frequently diagnosed cancer in Poland. It develops slowly, very often without any symptoms for a long time. The key element in the prevention of breast cancer, which affects the rate of incidence, is women's knowledge of the disease and participation in screening tests.

Aim: The purpose of this study is to assess the relationship between the prevalence and intensity of health behaviours and self-efficacy and the level of knowledge about breast cancer prevention in a group of professional nurses.
Material and methods: The study involved 125 nurses employed at the St. John Paul II Hospital in Krakow. Standardised tools were used in the study: Generalized Self-Efficacy Scale (GSES), Health Behavior Inventory (HBI) and a self-designed questionnaire assessing knowledge about breast cancer prevention.
Results: Nurses with higher education presented a higher level of knowledge regarding breast cancer prevention. Women with a high intensity of health behaviours in the preventive domain showed a better knowledge of breast cancer topics. Similarly, nurses characterised by a strong sense of self-efficacy presented a higher level of knowledge in this area.
Conclusions: Almost half of the nurses surveyed presented a good level of knowledge about breast cancer prevention. The severity of health behaviours was rated as average, slightly higher in preventive behaviours and lower in terms of health practices. The stronger the sense of self-efficacy, the higher the level of knowledge and the higher the intensity of health behaviours.
Key words: breast cancer, prevention, health behaviours, self-efficacy, nurses

Introduction

Breast cancer is the most common type of malignant tumour among women in Poland. Despite the dynamic progress of medicine, a constant increase in the number of cases has been observed for many years. Data from the Polish National Cancer Registry indicate that in 2020 breast cancer and gynaecological cancers accounted for a total of 37% of all cancer cases among Polish women. The diagnosis of breast cancer in Poland is heard by more than 22,000 women every year, and in five to ten percent of them the cancer is not diagnosed until an advanced stage [1]. Diagnosing the disease at an early clinical stage allows for quicker treatment and thus a reduction in the number of deaths due to this disease. A key element in breast cancer prevention that reduces the incidence and mortality rate is women's knowledge of the disease and participation in screening tests. OECD data indicate that Poland has one of the worst results in the EU when it comes to women's willingness to undergo screening tests – mammography [2]. In order to improve access to prevention and to encourage more women to undergo tests, the Coalition "Together for Women's Health" was established. The initiator of its

creation is Polish Chamber of Commerce "Polish Pharmacy", the Onko-Cafe – Together Better Foundation, the OmeaLife Foundation and the association Polish Amazons Social Movement. Their task, apart from prevention, is to teach women health-promoting attitudes and cooperate with doctors in terms of access to modern treatment methods [3].

The purpose of this study is to assess the relationship between the prevalence and intensity of health behaviours and self-efficacy and the level of knowledge of breast cancer prevention in a professional group of nurses.

Material and methods

This study was conducted between February and April 2020 among 125 women employed as nurses at the St. John Paul II Hospital in the city of Krakow. The study used the diagnostic survey method, the research tools being two standardised questionnaires: the Generalized Self-Efficacy Scale (GSES) according to Schwarzer and Jerusalem adapted by Juczyński, and the Health Behavior Inventory (HBI) by Juczyński, as well as a questionnaire of his own authorship, containing vital data and questions regarding nurses' knowledge about breast cancer prevention. The GSES scale measures the strength of an individual's overall conviction about the effectiveness of coping with problematic situations and beliefs. The scale consists of ten statements that the respondent rates as true or false. The sum of the points obtained is converted on the sten scale: scores from one to four sten indicate low, from five to six average, and from seven to ten sten high self-efficacy. The HBI was used to assess health behaviours, consisting of twenty-four statements describing health-related behaviours. Taking into account the frequency of individual behaviours selected by the respondents, the overall intensity of behaviours that promote health and the degree of intensity in four domains of health behaviours, i.e. proper eating habits, preventive behaviours, health practices and positive mental attitude are determined. The sum of all points ranges from twenty-four to one hundred twenty points (the higher the score, the greater the intensity of health behaviours).

