

Pain, acceptance of illness, adjustment to life with cancer and coping strategies in prostate cancer patients

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Abstract

Introduction: Prostate cancer is the second most common type of carcinoma in men. The rate of prostate cancer has increased approximately fivefold over the last 30 years. The purpose of the study was to evaluate coping strategies, pain management, illness acceptance, and adjustment to cancer in patients diagnosed with prostate carcinoma and the effect of socioeconomic variables on the above-mentioned issues.

Material and methods: The study included 228 patients diagnosed with prostate cancer. The questionnaire interview consisted of demographic questions and four psychometric tests: BPCQ, measuring the influence of factors affecting pain management, CSQ, designed to evaluate pain coping strategies, the AIS questionnaire, measuring disease acceptance, and the Mini-Mac.

Results: Pain locus of control scores in prostate cancer patients are distributed evenly across all three BPCQ subscales. The top mean score was observed in the area of beliefs that powerful others (doctors) control pain. Increased behavioral activity was the most frequently selected coping strategy (mean score = 18.27). The average level of disease acceptance in study patients was 30.39, with a standard deviation of 8.07. The results were differentiated by education ($p = 0.08$) and income ($p = 0.012$). The most frequently indicated coping strategies were fighting spirit (mean score = 22.46) and positive re-evaluation (mean score = 22.04).

Conclusions: The main belief about pain control in prostate cancer patients is that powerful others (doctors) control pain. The study patients cope with disease constructively. The main socioeconomic variables which differentiate the scores obtained across all tests are income and education.

Key words: prostate cancer, acceptance of illness, BPCQ, CSQ, AIS, mini-MAC.

Introduction

Coping strategies, pain management, illness acceptance and adjustment to cancer are conceptions that, in the light of research, have a substantial impact on the treatment of many chronic illnesses, including cancers [1–4]. To study the above issues, many research tools have been developed, including psychometric tests used in the personal study [1, 2, 5, 6]. Some authors also point out a significant interrelation between these conceptions [7]. For instance, research suggests that patients who

show a higher degree of acceptance of their disease are better at handling pain, and choose more effective strategies of coping with the disease [6]. In light of the research, such an active approach to the disease may produce better therapeutic effects in a number of diseases, cancer in particular [2, 3].

There are also studies that show the impact of socioeconomic variables on problems related to the acceptance of an illness, adapting to it and managing the pain [8–10]. Variables that differentiate patients in terms of the above aspects include sex, age, education and socioeconomic status. It is not uncommon that younger patients with a higher level of education and a high socioeconomic status demonstrate a higher degree of acceptance of the disease and use more effective strategies of coping with pain.

Taking into account the impact of the problem related to acceptance of the illness and coping with it, pain management and the impact of socioeconomic variables on the above conceptions, it seems justified to conduct further research in this field. Therefore, the study of this topic would constitute an important element of education of psychologists, doctors, and patients themselves and help to improve those individuals factors which contribute to the decrease of pain and increase of quality of life.

Based on the available studies [7–9], the authors created hypotheses concerning the impact of coping strategies, pain management, illness acceptance, and adjustment to cancer on the treatment of patients with prostate cancer. The above hypotheses were formulated in view of the research of other authors who found significant correlations between coping strategies, pain management, illness acceptance and adjustment to the disease, and the effects of administered therapy. Such correlations have been identified in patients with herniated lumbar discs and coexisting spondylotic changes [9] and patients with active cancer [8]. Some hypotheses have been formulated regarding the effects of socioeconomic variables, such as professional status, place of residence, income, and education, on the above fields in prostate cancer patients.

Prostate cancer is the second most common type of carcinoma in men [11]. The standardized incident rate of prostate cancer for Western Europe is 94.1/100,000 individuals, and it is the second highest coefficient in the world, after that of Australia and New Zealand. North America and Northern Europe follow, with prostate cancer incidence rates of 85.6 and 75.2/100,000, respectively. Such high incidence rates require focusing on the difference between these and other regions of the world, e.g. Asian countries, for which it is as low as 4.1–13.6/100,000 individuals [12].

