



## Does Pain Adversely Affect the Quality of Life in Hospitalized Cancer Patients?

Dagistan Gozde<sup>1</sup>, Karsli Bilge<sup>1\*</sup>, Kayacan Nurten<sup>1</sup>, Kol Emine<sup>2</sup>  
and Akbas Mert<sup>1</sup>

<sup>1</sup>Division of Algology, Department of Anesthesiology, Faculty of Medicine, Akdeniz University, Antalya, Turkey.

<sup>2</sup>Faculty of Nursing, Akdeniz University, Antalya, Turkey.

### Authors' contributions

This work was carried out in collaboration between all authors. Authors DG and KB designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors DG and KB managed the analyses of the study. Authors KN, KE and AM managed the literature searches. All authors read and approved the final manuscript.

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### ABSTRACT

**Background:** Each year, 9 million patients are diagnosed as a cancer. The pain is the most common cancer-related symptom. The prevalence of severe pain at diagnosis, during-active treatment and at advanced disease stage range from to 14-100%, to 50-70% and to 60-90% respectively.

**Methods:** In this study, the factors affecting the quality of life of cancer patients, the effects of these factors and pain on the quality of life of hospitalized cancer patients were investigated. 175 patients in Oncology Department were included. Short Form 36 and Algology Department form.

**Results:** In our study, the proportion of patients who had pain and who had no pain were 98.9%

\*Corresponding author: E-mail: bilgekarsli@akdeniz.edu.tr;

and 1.1% respectively. When we looked at the Visual Analogue Scale (VAS) score of patients, we saw that pain affects negatively on quality of life scores. When we evaluated the factors like weakness, nausea, vomiting, insomnia, sweating and when we compared the patients who had these symptoms and no symptoms like this; we found that all of these symptoms have negative impact on quality of life.

**Conclusions:** The development of new surgical techniques, the use of new drugs and therapies in cancer treatment increase survival and decrease mortality in cancer patients. As a progressive disease and duration of life with cancer is prolonged. So, quality of life and pain in cancer patients are becoming increasingly important.

*Keywords: Pain; quality of life; cancer.*

## 1. INTRODUCTION

For the majority of cancer patients and their family members, the most feared aspect of cancer diagnosis is the possibility of experiencing pain, after the fear of having an untreatable condition, and the fear of death. Also, pain represents the most common symptom of cancer related symptom. Severe pain has been reported to be experienced by 14 to 100% of all cancer patients at the time of diagnosis, 50 to 70% of patients receiving active treatment, and 60 to 90% of patients who have advanced disease [1, 2].

Management of cancer pain is a major public health problem. Despite current availability of effective treatments for pain control, it is saddening to see that 25% of all cancer patients die without adequate pain control.

On the other hand, in over 50% of cancer patients pain cannot be adequately alleviated despite the "3-step analgesic treatment" endorsed by the World Health Organization (WHO), advances in the field of pain research, and sophisticated interventional procedures. A major factor responsible for this therapeutic failure in pain management in cancer patients is the lack of knowledge and expertise among clinicians regarding the assessment and management of cancer pain. Particularly, lack of knowledge on opioid treatment, the fear of side effects and addiction with opioid use, and legal restrictions placed upon the use of analgesics such as morphine play a significant role in this failure [3-7].

Addressing the shortcomings of existing strategies for cancer pain management and development of standard approaches may allow us to reach the ultimate target that "no cancer patients will live with uncontrolled pain".

In this study, our objective was to examine the impact of pain on life quality in hospitalized cancer patients.

## 2. MATERIALS AND METHODS

The questionnaires used for assessing the effect of cancer pain on patients' quality of life were approved by the University Ethics Committee (date: 09 June 2013, no. 139) and written consent was obtained from patients.

A total of 175 patients admitted and treated at the Oncology Unit of the Medical Faculty were included in this study regardless of the type of cancer.

In order to evaluate the extent of the impact of pain on life quality of cancer patients, Quality of Life Short Form 36 and Akdeniz University Algology Pain Evaluation Form were used as well as another questionnaire consisting of short and clear questions aimed to delineate the localization, duration, and character of pain. Short Form consists of 36 items measuring 8 different domains: physical function (10 items), social functions (2 items), role limitations due to physical functions (4 items), role limitations due to emotional problems (3 items), mental health (5 items), energy/vitality (4 items), pain (2 items), and general health perception (5 items). SF-36 concerns the past 4 week period. Except for items 4 and 5, the assessment is based on a Likert scale (triple and sextette), while yes/no responses are provided for items 4 and 5. Rather than yielding a single sum score, a separate score is given for each sub-scale, which assesses the health in a score range between 0 and 100, 0 showing poor health and 100 showing good health status. Accordingly, the scores for each of the 8 domains were calculated in our patient group. Questiones of Forms;

### Quality of Life Short Form 36:

- 1) Which of the following statement is correct about your general health situation?
- 2) How do you consider about your general health situation when you compared yourself with a year ago?
- 3) The questions below are about the things that you may do in a day. Does your health limits you? If it does, how much?
- 4) Have you had any of these problems below while you are working or doing your daily activities over the last 4 weeks?
- 5) have you had any of these problems below because of emotional problems (such as depression or nuisance) over the last 4 weeks?
- 6) How much has your physical health or emotional problems affected your social relations between your family, friends and neighbours over the last 4 weeks?
- 7) How much pain have you had over the last 4 weeks?
- 8) how much has your pain affected your routine works (both as outdoor and as housework) over the last 4 weeks?
- 9) Indicate that how much these sentence below are correct or wrong for you.
- 10) These questions are prepared to understand your feelings and how you are over the past month. Please choose the most suitable answer for each question.

