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EXPLORING FACTORS PREDICTING WOMEN'S PARTICIPATION IN CANCER PREVENTION SCREENING

Background: The main areas of prophylaxis in oncology are the identification and elimination of factors that favor the formation of cancer cells, as well as early diagnosis of already formed lesions. The aim of this paper was to search for variable factors influencing women's decisions concerning prophylaxis. **Methods:** The questionnaires used included our own and standardized research. The research group consisted of 100 dyads. **Results:** All significant predictors were associated primarily with factors located on the female side. The only predictor on the side of men was their knowledge about women's cancer diseases. The frequency of taking preventive examinations for early diagnosis of cancer increased when the level of anxiety about one's own health was higher, and when the partner's support for preventive examinations was higher. **Conclusions:** The predicting factors identified in our study might be included in the development of cancer prevention action strategies by public health institutions.

Keywords: women's cancer prevention, dyads, support, health.

1. INTRODUCTION

The epidemiological situation regarding the incidence of cancer in women is not optimistic [National Cancer Registry..., [http;](http://) Markowska, Mądry, 2014; Youlden, Cramb, Dunn et al., 2012; Szkiela, Worach-Kardas, Marcinkowski, 2014]. The global aging of society additionally influences the increase in the number of new patients. The health policy of many countries includes cancer prevention and counteracting cancer in its main objectives [Gail, Pfeiffer, 2018]. In Poland, already since 2007, the Population Screening Program for Early Detection of Breast Cancer has been operating; it is aimed at women aged 50–69 years who do not have malignant breast cancer and have not undergone any treatment; it is reimbursed by the National Health Fund. The testing frequency and the

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selection of the age group of women in the national population screening are in accordance with the guidelines of the European Union.

The main areas of prevention in oncology are the recognition and elimination of factors that promote the formation of cancer cells, as well as an early diagnosis of already formed lesions [Tkaczuk-Włach, Sobstyl, Jakiel, 2012; Sun, Zhao, Yang, Xu, Lu, Zhu, Shi, Jiang, Yao, Zhu, 2017; Kolak, Kamińska, Sygit, Budny, Surdyka, Kukielka-Budny, Burdan, 2017; Borgquist, Hall, Lipkus, Garber, 2018; Gałuszka-Bednarczyk, Kiałka, Milewicz, Mrozińska, Dobosz, Janeczko, 2016; Kalliguddi, Sharma, Gore, 2019]. Although an increasing number of people is observed to be consciously taking preventive examinations, mammography and cytology, it is still not an optimal attendance [Najdyhor, Krajewska-Kułąk, Krajewska-Ferishah, 2013; Dahlui, Ramli, Bulgiba, 2011]. The low rate of women's participation in prophylactic examinations is confirmed in a study by Najdyhor et al [Najdyhor, Krajewska-Kułąk, Krajewska-Ferishah, 2013], where the vast majority of women have had neither mammography – 74% – nor breast ultrasound examination – 67% – in the 12 months preceding the examination. The results of Paździor et al. indicate that only 36% of the surveyed women performed regular breast self-examinations [Paździor, Stachowska, Zielińska, 2011], while Podolska confirms the respondents' insufficient participation in prophylactic tests for cervical cancer [Podolska, 2013].

Having knowledge about the prevention does not guarantee pro-health choices. Also, the fact of a better prognosis in the case of an early detection of lesions does not directly influence the women's choices. The conducted studies confirm that women were aware of the importance of prophylactic breast examinations, yet they performed them unsystematically [Dahlui, Ramli, Bulgiba, 2011; Paździor, Stachowska, Zielińska, 2011; Karczmarek-Borowska, Strykowska, Grądalska-Lampart, Grybel, 2013; , Ślusarska, Nowicki, Łachowska, Piasecka, Marciniak, 2016].

Therefore, after a thorough analysis of the available literature, the authors of this article took up the challenge to identify the variables that influence women's decision-making about prevention and, as a result, about life or its quality. Men were also invited to participate in the study. We assumed that their attitude, knowledge, and actions could have a significant impact on the women's choices.