The rate of prostate cancer has increased approximately fivefold over the last 30 years. In 2010, there were more than 9,200 new cases of cancer in Poland. Cancer may be diagnosed as early as at the age of 45 or 55, but the peak of prostate cancer diagnoses is observed in the group of 70 to 74 year olds, where the incidence rate is over 350/100,000 individuals. The mean prostate cancer incidence rate in Poland is 32.3/100,000, which is notably lower than the rate observed in Western Europe.

The 5-year survival rate recorded in Poland decreased over the last 10 years and is now 76.4% [11]. The standardized mortality coefficient in Poland is 12.4/100,000, whereas in Western Europe, despite the higher incidence rate, it is estimated at 12.1 [11].

The purpose of the study was to evaluate coping strategies, pain management, illness acceptance, and adjustment to cancer in patients diagnosed with prostate carcinoma and the effect of socioeconomic variables (education, professional status, income, place of residence) and chemotherapy on the above-mentioned issues.

Material and methods

The study covered 228 male patients diagnosed with metastatic prostate cancer, and treated by an experienced oncologist at the outpatient department of the Maria Skłodowska-Curie Memorial Cancer Center – Institute of Oncology in Warsaw, in 2013. The study investigated only those men with prostate cancer who did not experience any other conditions/comorbidities that might have caused pain, based on the opinion of the attending oncologist. The paper and pencil interview (PAPI) technique was applied. The questionnaire interview consisted of demographic questions (socioeconomic variables) and the following four psychometric tests:

1. Beliefs about Pain Control Questionnaire (BPCQ) designed to evaluate patients in pain [1].
2. Pain Coping Strategies Questionnaire (CSQ) used to evaluate patients suffering from pain [13].
3. Acceptance of Illness Scale (AIS), measuring disease adjustment [2].
4. Mental Adjustment to Cancer (mini-MAC) scale, measuring the level of mental adjustment to disease [6].

The impact of socioeconomic variables on the quality of life in chronic diseases is indicated in different studies [14, 15]. In our study, the largest group of respondents with prostate cancer had higher education (37.72%), 27.19% had secondary education, 26.75% vocational education, and 8.34% primary education. Professional status indicated by the patients was pensioner (68.42%),

employee (27.19%), unemployed (3.07%) and homemaker (1.32%).

The most common place of the respondents' residence were town with over 500,000 (38.16%) inhabitants, town with up to 50,000 (15.35%) inhabitants, town with up to 100,000 (14.91%) inhabitants, village (14.47%), town with up to 200,000 (8.77%) inhabitants and town with up to 500,000 (8.34%) inhabitants.

The net income per household member among prostate patients was as follows: PLN 1201–1500 (300–375 EUR) – 29.82%; PLN 901–1200 (225–300 EUR) – 28.94%; PLN 601–900 (150–225 EUR) – 24.12%; PLN 300–600 (75–150 EUR) – 14.47%; up to PLN 300 (up to 75 EUR) – 2.65%.

The research was conducted with the permission of the President of the Maria Skłodowska-Curie Memorial Cancer Center – Institute of Oncology in Warsaw and 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 informed 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.

Due to a low amount of research on patients who are oncologically ill with the use of personal psychometric tests in the study, the obtained results for patients with prostate cancer were compared to results from patients with other chronic sicknesses, mainly with chronic lower limb ischemia or spinal problems, a population of degenerative joint disease patients, diabetes patients and leukemia patients. The results were also correlated with results obtained by other authors studying patients with prostate cancer.

Statistical analysis

The Kruskal-Wallis and ANOVA tests were applied to analyze the findings of the study. We used the Mann-Whitney *U* test to compare the study groups. *P*-values of less than 0.05 were treated as statistically significant.

