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# Loneliness and depression levels as risk factors of pain in geriatric prostate cancer patients

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## ABSTRACT

**BACKGROUND**

Prostate cancer is the most prevalent malignancy among men, and psychological symptoms may affect many patients. Although much work has been carried out on loneliness, depression, and pain in geriatric prostate cancer patients, far less research has examined their associations. Therefore, the present study explored the association of loneliness and depression with pain in geriatric prostate cancer patients.

**METHODS**

A cross-sectional study was conducted involving 83 patients between the ages of 60 and 74 years, who were diagnosed with prostate cancer and were close relatives of students studying at a health sciences university. Data were collected with the Loneliness Scale for the Elderly, Beck Depression Inventory, and Numerical Rating Scale. The duration of prostate diagnosis was evaluated according to patient files. Simple and multiple logistic regression analyses were used to analyze the data.

**RESULTS**

It was determined that the median age of the individuals included in the study was 66 years, and the median pain duration of these patients was two years. Severe pain was found in 62.7%, loneliness in 61.4%, and depression in 68.7% of the patients. Duration of diagnosis, loneliness, and depression were significantly associated with pain intensity. Depression increases the risk of pain intensity 3.41 times among patients (aOR=3.41;95% C.I.: 3.07-8.16; p=0.038)

**CONCLUSION**

It was determined that duration of diagnosis, loneliness, and depression levels were risk factors for pain intensity in geriatric prostate cancer patients. Developing interventions for patients' mental states in rehabilitation studies may help alleviate the severity of pain.


**Keywords:** Loneliness, depression, pain, prostate cancer, elderly

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## INTRODUCTION

Prostate cancer occurs due to the abnormal course of some cells that make up the prostate tissue, forming tumor structures. The World Health Organization International Cancer Agency reports that the annual incidence of prostate cancer in men aged 60-74 years in our country was 18%.[1] These data show that the risk of prostate cancer in geriatric male patients is relatively high. Unfortunately, prostate cancer is the leading cause of cancer-related death in men after lung cancer.[1]

High mortality rates may cause fear of death and depression in individuals. [2] The literature has reported that depression is a common condition in prostate cancer patients and is observed in approximately one in six patients. [2,3] In addition, in these patients, psychosocial problems such as guilt, regret, fear of pain, fear of cancer, and physiological problems such as fatigue, sleep, loss of appetite, weight loss, and loss of sexual activity, urinary incontinence, and pain in case of metastasis, can be seen.[2]

Patients may also experience social isolation due to problems experienced due to the cancer. Especially in patients with frequent urination and incontinence, the occurrence of urine leakage, urine smell, and diaper use, are the leading causes of social isolation. Patients experiencing social isolation generally avoid communicating with their environment and experience loneliness. [2]

Pain negatively affects the quality of life, in that depression increases in individuals experiencing pain, and depression increases pain.[4] Cancer patients experience significant symptoms resulting from the cancer and its treatment. Across cancer types and stages, pain, fatigue, sleep disturbance, and cognitive complaints are among the most commonly reported symptoms.[5,6] Canoui-Poitrine et al.[7] showed that the prevalence of depression among elderly patients with cancer was associated with impaired mobility and function status, inadequate social support, and cancer-related pain.

Cancer-related loneliness may be a key theory-based pathway linking social constraints and symptoms in cancer patients. For example, loneliness was positively associated with fatigue and pain and negatively associated with sleep quality in recently diagnosed and long-term cancer survivors.[8]

When the literature information is examined, it becomes necessary to determine the cancer-related loneliness, depression levels, and pain in prostate cancer patients who experience loneliness and have a high depression rate. For this reason, the study was conducted to determine the relationship between loneliness and depression levels with pain in geriatric prostate cancer patients.

## METHODS

### Research design

This cross-sectional study was conducted in 7 regions of Turkey from May to June 2023.

### Research subjects

The study sample consisted of nursing students' first- and second-degree male relatives, aged 60-74 years, and diagnosed with prostate cancer. According to the World Health Organization International Cancer Agency 2023 data, the annual incidence of prostate cancer in men aged 60-74 in our country was 18%.[1] In addition, according to the data of the Turkish Statistical Institute for 2021, the rate of cancer in the elderly population in Turkey is 9.7%.[10] Based on these data, the minimum sample size was calculated with the sampling formula used in cases where the population's number of individuals is unknown.[9] The p-value was considered to be 0.05 in the formula, and the sample size was calculated as 138 individuals. However, only 111 individuals in the population could be reached. Seven patients were excluded because they did not want to participate in the study, 8 had communication problems, and 13 were illiterate. The study was completed with 83 individuals.

