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Review

What do women know about breast cancer prophylaxis and a healthy style of life?

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ABSTRACT

Aim: The aim of the study was to determine the factors influencing women's knowledge concerning breast cancer prophylaxis and find out the sources of the knowledge.
Background: In the Greater Poland region, breast cancer has been the most frequently detected tumour for years. The percentage of breast cancer cases has increased by 31% in the last decade.
Materials and methods: The study encompassed 337 women aged 40–59 who participated in the mammographic examinations. An original research tool was used which assessed the level of knowledge concerning breast cancer prophylaxis, the knowledge of health-oriented behaviour in this regard and the influence of the medical personnel on women's education.
Results: Age is a factor diversifying the knowledge of the breast self-examination method. Doctors and nurses were rarely indicated as a source of knowledge concerning breast cancer prophylaxis. The subjects presented a high level of knowledge of the factors increasing the risk of developing cancer.
Conclusions: A correlation between the level of education and the knowledge of one's own breast to a degree which enables a woman to detect even a slight change was observed. Vital findings also concern the sources of knowledge concerning breast cancer prophylaxis. The results of the studies indicated little informative support on the part of the medical personnel; therefore, one should call for supplementing training courses for doctors and nurses focusing on the issues of prophylaxis, including the method of breast self-examination.

1. Background and aim

Breast cancer is the most frequent malignant tumour occurring in women in Poland. It constitutes almost 22% of the cases of all the malignant tumours and is the main – among tumours – cause of women's deaths. Thirteen percent of oncological patients die because of breast cancer. According to the data of the National Cancer Register, in 2010, 15,784 new cases of breast cancer were observed in Poland.[1] Taking into

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consideration the ageing of the population, an increase of tumour cases is predicted.[2] Every day 14 Polish women die of *breast cancer*. Every year the number of deaths exceeds 5000.[3]

The commonly used method of diagnosing the disease at an early stage of development is the mammographic examination, performed in women who do not show clinical symptoms. It has been proven that long-term studies of a population character may lead to a decrease of death rate due to breast cancer by as much as 25%.[4]

Despite information campaigns (national and local), a low participation of women in the breast cancer screening programmes has constituted a serious problem for years. According to the data of the Main Coordination Centre for the Population-Based Programme for Early Detection of Breast Cancer, only 35% of the entitled women take part in the examinations.[5]

Therefore, it is necessary to take further action focusing not only on informing women about the possibility of taking part in the examinations but also improving women's knowledge of breast cancer prophylaxis and, in a further perspective, changing women's way of thinking of the issue.

It was the diagnosis of the level to which the women in the Greater Poland region are familiar with breast cancer prophylaxis and determining vital deficits in this area that became the point of departure for undertaking this study. While designing the study and establishing the criteria for inclusion of women in the study group, the researchers decided that women between 40 and 59 years of age would become the participants of the study since the largest number of breast tumour cases occurs in women in this particular age group. The women in the 40–59 age bracket constitute over 47% of all tumour cases.

The aim of the paper was to select the factors which determine women's knowledge concerning breast cancer prophylaxis and indicate the sources of this knowledge.

2. Materials and methods

While searching for participants, the purposive sampling was used, taking into account the following criteria:

(1) age:
   (a) between 40 and 49 years of age (turning forty conditions using mammography),
   (b) between 50 and 59 years of age (women in this age group are entitled to free mammography that does not require prescription as part of the National Breast Cancer Prevention Programme).
(2) The lack of a diagnosis of a malignant breast tumour.
(3) The willingness to take part in the preventive examinations for early detection of breast cancer.
(4) A written consent to the participation in the study.

The study was conducted in the period from July to December 2010 in a group of 337 healthy women who decided to take part in the mammographic examinations in the Centre of Cancer Prevention and Epidemiology (24/26 Kazimierza Wielkiego Street, Poznan). In order to eliminate potential imperfections of the research tool, the researchers found it necessary to carry out a pilot study in advance in which 100 women took part.

The original research tool consisted of 32 questions concerning three areas:

1. The assessment of the level of knowledge in the area of breast cancer prophylaxis.
2. The knowledge of health-oriented behaviour and using it in practice.
3. The scope of education provided by doctors and nurses as far as breast cancer prophylaxis is concerned.

While preparing the questions concerning the knowledge of breast cancer prophylaxis, the recommendations addressed to women in the brochures prepared by the National Health Service and the Ministry of Health were taken into consideration. The information about breast tumour available in women's magazines was also taken into account. Moreover, it was deemed appropriate to include questions about the sources of knowledge concerning breast cancer prophylaxis and personal experience in obtaining the knowledge in direct contacts with the medical personnel.

