

# The influence of socio-demographic factors on making a decision related to the disease and treatment in women with breast cancer

*Andrzej Nowicki, Assoc. Prof. UMK<sup>1</sup>, Kamila Wiśniewska, MSc<sup>1</sup>,  
Piotr Rhone, MD, PhD<sup>2</sup>*

<sup>1</sup>Department of Oncology Nursing, Collegium Medicum in Bydgoszcz,  
Nicolaus Copernicus University in Toruń, Poland

<sup>2</sup>Clinical Department of Breast Cancer and Restorative Surgery,  
Oncology Center in Bydgoszcz, Poland



Received: 15.02.2015. Accepted: 15.05.2015.

## ABSTRACT

**Introduction.** Socio-demographic factors may affect the decision-making associated with the disease and the long-term results of treatment.

**Objective.** Exploring the relationship between socio-demographic factors of women treated for breast cancer and decision-making associated with the disease and treatment.

**Material and methods.** The study involved 100 women aged 30 to 72 (mean: 57 years) who were treated at the Oncology Center in Bydgoszcz in 2013–2014 due to breast cancer. A survey questionnaire on socio-demographic factors and data on knowledge about prevention and disease was used in the study.

**Results.** The number of women performing breast self-examination decreased with age; 83% of patients over 50 years old and 76% ( $p = 0.0001$ ) over 69 years old underwent mainly mammography ( $p = 0.03$ ). Self-detection of breast tumor also decreased with age and was detected more frequently by the medical personnel ( $p = 0.0001$ ). More educated women (85%) examined themselves more often than those with primary and vocational education ( $p = 0.001$ ). According to our assessment, the number of women with knowledge about cancer decreased with age ( $p = 0.004$ ). The same was true for women in a very good and good financial situation, with 94% of them declaring a higher knowledge level ( $p = 0.001$ ).

**Conclusions.** Women's knowledge about breast cancer is not satisfactory, especially in older and less educated women. They obtain knowledge from the Internet mainly and from the medical staff in the smallest degree. Young women up to 49 years of age perform self-examination to detect breast cancer most often, while older women use mammography. Almost all women immediately report to the doctor and are admitted to clinics after detecting lesions with mammography or self-examination.

**KEY WORDS:** breast cancer, socio-demographic factors, prevention

## Correspondence:

Andrzej Nowicki, Assoc. Prof. UMK  
Nicolaus Copernicus University  
85-801 Bydgoszcz, ul. Techników 3  
e-mail: anow1\_xl@wp.pl

Breast cancer is a disease that not only negatively affects women's emotions but it also involves a lot of physical and social limitations. Every time a woman thinks about the disease and the history of treatment, she experiences fears of disease recurrence and death. Adequate support received by medical professionals, family, and the loved ones is a priority during this period. Accompanying fear and anxiety contribute to delays in seeking therapy. Research shows that the average delay time is 12 months [1]. Some patients believe in spiritual and physical unity of a human being, and thus in the influence of the healing of the soul on the healing of the bodily diseases. That is why they often use alternative forms of treatment and/or rely on prayer. Factors which affect decision-making about treatment are: age, marital status, fear of mastectomy, economic reasons and nature of complaints. In contrast, patients who had previously gone through benign breast cancer are more aware and less afraid of the treatment, so they seek help earlier [2].

In addition, various socio-demographic factors may contribute to delay in treatment. Neglecting symptoms and ailments as well as giving the doctor late notifications make cancer progress. This is related to poorer prognosis, longer treatment and increased costs.

## OBJECTIVE

The aim of this paper is to examine the importance of socio-demographic factors in women treated for breast cancer in making a decision related to the disease and treatment.

## Material and methods

The study involved 100 women aged 30 to 72 (mean: 57) with breast cancer who were treated in 2013–2014 at the Oncology Center in Bydgoszcz. Amputation was performed in 68 women while 31 women had breast-conserving surgery. The survey method used in the study was an original questionnaire containing 29 closed questions. Questions from 1 to 9 were related to socio-demographic factors, while questions from 10 to 29 were related to data on the disease and prevention. Patients were informed about the procedure and opportunities to ask questions. The only condition for the realization of this study was to obtain a consent of the Bioethics Committee at Collegium Medicum in Bydgoszcz.

