



Acceptance of Cancer in Patients Diagnosed with Lung, Breast, Colorectal and Prostate Carcinoma

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Abstract

Background: The ability to accept illness is a major issue in the life of a person with cancer. Acceptance of disease is simultaneously conducted at two levels: the emotional and cognitive-behavioral one. It is consequential to cancer affecting numerous aspects of patient's life, i.e. the physical, mental, social and the spiritual area. The aim of the study was to verify the influence of socioeconomic factors on acceptance of illness in patients suffering from breast, lung, colorectal and prostate carcinoma.

Methods: The study included 902 patients treated on an outpatient basis at the Center of Oncology, the Maria Skłodowska-Curie Institute in Warsaw, in the year 2013. The Paper and Pencil Interview (PAPI) technique was applied. The questionnaire comprised basic demographic questions (socioeconomic factors) and Acceptance of Illness Scale (AIS) test estimating the level of disease acceptance in patients.

Results: Prostate carcinoma patients scored highest (30, 39), whereas lung carcinoma patients scored lowest (23, 17) concerning illness acceptance according to the AIS scale. In all cases, linear dependence between the net income-per-household-member and the AIS score could be observed. Another diversification factor in the case of prostate carcinoma patients was the level of education. Yet one more dependence could be observed between the level of illness acceptance and chemotherapy over the course of past twelve months.

Conclusion: The degree of disease acceptance is subject to a type of carcinoma. Patient income is an economic factor significantly affecting the acceptance of illness score.

Keywords: Acceptance of illness scale, Disease acceptance, Quality of life, Cancer, AIS-scale

Introduction

Cancer is the second most common cause of death in Poland (1). The highest incidence of carcinoma in men include lung, prostate and colorectal cancer, and in women - breast, colorectal and lung cancer. Medical statistics show, that more than 20.000 new cases of lung cancer, 17.000 new cases of breast cancer, 15.000 new cases of colorectal cancer and 9.200 new cases of prostate cancer are recorded every year in Poland (2).

Emergence of disease entails long-term consequences for patients, including not only stress related to cancer diagnosis, but also whole treatment process, decreased quality of life, and often coping with side effects. As a result, patient's social life and ability to work may be limited. Physical symptoms of disease are often associated with various mental disorders. However, depending on individual types of behaviors, as well as earlier experience, the attitude to the disease may vary significantly.

Nevertheless, it is important to emphasize that an attitude adopted towards the disease may influence the quality of life, as well as decide about the outcome of therapy (3, 4).

Therefore, acceptance of illness, and related acceptance of pain, suffering and life discomfort, is serious issues for carcinoma patients. It is because cancer affects numerous aspects of patient's life, i.e. the physical, mental, social and spiritual area.

Acceptance of disease is simultaneously conducted at two levels: the emotional and cognitive-behavioral one. Patients learn to accept not only the symptoms but also the resulting changes in the quality of life, limitation of self-reliance and independence, and thus the change of their individual roles in their families and the society. Disease acceptance is largely correlated with symptom severity and personal control over pain (5). It is perceived as an emotional indicator of the way patients function in disease (6), it reduces the intensity of negative emotions associated with illness and allows one to accept the limitations it induces (7-9).

The primary objective of the study was to verify the influence of socioeconomic factors on acceptance of illness in patients suffering from breast, lung, colorectal and prostate carcinoma. In addition, the analysis included the relationship between illness acceptance and the primary site of cancer and chemotherapy use over the course of past 12 months.

Materials and Methods

The study included 902 patients treated on an outpatient basis at the Center of Oncology, the Maria Skłodowska-Curie Institute in Warsaw, Poland in the year 2013. The patients consisted of those diagnosed with breast, lung, colorectal and prostate carcinoma. The study group was selected based on the incidence of cancer amongst the Poles. Carcinoma types, which are significant in terms of epidemiology, were selected. The Paper and Pencil Interview (PAPI) technique was applied. The questionnaire comprised demographic questions (socioeconomic variables) and Acceptance of Illness Scale test.

