An analysis of selected health behaviours of women as breast cancer risk factors

Analiza wybranych zachowań zdrowotnych kobiet jako czynników ryzyka raka piersi

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Summary

Introduction: Health behaviours are the most important factor conditioning human health in approx. 50%. Also in cancer prevention the behaviours which women can have impact an on are crucial.

Aim of the study: An attempt to diagnose selected health behaviours as breast cancer risk factors and to determine their scale using the Health Behaviour Inventory.

Material and methods: The survey was carried out among 566 women from the Lubelskie Voivodeship in a period from March to November 2007. 37.5% of the surveyed were patients of 4 Lublin hospitals (group 1), while 62.5% accounted for healthy women, selected at random (group 2). To diagnose and assess health behaviours' scale, a standardised research tool – the Health Behaviour Inventory, and the questionnaire were applied. Differences in the groups were significant when $p \leq 0.05$.

Results: The survey shows that overweight and obesity, alcohol abuse and low physical activity at work were significantly more frequent in women with cancer than in healthy women. No statistically significant differences were identified in consuming cereal products, fruit and vegetables, vegetable oils, fish, poultry, red meat and legumes. Passive forms of leisure were the most popular free-time activities. Women with cancer presented the declared health behaviours at a larger scale, including preventive behaviours and a positive mental attitude.

Conclusions: The following breast cancer risk factors were found: overweight and obesity, alcohol abuse and low physical activity at work. A larger scale of declared health behaviours considerably more often concerned women after mastectomy than healthy women.

Key words: breast cancer, risk factors, health behaviour.

Streszczenie

Wstęp: Zachowania zdrowotne są najistotniejszym czynnikiem, warunkującym w ok. 50% zdrowie człowieka, również w profilaktyce raka piersi te zachowania, na które kobieta ma wpływ, zajmują istotne miejsce.

Cel pracy: Próba zdiagnozowania wybranych zachowań zdrowotnych kobiet jako czynników ryzyka raka piersi oraz określenie ich natężenia za pomocą *Inwentarza zachowań zdrowotnych*.

Materiał i metody: Badaniami objęto grupę 566 kobiet z terenu województwa lubelskiego w okresie od marca do listopada 2007 r. Wśród badanych 37,5% stanowiły pacjentki 4 lubelskich szpitali (grupa 1), 62,5% kobiet zdrowych wybrano z populacji w sposób losowy (grupa 2). Do zdiagnozowania i oceny natężenia zachowań zdrowotnych wykorzystano standaryzowane narzędzie badawcze *Inwentarz zachowań zdrowotnych* oraz kwestionariusz ankiety. Różnice w badanych grupach były istotne w przypadku, gdy $p \leq 0,05$.

Wyniki: Z badań wynika, że nadwaga i otyłość, nadużywanie alkoholu oraz niski poziom aktywności fizycznej w zakresie wykonywanej pracy dotyczył istotnie częściej kobiet chorych niż zdrowych. Nie stwierdzono istotnych różnic statystycznych w zakresie spożycia produktów zbożowych, owoców i warzyw, olejów roślinnych, ryb, drobiu, czerwonego mięsa oraz roślin strączkowych. Najczęstszą formą aktywności w wolnym czasie są bierne formy odpoczynku. Kobiety chore prezentowały wyższe nasilenie deklarowanych zachowań zdrowotnych, także w obszarze: zachowań profilaktycznych i pozytywnego nastawienia psychicznego.

Wnioski: Stwierdzono występowanie takich czynników ryzyka raka piersi, jak: nadwaga i otyłość, nadużywanie alkoholu, niski poziom aktywności fizycznej związany z wykonywaną pracą. Wyższe nasilenie deklarowanych zachowań zdrowotnych dotyczyło istotnie częściej kobiet po mastektomii niż kobiet zdrowych.

Słowa kluczowe: rak piersi, czynniki ryzyka, zachowania zdrowotne.