2. MATERIALS AND METHODS

The study was designed to include the participation of women and their partners. The diagnostic survey method was used. The research technique was a questionnaire. The research tools were the author's questionnaire for socio-demographic assessment (which included a different set of questions for women and men) and standardized tools:

- Berlin Social Support Scale (BSSS) [Łuszczyńska, Kowalska, Mazurkiewicz, Schwarzer, 2006], to measure the cognitive and behavioral dimensions of social support,
- Health Anxiety Questionnaire (HAI-18) to estimate the severity of hypochondriacal attitudes,
- Illness Perception Questionnaire (IPQ-R), used to determine the respondents' beliefs about cancer,
- Health Opinion Questionnaire to assess the beliefs about health and its function in the life of the contemporary human beings,
- The statistical analysis methods were applied using the STATISTICA program.

The assumptions and implementation of the research project included the principles of good academic research practice, particularly the protection of the participants. Participation in the study was voluntary and anonymity was provided.

Each couple received a packet: a questionnaire for the woman and a questionnaire for the man, information on the study, instructions for completing the questionnaire, and an unmarked envelope. After completing the questionnaires, the respondents placed them in the envelope and sealed it, which guaranteed that each envelope contained data from one couple. Once the envelope was opened, both forms were coded with the same code for the female and the male version.

The requirements for including the couples in the study were: being in a formal or informal relationship for at least 1 year, no professional ties to the medical field, good health, and no contact in the immediate environment with people diagnosed or treated for cancer.

3. RESULTS

3.1. Characteristics of the study group

The study included 200 individuals, i.e., 100 female-male dyads, living in Poland.

The characteristics of the subjects in terms of the sociodemographic data are shown in Table 1.

Table 1. Group characteristics regarding sociodemographic data

Sociodemographic data	Women (<i>n</i> =100)	Female partners (<i>n</i> =100)
Age [years]		
<i>M (SD)</i>	40.07 (12.01)	42.58 (12.09)
<i>min – max</i>	18-70	24-79
Place of residence [%]		
Country		56
City		44
Education [%]		
Elementary	2	4
Vocational	30	21
High school	5	28
Higher	63	47
Employment status [%]		
Working	75	85
Unemployed	17	5
Pensioner	8	10
Nature of relationship [%]		
Married		82
Informal relationship		18
Relationship seniority [years]		
<i>Mean (SD)</i>		16.04 (12.19)
<i>minimum – maximum</i>		1-51

Source: authors' own research.

Men were slightly older than their female partners ($t=-7.65$; $p<0.001$). Both women and men most often declared higher education and working professionally. The vast majority of relationships, 82% of respondents, were married couples with an average relationship duration of 16 years.

3.2. Findings based on the analysis of research tools

In our study, only 19% of women took preventive tests according to the recommendations, 21% of women estimated that they generally followed the rules, but without attachment to the time of performance. As many as 42% of women performed examinations infrequently, while 11% not at all.

Based on the obtained results, it may be stated that only 26% of the women have had a prophylactic examination for early detection of breast cancer within the last year, while one third have had a test for cervical cancer. It is noteworthy that 52% of the surveyed women admitted that they had other preventive examinations than those related to female cancer. However, 25% of women did not have any examinations within the last 12 months.

At the same time, the respondents were convinced that preventive tests were very effective. The most frequently chosen answer was the one with the highest effectiveness of the examinations. Only 4 participants claimed that these tests are not effective, and 18 people thought that the effectiveness of these tests was moderate. The respondents rated their own involvement in taking care of their health relatively highly: more than half (54%) believed that they were very involved in taking care of their health. Only 12 female participants declared that they did not care about their health (Table 2).

Table 2. Women's opinions on the effectiveness of preventive screenings in cancer prevention

Women's opinions	Descriptive characteristics					
	Mean	standard deviation	minimum	max	Median	Modal
Effectiveness of preventive testing	7.81	2.13	0	10	8	10
Commitment to taking care of your own health	6.67	2.03	1	10	7	8

Notes: n=100.