The AIS test includes eight statements regarding negative consequences of poor health condition. Said consequences are grounded in accepting the limitations resulting from disease, the feeling of dependence on others, decreased self-esteem and a lack of self-sufficiency. Owing to its structure, the scale may be used to estimate the degree of acceptance in patients diagnosed with any condition. It is designed for use solely in currently ill adults. It is assumed that the higher disease acceptance, the better adjustment and the lower feeling of mental discomfort. Each of the eight statements listed in AIS can be graded on a scale from 1 to 5. The study participant indicates one number which best describes his status. Number 1 means: "I strongly agree", whereas number 5 stands for "I strongly disagree". Selecting 1 on the AIS scale displays poor adjustment to disease, while choosing 5 - complete acceptance of illness. An individual patient may score between 8 and 40 points, which will reflect the degree of illness acceptance. A low score means lack of adjustment to disease, no acceptance of one's condition and strong mental discomfort. Any result near 40, on the other hand, will be indicative of acceptance of disease and a lack of negative emotions related to disease. The reliability of AIS scale recorded for the whole study sample was 0.86. Thus, it proved very close to the value obtained in the process of test normalization in preliminary studies, i.e. 0.85. The reliability of the original version of the scale is also very similar (0.82) (10). The Acceptance of Illness scale used in the study is reliable and internally consistent (Table 1).

AIS scores were correlated with socioeconomic characteristics of the respondents: sex, education, professional status, place of residence, and net income-per-household-member, and with chemotherapy in the past 12 months.

Sample selection was made based on respondent availability. The study was conducted with the participation of patients available at a given time and place at the Center of Oncology. The selected study method allowed investigators to obtain a sample with characteristics of a representative sample since it consisted of various categories of respondents based on their random visits at the

Center. The sample included patients with diverse primary sites of cancer, of various sexes, places of residence, education level and income. One essential feature of the sample in this large quantitative study is its size. Nine hundred two respondents

participated in the study, hence reliable material for statistical comparisons was obtained and the risk of the effect of extreme cases on mean scores was minimized.

Table 1: Detailed estimation of AIS reliability

Statement	Scale point average upon item removal	Total internal consistency	Cronbach's Alpha if item is deleted
I find it difficult to adjust to disease-induced limitations	24.09	0.559	0.851
Because of my condition I cannot do what I like most	24.20	0.600	0.846
My disease makes me feel redundant at times	23.66	0.660	0.839
Health issues make me more dependent on others than I wish I were	24.01	0.652	0.840
My disease makes me a burden for my family and friends	23.52	0.616	0.844
My condition makes me feel incompetent	23.80	0.638	0.842
I will never be as self-sufficient as I would like to	24.07	0.616	0.844
I believe that people who spend a lot of time with me are embarrassed because of my disease	23.97	0.531	0.854

The Kruskal-Wallis and ANOVA were used for the purpose of statistical analysis of results variance between the study groups. The Mann-Whitney *U* test was employed for the comparison of differences between the two study groups. The adopted statistical significance was at $P < 0.05$.

Results

The sample structure classified by the primary site of cancer is displayed in Table 2.

The study demonstrates that there is a statistically significant correlation between the primary site of cancer and disease acceptance. The prostate cancer patients had the highest mean score in the test.

Table 2: Sample structure classified by the primary site of cancer

Primary site of cancer	Sample	AIS
Breast	193	28.46
Lung	243	23.17
Colon/rectum	238	27.74
Prostate	228	30.39
Total	902	-

The breast and colorectal cancer patients also scored high - their result was above the mean value for the whole study (study mean is 27.33). A markedly lower score was achieved by patients diagnosed with lung carcinoma.

In order to show the significance of differences between the study groups, a single-parameter analysis of variance preceded by the Levene's test to assess the equality of variances was performed ($P=0.218$).

The significance of test was >0.05 , which suggests that there are no grounds on which to rule out the variation homogeneity hypothesis. Next, the ANOVA analysis of variance was carried out (Table 3). The significance of the variance analysis did not exceed 0.05. It means that the differences between the groups of patients diagnosed with various types of cancer are statistically significant. Thus, we may assume that the result of the AIS test is differentiated by the primary site of cancer. A relatively high and almost equal number of respondents in each study group allow us to accept the results obtained.

Table 3: Analysis of variance (ANOVA) for study groups

	Sum of squares	df	Mean square	F	Significance
Between groups	6633.131	3	2211.044	34.500	0.000
Intra-group	57550.755	898	64.088		
Total	64183.886	901			

The major socioeconomic factor differentiating the AIS test scores amongst respondents in particular groups (primary site of cancer) was income. In all groups, linear correlation between the net

income-per-household-member and the AIS score could be observed; although, in the case of lung cancer patients the results proved statistically insignificant (Table 4).