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Introduction

Breast cancer is one of the most frequent malignant tumours diagnosed in Polish women; approx. 13% of women in Poland die because of this disease [1-4]. Breast cancer risk factors include age, family and hereditary predispositions, and hormonal factors [5-10].

Environmental risk factors associated with lifestyle, which can be modified or eliminated within breast cancer prevention, are also extremely important [2]. Lifestyle-related risk factors include a diet rich in animal fats and red meat, the lack of physical activity during leisure time, drinking high-proof alcohol, obesity, in particular of the abdominal type, especially in the postmenopausal age. In turn, a diet rich in fruit and vegetables and regular physical activity substantially reduce the risk of breast cancer [11]. The lack of knowledge is also considered a risk factor; therefore, increasing women's health-related awareness may lead to eliminating or modifying risky behaviours, simultaneously decreasing the risk of breast cancer [10].

Aim

To diagnose selected health behaviours as breast cancer risk factors and determine their scale with the use of the Health Behaviour Inventory.

Material and methods

The survey was carried out among 566 women from the Lubelskie Voivodeship in a period from March to November 2007. 37.5% of the surveyed (n = 212) were women after mastectomy – patients of St. John's Oncology Centre, Independent Public Clinical Hospital No. 1, the Voivodeship Specialist Hospital and the Institute of Rural Health, whereas 62.5% (n = 354) accounted for healthy women, selected at random from the population. In the subsequent parts of the study, group 1 means women with cancer and group 2 – healthy women.

To diagnose and assess health behaviours' scale, a standardised research tool – the Health Behaviour Inventory (HBI) by Z. Juczyński was applied, specifying the general scale of health behaviours (HB) and their level in the following categories: proper nutritional hab-

its (NH), preventive behaviours (PB), health practices (HP), and a positive mental attitude (PA). The tool consists of 24 statements assessed on a scale from 1 to 5 (1 meaning hardly ever and 5 – nearly always). Raw values (within the range of 24-120 points) were converted into standardised units in the standard ten scale and the results were interpreted in the following categories: low (sten score 1-4), medium (sten score 5-6) and high (sten score 7-10). The scale of the four categories of health behaviours was calculated as an average score in each category. Questions included in the questionnaire concerned obesity, nutrition, alcohol consumption, physical activity at work and preferred forms of leisure. In the study, the χ^2 homogeneity test and Student's t-test were applied. Differences in the surveyed groups were significant when $p \leq 0.05$.

Results

The average age of women in group 1 was 53.88 (SD = 9.19), while in group 2 it was 44.32 (SD = 8.04). Body mass index (BMI) was specified based on the results of anthropometric measurements such as height (cm) and body weight (kg). Differences in the surveyed groups were significant within the average BMI values (26.54 for group 1 (SD = 4.07) and 24.82 for group 2 (SD = 3.88), (p < 0.05) (Table I).

Table II presents the differences in the self-assessment of nutritional habits of the surveyed women. Women with cancer significantly more often than healthy women declared that their nutritional habits were consistent with the principles of healthy diet (group 1 – 65.1%, group 2 – 54.5%), (p < 0.01) (Table II).

Qualitative errors in nutrition did not constitute a statistically significant differentiating factor between the two groups of women (p > 0.05). Most of them (group 1 – 73.6%, group 2 – 77.1%) stated that they most often prepared their meals by boiling, and slightly more women in the first group still fried and roasted their meals (16% and 13.9% in the two groups, respectively) (Table III).

Body mass index turned out to be a differentiating factor between the surveyed groups with a high level of significance (p < 0.001). Overweight was identified in 46.2% of cancer patients and 34.2% of healthy women, while

Table I. Descriptive statistics for the surveyed population characteristics

Parameter	Group 1		Group 2		t	p-value
	M	SD	M	SD		
age	53.88	9.19	44.32	8.04	5.48	< 0.001
height	163.30	6.05	163.59	5.99	0.49	> 0.05
body weight	70.80	11.52	66.48	11.29	1.87	> 0.05
BMI	26.54	4.07	24.82	3.88	2.14	< 0.05

BMI – body mass index

Table II. Self-assessment concerning nutrition in the surveyed women's population

Nutrition	Group 1 (n = 212)	Group 2 (n = 354)	χ^2	p-value
	%	%		
excessive amounts	19.8	18.1		
according to the rules	65.1	54.5	11.55	< 0.01
poor	15.1	27.4		

the percentage of obese women, regardless of its degree, was 19.4% in group 1 and 8.5% in group 2 (Table IV).