Source: authors' own research.

An important factor, following our research assumptions, was the participation of men in cancer prevention of their female partners. According to the women, their partners tended to try to take care of their overall health. Little or no involvement of men in caring for their partners' health was indicated by 24% of the women surveyed. 45% of men were assessed as moderately involved, while 31% were very involved in caring for their partners' health.

When it comes to motivating their women to get preventive screenings, only 11% of men were very actively involved. The majority of partners were either very rarely interested in these tests (39%), or occasionally mentioned the issue of performing them (39%). The remaining men were not at all interested in the preventive tests recommended for their female partners.

Partners' participation in women's preventive screenings consisted primarily of asking about the results of the screening (30%). 17% of partners were reminding about the necessity of the examination, and also 17% of men accompanied their partners during the examination. The lack of any form of participation of men was indicated by 36% of women.

As many as 61% of women declared that they would perform preventive examinations if their partner motivated them to do so. For 30% of female respondents it did not matter, while 9% declared that they would not perform these tests under the influence of their partners.

Being reminded and motivated by their partners were the behaviors most often indicated as favorable for taking preventive tests by women (23%). This was followed by a conversation and emphasizing the importance of examinations (15%) and accompanying the woman during these tests (8%). Other men's behaviors, related to modeling by their own example, caring for the family, or expressing love, were indicated as only occasionally motivating women to take preventive examinations. A comparison of men's and women's opinions on men's involvement in preventive screenings is presented in Figure 1.

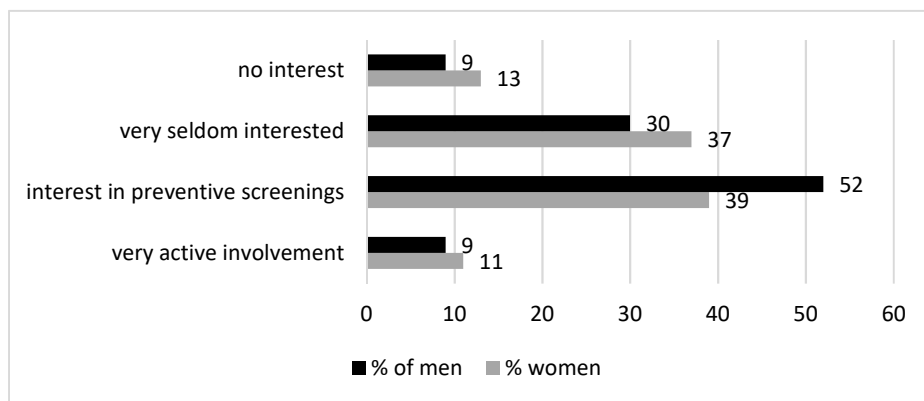


Figure 1. Men's involvement in women's preventive screenings as perceived by male and female respondents

Source: authors' own research.

The male respondents believed that regular preventive screenings are very important in the early diagnosis and treatment of cancer ($M=8.38$; $SD=1.92$; $Me=9$; $Mo=10$; $min-max = 1 - 10$). The response most frequently indicated was the one that suggested a full belief that such screenings are significant.

According to the men, their female partners were committed to taking care of their health ($M=6.87$; $SD=2.38$). The responses of the male partners indicated that 45% of the women were very concerned about their health, while 27% were moderately concerned about their health. Only in 18% of the ladies the involvement was described as poor or a completely lacking action in this matter.

Almost one third of the men surveyed (30%) declared that they knew how to perform a breast self-examination. Simultaneously, 57% of them were convinced that their female partner could perform the examination correctly, while 37% did not know whether she knew

the rules of breast self-examination. Almost 38% of the men declared that the woman regularly performed breast self-examination, and 44% believed that their female partners regularly performed gynecological examinations.