The coefficient for the whole BPCQ test was 0.81, which is higher than the standardization process coefficient, where reliability in a 138-patient sample was 0.75. Reliability of the CSQ was assessed with Cronbach's α , which was 0.95 for the whole questionnaire, at the same time significantly exceeding reliability in Z. Juczyński's standardization study (0.80). The reliability of the 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). The reliability coefficient for the total mini-MAC test was 0.79 [2].

Results

Pain control

The Beliefs about Pain Control Questionnaire (BPCQ) is an instrument designed to measure the power of individual convictions with regards to pain management. Our BPCQ distinguished three possible areas of pain control: personal (internal factors), the power of doctors – health professionals (powerful others), and chance events.

The impact on pain control during oncological treatment is exerted not only by doctors but also by nurses and other health professionals who accompany the patient during treatment. Nevertheless, the BPCQ test does not establish a division of health professionals as doctors, nurses or other medical personnel. Due to the formal requirements of the used research tool, the authors could not introduce such differentiation into the research.

We found that the pain loci of control scores in prostate cancer patients were distributed evenly across all three BPCQ subscales. The top mean score was observed in the area of beliefs that powerful others (health professionals) control pain (mean = 16.31) (Table I).

Amongst respondents with the prostate as the primary site, BPCQ test results differentiation by socioeconomic variables was rare. While ascribing pain control to internal factors varied according to net income per household member; subscribing pain control to internal factors and powerful others (health professionals) changed together with the professional status of respondents. In the chance events subscale, respondents with an income of PLN 601–900 (150–225 EUR) (16.96) had the highest mean scores. Patients with an income of PLN 300–600 (75–150 EUR) (15.48) scored the lowest. The top income groups had the lowest scores: the PLN 901–1200 (225–300 EUR) income patients (14.32) and the PLN 1201–1500 (300–375 EUR) respondents (14.15). Pensioners scored the highest when ascribing control over

Table I. BPCQ test scores in prostate cancer patients

BPCQ subscale	Mean	Standard deviation
Internal factors	15.82	6.311
Power of doctors (health professionals)	16.31	5.141
Chance events	15.17	5.059

pain to powerful others (health professionals) and chance events: 16.79 at 14.94 for doctors' effect and 15.54 at 13.81 for chance events. Both results proved statistically significant ($p = 0.025$ and $p = 0.035$, respectively).

Strategies of coping with pain

The Coping Strategies Questionnaire serves as a tool in assessing patient strategies of coping with pain. We wanted to verify the effectiveness of pain control strategies adopted by patients. Methods of coping with pain reflect six cognitive strategies and one behavioral strategy, which in turn are a part of these three components: cognitive coping, diverting attention and undertaking replacement activities, catastrophizing and hoping [16].

Respondents diagnosed with prostate cancer assigned the most value to increased behavioral activity (mean score 18.27 and a standard deviation of 10.81) and coping self-statements (mean score 17.85 and a standard deviation of 11.68) strategies, and the least value to the catastrophizing strategy (mean score 6.54 and a standard deviation of 7.75) (Table II).

Upon the analysis of the mean scores obtained in four CSQ subscales – diverting attention, reinterpreting pain sensations, praying/hoping, and increased behavioral activity – with regards to respondents' level of education, we could see that

Table II. CSQ test scores in prostate cancer patients

CSQ subscale	Mean	Standard deviation
Diverting attention	16.61	10.482
Catastrophizing	6.54	7.754
Reinterpreting pain sensations	9.46	10.128
Ignoring pain	12.97	9.868
Praying/hoping	14.71	10.776
Coping self statements	17.85	11.680
Increased behavioral activity	18.27	10.807

Table III. Acceptance of illness vs. level of education of prostate cancer patients

Education	N	Mean	Standard deviation
Elementary	19	26.3684	7.90366
Vocational	61	28.7213	8.79039
High-school	62	32.3548	6.79946
Higher	86	31.0581	7.99317
Total	228	30.3947	8.06539

the lower the mean score, the higher was the level of education of a given group. In the case of elementary school graduates, the mean score was 18.16, and in the case of university graduates it was 12.17. Nevertheless, only in the praying/hoping subsection could we observe statistical significance ($p = 0.022$).