Daily consumption of recommended cereal products (bread, pasta, groats, rice) did not constitute a substantial differentiating factor between the surveyed groups ($p > 0.05$). No differences were found in terms of consumption of other products such as fruit and vegetables, vegetable oils, fish, poultry and red meat ($p > 0.05$). A considerable majority of women limited the consumption of legumes (group 1 – 84.4%, group 2 – 89.5%).

A history of alcohol abuse is among breast cancer risk factors. Women with cancer significantly more often had a history of alcohol abuse than healthy women ($p < 0.001$). This fact was confirmed by 10.4% of women with cancer and 2.5% of healthy women. Most of the surveyed women admitted occasional alcohol consumption (68.9% and 91.8% in the groups, respectively).

Another breast cancer risk factor differentiating the investigated groups was physical activity and lifestyle associated with the women's profession/duties ($p < 0.001$). A low level of physical activity in the surveyed field was a factor significantly differentiating the groups (1 – 75.9%, 2 – 42.4%) (Table IV).

No statistically significant differences were found in the preferred forms of leisure ($p > 0.05$). The most frequent forms of leisure practised by the surveyed women were divided into two groups: passive (reading newspapers/magazines, watching television) and active (working in the garden, riding a bicycle, sports or any other form of leisure involving physical activity). Passive

Table III. The method of meal preparation in the surveyed women's population

Meal preparation	Group 1 (n = 212) %	Group 2 (n = 354) %	χ²	p-value
boiling	73.6	77.1		
frying/roasting	16.0	13.9	0.90	> 0.05
simmering without frying	10.4	9.0		

Table IV. The selected breast cancer risk factors in the surveyed women's population

Risk factors %		Group 1 (n = 212) %	Group 2 (n = 354) %	χ²	p-value
BMI	normal	34.4	57.3		
	overweight	46.2	34.2	14.27	< 0.001
	obesity	19.4	8.5		
cereal products	yes	29.7	26	0.93	> 0.05
	no	70.3	74		
fruit and vegetables	yes	70.6	63.6	3.07	> 0.05
	no	29.4	36.4		
vegetable oils	yes	32.1	31.4	0.032	> 0.05
	no	67.9	68.6		
fish	yes	20.3	15.3	2.36	> 0.05
	no	79.7	84.7		
poultry	yes	50.5	44.9	1.64	> 0.05
	no	49.5	55.1		
red meat	yes	54.7	57.1	0.30	> 0.05
	no	45.3	42.9		
pulses	yes	15.6	10.5	3.20	> 0.05
	no	84.4	89.5		
alcohol consumption	yes, occasionally	68.9	91.8		
	yes, every day	0.0	0.0	50.20	< 0.001
	yes, in the past	10.4	2.5		
	no	20.7	5.7		
physical activity at work	yes	24.1	57.6	60.36	< 0.001
	no	75.9	42.4		
physical activity unrelated to work/form of leisure	active	40.1	43.2	0.53	> 0.05
	passive	59.9	56.8		

Table VI. Descriptive statistics for the analysed variables in the surveyed groups of women

Parameter	Group 1		Group 2		t	p-value
	M	SD	M	SD		
HB	86.27	11.74	79.26	13.17	2.78	< 0.01
STEN	5.77	1.67	4.81	1.75	2.77	< 0.01
proper nutritional habits (NH)	3.55	0.68	3.31	0.70	1.72	> 0.05
preventive behaviours (PB)	3.62	0.62	3.34	0.71	2.08	< 0.05
health practices (HP)	3.61	0.56	3.42	0.63	1.58	> 0.05
positive mental attitude (MA)	3.60	0.65	3.16	0.65	3.35	< 0.01

HB – the general index representing the scale of health behaviours; STEN – standard ten score

leisure was reported by 59.9% of women in group 1 and 56.8% of women in group 2 (Table IV).