Table 4: AIS results for individual patient groups classified by income

Group	Income	n	Mean	Standard deviation
Breast	Less than PLN 300 (less than USD 80)	4	26.0000	9.93311
	PLN 300-600 (USD 80-160)	39	24.3846	7.77180
	PLN 601-900 (USD 160-240)	57	28.3036	7.98845
	PLN 901-1200 (USD 240-320)	40	29.1500	6.89314
	PLN 1201-1500 (USD 320-400)	53	31.4906	7.53868
	Total	193	28.5156	7.95536
Lung	Less than PLN 300 (less than USD 80)	5	24.20	7.225
	PLN 300-600 (USD 80-160)	48	20.96	6.569
	PLN 601-900 (USD 160-240)	78	22.78	7.784
	PLN 901-1200 (USD 240-320)	67	24.28	6.555
	PLN 1201-1500 (USD 320-400)	45	24.42	9.384
	Total	243	23.17	7.611
Colon/rectum	Less than PLN 300 (less than USD 80)	3	23.0000	10.53565
	PLN 300-600 (USD 80-160)	55	23.1111	6.91639
	PLN 601-900 (USD 160-240)	78	28.3896	7.96729
	PLN 901-1200 (USD 240-320)	56	28.8036	7.95994
	PLN 1201-1500 (USD 320-400)	44	31.5682	8.84070
	Total	238	27.7458	8.38711
Prostate	Less than PLN 300 (less than USD 80)	3	30.6667	3.51188
	PLN 300-600 (USD 80-160)	34	27.3333	8.98146
	PLN 601-900 (USD 160-240)	56	28.5818	8.48897
	PLN 901-1200 (USD 240-320)	67	31.3030	7.30220
	PLN 1201-1500 (USD 320-400)	68	32.4412	7.65756
	Total	228	30.3911	8.10687

The mean test score of respondents suffering from lung cancer, and with net income-per-household-member of PLN 300-600 (USD 80-160 (the exchange rate according to Polish National Bank at May 6, 2015 is USD 1 = PLN 3.7371)), was merely 20.96; in the case of income between PLN 601 and 900 (USD 160-240), it was 22.78; while in respondents with income between PLN 901 and 1200 (USD 240-320), and PLN 1201 and 1500 (USD 320-400), it was 24.28 and 24.42, respectively. In the studied breast cancer patients, the differences are even more pronounced: from the mean score of 24.38 amongst those with low income, up to 31.49 in those with highest income. In colorectal carcinoma respondents, whose net income-per-household-member did not exceed PLN 600 (USD 80), the mean test score recorded was 23.11. The mean score exceeded 28.00 for the two consecutive income groups, whereas in the most affluent group of patients (PLN 1201 – 1500, i.e. USD 320-400) it was 31.57. In the instance of prostate cancer patients, we may notice a surge of AIS test results accompanying the rise in income (from 27.33 to 32.44). Typically, a higher AIS score was associated with a greater dispersion of answers. Such diversification may indicate high heterogeneity of the group of the richer respondents. It might be a consequence of various degree of use of material means for the purpose of disease acceptance by individual respondents, of discomfort of some of the study participants resulting from their financial situation not reflected by their health condition, or of various psychological factors. Another factor diversifying the level of illness acceptance in the case of prostate carcinoma patients is education ($P=0.08$). The top AIS scores were achieved by high school graduates (32.25) and university graduates (31.06). A somewhat lower result was obtained by patients with vocational high school education (28.72). Once more, the group with the highest test score turned out to be the most diversified. Education seems to play an important role in the diversification of disease acceptance since the distribution of means achieved by particular groups appears to be a

regular pattern: the test mean values increase with the level of education of the patients.

The AIS scores were further varied by chemotherapy. In persons who underwent chemotherapy in the past 12 months we could observe intensification of negative reactions and emotions related to current disease. The difference in the scores proved statistically significant ($P=0.000$). Therefore, we may conclude that chemotherapy has a negative impact on acceptance of illness in patients diagnosed with the study cancers. For instance, colorectal patients who did not undergo chemotherapy achieved a slightly higher score in the AIS test (30.91) than those undergoing such treatment (27.90). Concerning prostate patients, no differences between the groups could be established due to a huge disproportion in their sizes.