The overall HBI result was converted into stens, in accordance with the standards given in the key. Sten scores from one to four mean low, from five to six average, and from seven to ten high intensity of health-related behaviours. For the four individual HBI domains, there are no norms that would allow the results to be interpreted as low, high or average. However, the results of each domain were interpreted thanks to the calculated average obtained from the appropriate questions translated into a five-point scale used in the HBI [4].

To examine the nurses' level of knowledge about breast cancer, the author's questionnaire included sixteen questions that allowed the respondents' knowledge to be verified. Each respondent could score a maximum of twenty-eight points (one point for each correct answer, zero points for each incorrect answer). The higher the sum of points obtained, the higher the level of knowledge of the respondents; the number of points below fourteen indicated an insufficient level of knowledge, fourteen to twenty points a sufficient level, twenty-one to twenty-five points a good level, and above twenty-five points a very good level of knowledge.

The statistics were analysed using R, version 4.0. Quantitative variables in two groups were compared using the Mann-Whitney test, and in three or more groups using the Kruskal-Wallis test. When statistically significant differences were detected, a post-hoc analysis was performed using Dunn's test. Correlations between quantitative variables were analysed using Spearman's correlation coefficient. A level of $p \leq 0.05$ was considered statistically significant.

Results

The research included 125 professionally active nurses. The average age of the respondents was 38 years. The largest groups were women aged 22 to 30 and 41 to 50, while the smallest group was women aged 51 to 60 (Table 1).

Table 1. Age in the study group

Age	n	%
22–30 years	41	32.8%
31–40 years	25	20.0%
41–50 years	37	29.6%
51–60 years	22	17.6%

Source: own compilation of research.

The analysis of the level of education indicates that 56.8% of nurses had a specialisation, including 50.4% with higher education and 6.4% with secondary education. The remaining women had higher education without specialisation (39.2%) and secondary education (4%) (Table 2).

Table 2. Education level in the study group

Educataion	n	%
Secondary	5	4.0%
Secondary with specialisation	8	6.4%
High	49	39.2%
High with specialisation	63	50.4%

Source: own compilation of research.

As for the place of residence, the respondents' indications were almost evenly distributed: 50.4% of the respondents lived in the countryside, and 49.6% in the city (Table 3).

Table 3. Place of residence in the study group

Place of residence	n	%
City	62	49.6%
Countryside	63	50.4%

Source: own compilation of research.

The respondents were asked about the presence of breast cancer in the female line in the family, 17.6% of respondents indicated that such cancer had occurred in the family, and 55.2% indicated the presence of another type of cancer.

The assessment of the level of knowledge of nurses on breast cancer prevention indicates that almost two thirds of the respondents have a good (49.6%) and very good level of knowledge (9.6%) in this area, but as many as 40% have only a sufficient level of knowledge (Table 4).

Table 4. Level of knowledge about breast cancer prevention in the study group of nurses

Level of knowledge	n	%
Inadequate	1	0.8%
Sufficient	50	40.0%
Good	62	49.6%
Expertise	12	9.6%

Source: own compilation of research.

The level of knowledge was significantly higher in the groups with higher education than in the group with secondary education (Table 5).

Table 5. Correlation between education and level of knowledge

Level of knowledge [points]	Education			P
	Secondary or without specialisation (N = 13) – A	Higher (N = 49) – B	Higher with specialisation (N = 63) – C	
mean ± SD	19.27 ± 3.64	22.16 ± 2.9	21.73 ± 3.07	p = 0.025
Median	18.4	22.2	22.1	
Quartiles	16.45–21	20.5–24.4	19.67–23.75	B,C > A

p – Kruskal-Wallis test + post-hoc analysis (Dunn's test)

Source: own compilation of research.