Information obtained through the questionnaires was introduced into the database STATISTICA 10 and was statistically analyzed using descriptive statistics and chi-square

Pearson test of significance; in the case of the analysis of parameters in ordinal scale, the Mann-Whitney U test was used. Univariate analysis (two-dimensional) was carried out in which each factor was evaluated separately. Age, marital status, place of residence, education, profession and economic status were treated as independent variables, whereas breast self-examination, mammography, knowledge and sources of knowledge about breast cancer, detection of breast lesions, time from diagnosis to treatment and admission to a preventive examinations clinic were treated as dependent variables. Significance coefficient at  $\alpha = 0.05$  level was used, which allowed to recognize variability at  $p < 0.05$  as statistically significant.

## RESULTS

The relationships between the independent variables – socio-demographic data (shown in table 1) and the dependent variables – data on prevention, diagnosis and treatment of breast cancer as well as knowledge about it are discussed below.

TABLE 1.  
Socio-demographic data.

Socio-demographic data		Number of respondents
Age	30-49	26
	50-69	53
	> 69	21
Marital status	Unmarried women	3
	Married women	76
	Widow	21
Place of residence	City	61
	Village	39
Education	Primary/vocational	53
	Secondary/higher	47
Professional status	Employed	58
	Unemployed	42
Economic status*	Average	28
	Very good/ good	69

\* 3 people abstained from answering

### 1. The age of the respondents and dependent variables

**Breast self-examination.** All women below 49 years of age performed self-examination. In the groups between 50 and 69 years old and above the self-examination was performed by 72% and 48% of women respectively. The older the woman, the less frequently self-examination was performed ( $p = 0.0001$ ).

**Mammograms.** Younger women were significantly less likely to perform preventive mammography whereas the majority of women in the 50–69 age group (83%) performed such examinations. Mammograms were performed least frequently by women in the 31–49 age group (52%) ( $p = 0.03$ ).

**Knowledge about breast cancer.** The number of women claiming to have knowledge about breast cancer decreased significantly with age. Only a few women aged 50–69 and > 69 (15% in each group) had knowledge about cancer ( $p = 0.004$ ).

**Sources of knowledge about breast cancer.** In the group of women aged 31–49 (88%) the most common source of information was the Internet (besides a doctor, brochures, movies, literature, family and friends), while patients over 69 years old (57%) obtained information about the disease most frequently from family and friends ( $p > 0.05$ ).

**Detection of breast lesions.** Self-detection of breast tumor decreased with age, significantly more tumors were detected by doctors and mammography. Almost all women aged 31–49 (92%) detected the tumor themselves. In older patients aged 50–69 and over 69, the tumor was detected by mammography (54.7% and 61.9%, respectively) ( $p < 0.0001$ ).

**Time from diagnosis to treatment.** 100% of women aged 31–69 years and 95% over 69 years of age reported to the physician immediately after detection of a lesion ( $p = 0.05$ ).

**Admission to preventive examinations clinic.** Hardly any patient had difficulties in being admitted to a preventive examination clinic. Only 6 women over the age of 50 reported such difficulties ( $p = 0.8$ ).

## 2. Marital status and the dependent variables

(Unmarried women were excluded from the analysis because they were underrepresented).

**Breast self-examination.** Proportions of widows and married women performing self-examination were similar (57% and 78% respectively) ( $p = 0.05$ ).

**Mammograms performed.** Proportions of widows and married women having undergone mammography were almost the same (76% and 73% respectively) ( $p = 0.6$ ).

**Knowledge about breast cancer.** Married women had a significantly higher level of knowledge in comparison to widows. 89% of married women and 57% of widows had knowledge about breast cancer ( $p < 0.001$ ).

**Sources of knowledge about breast cancer.** The Internet was the main source of knowledge about the disease among married women (38%), while family and medical personnel were important for widows (47% and 24% respectively) ( $p > 0.05$ ).

**Detection of breast lesions.** Married women detected changes in the breast significantly more independently (53%) and by mammography (41%), while only in 6% of women were lesions detected by their doctors. Mammography detected changes in 61% of widows ( $p < 0.001$ ).

**Time from diagnosis to treatment.** 96% of married women and 100% of widows started treatment immediately after the diagnosis of cancer. Two married women (2.6%) waited 6 months ( $p < 0.9$ ).