An analysis of the cognitive image of cancer among men and women allowed us to search for correlations and their influence on women taking up preventive examinations. The respondents tended to perceive cancer as a chronic process, poorly understood, characterized by many negative consequences in the daily functioning of the sick person and their emotional state. The participants believed that there was a moderate possibility of influencing the course of the cancer disease by one's own activity. The effectiveness of medical treatment was also assessed as moderate. Men observed fewer health complaints in their female partners than the women did themselves. Meanwhile, they more frequently considered these complaints as symptoms that might be a manifestation of cancer. However, these differences did not reach the level of statistical significance. No significant differences were observed between women and men in the individual dimensions of the image of cancer (Table 3).

Table 3. Cognitive image of cancer in men and women

Image of cancer	Group	Descriptive statistics				Comparison of women vs men [p]
		Mean	SD	min	max	
Number of discomfort complaints experienced	K	6.00	1.38	0	13	0.195
	P	5.58	3.04	0	14	
Number of complaints experienced that might be a symptom of cancer	K	1.38	2.25	0	9	0.092
	P	1.89	2.94	0	13	
Duration and intensity (acute/chronic)	K	21.45	3.30	15	30	0.958
	P	21.43	3.17	15	30	
Consequences of the condition	K	25.16	3.20	14	30	0.064
	P	24.44	3.00	17	30	
Personal impact on the course of the disease	K	20.00	3.69	8	30	0.239
	P	19.45	3.61	8	27	
Effectiveness of treatment	K	17.20	2.82	10	25	0.953
	P	17.18	2.47	10	24	
Comprehensibility	K	13.86	4.34	5	25	0.983
	P	13.85	4.50	5	25	
Cyclical/ recurrence	K	13.80	1.93	10	18	0.144
	P	13.42	2.28	6	20	
Impact on emotions	K	24.50	3.82	13	30	0.38
	P	24.13	4.07	12	30	

Notes: nK=100; nM=100; K – female; P – partner.

Source: authors' own research.

The level of health anxiety due to cancer in the study group was moderate for both genders (K-33.03; M-31.22). Women showed a slightly higher hypochondriacal attitude than men, but this difference did not reach the level of statistical significance.

An important factor in taking care of one's health is knowledge about the topic. Figure 2 shows the men's assessment of their knowledge of "female cancer" issues.

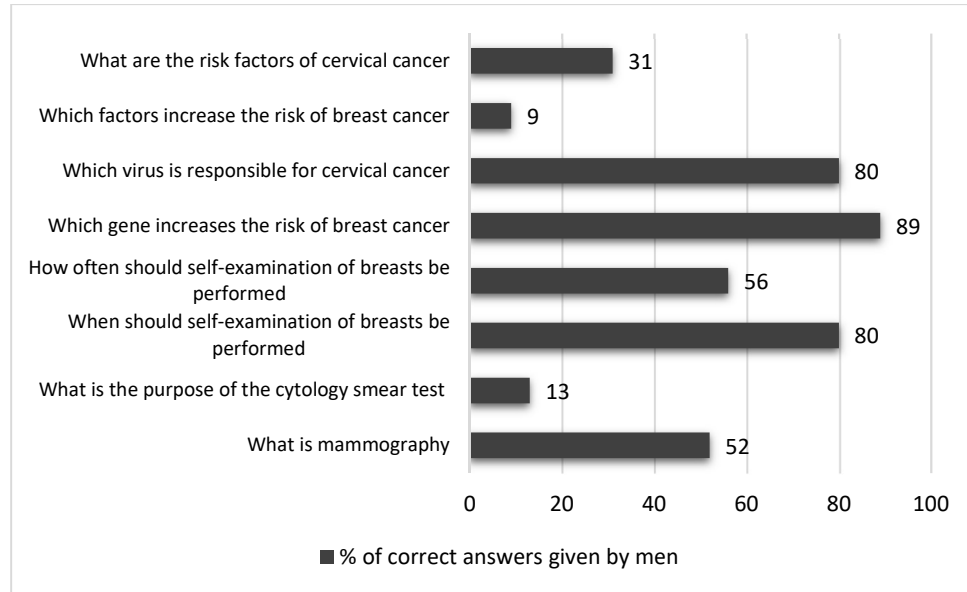


Figure 2. Men's knowledge of breast and cervical cancer

Source: authors' own research.