The 'place of residence' variable did not vary any of the CSQ subscales in the prostate cancer patients who were studied. Net income per household member differentiated scores only in the praying/hoping subscale ($p = 0.010$). We recorded mean scores of 17.91 and 17.31 in the lower income groups and mean scores of 13.61 and 11.99 in the top income groups. All groups displayed an analogous internal consistency: the standard deviation in the case of each group was approximately 10.50 points.

Dependencies between individual test subscales and respondents' professional and marital status were not analyzed as discrepancies in the size of individual groups were too large.

Disease acceptance

The Acceptance of Illness Scale (AIS) measures the extent to which disease is accepted by patients. The AIS questionnaire is composed of eight statements, and the total score of every respondent may be between 8 and 40. The lower the score, the more extreme are negative reactions to disease and illness-related emotions and the lower is the acceptance. The higher the score, the better is the adjustment to illness and the lower is the mental discomfort.

The mean level of disease acceptance in AIS in prostate patients was 30.39, with a standard deviation of 8.07. We found education to be the socioeconomic variable which differentiated the test scores most significantly ($p = 0.08$). The highest level of disease acceptance was demonstrated by high-school and college graduates, the lowest by respondents having an elementary level of education (Table III).

We observed that another factor differentiating the AIS test results in patients was income ($p = 0.012$). We registered a linear dependence between the rise in net income per household member and the rise in disease acceptance (Table IV).

The size of the place of residence and professional status of respondents did not affect the level of disease acceptance in prostate cancer patients. However, we noted a statistically significant correlation between chemotherapy and cancer acceptance. Individuals who did not undergo chemotherapy in the last year demonstrated higher disease acceptance (the average score of 30.91 in comparison with the average score of 27.90 in

patients who did undergo chemotherapy in the last 12 months).

Mental adjustment to disease

The mini Mental Adjustment to Cancer (mini-MAC) scale measures four methods of coping: anxious preoccupation, fighting spirit, helplessness-hopelessness, and positive re-evaluation. While the two former methods are a part of the passive (destructive) style of coping, the latter two refer to the active (constructive) way of coping with the disease [17].

Prostate cancer patients had the highest scores in the mini-MAC with regards to fighting spirit (mean score of 22.46 and a standard deviation of 3.44) and positive re-evaluation (mean score of 22.04 and a standard deviation of 2.99), and the lowest in the helplessness-hopelessness subscale (11.39) (Table V).

Education and income of the studied patients differentiated results obtained in the interrelated subscales, i.e. anxious preoccupation and helplessness-hopelessness. In both cases, the mini-MAC scores decreased along with an increase in income and education. With regards to anxious preoccupation, the mean score in respondents of vocational education was 15.38 and in those of high-school and college education it was 13.16 and 13.10, respectively. As part of the helplessness-hopelessness subscale, the mean scores in respondents of an elementary and vocational education were 13.89 and 12.66, respectively, while in high-school and college graduates the mean scores were only 10.77 and 10.36, respectively. In the first subscale, respondents with a net income per household member of PLN 300 to 600 (75–150 EUR) had a mean score of 15.82; respondents with an income of PLN 601 to 900 (150–225 EUR) had a mean score of 14.67; respondents in the income group of PLN 901 to 1200 (225–300 EUR) had a mean score of 13.47; and finally, respondents with the highest income had a mean score of only 13.07. The mean scores in the helplessness-hopelessness subscale ranged between 13.12 in the lowest income patients and 11.89, 10.98 and 10.16 in top income patients.