**Access to preventive examinations clinic.** Married women and widows rarely reported limited access to preventive examination clinic (7% and 5% respectively) ( $p = 0.7$ ).

## 3. Place of residence and the dependent variables

**Breast self-examination.** Breast self-examination was performed by a similar number of residents of both towns and villages (75% and 72% respectively) ( $p = 0.09$ ).

**Mammograms performed.** Mammograms were equally popular among residents of both towns and villages (72% and 77% respectively) ( $p = 0.6$ ).

**Knowledge about breast cancer.** There were no differences in knowledge about breast cancer between residents of towns and villages. Both residents of towns and rural areas declared that they have such knowledge (85% and 79% respectively) ( $p = 0.07$ ).

**Sources of knowledge about breast cancer.** The main sources of information for women living in rural areas were medical staff and the Internet (35% and 30% respectively). Residents of towns obtained knowledge mainly from the Internet (33%) ( $p > 0.05$ ).

**Detection of breast lesions.** Patients living in towns detected changes themselves more often (51%) than residents of rural areas (36%), while proportions of women living in the urban and rural areas performing mammography were similar (43% and 46% respectively) ( $p = 0.06$ ).

**Time from diagnosis to treatment.** 100% of women living in the rural areas and 95% of urban residents reported to doctor immediately. Two women from towns waited 6 months ( $p = 0.08$ ).

**Access to preventive examinations clinic.** Limited access to preventive examinations clinic was reported by 11% of women surveyed: 6% of urban residents and 5% of rural residents ( $p = 0.8$ ).

## 4. Education and the dependent variables

**Breast self-examination.** Women with secondary/higher education were significantly more likely to perform breast

self-examination (85%) compared with women having primary/vocational education (64%) ( $p = 0.001$ ).

**Mammograms performed.** Women with primary/vocational education (81%) were significantly more likely to perform mammography than women with secondary/higher education (66%) ( $p = 0.03$ ).

**Knowledge about breast cancer.** Almost all women with secondary/higher education (94%) claimed to have knowledge about breast cancer, compared with 74% of women with primary/vocational education ( $p = 0.00009$ ).

**Sources of knowledge about breast cancer.** Family and friends were the main source of knowledge among 36% of women with primary/vocational education, whereas the Internet was the main source of information for 53% of patients with secondary/higher education ( $p > 0.05$ ).

**Detection of breast lesions.** In 50% of patients with primary/vocational education breast cancer was detected by mammography and 32% by self-examination. In the group of women with secondary/higher education, more patients (59%) detected breast cancer by performing self-examination, compared with mammography which allowed to detect changes in 31% of patients ( $p < 0.0001$ ).

**Time from diagnosis to treatment.** Patients with primary/vocational education reported to a doctor immediately after the detection of a change, similarly to women with secondary/higher education (100% and 94% respectively). 3% of women with secondary/higher education delayed their decision by 6 months ( $p = 0.05$ ).

**Access to preventive examinations clinic.** 10% of women with secondary/higher education and 2% of patients with primary/vocational education claimed to have had difficulties with access to preventive examinations clinic ( $p = 0.04$ ).

## 5. Profession and the dependent variables

### Breast self-examination.

Working women performed breast self-examination significantly more often than non-working women (90% and 67% respectively) ( $p < 0.001$ ).

**Mammograms performed.** The proportions of women having performed mammography were similar in the working and non-working group (72% and 71% respectively) ( $p = 0.6$ ).

**Knowledge about breast cancer.** Working women had significantly higher level of knowledge about breast cancer than non-working women (98% and 59% respectively) ( $p = 0.003$ ).

**Sources of knowledge about breast cancer.** The Internet was the main source of knowledge among working women

(48%). Non-working women got their knowledge from medical staff, family and friends (31%) ( $p > 0.05$ ).

**Detection of breast lesions.** Breast tumor was detected through self-examination significantly more often in the group of working women (62%) than non-working women (12%). Detection of the tumor thanks to mammography was more frequent in the group of non-working women (71%) ( $p < 0.001$ ).

**Time from diagnosis to treatment.** 98% of working women and 95% of non-working women reported to the doctor immediately after the detection of changes.