The minimum level of significance $p < 0.05$ was assumed for the analyses. The calculations were conducted with the use of the SPSS version 12 statistical package. The detailed research aims are presented in Table 1.

The study included the following variables:

1. dependent ones: the level of knowledge concerning breast cancer prophylaxis, the knowledge of the breast self-examination method, reported knowledge of one's own breast which enables to detect even a slight change,
2. independent ones: age, education, the financial situation.

Taking into account the division into two age groups, women at the age between 50 and 59 may be said to constitute 70% of the subjects. Such a significant majority of women in the older age group should be explained by the tasks carried out by the Centre of Cancer Prevention and Epidemiology in which the studies were conducted. The Centre specialises in performing mammographic examinations as part of the National Breast Cancer Prevention Programme which is addressed to women between 50 and 59 years of age. There were 55.7% of women with secondary education, 24% with higher education, 15% with vocational secondary education and 6% with primary education. 20% of the women defined their financial situation as a good, 10% as a poor and 70% as an average.[a] At the same time, it is worth adding that such factors as: the place of residence (city/village), being a member of a specific socio-occupational group (e.g. a manager, a private entrepreneur, a service administration employee, a housewife, a pensioner), being a member of a religious group or the number of children did not have a significant influence on the results of the study.

[a] As far as the education of the women in the younger age group (40–49 years of age) is concerned, it was as follows: primary education (2.4%); vocational education (13.4%); secondary education (58.5%); higher education (25.6%).

Table 1 – Questions posed in the questionnaire addressed the potential association of: (1) age; (2) the role of the medical personnel; (3) the women's expectations; (4) the level of the women's knowledge.

1.	(a) Examining whether age is a factor which determines the knowledge concerning breast cancer prophylaxis among women aged 40–59 who decided to participate in prophylactic mammographic examinations. (b) Establishing whether age determines the sources of women's knowledge concerning breast cancer prophylaxis.
2.	Indicating the role of the medical personnel in shaping appropriate behaviour in the scope of prophylaxis.
3.	Finding women's expectations towards general practitioners and medical specialists: (a) in the scope of informing about breast cancer prophylaxis (b) in the scope of teaching the method of breast self-examination
4.	Determining the level of women's knowledge concerning the factors which increase the risk of developing breast cancer.

Source: own study.

3. Results

3.1. *The sources of knowledge concerning prophylaxis*

As was determined, age is not a diversifying factor with reference to the sources of information concerning breast cancer prophylaxis, such as: the press, TV, radio, health columns in daily papers and periodicals, women's magazines. Regardless of the age, the majority of women (64.71%) reported that they obtained information concerning breast cancer prophylaxis from the press, electronic media constituted the second vital source of knowledge (41.05% of the answers), 28.09% of the participants used women's magazines, whereas 21.36% of the subjects pointed to health columns in daily papers and periodicals as a significant source of knowledge. At the same time, women in the 40–49 age group more frequently than those in the 50–59 age group indicated the social environment as a source of knowledge concerning breast cancer prophylaxis.

On the basis of the analysis of the research material gathered, no significant correlations were found between the age of the women partaking in the study and the sources of information about breast cancer prophylaxis, such as the audiovisual media, the press, women's magazines, health columns in daily papers and periodicals.

Worth noticing is the fact that the participants of the study very rarely indicated medical personnel as a source of knowledge concerning the subject of breast cancer prophylaxis. The subjects were asked to give the sources of knowledge from which they obtain information about breast cancer prophylaxis. Among the answers (the press, TV, radio, women's magazines, health columns, family and friends, a doctor, a nurse, other) the participant could choose not more than three options. A doctor was not indicated by 59.8% of the women aged 50–59 and 55.7% of the women aged 40–49. Taking into consideration the fact that the questions did not focus on a particular speciality (general practitioner, gynaecologist, oncologist), it can be stated that the participants of the study did not obtain information concerning the threats connected with breast cancer from any of the specialists with whom they had contact in their adult lives. Nurses as sources of information about breast cancer prophylaxis were not indicated by 87.3% of the subjects aged 40–49 and 92.5% of the participants at the age of 50–59.

While indicating the role of a general practitioner in the prevention of breast cancer, the participants of the study marked the answers: 'He or she encourages me to a regular self-examination and mammography' (63%), 'He or she refers me for further examination when something worrying is happening' (45%), 'He or she examines the breasts during a medical check up' (41%), 'He or she teaches me how to self-examine the breasts' (36%).