Next, the overall intensity of health behaviours was assessed in the study group – more than one in three respondents showed an average intensity of health behaviours (36.8%), every third had a low intensity (33.6%), and almost 30% had a high intensity of health behaviours (Table 6).

Table 6. Intensity of health behaviours in the study group

HBI – number of points Women	Interpretation	n	%
24–77	Low	42	33.6%
78–91	Average	46	36.8%
92–120	High	37	29.6%

Source: own compilation of research.

The analysis of the evaluation of health behaviours in all domains of the HBI questionnaire, i.e. proper eating habits, preventive behaviours, positive mental attitude and health practices, is between "from time to time" and "often" (Table 7).

Table 7. Average frequency of behaviours in individual IZZ domains in the study group

HBI	N	Data gaps	Mean	SD	Median	Min	Max	Q1	Q3
Proper eating habits	125	0	3.43	0.74	3.5	1.67	5	3	4
Preventive behaviour	125	0	3.55	0.75	3.5	1.67	5	3	4.17
Positive mental attitude	125	0	3.48	0.65	3.5	1.67	4.67	3	4
Health practices	125	0	3.27	0.72	3.33	1.33	4.67	2.83	3.83

Source: own compilation of research.

No correlation was observed between the general result of the HBI and the level of knowledge about breast cancer prevention among professional nurses (Table 8), but such a correlation occurred between the level of knowledge and the domain of preventive behaviours ($p = 0.089$) (Tables 8, 9).

Table 8. Correlation between the overall IZZ score and the level of knowledge

Features	Spearman correlation coefficient	p
HBI overall score and Knowledge level	0.153	p = 0.089

Source: own compilation of research.

Table 9. Correlation between preventive behaviours and level of knowledge

Features	Spearman correlation coefficient	p
Preventive behaviour and Level of knowledge	0.207	p = 0.021

Source: own compilation of research.

The assessment of self-efficacy in the group of nurses studied indicates high (60%) and medium (32%) self-efficacy; only less than one in ten respondents had a low level of self-efficacy (Table 10).

Table 10. Self-efficacy in the study group of nurses

GSES – number of points	Interpretations	n	%
10–24	Low self-efficacy	10	8.0%
25–29	Average sense of self-efficacy	40	32.0%
30–40	High sense of self-efficacy	75	60.0%

Source: own compilation of research.

A statistically significant relationship was observed between self-efficacy and the level of knowledge about breast cancer prevention; the stronger the self-efficacy, the higher the level of knowledge of the respondents (p = 0.029) (Table 11).

Table 11. Correlation between self-efficacy and level of knowledge

Features	Spearman correlation coefficient	p
GSES and level of knowledge	0.195	p = 0.029

Source: own compilation of research.

Attention was also paid to the existence of a relationship between self-efficacy and health behaviours in general and in individual domains; the stronger the sense of self-efficacy, the greater the intensity of health behaviours in general and in individual domains (Table 12).

Table 12. Correlation between the HBI score and self-efficacy

Features	Spearman correlation coefficient	p
Overall score of HBI and GSES	0.397	$p < 0.001$
Proper eating habits and GSES	0.327	$p < 0.001$
Preventive behaviour and GSES	0.376	$p < 0.001$
Positive mental attitude and GSES	0.414	$p < 0.001$
Health practices and GSES	0.197	$p = 0.028$

Source: own compilation of research.

Discussion

Despite the dynamic progress of medicine, a continuous increase in the number of breast cancer cases has been observed for several years. The key element affecting the reduction of morbidity and mortality due to this disease is oncological prevention. Authors on the subject have been emphasising insufficient knowledge of breast cancer prevention among women for years. Currently, the main problem is the lack of participation in preventive tests [2]. In the group of nurses surveyed, the burden of cancer was found; 17.6% of the nurses indicated that their close family had breast cancer in the female line, and 55.2% indicated the occurrence of another type of cancer.