**Access to preventive examinations clinic.** Neither working nor non-working women had difficulties with access to preventive examinations clinic (95% and 93% respectively) ( $p = 0.6$ ).

## 6. Economic status and the dependent variables

(3 patients abstained from answering the question about their economic status).

**Breast self-examination.** Women in a very good or good financial situation performed breast self-examination much more often than women in an average financial situation (81% and 57% respectively) ( $p = 0.04$ ).

**Mammograms performed.** Mammograms were performed by 71% of women with an average economic status and 75% of women with a very good or good economic status ( $p = 0.8$ ).

**Knowledge about breast cancer.** Patients in a very good and good financial situation had significantly higher declared knowledge about cancer (94%). Such knowledge was possessed by 54% of patients in an average financial situation ( $p < 0.001$ ).

**Sources of knowledge about breast cancer.** Medical staff as well as family and friends were the main source of information for women with an average economic status (41% and 37% respectively) while the Internet was the main source of information for patients with a very good or good economic status (37%) ( $p > 0.05$ ).

**Detection of breast lesions.** Women in a very good and good financial situation were more likely to detect changes themselves (51%), whereas those in an average financial situation often used mammography (53%). Changes were detected by a doctor in 19% of women with an average economic status and 9% of women with a very good and good economic status ( $p = 0.2$ ).



**Time from diagnosis to treatment.** Most women in both average and very good and good financial situation reported to the doctor immediately after the detection of a change (96% and 97% respectively) ( $p > 0.05$ ).

**Access to preventive examinations clinic.** Women in an average and very good/good economic condition had similar access to preventive examinations clinic (93% and 95% respectively) ( $p = 0.7$ ).

## DISCUSSION

All patients under the age of 49 performed self-examination regularly, while older women did it less frequently. As it turned out, almost all women had sufficient knowledge on the subject [3–5]. Younger women aged up to 30 and those over 61 years old were least likely to perform self-examination, whereas women at the age of 41–60 did it most often [6]. Married women and widows were equally likely to carry out this test. Different results were obtained at the Department of Oncology and Radiotherapy at the Hospital in Kuala Lumpur, where it was found that divorced and widowed women hardly ever performed breast self-examination [7]. This can be explained by a low level of knowledge and ignorance of the principles of self-examination. Additionally, neither marital status nor place of residence had effect on carrying out self-examination. Other studies relating only to urban residents showed that almost half of surveyed women had heard about breast self-examination, almost half of them knew how to do it, but only nearly one third performed self-examination regularly [8]. However, professional status, financial situation and education level had influence on performing breast self-examination. The higher the education level, the more frequently self-examination was performed. Research carried out in another Polish region showed that almost all women were aware of the necessity for breast self-examination but only one third did it regularly, and among them, more than half of women with higher education [9]. In our study, working women with good economic status were most likely to perform this examination. According to other authors, breast self-examination is performed by more than half of working women and non-working women as well as three quarters of women with a good economic status. However, only 1 in 10 did it regularly and in a timely manner [6, 10].

Older women performed mammograms more often, which was associated with screening programs. It is emphasized that mammography is the most sensitive test to detect breast

cancer. Other authors argue that women had limited awareness of breast cancer prevention. Almost half of women demonstrated little knowledge on this topic and there were no connections with age and place of residence found [11]. Similar results were obtained in our study, with only half of women aged 51–60 years having performed mammography once in their life. Almost all said that it is worth performing medical examinations for early detection of breast cancer. Half of the patients were not subjected to examination under a prevention program, and only one in five wanted to undergo examination but had no such possibility [11]. Marital status and place of residence did not affect the number of women undergoing these examinations. Other authors agree with these results saying that proportions of married women and widows undergoing examinations were similar. Moreover, difficulties with access to a clinic were the biggest obstacle in having preventive examination done for half of women, regardless of their place of residence [11, 12]. However, this was not confirmed by our study. The level of education had an impact on the number women performing mammography. In our study, significantly more women with primary and vocational education performed this examination. It is hard to say why less educated women were examined more frequently. This may be explained by the fact that our study was conducted among patients who had already completed treatment. According to other authors, the percentage of women who had mammography is around 50, regardless of their level of education [6]. Proportions of working and non-working women performing mammograms were similar. Other authors confirm these results and observe that mammograms were performed more than once by half of pensioners, almost as many as in the case of working women, while every fifth pensioner performed mammography only once, compared to most of working women [13]. Mammography was carried out mostly by women with good and average financial situation. Research carried out in France showed that economic status is an important factor affecting the practice of undergoing screening examination. Mammography is performed less frequently among women with adverse financial conditions [14].