3.2. *The knowledge of the factors which increase the risk of developing cancer*

The analysis of the material gathered does not allow the researchers to state with certainty if there is a relationship between age and the ability to identify the factors increasing the risk of developing breast cancer. However, it is worth emphasising that the women who participated in the study had a high level of knowledge with reference to the factors increasing the risk of cancer development: already experienced breast cancer (64.66% of the indications), other already experienced tumours, such as a cervix tumour, an ovary tumour, a melanoma, a large intestine tumour, a salivary gland tumour (60.78% of the indications), undergoing a radiation therapy (16.61% of indications).

3.3. *Knowledge concerning the method of early detection of changes*

The best known method for early detection of breast cancer – in the opinion of the women partaking in the study – is mammography (78% of the responses), self-examination (52%), an examination performed by a doctor (31%). Few women indicated magnetic resonance (1.2%) and computed tomography (1.2%).

It should be emphasised that a relationship between age and the knowledge of the breast self-examination method was observed – a greater knowledge in this scope was declared by the women from the younger age group (40–49 years of age).

Furthermore, it is worth noting that among the subjects who indicated a doctor as a person providing information about the method of breast self-examination, the women from the younger age group constituted 29% and the women between 50 and 59 years of age made up 71%. Moreover, a relationship between the financial situation and the sources of knowledge about the method of breast self-examination was determined – 44% of the women evaluating their financial situation as a good stated that they had learnt the method of

self-examination from a brochure or articles in a magazine; 40% of the women who reported a poor financial situation indicated a doctor as a source of knowledge; 4% of the women who evaluated their situation as average and 7% of the women satisfied with their material status stated that they had learnt breast self-examination from a family member or a friend. Only 8% of all the women participating in the study (irrespective of the financial situation) indicated a nurse as a source of knowledge in this area.

3.4. *The knowledge concerning the changes which require medical advice*

The knowledge of one's own breasts to a degree which allows a woman to detect even a slight change was declared by 30.25% of the participants of the study (women with secondary education (56%) and higher education (23.46%) predominated in this group). When asked about the character of the changes which one should pay special attention to while self-examining breasts, the women mentioned: palpable thickened areas (72.06%), bleeding or a leaking nipples (65.08%), the changes in the size or shape of one of the breasts (57.78%), holes or ulcerations of the nipple or the skin on the breast as well as changes of the shape or outline of the nipple (53.02%), changes in the appearance of the nipples, such as red marks or scabs (47.94%), changes in the colour or structure of the skin (28.25%), arm swelling (15.56%), veins which are visible through the skin more than before (10.79%).

When asked which changes require urgent medical attention although they do not have to mean a tumour, the majority of women (70.31%) checked a discharge from the nipple. Second most often selected answer was "the pain in the breast" (51.56%), then a change in the shape of the nipple (50.82%), a tuber in the armpit (47.81%), a tuber in the breast which does not change during the menstrual cycle (35.94%). For comparison, it is worth quoting the result of the study conducted among 650 women in Teheran where 60.8% of the women checked painless lesions, especially nodules, as symptoms that require medical attention, while 44.9% indicated bloody effusions on the skin. More than 70% of the participants stated that only an early detection and beginning of a therapy may end up in a full remission.[6]

3.5. *Reasons for delayed participation in medical examinations*

Among the reasons why women suffering from a tumour wait too long to visit a doctor, the following answers were chosen: 'Anxiety of the diagnosis of the disease (63.6%)', 'Fear that disturbing the tumour will cause its fast development' (44%), 'Ignoring the disease – no awareness that it is dangerous' (37%), 'Difficult access to a doctor and specialist examinations' (27%). When requested to provide statements which most accurately express what women are most afraid of in connection with the breast cancer diagnosis, the subjects of the study indicated: surgery (62%), pain and suffering (51%), disability (32%), the loss of attractiveness (29%), loneliness – rejection by the spouse (26%), being a burden to the family (25%).