Table V presents data on particular forms of leisure: reading newspapers and magazines (group 1 – 27.8%, group 2 – 30.5%), watching television (group 1 – 32.2%, group 2 – 26.4%) and working in the garden (22.6% and 23.4%, respectively) were the most often selected answers.

During the analysis of the women's health behaviours with the use of the Health Behaviour Inventory, statistically significant differences were found in the average values of the general scale of health behaviours (HB) – group 1 – 86.27 (SD = 11.74), group 2 79.26 (SD = 13.17) and the scale of health behaviours in sten scores – 5.77 (SD = 1.67), and 4.81 (SD = 1.75), respectively ($p < 0.01$). In terms of specific categories of behaviours conducive to health, the average values of the analysed preventive behaviours and positive mental attitude significantly differentiated the surveyed groups of women. However, it is worth pointing out that in each of the surveyed categories of health behaviours, the average values were higher in the case of women with cancer than healthy women. Detailed data on this part of analysis are presented in Table VI.

Discussion

Overweight and obesity are associated with the risk of breast cancer and other hormone-dependent neoplasms. The risk of breast cancer in obese women, especially after menopause, is approx. 3 times higher than in slim women [12, 13]. In studies on the European population, 15-45% of women with cancer were overweight or obese [14].

The authors' own study on breast cancer risk factors confirms statistical differences both in the average BMI values and the presence of overweight or obesity. In studies on the Chinese population regarding breast cancer risk factors, average BMI values were lower (for the two groups 23.77 ±3.6; 23.21 ±2.93, respectively). Differences in the authors' own study concerning overweight and obesity are substantially higher ($p < 0.001$) than in the research of the Chinese population ($p = 0.05$) [15].

The results of the meta-analysis conducted in the Chinese population have identified a 7.7% higher risk of breast cancer in women with overweight or obesity [16].

In obese women, especially after menopause, apart from the increase in the risk of this type of cancer there are more diagnosis-related difficulties, the risk of complications during treatment, generalisation of the disease and death, as well as an increased risk of cancer in the other breast. Obesity may also have a negative impact on the prospects for women with favourable prognosis factors. The risk of death within 5 years following diagnosis in obese women with breast cancer is 2.5 times higher than in slim patients [17].

The protective influence of diet in breast cancer prevention has not been determined, and survey results are inconclusive. There is no consistent view presented in the literature on the subject concerning the frequency of consumption of recommended products in order to determine the frequency and formulate a proper recommendation. In the survey conducted, the recommended product consumption was not a factor significantly differentiating the surveyed groups. Despite the lack of such differences, a higher tendency for pro-health behaviours is observed in group 1 (except for red meat consumption), with a prevalence of such behaviours in group 2.

The first studies assessing the influence of the frequency of fruit and vegetable consumption on breast cancer risk in Polish women, also including other elements of lifestyle, is a report by Kruk, according to which

diet rich in fruit and vegetables significantly reduced the risk of cancer, and an evident correspondence was identified between the lowering of the risk and the increase in consumption of these products ($p < 0.001$) [11]. The authors of studies on the connection between vegetarian diet and breast cancer have shown that the risk decreases together with an increase in consumption of fresh fruit and vegetables [18]. Fruit and vegetables are the main source of folic acid, however, no definite positive influence of foliates on the risk of cancer was found, but attention was drawn to the fact that the risk was lowered in women who abused alcohol [19].

The most recent studies on the type of diet recommended in breast cancer prophylaxis point to the high consumption of fruit and vegetables, wholemeal products and lean meat [20].