It was observed that older women had less knowledge about breast cancer or lack thereof. This may be due to older people's belief that they do not feel the need to broaden their knowledge or they claim that this problem does not concern them. In Poland, the level of knowledge on the procedure followed in case of diagnosed changes in the breast in women aged 28–45 is lower than in other countries [11].

Married women had a significantly higher declared level of knowledge in comparison with widows, while both residents of towns and villages had declared knowledge about breast cancer at a similar level. Other authors point out that, in general, almost all women have knowledge about breast cancer; yet others claim that almost half of women aged 30–60 have a very low level of knowledge and the other half has very fragmented knowledge. These results are said to be independent of age or place of residence [3, 11]. However, the higher the education level, the higher the declared knowledge. Currently, the level of knowledge is one of the determinants of health-related beliefs and behavior. Similarly, other studies found that knowledge about breast cancer is insufficient, and it depends on the level of education. Women with higher and secondary education have a similar level of knowledge, whereas knowledge among women with vocational education is much lower. Research conducted in Nigeria also showed that women with higher education had more knowledge about breast cancer compared to women with low education level [2, 15]. Additionally, working women demonstrated a higher level of knowledge. In another study, where one half of the surveyed women was working and the second half non-working, roughly 50% of all women had knowledge about breast cancer [6]. Also in our study, a higher level of knowledge was observed in almost all women with good economic conditions. Similarly, others found that women in a better financial situation assess their knowledge about breast cancer at a higher level. More than half of women with good economic status select 8–10 points on a scale of 1 to 10. Only a few women with poor economic status assess their knowledge at 10 points [16].

The Internet was the main source of knowledge about breast cancer in women aged 30–49 years and family and friends for those over 69 years old. Media play a significant role in educating women, whereas the role of healthcare institutions is significantly smaller. Most women hear about the need for preventive examinations on TV [11]. Married women acquired knowledge from the Internet mainly, while widows relied more on medical staff. Similar results were obtained in studies conducted by other authors; they showed that for the majority of women, media (mainly television and magazines) played a significant role as a source of information about breast cancer whereas healthcare institutions were less important in that matter [12]. When it comes to place of residence, women living in villages declared different source of knowledge than women living in cities: the former relied mainly on medical staff whereas

the latter preferred the Internet. Other studies suggest that for residents of cities knowledge about breast cancer comes more often from medical staff while knowledge of residents of villages has its source mainly in the press, brochures, leaflets and TV [17]. Women with primary and vocational education obtained their knowledge chiefly from family and friends whereas those with secondary and higher education from the Internet. According to other studies, brochures and leaflets were mentioned in the first place, regardless of the level of education, then the media and medical personnel [18]. Working women obtained their knowledge mainly from the Internet while non-working women rely on the medical staff, family and friends. Other studies indicate that, regardless of whether women work or not, they mostly use the Internet and medical books, and the doctor is cited least often as a source of information [19]. Internet was the main source of knowledge for women with a good economic status while medical personnel was important for women with an average economic status. According to others, media, newspapers, leaflets, family and friends are the most important source of information, regardless of the economic status. Also, these women claim that medical staff does not transmit knowledge about breast cancer [11]. Under 20% of women with good economic conditions and one third with difficult ones indicate friends and family as the main source of knowledge [16].

In older women, the tumor was detected by medical personnel more frequently while in younger women aged 31–49 lesions were detected by breast self-examination. Regardless of age, breast tumor was most often detected by self-examination among married women, while widows had their tumors detected by mammography. Residents of cities detected changes in the breast themselves most frequently, and residents of villages through mammography, which can be explained by examinations carried out using mobile mammography units. In contrast, according to other authors, the women who check in for mammography live mainly in large and medium-size urban areas [20]. Women with higher education detected breast tumor themselves more often while women with primary or vocational education had their tumor detected by mammography. In another study including patients after mastectomy, most of the respondents had detected a lump in the breast during self-examination, and in only a few cases was it detected by a breast examination conducted by doctor or using mammography [21].