The men drew their knowledge primarily from Internet sources and from friends. A relatively small percentage of men (7–16%) used professional sources of information (doctors, nurses, medical publications).

To verify the correlations between the men's knowledge of breast and cervical cancer prevention and health-seeking behaviors in women, Kendall's tau-b coefficient analysis was conducted.

It was shown that greater knowledge of men about breast and cervical cancer is associated with better care for women's health ($\tau=0.25$; $p<0.001$), a greater frequency of preventive examinations taken by their female partners ($\tau=0.27$; $p<0.001$) and a greater feeling of women that their partner cares about their health ($\tau=0.24$; $p<0.01$). On the other hand, we also found that the greater the men's knowledge about women's cancers, the less often their female partners felt motivated by the men to have preventive tests ($\tau=-0.25$; $p<0.01$).

The object of the study was also to analyze the relationship between men's knowledge of breast and cervical cancer prevention and social support. To investigate this, Kendall's tau-b coefficient analysis was conducted (Table 4).

Table 4. Men's knowledge of women's cancer vs. social support

Social support	Men's knowledge of women's cancers
Support received (k)	0.15*
Emotional support	0.16*
Instrumental support	0.09
Informational support	0.12
Buffering support (k)	-0.02
Satisfaction from support received (k)	0.21*
Support provided (m)	0.24**
Emotional support	0.27**
Instrumental support	0.18*
Informational support	0.22*
Buffering support (m)	0.09
Deficit of support	-0.07

Notes: n=100; * p<0.05; ** p<0.01; *** p<0.001; (k) – female rating; (m) – male rating.

Source: authors' own research.

Men's greater knowledge of women's cancer was significantly associated with their greater declared support, primarily emotional, as well as with the women's greater satisfaction with the support they received. The remaining correlations proved to be either insignificant or their strength was very poor.

An investigation of the correlation between taking care of one's health and undertaking preventive screenings and social support is presented in Table 5. Women were more likely

Table 5. Social support and health-seeking behaviors in women.

Social support	Women's health-seeking behavior	
	Taking care of one's health	Frequency of preventive examinations
Support received (k)	0,24**	0,21**
Emotional support	0,23**	0,21**
Instrumental support	0,24**	0,25**
Informational support	0,24**	0,21**
Buffering support (k)	0,03	0,06
Satisfaction from support received (k)	0,23**	0,30***
Support provided (m)	0,29***	0,30***
Emotional support	0,32***	0,34***
Instrumental support	0,22**	0,25**
Informational support	0,23**	0,23**
Buffering support (m)	0,02	0,04
Deficit of support	-0,02	-0,02

Notes: n=100; * p<0.05; ** p<0.01; *** p<0; male rating.

Source: authors' own research.

to take preventive screenings and were more likely to take care of their health when they received more emotional, instrumental, and informational support. Buffering support did not prove to be statistically significant.

A similar pattern of relationships was observed for the correlation between the support declared by the men and the women's health-seeking behaviors. Women cared more about their health and undertook more preventive examinations when their partners provided more emotional, instrumental and informational support. It is noteworthy that in according to the men, the correlation between the women's pro-health behaviors and the support provided by the men is stronger than the correlation between the pro-health behaviors and the men's support received as reported by the women. The correlations between the support deficit and pro-health behaviors of women turned out to be statistically insignificant.

The authors attempted to determine the predictors of women's caring for health and participation in preventive examinations for breast cancer and cervical cancer by conducting a stepwise linear regression analysis. First, variables characterizing women were introduced into the model: health image, cancer image, health anxiety, received support, emotional state, and belief in the effectiveness of preventive examinations. In the next steps, analogous variables characterizing the women's partners were introduced. The analysis was conducted twice – once to identify the predictors of caring for one's health, and a second time to identify the predictors of the frequency of preventive screenings. The results of the regression analysis for caring about one's health are presented in Table 6.