The review of the literature on the subject leads to a conclusion that there is a tendency pointing to an increased oestrogen concentration and the risk of breast cancer combined with the growth in consumption of total fat, saturated fat acids and polyunsaturated n-6 acids. The studies show that n-3 acids protect against breast cancer, although there are no conclusive studies in this area. The results of epidemiological studies indicate that limiting the amount of fats in diet to 15-20% of total daily energy supply in women with nipple cancer has a positive impact on prolonging the patients' lives [21].

A history of alcohol abuse turned out to be among breast cancer risk factors in the surveyed group of women. None of the women participating in the authors' own study stated that they consumed alcohol every day. However, it should be borne in mind that there is a tendency to report a lower amount of consumed alcohol and that alcohol drinking by women is generally received in a reproachful way. Ethanol has a cancerogenic effect on estrogens and their metabolites, influencing the neoplastic process in hormone-dependent tissues. The risk increases when regular alcohol consumption is combined with limited physical activity and low beta-carotene consumption. Drinking alcohol is directly related to cancer in women after menopause. The results point to a direct connection between women's hormonal state, alcohol consumption and a predisposition for breast cancer [22].

Current reports do not specify the general threshold below which drinking alcohol is safe. The risk of the disease increases together with the growth in alcohol consumption. The most recent data show that women should not exceed the amount of one drink per day, and women with an increased risk should avoid alcohol in general or drink only sporadically [23, 24].

The literature on the subject discusses the issue of physical activity as a factor contributing to keeping the proper body weight, at the same time limiting the risk of breast cancer. The analysis of the authors' study in terms of lifestyle conducive to physical activity supports the conclusion that the level of physical activity is higher among healthy women. Within their spare time the respondents selected passive forms of leisure, and none of the women with cancer reported practising sports in their leisure time; the percentage among healthy women was scarce. The results obtained by Kruk demonstrated that there were considerably more women spending their time actively in the control group than in the group of women after mastectomy [11]. In studies in this field, the average reduction in breast cancer risk was 25%, when comparing women with the highest level of physical activity to those who were the least active. The strongest correspondences were found in terms of recreational and household activity, which was at least moderate and lasted throughout the surveyed women's lifetime [25].

The literature concerning the measurement of health behaviours using Juczyński's HBI comprises no publications demonstrating such correspondence in the area of breast cancer preventive behaviours. The results of the authors' own study were compared with the provisional average values for Poland provided by the author of the HBI, where the health behaviour index is the most similar in relation to the women in the menopause age (85.98) [26]. The result of the general scale of health behaviours in the authors' own study was the closest to the studies carried out with the use of the HBI among overweight and obese women (86.34) [27]. Other studies concern persons after cardio-surgical procedures (83.21) [28] and persons with type 1 diabetes (84.29) [29]. The highest level concerned persons with type 2 diabetes (92.92) [30], which is confirmed by the average results of Juczyński's normalisation group (92.44). The research results concerning the scale of declared health behaviours may suggest that the disease, disability, the quality of life after the surgery, and perhaps the will to live caused women to display more frequently the declared health behaviours in the form of preventive behaviours and a positive mental attitude.

The average values for these categories of behaviour were the most similar to Kurowska's research concerning the measurement with the use of the HBI after cardio-surgical procedures.

To recapitulate, it is difficult to definitely determine the influence of specific health behaviours and to evaluate the risk of cancer. The same applies to knowledge itself – declarations do not necessarily reflect its level; for instance, declaring the ability to perform self-examination does not mean that that the person knows how, or that the examination is actually performed. The weak point of the above research is the analysis of only selected risk factors, so actions should be taken to build pro-health awareness of women and influence the modifiable risk factors. Emphasis should also be put on secondary prevention, directed at early detection of lesions before clinical symptoms occur, thus reducing the mortality due to breast cancer.

Conclusions

The following breast cancer risk factors were found: overweight and obesity, a history of alcohol abuse, a low level of physical at work. These behaviours were considerably more often found in women after mastectomy than healthy women.

The larger scale of declared health behaviours significantly more often pertained to women with cancer.

Women with cancer more often presented pro-health behaviours in the area of preventive behaviours and a positive mental attitude.

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