**Socio-demographic characteristics of the participants and clinical information**

The data of the study were collected with an online questionnaire. The age range of the prostate cancer patients constituting the sample was determined as 60-74 years. While patients aged 60 and over were included in the sample to classify the patient as elderly, this age range was preferred because communication problems may occur in patients over 74 years of age. It was important for the accuracy of the data that the patients did not have any psychiatric diagnoses and did not have any communication problems. In addition, since the data would be collected through an online survey application, the patients had to be literate.

## MEASURES

**Loneliness scale for the elderly**

The scale, developed in 1985 [11] and revised in 1999 [12] to measure the feeling of loneliness, is a measurement tool based on the cognitive-behavioral approach. The triple Likert-type scale consists of 11 items and two sub-dimensions. On the scale, items 2, 3, 5, 6, 9, and 10 (negative items) measure emotional loneliness, and items 1, 4, 7, 8, and 11 (positive items) measure social loneliness. Positive items are scored as 0=yes, 1=maybe, 2=no, while negative items are scored as 2=yes, 1=maybe, 0=no. The lowest 0 and the highest 22 points are taken from the scale. The Turkish validity and reliability of the scale were evaluated in 2015, when Cronbach's alpha was found to be 0.85. [13]

**Beck depression inventory**

Beck's depression inventory is efficient and reliable, allowing accurate diagnosis by detecting physical and emotional depression. Based on this inventory, questions are asked by creating 21 titles and four options for each title. [14] It is filled in by asking people to self-report (answer according to their true condition), and depression is classified according to the score obtained. According to this scale, 0-9 points indicate the average level (no signs suggesting depression), 10-18 points indicate mild depression, 19-29 points indicate moderate depression, and 30-63 points indicate the probability of severe depression. The Turkish validity and reliability of the scale were made in 1989, and the Cronbach alpha coefficient was found to be 0.80. [15]

**Numeric rating scale**

The scale expresses the pain level in numbers from 0 to 10. A "0" point indicates no pain, while a "10" indicates the worst pain imaginable. This scale is often preferred because it is effortless to define, score, and record the severity of pain with the scale. However, illiterate patients need help using the scale. [16]

**Statistical analysis**

The data of the study were analysed with the SPSS 21.0 program. Simple binary and multiple binary logistic regression analyses were used. To predict significant factors for pain severity, Odds ratio (OR) and 95% confidence interval (CI) were calculated. Variables with p-value <0.25 were included in the multiple logistic regression model.

**Ethical clearance**

Before starting the study, ethical approval (Date: 03.05.2023 and Decision No: 2023-05) was obtained from the Non-interventional Ethics Committee of Hitit University and complied with the tenets of the Helsinki Declaration of 1975.

## RESULTS

Of the participants, 65.1% were 65 years of age or older, and the median age was 66 years. Among the participants, 85.5% were married and 86.7% had children. While the rate of those whose education level was primary school was 47.0%, the rate of those who stated that their income equals their expenses was 63.9% (Table 1).

Table 2 shows the characteristics of the participants regarding their diseases. The duration of prostate cancer diagnosis was less than five years in 71% of the study group. The rate of those

Table 1. Socio-demographic characteristics of the subjects (n=83)

| Characteristics | n | % |
|---|---|---|
| Age group (years) | Median: 66 | |
| < 65 | 29 | 34.9 |
| ≥65 | 54 | 65.1 |
| Marital status | | |
| Married | 71 | 85.5 |
| Single | 12 | 14.5 |
| Child presence | | |
| Yes | 72 | 86.7 |
| No | 11 | 13.3 |
| Education level | | |
| Literate | 21 | 25.3 |
| Primary school | 39 | 47.0 |
| Middle school | 9 | 10.8 |
| High School/University | 14 | 16.9 |
| Income Rate | | |
| Income less than expenses | 17 | 20.5 |
| Income equals expenses | 53 | 63.9 |
| Income more than expenses | 13 | 15.7 |

who stated that they received cancer treatment was 77.1%. Among those who received treatment, the proportions of those who received surgical treatment and chemotherapy were 48.4 and 43.8, respectively. The median duration of participants suffering from pain was two years. While the rate of those who used painkillers was 89.2%, the rate of those who used non-pharmacological methods instead of painkillers was 67.5%. Prayer (71.4%), hot-cold application (50.0%), and massage (46.4%) were among the most commonly used non-pharmacological methods.