4. Discussion

The incidence of breast cancer in the Greater Poland region is one of the highest in the country. In 2008, breast tumour was diagnosed in 1391 inhabitants of Greater Poland. 485 women died due to breast cancer. The data of the Greater Poland Oncology Centre shows that in the years 2001–2010 the number of diagnosed tumours increased from 1215 to 1586 (i.e. by 31%). According to the reports, the increase of the number of breast cancer cases in terms of absolute values as well as standardised coefficients should not be related to the increase of breast cancer cases but to the increase of the number of prophylactic examinations.[7] It is worth emphasising at this point that the access to prophylactic examinations and treatment in Poland is improving. This tendency is proved by a shorter waiting time for examinations and radiotherapy.[8]

The participants of the present study showed a high level of knowledge concerning the factors which increase the risk of developing breast cancer, the majority of the women could indicate the vital risk factors. Many subjects admitted that they knew the method of breast self-examination. Breast self-examination was the method most frequently used by the women who participated in a study conducted in Turkey (59.4%). The second and the third most often used methods were mammography (34%) and clinical breast examination (14.1%), respectively.[9] The necessity to inform women about the rules of performing breast self-examination (BSE) is postulated by the American Cancer Society.[10] A high value of breast self-examination was confirmed by the studies carried out in the years 1994–2004 among 822 women treated for breast cancer at St. Mary's Hospital in Waterbury (the USA). 7.7% of the women participating in the studies were below 40 years of age at diagnosis – in almost 70% the disease was detected thanks to breast self-examination. In the group of 758 women above 40 years of age, 39% observed worrying changes during self-examination. In the authors' view, the increase of breast cancer cases in women below 41 years of age require actions aimed at increasing the number of women who regularly perform breast self-examination.[11] The studies carried out among students in Malaysia show that the main barriers in the use of the breast self-examination method are: insufficient knowledge, lack of symptoms and the fear of being diagnosed with breast cancer. The authors find it necessary to organise campaigns directed at developing young women's awareness concerning the meaning of this prophylactic method.[12] The need to conduct studies aimed to identify barriers (psychological, cultural, perception and environmental factors) in using the breast self-examination method is also indicated by another Malaysian study.[13]

The study conducted in France, where breast self-examination is neither obligatory nor recommended, shows a significant increase in the number of women performing self-examination after tests for the presence of BRCA1/2 gene. The study included 217 women who were found to be the gene carriers and 317 in whom the gene did not occur. As it turned out, a year from after the test, both groups of women performed self-examination several times more frequently than before the test. It is worth emphasising that the increase of the frequency of performing self-examination

after conducting the genetic test was not related to the level of education.[14] An attempt was made to show the correlation between the level of education and the effects of training in breast self-examination in a study involving 413 Turkish women aged 20–59. The results of the study showed that the Turkish women, regardless of the level of education, need support in this area – both informative and instrumental. The authors stressed the necessity to take into consideration the level of education of the women while implementing educational programmes, which will allow to increase their effectiveness.[15] The necessity to provide women with informative and instrumental support is also confirmed in other studies which indicate that avoiding breast self-examination results, among others, from the lack of knowledge of how to perform it.[9,16] Interesting results – especially from the psychological point of view – were obtained in another Turkish study; their authors noticed namely that women in whom breast physical examinations were performed by a doctor revealed, among others, higher self-efficacy, health motivation and fewer barriers to mammography in comparison to women who did not have breast physical examinations.[17] The vital role of nurses in the process of promoting preventive behaviour, with an emphasis on the breast self-examination method, is also stressed by other authors of studies conducted in Turkey.[18]

The need to undertake educational actions in the area of breast self-examination was also shown by the study on 287 secondary school students in Abuja in Nigeria,[19] as well as studies conducted in China[20] and Northwest Ethiopia.[21] Similar conclusions were formulated on the basis of the study conducted on 474 women in Ghana – need for education is more urgent there as the women who start treatment only at the third or fourth stage of the disease constitute more than 60% of the patients with breast cancer.[22] American studies carried out in South Carolina point to the differences in breast cancer detection and mortality rate in American women of European and African origin. Larger detection is observed in the former group, whereas larger mortality rate is recorded in the latter.[23,24]

The recommendations printed in Polish brochures indicate that breast self-examination should be performed once a month. It follows from the literature that performing examinations at shorter time intervals intensifies the anxiety; cases of a false detection of a tuber have even been described.[10,25] A high frequency of performing breast self-examination is also connected with the increase of the number of visits to a doctor and, consequently, with ungrounded biopsies which are the source of additional distress.[10]

It is worth noticing that in connection with the developing market of mobile health applications, i.e. software installed in portable devices (such as smart phones or tablets), it is predicted that in the years to come breast self-examination will be replaced or supplemented by a new examination which will allow women to detect a tumour or other abnormalities at an early stage.[b]

[b] Software intended for users of mobile phones and other personal electronic devices (e.g. tablets).