Working women detected changes themselves most frequently while non-working women chiefly through mammograms. Poorer results were presented by other authors conducting a survey among working women. Only few percent of them found worrying symptoms during self-examination [22]. Women in good and average financial situation detected breast cancer themselves as often as using mammography. Similar results were obtained by other authors. They found that women with good conditions detect cancer using mammography as often as women in an unsatisfactory financial situation [13].

Age of the respondents had a negligible impact on reporting changes to the doctor. Only a few women over 59 years old delayed their visits to doctor. Similar results were obtained in a study of Egyptian women, whose average age was 48.2. The study showed that most women reported to the doctor immediately after noticing disturbing changes [23]. Almost all married women and widows reported to doctor immediately. Equally interesting studies were conducted in order to examine the time elapsed from the moment in which women noticed changes in their breasts and the time of notification to the doctor. The results obtained were worse than ours, with only nearly half of women reporting to the doctor immediately [24]. The study conducted in Nigeria indicate otherwise: women with a low level of education are far less likely to seek medical care after the diagnosis and they have low level of knowledge about the disease. Insufficient understanding of the severity of symptoms is the main cause of delays in reporting to the doctor [2]. Almost all working and non-working women and those with good and average economic status report to the doctor immediately after the diagnosis. Other studies showed that women who indicated a better economic condition reported earlier to the doctor [16].

Only a few patients over the age of 50 as well as some married women and widows living in the city and the country-

side declared limited access to preventive examinations clinic. Other studies suggested otherwise, with rural community having worse access to healthcare institutions [25]. In our study, only a few patients with higher or secondary education level declared limited access to preventive examinations clinic. Neither working nor non-working women, regardless of their economic status, reported difficulties with access to preventive examinations clinic.

Our study was carried out among a group of women who had completed treatment. The discussion includes mainly works of authors who examined populations of healthy women. The results of these studies may differ because they were conducted on various populations. It seems that breast cancer patients are a special group in terms of healthy behavior, as they may be particularly interested in the evaluation and the influence of various factors on their health.

## CONCLUSIONS

1. Socio-demographic factors such as age, marital status, education, employment status and economic condition are the determinants of health-related behavior.
2. Women's knowledge about breast cancer is not satisfactory, especially in older and less educated women. In general, women obtain information mainly on the Internet; the medical staff is the least popular source of knowledge.
3. Young women up to 49 years old detect breast cancer most often by self-examination while older ones by means of mammography.
4. Almost all women immediately report to the doctor after detecting changes in the breast and have good access to preventive examinations clinic.

## Acknowledgements

Authors report no conflict of interest.

## References

1. Pawlicki M, Żuchowska-Vogelgesang B, Rysz B, et al. Wyniki badań nad przyczynami opóźnień w leczeniu chorych na raka piersi z próbą oceny wpływu czynników psychologicznych. *Współcz Onkol* 1999; 6: 253-258.
2. Ibrahim NA, Oludara MA. Socio-demographic factors and reasons associated with delay in breast cancer presentation: A study in Nigerian women. *Breast* 2012; 21: 416-418.
3. Goworek P, Durka M, Borowiak E, Cieślak H. Wiedza na temat samobadania piersi wśród kobiet mieszkających w Polsce i Nowej Zelandii. *Probl Pielęg* 2008; 16: 144-150.
4. Antos E. Badanie wiedzy kobiet na temat samokontroli w profilaktyce nowotworów sutka. Praca Magisterska. Akademia Medyczna w Warszawie. Warszawa 2005.

