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Adjustment to Life with Lung Cancer

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of article

Abstract

Background. In Poland, lung cancer is the most common type of cancer in males (20% of all cases) and third most common type of cancer in females (9% of all cases), right behind breast and colorectal cancers. Recently, 28,000 new cases of lung cancer per year were reported in both genders.

Objectives. The objective of the study was to assess coping strategies, pain management, acceptance of illness and adjustment to cancer in patients diagnosed with pulmonary carcinoma and the effect of socioeconomic variables on the abovementioned issues.

Material and Methods. The study included 243 patients diagnosed with lung cancer during outpatient chemotherapy (classical chemotherapy and molecularly targeted therapies) at the Center of Oncology, Maria Skłodowska-Curie Institute in Warszawa. We applied the Paper and Pencil Interview (PAPI) technique. The questionnaire interview was composed of demographic questions and the following four psychometric tests: BPCQ measuring the influence of factors affecting pain management in patients, CSQ designed to evaluate pain coping strategies, AIS questionnaire, measuring disease acceptance, and the mini-Mac scale, assessing psychological adjustment to disease.

Results. The highest mean score recorded in the BPCQ was recorded in the powerful doctors subscale (16.79) and the lowest in the internal factors section (15.64). Education, professional status and income were the variables which differentiated the scores. We recorded the top average score in CSQ in the coping self statements subscale (mean = 19.64), and the lowest score in the reinterpreting pain sensations subscale (mean score = 10.32). The results of the test were differentiated by education and income. Patients had the highest Mini-MAC scale scores in the fighting spirit section (21.91).

Conclusions. In the case of patients affected with lung cancer, education and professional status affect the way patients treat doctors in the disease process. These variables are also critical in patients' approach to disease and methods of coping with it (*Adv Clin Exp Med* 2016, 25, 4, 733–740).

Key words: lung cancer, acceptance of illness, pain management.

Lung cancer is the most common type of cancer in males (20% of all cases) and third most common type of cancer in females (9% of all cases) in Poland, right behind breast and colorectal cancers. Its incidence rate is growing in women and falling in men. Nonetheless, 80% of those affected with lung cancer are still males [1].

Lung cancer is associated with unfavorable prognosis. Every year in Poland the number of patients who die of the disease nearly equals the number of new cases. The main reason is very low disease detectability at an early stage, when it is still

asymptomatic. In 2011, there were 23,000 male and female deaths due to lung cancer [2].

The highest lung cancer incidence rate is reported between the age of 55 and 70 [1]. The major risk factors are smoking and exposure to cigarette smoke, or passive smoking. These factors account for 90% of all cases. Amongst other risk components are: Exposure to asbestos, chromium or arsenic compounds. Failure to reduce cigarette smoking in Poland is forecast to increase the number of new cases by 40% in the next 10 years [3].

The lung cancer incidence rate in Western Eu-

rope is slightly lower than in Poland. However, the tumor's incidence rate seems to be growing. It is predicted that lung cancer will soon become the main cause of death in most European countries. Nowadays, a higher incidence rate than in Poland (38/100,000 inhabitants) is reported only in Hungary (51.6/100,000 inhabitants) and few other European states [3].

The purpose of the study was to evaluate coping strategies, pain management, disease acceptance and adjustment to cancer in lung cancer patients [4]. In addition, we also analyzed the effect of socioeconomic factors (professional status, place of residence, income, education) and chemotherapy on the assessment of pain, acceptance of illness, adjustment to life with cancer and coping strategies.

Material and Methods

Two hundred forty three patients diagnosed with lung cancer, undergoing outpatient chemotherapy (classical chemotherapy and molecularly targeted therapies) at the Center of Oncology, Maria Skłodowska-Curie Institute in Warszawa in the year 2013 were included into the study [4]. We applied the Paper and Pencil Interview (PAPI) technique. The questionnaire interview was composed of demographic questions (socioeconomic variables) and the following four psychometric tests:

1. Beliefs about Pain Control Questionnaire (BPCQ) designed to assess patients in pain [5];
2. Pain Coping Strategies Questionnaire (CSQ) used to evaluate patients suffering from pain [6];
3. Acceptance of Illness Scale (AIS), measuring the level of disease acceptance [7];
4. Mental Adjustment to Cancer (mini-MAC), measuring the degree of psychological adjustment to disease [8].