Table 3 shows the distribution of the scores obtained by the participants from the scales. The pain intensity of the participants ranged from 1 to 9, with a median pain intensity of 5. The rate of those who stated that they had severe pain

Table 2. Characteristics of the disease of the participants (n=83)

| Characteristics | n/Median | % |
|---|---|---|
| Duration of diagnosis (years) | Median: 3 | |
| < 5 | 59 | 71.1 |
| ≥ 5 | 24 | 28.9 |
| Status of receiving treatment | | |
| Yes | 64 | 77.1 |
| No | 19 | 22.9 |
| Treatment method (n=64)* | | |
| Surgery | 31 | 48.4 |
| Chemotherapy | 28 | 43.8 |
| Hormone replacement | 20 | 31.3 |
| Radiotherapy | 17 | 26.6 |
| Time of suffering from pain (years) | Median: 2 | |
| Pain killer use | | |
| Yes | 74 | 89.2 |
| No | 9 | 10.8 |
| Use of non-pharmacological methods instead of painkillers | | |
| Yes | 56 | 67.5 |
| No | 27 | 32.5 |
| Non-pharmacological methods used (n=56)* | | |
| Prayer | 40 | 71.4 |
| Hot-cold application | 28 | 50.0 |
| Massage | 26 | 46.4 |
| Relaxation exercises | 11 | 19.6 |
| Listening to music/watching TV | 10 | 17.9 |
| Dreaming | 5 | 8.9 |
| Hypnosis | 1 | 1.8 |
| Acupuncture | 1 | 1.8 |

* Participants ticked more than one option

Table 3. Distribution of the scores obtained by the participants from the scales

| Scales | Number | % |
|---|---|---|
| Numeric Rating Scale (Median score: 5) | Min-max:1-9 | |
| <5: Pain is not severe | 31 | 37.3 |
| ≥ 5: Pain is severe | 52 | 62.7 |
| Loneliness Scale for Elderly (Median score: 16) | Min-max: 6-22 | |
| <16: No loneliness | 32 | 38.6 |
| ≥16: Experienced loneliness | 51 | 61.4 |
| Beck Depression Inventory (Cutoff point: 17 score) | Min-max:2-60 | |
| 0-16: No depression | 26 | 31.3 |
| 17-63: Experienced depression | 57 | 68.7 |

was 62.7%. The median of the scores obtained from the loneliness scale of the research group was 16, and it was determined that 61.4% of them had loneliness. Depression was found in 68.7% of the participants.

Table 4 shows associations of several risk factors with pain severity. Pain intensity was 1.16 times higher in those with a prostate diagnosis of five years or more (OR.=1.16;95% C.I. 1.08-2.02; p<0.018). Pain intensity was 1.83 times higher in those with severe loneliness (OR=1.83; 95%C.I. 1.61-5.43; p=0.027) and 1.46 times higher in those with severe depression (OR=1.46; 95% C.I. 1.05-2.95; p=0.036).

Multiple binary logistic regression analysis of variables affecting pain intensity is given in Table 5. Pain intensity was 2.98 (aOR=2.98;95% C.I.= 1.62-6.27; p=0.000) times higher in those with long duration of diagnosis, 1.74 (aOR=1.74;95% C.I.=1.14-3.68; p=0.013) times higher among patients with loneliness, and 3.41 (aOR=3.41; 95% C.I.=3.07-8.16;p=0.038) times higher among those with severe depression.