Table 6. Predictors of women's taking care of their health

Predictors	Taking care of one's health			
	<i>R</i> ²	ΔR^2	β	<i>F</i>
Personal check (k)	0.35	0.09	0.23	11.58 (<i>p</i> <0.001)
Partner support with preventive screenings (k)		0.15	0.19	
Instrumental support received (k)		0.03	0.10	
Emotional support provided (m)		0.04	0.27	
Knowledge on female cancers (m)		0.04	0.16	

Notes: n=100; (k) – female assessment; (m) – male assessment.

R – Multiple correlation coefficient, F; p – Significance of the equation
*R*² – Coefficient of multiple determination, *t* – *t*-Student's test

Source: authors' own research.

The results of the regression analysis for the frequency of preventive screenings are presented in Table 7.

Table 7. Predictors of women's participation in preventive screenings for early diagnosis of breast and cervical cancer

Predictors	Frequency of preventive examinations			
	<i>R</i> ²	ΔR^2	β	<i>F</i>
Health anxiety (k)	0.41	0.07	0.34	12.21 (<i>p</i> <0.001)
Personal check (k)		0.03	0.03	
Instrumental support received (k)		0.09	0.15	
Partner support with preventive screenings (k)		0.04	0.19	
Need for help in coping with emotions (k)		0.14	-0.41	
Knowledge of female cancers (m)		0.04	0.20	

Notes: n=100; (k) – female assessment.

R – Multiple correlation coefficient, *F*; *p* – Significance of the equation
*R*² – Coefficient of multiple determination, *t* – *t-Student's* test

Source: authors' own research.

4. DISCUSSION

The widely discussed branch of oncology, cancer prevention, is still not treated as a priority by many people, including health professionals. In our study, only 26% of women had a prophylactic breast examination (self-examination, ultrasound, mammography) within the past year, and 33% had a cytology test.

More than half of the women surveyed (52%) declared having another preventive examination performed. The list included mainly blood tests and imaging diagnostics, i.e. ultrasound, radiological examinations (radiographs, tomography) and RMI of different body regions. However, these are not cancer prevention tests. Perhaps the respondents wished to be perceived better by indicating that they did perform certain medical activity to take care of their health, especially that all of these procedures required going to the doctor to get a referral. Yet unfortunately, this may actually confirm their low motivation and poor determination in taking care of their health.

In our project, women were convinced about the effectiveness of preventive examinations, which, however, did not prompt them to seek preventive examinations. Our study revealed that the majority, 61% of the women, said that they would perform preventive examinations if their partner motivated them to do so. However, nearly 80% said that men rarely or occasionally took interest in their medical examinations. In contrast, more than half of the men declared having mentioned preventive examinations to their female partners. As many as 72% of men felt that their female partners were very or moderately concerned about their health. In the context of the frequency of women actually getting examinations, these values do not match at all. Perhaps the ideas about participation are identified as activity. This might be true considering the fact that especially men were significantly convinced about effectiveness of preventive screenings for early diagnosis and

treatment of cancer, which may have been taken as an obvious indication of taking action for the benefit of one's health.

In addition, the study showed that men's knowledge about women's cancers correlated with the women better caring about their health. Although the correlation value was not high, it indicated this direction of dependency. A correlation between the women feeling less motivated by their male partners was also observed for men who had more knowledge. This may be related to the logical and pragmatic reasoning of men and the belief of almost three quarters of the respondents that their female partners are taking care of their health. Meanwhile, Najdyhor's study [Najdyhor, Krajewska-Kulak, Krajewska-Ferishah, 2013] confirmed men's insufficient knowledge about preventive breast cancer screening. And Pietraszek et al., investigating the awareness of men of different nationalities about women's breast self-examination in women, found that most of the respondents had no knowledge on whether the women around them perform breast self-examination [Pietraszek, Charzyńska-Gula, Łuczyk, Stanisławek, Koziół, Kocka, Kocki, 2015].