To analyze the results, the ANOVA and Kruskal-Wallis tests were applied. The Mann-Whitney U test was used for the comparison of differences between the study groups. P-values less than 0.05 were treated as statistically significant.

Test scores were correlated with socioeconomic characteristics of the respondents: Education, professional status, place of residence (number of inhabitants), net income-per-household-member, and chemotherapy in the preceding 12 months.

The study was conducted with the approval of the Bioethics Committee at the Medical University of Warsaw on April 16, 2013. The patients were informed that the study was carried out by the Medical University of Warsaw and familiarized with the study purpose. Each study subject was in-

formed that the results obtained would be used for research purposes only. The study included individuals who gave informed, non-written consent to participate. All individuals included in the study were adults [4].

Results

Pain Control

The statements which form the Beliefs about Pain Control Questionnaire (BPCQ) measure the power of patient beliefs according to pain management: personally (internal factors), through the effect of health professionals, mainly doctors (powerful others), and by chance events.

In the case of lung cancer, we observed that patients had the highest mean score in the powerful others (doctors) section (16.79); while the lowest – in the personal or internal factors area (15.64) (Table 1).

Table 1. BPCQ test scores in lung cancer patients

BPCQ subscale	Mean	Standard deviation
Internal factors	15.64	6.193
Power of doctors	16.79	5.519
Chance events	16.17	4.903

Education, professional status and income-per-household-member were the socioeconomic variables which affected the results of the test. The level of education of the respondents differentiated the scores obtained in the internal factors ($p = 0.015$) and the chance events subscales ($p = 0.010$). In the former subscale, we noted a considerable difference between the scores of people with vocational education (17.07), and those of high-school and college education (14.21 and 15.14, respectively). With regards to the letter subscale, the respondents with vocational (16.41) and college (16.16) level education scored similarly; whereas, high-school graduates had the lowest average (15.15).

Furthermore, we found that patients who were pensioners believed stronger in the effect of chance events on pain management (mean score = 16.29) than did patients in active employment (15.03) ($p = 0.044$) (Table 3).

With regards to the income-per-household-member, we could observe a linear correlation in each of the BPCQ subscales. Nonetheless, the test proved significant only in the case of the chance events subscale ($p = 0.042$). The average score in

Table 2. BPCQ test scores in lung cancer patients vs. education

BPCQ subscale	Education	N	Mean	Standard deviation
Internal factors	elementary	29	17.07	6.041
	vocational	74	17.07	6.601
	high-school	84	14.21	5.672
	college	56	15.14	6.053
	total	243	15.64	6.193
Power of doctors	elementary	29	19.03	5.506
	vocational	74	16.78	5.973
	high-school	84	16.52	5.461
	college	56	16.05	4.788
	total	243	16.79	5.519
Chance events	elementary	29	18.62	3.932
	vocational	74	16.41	5.244
	high-school	84	15.12	5.109
	college	56	16.16	4.133
	total	243	16.17	4.903

Table 3. BPCQ test scores in lung cancer patients vs professional status

BPCQ subscale	Professional status	N	Mean	Standard deviation
Internal factors	employed	67	15.18	5.957
	pensioner	156	15.92	6.230
	homemaker	11	13.55	4.655
	unemployed	8	16.13	9.188
	total	243	15.64	6.193
Power of doctors	employed	67	16.51	5.177
	pensioner	156	16.90	5.732
	homemaker	11	17.36	3.880
	unemployed	8	16.25	7.025
	total	243	16.79	5.519
Chance events	employed	67	15.03	4.703
	pensioner	156	16.29	4.994
	homemaker	11	19.55	3.205
	unemployed	8	18.63	4.241
	total	243	16.17	4.903

the chance events subscale of people with low-est income was 17.46, while the mean score in the same subscale in those with top income was 14.58. This indicates that a rise in income causes a drop in the beliefs that chance events control pain.

Gender and place of residence (number of inhabitants) did not differentiate the scores pertaining to pain management (in both cases $p > 0.05$). The presence or absence of chemotherapy did not differentiate test results in the powerful others

(doctors) subscale ($p = 0.007$). In the case of patients undergoing chemotherapy, these patients had higher scores in the above subscale (17.45) than did the patients who did not undergo chemotherapy in the last 12 months (16.26).