Discussion

The mean for all scale statements in the analysis is 27.33 and the standard deviation is 8.44. The above result is comparable to the mean scores of clinical groups analyzed in the years 1998 and 1999 (11). The mean result obtained seems high in comparison with other scores; only patients with breast and uterine carcinoma scored higher (28.13). The remainder of the study groups achieved poorer mean scores, as presented in Table 5. Nevertheless, the cited studies were conducted on a much smaller scale, in groups of 30 to 70 patients. In addition, they were carried out on homogenous basis, while in our study the group varies in terms of diagnosed conditions. Thus, the comparison of the results of this study and the outcomes of clinical trials' (Table 1) may be of theoretical nature only.

Our own research revealed statistically significant differences in the evaluation of disease acceptance amongst individual groups of patients with various primary sites of cancer. However, other researchers when studying acceptance of illness in two groups of patients (patients with diabetes and cardiovascular conditions), did not find any differences between the degree of disease acceptance and the two study groups (12).

Table 5: Mean AIS results in various patient groups

Study group	Arithmetic mean	Standard deviation
Diabetics	24.81	7.09
Dialyzed men	25.32	6.03
Men after myocardial infarction	22.14	6.05
Multiple sclerosis women	24.59	7.20
Men in chronic pain (neuropathy)	18.46	7.05
Men with spondylalgia	20.51	8.74
Women diagnosed with migraine	24.23	7.74
Mammary and uterine carcinoma women	28.13	7.60

Source: Juczynski Z (2001). *Narzędzia pomiaru w promocji i psychologii zdrowia*. Warsaw: Pracownia Testów Psychologicznych Polskiego Towarzystwa Psychologicznego. pp164. Polish.

Felton et al., who analyzed patients with chronic illnesses, obtained a general higher score of acceptance of illness in comparison to own research. The mean value of AIS test for said patients was 28.08 (13).

When we juxtapose our findings with the results of other studies employing the acceptance of illness scale (AIS) in patients diagnosed with other types of cancer, the resultant mean for all dimensions proves higher than in the case of leukemia patients. The mean score in the latter group of patients indicated was 23.27 (14). The worst evaluated by patients with leukemia were limitation induced by their disease they find difficult to accept (mean value = 2.74), dependency on others (mean = 2.41) and the inability to do what they like most (mean = 2.44). Rolka also points at difficulties with adapting to disease-induced limitations (15). Additionally, when studying the differences in the degree of disease acceptance between the group of women and men amongst people suffering from migraine, it was found - in correspondence with own research - that there are significant correlations in the AIS test scores between females and males. Even though own research shows a relation between the level of acceptance of illness and education, the above study did not vary the migraine patients concerning education. Similar findings were recorded by Basinska and Andruszkiewicz analyzing patients with Graves' disease and Hashimoto's thyroiditis (16).

Ogińska-Bulik's analyses show that the degree of illness acceptance correlates with women's age. Post-mastectomy patients below the age of 55

have the mean acceptance of illness at 31.27, whereas in the case of older patients the result proves markedly lower (25.93) (6).

Harrison et al. highlight that the better disease acceptance the higher control over one's own symptoms or the more motivation for undertaking actions with a view to improve one's well-being (17). Stuijbergen et al. (18) and Martin (19) arrived at similar conclusions when examining the influence of illness acceptance on behavior patterns of diabetic patients. Still, some assume that acceptance of illness may be manifested by one's satisfaction with current condition and a lack of desire to improve it (13). Therefore, it is worth to emphasize the meaning of psychological factors, such as patients' attitude towards disease, the ability to cope with stress and emotions or reaction to pain in the level of illness acceptance and consequently, the quality of life (20, 21).

There are limitations to every study design. In this study there were used no tools measuring the time from the disease diagnosis to the date of the research conducting. It can be assumed that the longer the duration of disease, the higher acceptance of illness. Nonetheless, the analysis of other studies published in this field suggests that our method is comparable with other study designs.

Conclusion

1. The level of acceptance of illness depends on the primary site of cancer. Prostate carcinoma patients show the highest and lung

carcinoma patients the poorest acceptance of illness.

2. The degree of disease acceptance depends on respondent's income. The higher the net income-per-household-member, the better disease acceptance.
3. Chemotherapy administration positively affects acceptance of illness amongst cancer patients.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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