On the basis of the analysis of the results of our own research, it can be concluded that less than two thirds of the nurses surveyed (59.2%) have a good and very good level of knowledge of breast cancer prevention, but as many as 40% of these women have only sufficient knowledge of the subject. Compared to women from outside the medical community, these nurses demonstrated a higher level of knowledge about breast cancer prevention. In the research conducted by Ślusarska *et al.*, the knowledge of more than half of the respondents (50.7%) was rated as satisfactory, 10.4% of the respondents received a good rating, and as many as 38.9% received an unsatisfactory rating. Research indicates that there is a relationship between the knowledge of nurses surveyed and their level of education ($p = 0.025$). Nurses with higher education have a significantly higher level of knowledge about breast cancer prevention than those with secondary education. However, this relationship is not statistically significant

(p = 0.313). Similar results were obtained by Ślusarska *et al.* [5], the authors also point out the relationship between women's level of knowledge about breast cancer prevention and their level of education.

The level of knowledge of nurses was assessed according to knowledge of such things as the risk factors for breast cancer. The respondents most often mentioned factors such as female gender (100%), breast cancer in the family (100%), lack of physical activity (100%), long-term use of oral contraception or hormone replacement therapy (98.4%), late motherhood, childlessness (96.8%) or early age of menarche (61.6%). Late menopause (26.4%) and alcohol consumption (17.6%) was mentioned much less frequently. Similar relationships are indicated in studies by other authors: in the study by Smoleń and Dobrowolska [6], the nurses surveyed considered the main risk factors to be a family history of cancer (91.3%), taking hormonal drugs (72.2%), and ionising radiation (71.2%); Ślusarska *et al.* [5] indicate genetic factors (88.9%), history of breast cancer (66%) and age (54.3%), and Lewandowska *et al.* include genetic factors among the most frequently indicated risk factors, such as burden (64%), use of oral hormonal contraception (50%) and being overweight (30%) [7].

Another important element from the point of view of breast cancer prevention is knowledge of diagnostic methods that enable early diagnosis of pathological changes in the mammary gland, and thus early initiation of treatment of the disease. Breast self-examination is the cheapest independent method enabling the detection of pathological changes in the mammary gland. Our research shows that 90.4% of nurses know that this examination should be started as early as the age of 20 and should be carried out once a month (80.0%) two to three days after menstruation (74.4%) and in postmenopausal women always on the same day of the month (65.6%). Tomaszek *et al.* [8] indicate that the nursing students they surveyed knew the age at which breast self-examination should begin, but only 60% of them indicated the correct date for performing it. A similar relationship was indicated by Ślusarska *et al.* [5]. Here, too, 62.5% of women indicated that the test should be performed after the end of menstrual bleeding. However, the analysis by Lewandowska *et al.* [7] shows that only half of the respondents knew the proper time to conduct the examination.

Breast ultrasound examination is a complementary examination enabling the diagnosis of even the smallest changes in the mammary gland. Our research indicates that 78.4% of nurses know that this examination should be performed on women aged between 20 and 40. Similar results were obtained by Ślusarska *et al.* [5]: 61.1% of respondents believed that a breast ultrasound should be performed in women before the age of 40.

Mammography, which is the gold standard in the diagnosis of breast cancer, allows the detection of changes in the fatty tissue of the breast that are not palpable. 70.4% of the women surveyed were aware that mammography should be performed after the age of 40 and that this examination in Poland is free of charge for women between 50 and 69 years of age (80%). Only two thirds of respondents correctly indicated that this test should be performed every two years. Comparable results were obtained by Ślusarska *et al.* [5]. More than two thirds of the respondents (79.2%) correctly indicated the age at which the examination is recommended, but only half of the respondents (51.4%) knew how often the examination should be performed. A similarly low result was obtained by Tomaszek *et al.* [8].