Discussion

Pain is one of the most prevalent sensations that can affect an individual, and it has the ability to significantly reduce life comfort. The International Association for the Study of Pain (IASP) distinguishes two typical pain components: a sensory experience, associated with the perception of pain, and an emotional experience, related to an individual reaction to pain stimulus [3]. We can distinguish the following important factors in cancer pain evaluation: pain intensification,

Table IV. Acceptance of illness vs income of prostate cancer patients

Net income per-household member	N	Mean	Standard deviation
Less than PLN 300 (less than 75 EUR)	3	30.6667	3.51188
PLN 300–600 (75–150 EUR)	33	27.3333	8.98146
PLN 601–900 (150–225 EUR)	56	28.5818	8.48897
PLN 901–1200 (225–300 EUR)	67	31.3030	7.30220
PLN 1201–1500 (300–375 EUR)	69	32.4412	7.65756
Total	228	30.3911	8.10687

Table V. Mini-MAC test scores in prostate cancer patients

Mini-Mac test subscale	Mean	Standard deviation
Anxious preoccupation	14.01	4.848
Fighting spirit	22.46	3.439
Helplessness-hopelessness	11.39	4.228
Positive re-evaluation	22.04	2.989

time, pain location, and psychological aspects of patient pain, such as anxiety or fear, which can have a vital influence on the perception of pain intensity [8].

Juczyński stated that the pain locus of control depends on the level of disease acceptance [18]. The consequence of a low disease acceptance level is the attribution of more meaning to doctors as those who control disease-related pain, which in turn is associated with the feeling of helplessness and fear. In our study health professionals were indicated to be the strongest factor affecting pain management.

Other authors who studied patients with chronic lower limb ischemia [19], spinal problems [9] and colorectal cancer [20] also indicated the importance of the role of health professionals in pain control. Similarly to the study group of prostate cancer patients, they observed no significant correlations between socioeconomic variables and the pain locus of control in subject literature.

In contrast, most patients suffering from spondylalgia believe in internal pain control, with a mean score of 19.50 [21]. Yet other analyses of patients with spondylalgia reveal that the role of doctors in pain control is the greatest, whereas that of one's personal or internal control is the smallest [9].

Psychological factors play an essential role in the process of selecting methods of coping with

disease, too [22, 23]. Individual beliefs have a major influence on the type of adopted strategy of fighting pain [7]. In the case of the studied population, we recorded the top scores in the CSQ test, which measures strategies of coping with pain, in the subscales increased behavioral activity (mean = 18.27) and coping self-statements (mean = 17.87), and the bottom scores in catastrophizing (mean = 6.54) and reinterpreting pain sensations (mean = 9.46). Koleček *et al.* [24] and Samwel *et al.* [25] indicate that choosing positive or active strategies of coping with pain results in less experience of pain when compared to patients adopting passive strategies.

Rosenstiel and Keefe, who analyzed chronically ill patients [26], demonstrated that the coping self-statements strategy is selected very frequently. What is interesting is that the authors underlined that the least often selected strategy in chronically ill patients was reinterpreting pain sensations, as evidenced by our own findings. The results of the study conducted by Andruszkiewicz *et al.* on a population of degenerative joint disease patients using the CSQ are also comparable with this study [27].

Even though we recorded no significant differences in the Coping Strategies Questionnaire with regards to the selected socioeconomic variables, some researchers have observed such dependencies in other patient groups [27–29], suggesting that there is a relation between the choice of strategy and the respondent's gender.

In addition, we should stress that many studies indicate that catastrophizing or praying/hoping significantly mediates pain intensification in chronic diseases and worsening of general health condition [30–32]. Finally, Rosenstiel and Keefe indicated that those for whom catastrophizing was an essential strategy exhibited more anxiety and helplessness [33].

On the basis of a comparison between our own research findings and available literature, we can state that prostate cancer patients express a relatively high level of disease acceptance (mean score = 30.39). For example, studies show that the mean level of disease acceptance measured with the Acceptance of Illness Scale in chronically ill patients is 28.08 [34], in diabetes patients 24.81 [35], and in leukemia patients 23.27 [36].