Strategies of Coping with Pain

The Coping Strategies Questionnaire is designed to assess various methods of dealing with pain used by patients. The methods of coping with pain reflect six cognitive strategies (diverting attention, reinterpreting pain sensations, catastrophizing, ignoring pain, praying/hoping, coping self statements) and one behavioral strategy (increased behavioral activity), which in turn form the following three components: Cognitive coping, diverting attention and undertaking replacement activities, catastrophizing and seeking hope [9].

We recorded the highest average score in the coping self-statements subscale (mean = 19.64), and the lowest score in the reinterpreting pain sensations subscale (mean score = 10.32) [10] (Table 4).

The results of the test were differentiated by education and income. It appears that the higher the level of education, the less important are reinterpreting pain sensations ($p = 0.024$), praying/hoping ($p = 0.00$) and coping self-statements ($p = 0.031$); although, high-school and college graduates showed similar results (Table 5).

Income-per-household-member differentiated the scores patients had in the praying/hoping subscale only ($p = 0.00$). Persons with lowest income applied the above strategy much more frequently (mean = 23.40) than those with highest income (mean = 14.24).

Gender, place of residence (number of residents) and one's professional status did not differentiate the CSQ outcomes in lung cancer patients ($p > 0.05$ for all of the above variables).

Disease Acceptance

The AIS questionnaire is a tool measuring the level of acceptance of illness. It is composed of eight statements which altogether form a single scale. Each respondent may have a total score of 8 to 40. The lower the score, the more intense negative reactions and emotions related to disease, and hence the lower the acceptance of illness. The higher the score, the better is the adjustment to illness and lower mental discomfort.

The average AIS score in the study group was 23.17 and the standard deviation was 7.61. None of the analyzed socioeconomic variables (gender, education, place of residence, professional status, income-per-household-member) affected the level

Table 4. CSQ scores in lung cancer patients

CSQ subscale	Mean	Standard deviation
Diverting attention	18.66	8.241
Catastrophizing	10.80	8.624
Reinterpreting pain sensations	10.32	9.354
Ignoring pain	14.15	9.714
Praying/hoping	18.87	9.447
Coping self statements	19.64	10.436
Increased behavioral activity	18.94	8.651

of disease acceptance ($p > 0.05$ for every variable) [10, 11].

Mental Adjustment to Disease

The mini-MAC questionnaire measures four methods of mental adjustment to cancer: Anxious preoccupation, fighting spirit, helplessness-hopelessness, and positive re-evaluation. Whereas anxious preoccupation and helplessness-hopelessness form a part of the passive (destructive) style of coping with disease, the remaining two strategies refer to the active (constructive) way of dealing with cancer [12].

Lung cancer patients had the highest scores in the mini-MAC in the fighting spirit (21.91) and positive reevaluation (21.40) subscales, and the lowest in the helplessness-hopelessness subscale (13.55) [10, 13] (Table 6).

Differences between individual groups distinguished due to different socioeconomic characteristics were minor. We reported statistical significance solely in the case of anxious preoccupation (the group of pensioners demonstrated the lowest score in the subscale). Gender, marital status, place of residence, education and income had no influence on the strategy a patient selected in order to adjust to cancer ($p > 0.05$ for all of the analyzed variables). However, we observed differences in the groups of patients who underwent or did not undergo chemotherapy in the preceding 12 months. The subscale which differentiated the two groups was the fighting spirit ($p = 0.01$). Patients who had chemotherapy in the preceding year had a higher average score in the subscale.

Discussion

Pain in cancer, particularly in end-stage disease, may affect even 90% of patients [14]. Nevertheless, despite multiple guidelines regarding pain

Table 5. CSQ scores in lung cancer patients vs. education

CSQ subscale	Education	N	Mean	Standard deviation
Diverting attention	elementary	29	20.17	8.611
	vocational	74	20.11	8.023
	high-school	84	17.81	8.148
	college	56	17,25	8.262
	total	243	18.66	8.241
Reinterpreting pain sensations	elementary	29	12.52	10.332
	vocational	74	12.41	9.560
	high-school	84	9.06	8.704
	college	56	8.32	8.949
	total	243	10,32	9.354
Catastrophizing	elementary	29	12.41	8.962
	vocational	74	10.53	7,652
	high-school	84	11.61	9.683
	college	56	9.13	7.863
	total	243	10.80	8.624
Ignoring pain	elementary	29	16.07	9.971
	vocational	74	15.81	9.849
	high-school	84	13.65	9.583
	college	56	11.71	9.230
	total	243	14.15	9.714
Praying/hoping	elementary	29	24.76	9.720
	vocational	74	19.95	9.401