The potential benefits connected with the use of applications installed in smart phones whose aim is to detect abnormalities in the breast structure (after self-examination) are indicated e.g. by a Korean study.[26] As early as in 2012, Apple offered 9000 mobile applications related to health, e.g. the Skin Scan which enables women to scan and analyse birthmarks and – depending on the result – indicates a need for a visit to a dermatologist. More than 1500 programmes allow people to examine health parameters while exercising and about 1300 programmes support various diets. Almost a thousand applications were designed for people interested in stress management and relaxation techniques. As shown in the literature, 650 programmes are addressed to women.[27] It is estimated that the value of the market of mobile health applications will reach 4.1 billion dollars in 2014. The authors of the study conducted on 156 women living in rural areas (divided into two groups – Spanish women and women of different origin) suggest that doctors and other health education specialists should use mobile devices (applications) in order to promote the knowledge concerning breast cancer prophylaxis.[28] Another form of awareness raising, which has been used for years, are events held with the aim to show the possibility of taking part in prophylactic examinations and contact with experts (e.g. a dietician, diabetes experts, dermatologist). American authors, on the basis of the literature review, indicated a few categories of meetings including: doctors' presentations, contact with lawyers specialising in health care protection issues, talks with former oncological patients. The meetings were not only of an educational nature but they also offered a possibility of partaking in screening examinations for the most frequent tumours.[29]

In order to increase women's participation in the Breast Cancer Prevention Programme, the Ministry of Health proposed the introduction of obligatory cytology and mammography within occupational health care.[30] This project initiated a public debate in which the opinions expressed by the post-mastectomy women were most frequently quoted – these women supported the proposal of raising public awareness and gaining personal experiences through contacts with people in whom the disease was detected at an advanced stage. A disparate point of view was presented by the feminists for whom the introduction of the obligation would mean a violation of patients' rights and the Medical Profession Act which stipulates that every medical procedure must be preceded by patient's consent. The feminist community criticised the guidelines according to which the examinations were to concern only the women who begin work or are already employed, while disregarding others (unemployed, housewives, self-employed, farmers).[31]

Referring to the results of our own studies, it should be noted that women very rarely mentioned medical personnel as a source of knowledge concerning breast cancer prophylaxis – nearly 60% of the participants aged 40–49 and 57% of women aged 50–59 did not indicate a doctor as a source of information in breast cancer prophylaxis. In this context, it is difficult to say that the information asymmetry in the medical personnel-patient relationships, also observed by other authors, is decreasing.[32] Trying to understand this fact with reference to breast cancer, one may also refer to the studies evaluating doctors' knowledge concerning tumours

and prophylaxis carried out by the Institute of Epidemiology and Prophylaxis of the Greater Poland Oncological Centre.[c] As it turned out, only 1/3 of the doctors from the Greater Poland region decided that mammography is the best form of screening for early detection of breast cancer, whereas as many as 2/3 of the doctors indicated breast self-examination. In the opinion of the authors of the studies quoted, doctors' knowledge in this regard should be improved.[33] It is a matter of concern that in the group of 268 doctors partaking in the study only 4 correctly indicated the age bracket in which mammography should be performed. There were answers suggesting that the optimal age to begin preventive mammography is 18, 20 and 25.[33] While discussing the sources of information concerning breast cancer prophylaxis, it is worth adding that the nursing personnel were also very rarely indicated. It means that the tasks of a district nurse, who is responsible for health promotion, are not performed in the right way.[34]

5. Conclusions

1. The women aged 40–59 can list the factors which increase the risk of developing breast cancer as well as the changes the occurrence of which should arouse anxiety and motivate to a visit to a doctor.
2. The level of education is a significant factor determining both the level of women's knowledge concerning breast cancer prophylaxis and their expectations towards doctors as specialists who encourage them to perform breast self-examination and undergo mammographic examination.
3. It is necessary to call for introducing changes in the series of postgraduate trainings for doctors and nurses. The curriculum should include the issues concerning breast cancer prophylaxis, which would include providing informative and instrumental support (breast self-examination briefing).

Conflict of interest

None declared.

Financial disclosure

None declared.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.rpor.2015.06.001.

[c] The study "Tumour prophylaxis – a study among doctors" was conducted in the third quarter of 2007 in a group of 4203 doctors across the country. In the Greater Poland region, 268 doctors took part in the study. GPs constituted the most numerous group (83 subjects). It is worth taking note of the specialists in gynaecology and obstetrics who participated in the study (22 subjects). The project was carried out by the Laboratory of Social Studies.

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