Despite the fact that our own study findings did not reveal any dependency between illness acceptance and education, and income of the respondent, other studies including diverse groups of patients showed relations between the mean scores and gender [37], or age [38].

A high degree of disease acceptance has a positive impact on the patient-perceived quality of life. The literature demonstrates that enhanced acceptance is one of the factors preconditioning better

control over symptoms or increased motivation to undertake actions aiming at improving one's well-being [38–42]. Nevertheless, some authors note that a high degree of illness acceptance may be reflected by satisfaction with current condition and a lack of willingness to improve it [43, 44].

The coping style is what determines the intensity of trauma-related symptoms more strongly. Destructive coping style and high emotional reactivity are temperament traits are conducive to intensification of cancer trauma symptoms in adult patients. Constructive coping style and low emotional reactivity may act as a specific protector against cancer trauma symptoms in adult patients [45].

Active methods of coping with disease may improve the quality of life, increase the survival rate, and reduce symptoms [46–48]. The study group scored much higher in the area of constructive ways of coping with disease than in the passive strategies. Even though the studies carried out by Juczyński in prostate cancer patients demonstrate a high degree of anxious preoccupation (mean = 22.10), our own research findings did not confirm that conclusion (the mean score in our own study was 14.01). The overall results recorded by Juczyński were as follows: 46.2 in the constructive style and 36.6 in the passive method [17]. Our study findings, by contrast, were 44.50 and 25.40, respectively.

Active strategies of coping with disease aim both at fighting the disease and at seeking emotional and instrumental support [49, 50]. A strategy adopted by a patient may be related to the level of illness acceptance, as stressed by Kozak, who studied, among others, prostate cancer patients [51]. Kozak found that the higher the illness acceptance, the more meaningful the fighting spirit strategy and the lower the level of anxious preoccupation and helplessness-hopelessness. Still, one should pay attention to the fact that cited studies reveal a markedly lower mean score in the fighting spirit subscale in prostate cancer patients (15.68) than the mean score recorded in our study (22.46), and a higher mean value in the helplessness-hopelessness strategy (24.32 in Kozak's study in comparison with 11.39 in our study population). The above findings are vital, as numerous authors indicate that there is a relation between the type of adopted method of adjusting to disease and the quality of life [51–54].

Our research and the research performed by other authors prove that the sense of control over pain can improve the functioning of the patient during a cancer illness and his/her quality of life [1–3]. The shaping and the development of the inner control locus in patients suffering in pain seems to be essential for this. For this, we can use behavior-cognitive techniques, which concentrate

on supporting stress management methods, as well as pain. Professional social support in the case of people suffering from chronic pain can take different forms. The basic form is of course medical care, including physiotherapy. Working with the therapist is an important area. Here, we classify a traditional form of individual work, concerning areas such as work with imagination (concentrating on nice images), work on belief, concerning the ability to control pain, and work with beliefs causing negative emotions (e.g. 'I will suffer forever'). We should also remember about education and giving knowledge in areas that are essential from the point of view of pain management, e.g. dietary knowledge in the nutritional aspect, ability to decrease pain, basic care knowledge (which can, for example, help to prevent painful bedsores) or training in painkiller handling, e.g. rules for giving opioids. Material support is also needed, e.g. help on acquiring certain medicine or medical equipment that helps to control pain (e.g. feeding pumps or inhalers) and rehabilitation equipment (e.g. walkers or wheelchairs).

In conclusion, prostate cancer patients attribute pain control mostly to powerful others (health professionals). The most frequently selected coping strategies in studied patients are increased behavioral activity and coping self-statements. Prostate cancer patients demonstrate constructive ways of coping with disease. The main socio-economic variables which differentiate the scores obtained in all tests used in our research are net income per household member and education.

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Conflict of interest

The authors declare no conflict of interest.

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