## DISCUSSION

In this study on the relationship of pain in geriatric prostate cancer patients with regard to their loneliness and depression levels, it was determined that more than two-thirds of the participants had severe pain levels. The pain intensified as the duration of the diagnosis increased. Pain is one of the most common complications in cancer patients. It has been reported that 60-90% of the patients experience pain in the advanced stage of the disease, and approximately 30% have severe and persistent pain.[17] In men with prostate cancer, there may be pain in joints or bones in cases where the cancer is not treated and metastasizes.[18]

On the other hand, in this study, it was seen that 71.1% of the patients had less than five years of diagnosis, the median duration of pain experienced was two years, and 77.1% of them received cancer treatment (Table 2). The study's findings support the literature but suggest that patients with severe pain levels may be in the advanced stage. In addition, in this study, the fact that the research group was composed of the geriatric age group and the education level of approximately one out of every four participants was low (literate/primary school) resulted in our inability to obtain information about the cancer stage.

This study determined that approximately 90% of the participants used analgesics in case of pain. The rate of use by the cancer patients of any non-pharmacological method instead of analgesics was 67.5%. Among the non-pharmacological methods most frequently preferred by patients, prayer is the first, hot-cold application is the second, and massage is the third (Table 2). Pain management in elderly cancer patients is an important problem due to various difficulties, such as multiple drug use, comorbid disease, changing cancer therapies, and slowing cognitive levels, that may complicate pain management.[19] In elderly cancer patients, pharmacological treatment should be applied carefully, by considering the location and severity

Table 4. Associations of several risk factors and pain severity

| Risk factors | Pain was not severe (n=31) | | Pain was severe (n=52) | | OR | 95%CL | p-value |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | | | |
| Age group (years) | | | | | | | |
| < 65 | 10 | 34.5 | 19 | 65.5 | 1 | | 0.949 |
| ≥ 65 | 21 | 38.9 | 33 | 61.1 | 0.96 | 0.31-3.04 | |
| Education level | | | | | | | |
| Primary school and below | 21 | 35.0 | 39 | 65.0 | 1.05 | 0.30-3.57 | 0.937 |
| High school and above | 10 | 43.5 | 13 | 56.5 | 1 | | |
| Marital status | | | | | | | |
| Married | 27 | 38.0 | 44 | 62.0 | 1 | | 0.688 |
| Single | 4 | 33.3 | 8 | 66.7 | 1.36 | 0.29-6.22 | |
| Child Presence | | | | | | | |
| Yes | 27 | 37.5 | 45 | 62.5 | 1 | | 0.812 |
| No | 4 | 36.4 | 7 | 63.6 | 0.83 | 0.18-3.77 | |
| Income rate | | | | | | | |
| Income less than expenses | 5 | 29.4 | 12 | 70.6 | 0.41 | 0.05-3.07 | 0.385 |
| Income equal expenses | 22 | 41.5 | 31 | 58.5 | 0.36 | 0.07-1.77 | 0.213 |
| Income more than expenses | 4 | 30.8 | 9 | 69.2 | 1 | | |
| Duration of diagnosis of prostate cancer (years) | | | | | | | 0.018 |
| < 5 | 23 | 39.0 | 36 | 61.0 | 1 | | |
| ≥ 5 | 8 | 33.3 | 16 | 66.7 | 1.16 | 1.08-2.02 | |
| Received prostate treatment | | | | | | | |
| Yes | 23 | 35.9 | 41 | 64.1 | 0.19 | 0.14-1.23 | 0.626 |
| No | 8 | 42.1 | 11 | 57.9 | 1 | | |
| Pain relief usage | | | | | | | 0.118 |
| Yes | 25 | 33.8 | 49 | 66.2 | 1.07 | 0.70-2.36 | |
| No | 6 | 66.7 | 3 | 33.3 | 1 | | |
| Severity of loneliness | | | | | | | 0.027 |
| Severe | 10 | 31.3 | 22 | 68.8 | 1.83 | 1.61-5.43 | |
| Not severe | 21 | 41.2 | 30 | 58.8 | 1 | | |
| Severity of depression | | | | | | | 0.036 |
| Severe | 17 | 29.8 | 40 | 70.2 | 1.46 | 1.05-2.95 | |
| Not severe | 14 | 53.8 | 12 | 46.2 | 1 | | |

of the pain. Simple analgesics such as paracetamol and non-steroidal anti-inflammatory drugs (NSAID) are essential to treatment in all patients with mild to moderate pain. In addition, the paracetamol group are analgesics attractive to elderly cancer patients because they do not have cognitive side effects, are safe at recommended doses, and are well tolerated.[20] Options in cancer treatment are not limited to systemic pharmacological treatment. Acupuncture and transcutaneous electrical nerve stimulation that constitute non-pharmacological