5. Skórzyńska H, Rudnicka-Drozak E, Pacian A, Zych B. Prophylaxis of breast cancer among women over 35. *Ann Unive M. Curie-Skłodowska Med* 2004; 59: 474-480.
6. Woźniak I. Wiedza o schorzeniach nowotworowych narządów kobiecych i postawy kobiet wobec badań profilaktycznych. *Probl Pielęg* 2000; 16: 136-139.
7. Ghazali SM, Othman Z, Cheong KC et al. Non-practice of breast self-examination and marital status are associated with delayed presentation with breast cancer. *Asian Pac J Cancer Prev* 2013; 14: 1141-1145.
8. Sobani ZU, Saeed Z, Baloch HN et al. Knowledge attitude and practices among urban women of Karachi, Pakistan, regarding breast cancer. *J Pak Med Assoc* 2012; 11: 1259-1264.
9. Szczepański M, Korzeniowski M, Suchacka M. Wiedza o nowotworach i profilaktyce. *Opolskie Centrum Onkologii* 2007; 2: 16-22.
10. Przestrzelska M, Knihinicka-Mercik Z, Kazimierzczak I et al. Zachowania zdrowotne kobiet w profilaktyce nowotworu szyjki macicy i sutka. *Onkol Pol* 2006; 9: 172-175.
11. Przysada G, Bojczuk T, Kuźniar A et al. Poziom wiedzy kobiet na temat profilaktyki i wczesnego rozpoznawania raka piersi. *Young Sports Science* 2009; 3: 129-136.
12. Najdyhor E, Krajewska-Kułał E, Krajewska-Ferishah K. Wiedza kobiet i mężczyzn na temat profilaktyki raka piersi. *Ginekol Pol* 2013; 84: 116-125.
13. Prażmowska B, Puto G, Huras H. Czynniki wpływające na częstość wykonywania badania mammograficznego. *Med Ogólna* 2010; 16: 474-483.
14. Manvielle G, Richard JB, Ringa V et al. To what extent is women's economic situation associated with cancer screening uptake when nationwide screening exists? A study of breast and cervical cancer screening in France in 2010. *Cancer Causes Control* 2014; 1: 11-20.
15. Zych B, Marć M, Binkowska-Bury M. Stan wiedzy kobiet po 35 roku życia w zakresie profilaktyki raka piersi. *Przegl Med Uniwers Rzeszowskiego. Rzeszów* 2006; 1: 27-33.
16. Sielska J. Diagnoza zachowań prozdrowotnych w aspekcie profilaktyki raka piersi u kobiet zdrowych. Rozprawa doktorska. Uniwersytet Medyczny w Poznaniu. Poznań 2012.
17. Florek-Łuszczki M. Poziom wiedzy mieszkanek wsi na temat czynników ryzyka zachorowania na nowotwór piersi oraz zasad profilaktyki. *Med Ogólna* 2010; 16: 406-415.
18. Turczak B. Zachowania zdrowotne kobiet. *Mag Piel i Poł* 2006; 6: 14-15.
19. Lewandowska A, Mess E, Laufer J. Profilaktyka raka piersi wśród kobiet. *Onkol Pol* 2011; 3: 131-134.
20. Wojciechowska U, Didkowska J, Zatoński W. Nowotwory złośliwe w Polsce w 2006 roku [Cancer in Poland in 2006]. Warszawa Centrum Onkologii 2008.
21. Dońska K, Kanadys K, Lewicka M et al. Reakcje kobiet na rozpoznanie zmian guzowatych i choroby nowotworowej piersi. *Ann Univ M. Curie-Skłodowska* 2005; 60: 357-362.
22. Dobrzyń D, Starosolska H, Kołodziej W. Świadomość kobiet w zakresie profilaktyki chorób nowotworowych. *Ann Univ M. Curie-Skłodowska* 2003; 13: 272-276.
23. El-Shinawi M, Youssef A, Alsara M et al. Assessing the level of breast cancer awareness among recently diagnosed patients in Ain Shams University Hospital. *Breast* 2013; 6: 1210-1214.
24. Meechan G, Collins J, Petrie K. Delay in seeking medical care for self-detected breast symptoms in New Zealand women. *Med J* 2002; 8: 39-45.
25. Synowiec-Piłat M. Zróżnicowania i nierówności społeczne a zdrowie. W: Barański J, Piątkowski W. *Zdrowie i Choroba. Wybrane problemy socjologii medycyny*. Oficyna Wydawnicza ATUT. Wrocławskie Wydawnictwo Oświatowe, Wrocław 2002; 89-96.

**Authors' contributions:**

Andrzej Nowicki – the idea and the project of the study, editing and approving the manuscript, data interpretation – 45%  
Kamila Wiśniewska – data collection, review and selection of references, writing the manuscript – 40%  
Piotr Rhone – statistical analysis, enabling access to patients – 15%