Greater knowledge of the male partners was also significantly associated with greater emotional support provided by them and a greater satisfaction of the women with the support received. The type of support indicated is interesting, in that theoretically approaching the issue, one would expect instrumental support. Perhaps when acting stereotypically, the men do not choose the right ways to motivate their female partners to get preventive examinations.

Of note, the strength of the correlation between health-seeking behaviors and the support given reported by men is greater than the strength of the correlation between health-seeking behaviors and support received reported by women. Either inappropriate cognitive assessment of the women might be the case, and they do not notice the support provided by the men, or their male partners are assessing the support they provide as better than is actually is. The lack of communication on this topic, or treating this matter in a purely intuitive way, might create such a picture.

An analysis of the cognitive image of cancer was also not without significance. Both women and men described cancer as a process that is poorly understood, has many negative consequences, and there is only a moderate possibility of influencing its course by taking one's own actions. Certainly, this opinion may have a demotivating effect on the desire to "do one's best".

The level of anxiety about health due to cancer in the study group was moderate in both genders. Perhaps the selection of the study group, where the criterion of inclusion was, among others, a lack of experience of cancer in one's immediate environment and the exercise of a non-medical profession, caused such an effect. In the studies of other authors, the fear of cancer possibly correlated with a more frequent participation in prophylactic examinations [Choi, Lee, Suh, Park, Jun, Kim, Choi, 2018; Vrinten, Waller, von Wagner, Wardle, 2015], and it may be decreased by reliable information [Pahlevan Sharif, Ahadzadeh, Ong, Naghavi, 2020].

The research project described above allowed us to fulfill the objective of the study. The authors of the article identified the predictors of women taking care of their health, as well as the predictors of taking preventive examinations by them.

As for the frequency of women having preventive screening, the model explained 41% of the variance in this variable. All significant predictors were associated primarily with factors on the woman's side. The only predictor on the male side was their knowledge on female cancers. The frequency of preventive examination for early diagnosis of cancer

increased when the level of health anxiety was higher, when the partner's support for screening tests was higher, when the instrumental support received increased, when there was a lower need for help in coping with negative emotions connected with the thought of having a preventive test, and when the men's knowledge about women's cancer and its prevention was higher. The women's belief that they are able to influence the course of the disease through their own behavior lost its statistical significance when instrumental support received was introduced into the model. The scope of support and its strength should be adequate to the needs. It is not possible to clearly define the theoretical pattern of the level of support given, as too much support may reduce the self-esteem of those supported and will not have a positive impact on the achievement of the intended goals. On the other hand, too little support will not be enough to convince people to take preventive measures.

In our unique study, the variables introduced into the model explain 35% of the variance in women caring about their health. Among the significant predictors there are factors that characterize women themselves, as well as factors that lie on the side of the men. It turns out that women's health-seeking behaviors increase when her belief that the course of cancer depends on her behavior is greater, when a woman perceives strong support from her partner regarding preventive examinations, when she receives more instrumental support from her partner, when the woman's partner has more knowledge about women's cancer, and when the man considers himself as giving the woman more emotional support.

Despite the issue of cancer prevention being present in many areas of our daily life, as well as in the medical sphere, our study proved that this topic should be deepened, and predictive factors for women's participation in preventive examinations should be investigated.

5. CONCLUSIONS

A study of male and female life partners found that their mutual relations should include health-related activities. Cancer prevention may be stimulated by engaging in appropriate behaviors, especially through motivating and supportive behaviors.

In cancer prevention, the predictors that proved to influence the women's decision making about preventive screenings are: greater partner support for preventive screenings, higher levels of health anxiety, increased instrumental support received, less need for help to cope with negative emotions related to the thought of preventive examinations, and greater male knowledge about women's cancers and their prevention.

Our study clearly shows that influencing by only disseminating knowledge is insufficient, although important. The predictive factors identified in our study could be taken into account in the development of cancer prevention action strategies by public health institutions.

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