Table 6. Mini-MAC test scores in lung cancer patients

Mini-MAC subscale	Mean	Standard deviation
Anxious preoccupation	16.98	5.347
Fighting spirit	21.91	4.730
Helplessness–hopelessness	13.55	4.475
Positive reevaluation	21.40	4.109

evaluation in cancer [15–17], there are a number of issues regarding the selection of a suitable method of pain treatment [18].

Similarly to the results of studies based on the BPCQ and conducted with the participation of other patient groups, e.g. in the analyses of Z. Juczyński [19], A. Wiśniewska [20] or E. Mister-ska [21], we demonstrated in our study that lung cancer patients attributed most power over pain

management to doctors (mean score = 16.79). Moreover, we also found that internal factors were the least important in pain control for lung cancer patients. The above may be associated with advanced anxiety and helplessness [19].

The strategies that patients employ in order to fight pain feature complex mechanisms and depend on individual psychological factors [22–24]. In the CSQ applied in our study, lung cancer patients thought that the most important strategy of coping with pain was positive coping self statements (mean score = 19.64). They also considered the following as quite vital: Increased behavioral activity (18.94), praying/hoping (18.87), and diverting attention (18.66). Other studies including chronically ill populations confirm the high value of the praying/hoping subscale [25] and low scores in the reinterpreting pain sensations subscale, as reported in our study. Patients with osteoarthritis of the hip demonstrated comparable results in the CSQ [26]. What significantly affects the choice of

coping strategies, as evidenced by many other researchers [27], is education.

An essential aspect of cancer is the level of its acceptance by affected patients. Studies indicate that disease acceptance decreases negative illness-related emotions and facilitates day-to-day functioning [25, 28, 29].

The average level of acceptance of illness on the AIS for lung cancer patients in our study was 23.17. Studies by Z. Juczyński reveal that higher acceptance is attributed to diabetic patients, dialyzed males, multiple sclerosis females, women diagnosed with migraine, breast and uterine carcinoma [30], and chronically ill patients, as proved by the studies by B. J. Felton et al. [31]. Our studies do not confirm that there are statistically significant correlations between the level of disease acceptance and socioeconomic variables. Other researchers [32, 33] also indicate an absence of such dependencies.

Literature shows that a low level of illness acceptance may worsen one's health condition and increase disease progression [34, 35]. In contrast, higher disease acceptance enhances one's motivation to improve one's wellbeing [36, 37].

An active style of coping with disease also yields positive outcomes [38, 39]. The average score in this area in the study group was 43.31. The studies by Z. Juczyński demonstrate a higher level of constructive coping in patients with prostate cancer (mean = 46.20) and a lower one in the case of breast or colonic carcinoma.

Although in our study we did not report differences in mental adjustment to cancer between the groups of women and men, such correlations

are suggested by I. Michałkowska-Wieczorek [40]. Based on an analysis of 36 women post-breast cancer treatment, she concluded that patients who took part in a minimum of 5 different types of activities had higher scores in the fighting spirit category. Touring and dancing, very important in this aspect, also played a significant role in improving the mini-MAC test scores in the following areas: Positive re-evaluation and constructive style [41]. Comparable dependencies were further identified by other researchers, amongst others by P. Lueboonthavatchai [42] and B. Pinto et al. [43].

What is important, literature shows that the fighting spirit strategy, which was evaluated as the most important by the study of the lung cancer patient group, positively affects the assessment of one's quality of life [44]. Furthermore, if patients choose the helplessness-hopelessness or anxious preoccupation strategy, these tend to significantly lower their evaluation of the health-mediated quality of life [45, 46].

Lung cancer patients attribute most power over pain management to doctors (highest mean score), although the scores are differentiated by education and professional status. The positive coping self-statements have the highest scores of all strategies of coping with disease. The choice of strategies is differentiated primarily by respondents' education. The level of acceptance of illness in lung cancer patients is not differentiated by any of the analyzed socioeconomic variables. The most common method of coping with disease declared by lung cancer patients is fighting spirit and positive re-evaluation.

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