Table 5. The relationship between participants' pain intensity and some risk factors

| | Adjusted OR | 95%CL | p-value |
|---|---|---|---|
| Duration of diagnosis of prostate cancer | 2.98 | 1.62-6.27 | 0.049 |
| Severity of loneliness | 1.74 | 1.14-3.68 | 0.013 |
| Severity of depression | 3.41 | 3.07-8.16 | 0.038 |

methods, as well as interventional methods such as peripheral nerve blocks, sympathetic blockade, and intrathecal drug delivery that are non-systemic pharmacological methods, can be preferred in elderly cancer patients.[21,22]

However, elderly cancer patients may turn to non-pharmacological methods instead of using analgesics due to the side effects of the drugs. This orientation may also increase the quality of life. Physical modalities and cognitive behavioral therapies can support pharmacological treatment. In recent years, there has been evidence that cancer patients resort to spiritual methods in pain management.[23] Spiritual methods have been indicated as a cohesive coping strategy [24] and an indicator of a better quality of life [21] for cancer patients. Spirituality and religion are interconnected concepts. Patients' religious beliefs, rituals, and practices may affect their ability to cope with pain.[26] In studies conducted with cancer patients in Turkey, praying is among the most widely used spiritual methods.[27,28]

In clinical studies, it has been shown that stress, chronic depression, social support, and other psychological factors can affect the onset and progression of cancer. On the other hand, it has been suggested that loneliness is a risk factor that increases cancer mortality.[29,30] Cancer-related loneliness or loneliness attributed to cancer experience is associated with patients' social expectations about cancer. Patients may have unrealistic expectations regarding practical and emotional support following a cancer diagnosis, and when these expectations are not met, it leads to loneliness.[31] Our study determined that more than two-thirds of the participants felt lonely, and the median score of the loneliness level was 16 (Table 3). In light of these findings, in our study, it can be thought that social support mechanisms are not functional enough, although a significant number of the participants are married and have children (Table 1). On the other hand, high levels of loneliness have been associated with increased fatigue and pain levels in cancer patients over time.[32] In this study, loneliness was high in elderly individuals with prostate cancer and associated with pain severity (Tables 4 and 5).

In this study, approximately 70% of the participants had depression, the levels of which were significantly associated with pain intensity (Tables 3-5). Pain and depression often coexist in elderly cancer patients, and both conditions exacerbate each other. While depression can change the perception of pain and reduce the mechanisms of coping with pain, on the other hand, pain and the resulting loss of function can be a trigger for depression.[19,33]

Gaining skills for properly managing pain in geriatric patients diagnosed with prostate cancer may reduce loneliness and depression. Developing interventions for patients' mental states in rehabilitation studies may help alleviate the severity of pain.

However, some limitations of this study need to be acknowledged. The fact that this study was conducted with the relatives of the investigators' students and the fact that some patients had insufficient internet access can be considered as limitations of the study.

Prostate cancer patients need to be closely followed and evaluated psychologically by healthcare professionals in the clinic. In addition, these patients, whose treatment is continued at home, require close monitoring by their families. In this way, the patient's symptoms of loneliness and depression can be noticed, and healthcare units can be notified to minimize the pain.

According to the study's limitations, the data will be collected more efficiently and reliably if the survey is conducted by visiting the patients in the hospital or at their homes in future studies.

## CONCLUSIONS

In line with the findings of our study, pain severity, loneliness, and depression levels were high in geriatric prostate cancer patients. Duration of diagnosis, loneliness, and depression were risk factors for pain intensity.

## CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

## CONTRIBUTORS

RC, NPA, and GY conceptualized and designed the work. GY analyzed the data and prepared the draft. RC and GY reviewed and interpreted the draft. RC and NPA finalized the draft. All authors have read and approved the final manuscript.

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None .

## DATA AVAILABILITY STATEMENT

The datasets generated and analyzed in this study will not be publicly available given that the included patients did not expressly provide their consent for public sharing of their data and that anonymization is unlikely to be feasible since the identification of patients treated in only one institution within a relatively short period may be possible when taking socio-demographic and clinical characteristics into account.

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