Various categories of health behaviours are modifiable factors that influence human health, and one of the important factors determining human behaviour is self-efficacy. Self-efficacy is the strength of the belief that one is able to carry out a specific action or achieve a set goal. A person's expectations regarding self-efficacy may determine whether or not they undertake specific behaviours, including those related to their own health [4]. The analysis of our results indicates that the level of intensity of health-related behaviours among the nurses surveyed varies. Nurses were characterised by average (36.8%) and high (29.6%) intensity of health-related behaviours, but as many as one third (33.6%) of respondents demonstrated a low level of these behaviours. Similar results were obtained by Bojakowska *et al.* [9], but they examined the intensity of health behaviours in women before and after the diagnosis of breast cancer. Before the diagnosis of "breast cancer", women showed a low level of intensity of health behaviours, while after the diagnosis of breast cancer, more than half of the women showed a high level of intensity of health behaviours. The study

also allowed for the assessment of individual categories of health behaviours. Nurses received the lowest ratings in the domain of health practices (3.27) and proper eating habits (3.43), with positive mental attitude (3.48) and preventive behaviours (3.55) ranking slightly higher. A similar distribution of answers was obtained by Gujska *et al.* [10] when examining the health behaviours of nursing students in the field of cancer prevention. The analysis of this author's results shows that preventive behaviours were rated the highest (3.50), eating habits (3.49) and positive mental attitude (3.47) were rated slightly lower, while health practices were considered the least intense (3.22). The study indicates that the domain of preventive behaviours depend on the nurses' level of knowledge regarding breast cancer prevention ($p = 0.021$). Research by other authors does not confirm the existence of such a relationship [10,11].

The analysis of the results of this study shows a high generalised sense of self-efficacy among 60% of nurses, average among 30%, and only 8% of respondents have a low sense of self-efficacy. There was also a relationship between self-efficacy and the level of knowledge about breast cancer prevention in the study group ($p = 0.029$). A high sense of self-efficacy concerned respondents with a higher level of knowledge. The study by Andruszkiewicz *et al.* [12] conducted in a group of nurses indicates a moderate sense of self-efficacy, and there is no relationship with the level of knowledge. Later in the study, a statistically significant correlation is shown between self-efficacy and the intensity of health behaviours ($p < 0.001$). The stronger the self-efficacy, the greater the intensity of health behaviours in general and in individual domains. The influence of self-efficacy on health behaviours is also indicated by Baumgart *et al.* [13].

Despite a strong sense of self-efficacy, health behaviours and satisfactory knowledge of breast cancer prevention, the nurses surveyed often do not follow the recommendations resulting from the principles of breast cancer prevention and undergo tests unsystematically. This may be a cause for concern, considering the fact that 17.6% of them indicated that a close family member in the female line has had breast cancer, and 55.2% indicated the presence of another type of cancer. Due to their

professional functions in the field of education and health promotion, nurses' knowledge of breast cancer prevention should be above average, and they themselves should set an example and be a source of knowledge for other women.

Conclusions

The level of knowledge of the nurses surveyed about breast cancer prevention may be alarming – as few as less than 60% of them had a good and very good level of knowledge on this subject, but as many as over 40% had only a sufficient level. Nurses with a higher level of education had a better level of knowledge in the field of breast cancer prevention.

The intensity of health behaviours in general and in individual domains in the study group of nurses was at an average level. A relationship was observed only between the nurses' level of knowledge about breast cancer prevention and the HBI domain of preventive behaviours: the higher the level of knowledge, the greater the intensity of preventive behaviours.

A high level of generalised self-efficacy was found in the study group of nurses. There was also a relationship between the sense of self-efficacy and the level of knowledge about breast cancer prevention in the study group: the stronger the sense of self-efficacy, the higher the level of knowledge of the nurses. Such a relationship also occurred between self-efficacy and health behaviours in general and in individual domains: the stronger the self-efficacy, the greater the intensity of health behaviours.

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