### Akdeniz University Algology Pain Evaluation Form:

- 1) Pain side
- 2) Location of pain
- 3) Dissemination of pain
- 4) Since when has your ached been available?
- 5) How did your pain start?
- 6) When did your pain get worst?
- 7) The time of since the beginning of the pain until applying for a Dr.
- 8) Frequency of pain
- 9) The period of pain
- 10) How long does your pain-free terms last
- 11) Quality of your pain (How do you describe your pain)
- 12) Has your pain qualification changed since it started
- 13) What is your pain intensity now
- 14) Facts that affect your pain (get starts, increases, reduces)
- 15) Which position does your pain reduceses?
- 16) Symptoms that accompanying the pain

- 17) Activities that limits from pain
- 18) Painkillers that you are using because of your current pain
- 19) Ache treatments that you had before ?
- 20) Is there any methods which you found you think that reduces your pain
- 21) Pain story

Data were analyzed using SPSS statistical program - PASW 18 (SPSS/IBM, Chicago, IL, USA). Frequency distribution, mean, standard deviation, median, minimum and maximum values were used for descriptive statistics. Also, the association between the continuous variables was analyzed using the correlation analysis. For categorical data, a chi-square significance test was used. When parametric test assumptions were met, the difference between two independent groups was tested using Student's t-test, the difference between two dependent group means was tested using pairwise difference test, and the difference between more than two groups were tested using the variance analysis. When parametric test assumptions were not met, the non-parametric alternatives including Mann Whitney U, Wilcoxon signed rank and Kruskal Wallis tests were utilized. A significance level of 95% were used to determine the differences in the study (or a margin of error at  $\alpha=0.05$ ).

## 3. RESULTS

### 3.1 Demographic Datas

The mean age of 175 study participants was  $57.6 \pm 12.94$  (23-87) years, and 65.1% and 34.9% of the study population were male and female, respectively (Fig. 1). Housewives, retired individuals, and self-employed subjects comprised 31.4%, 22.9%, and 15.4% of the population. The most frequent type of cancer was lung cancer in 25.7% of the subjects.

Pain was reported by 98.9% of the individuals, while 1.1% reported no pain (Fig. 2).

The most common site of pain was the abdomen in 38.9%, followed by chest pain in 20%, and headache in 18.3% (Fig. 3, Fig. 4).

Diffuse body pain was reported by 3.4% of the patients (Table 1).

### 3.2 The Onset of Pain

The time from the onset of pain to study entry exhibited a wide variation in the participants

ranging between 10 days and 4 years. While 19.4% of the patients reported acute onset pain, a gradual occurrence was reported by 79%, with 1.1% of patient reporting no pain.

Of the patients with pain 58.3% sought medical assistance soon after the onset of pain, while in

12%, 9.1%, 16%, and 2.3% of the patients there was a delay of days, weeks, months, or years, respectively, after the onset of pain and seeking medical assistance. Again, among those experiencing pain as a symptom the pain occurred several times a day, several times a week, several times a month, and several times

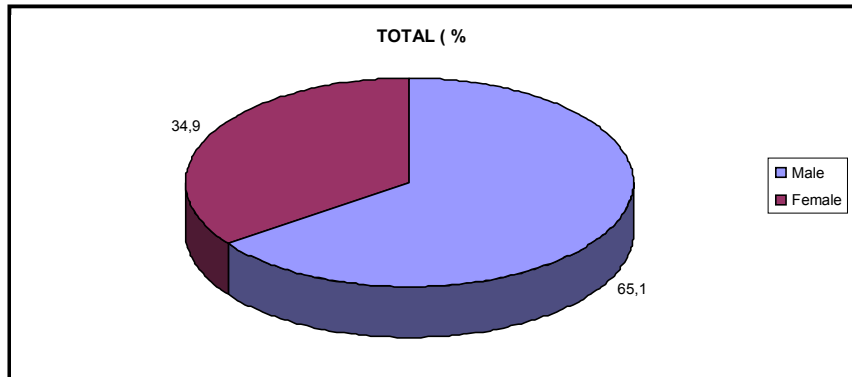


Fig. 1. Gender distribution in the patient population

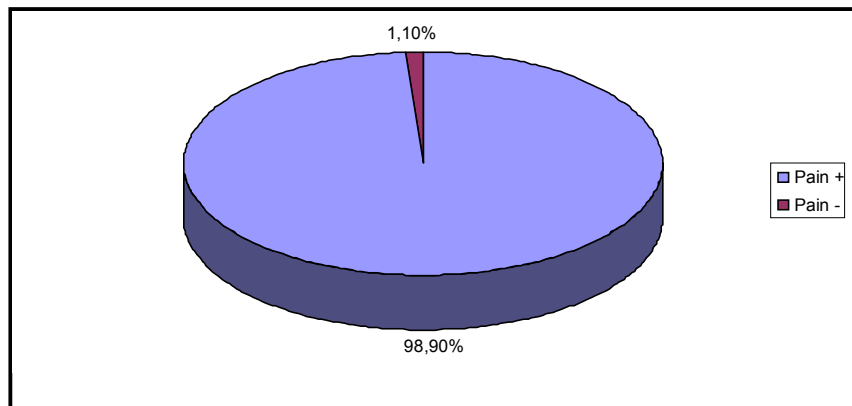


Fig. 2. Pain status of the study patients

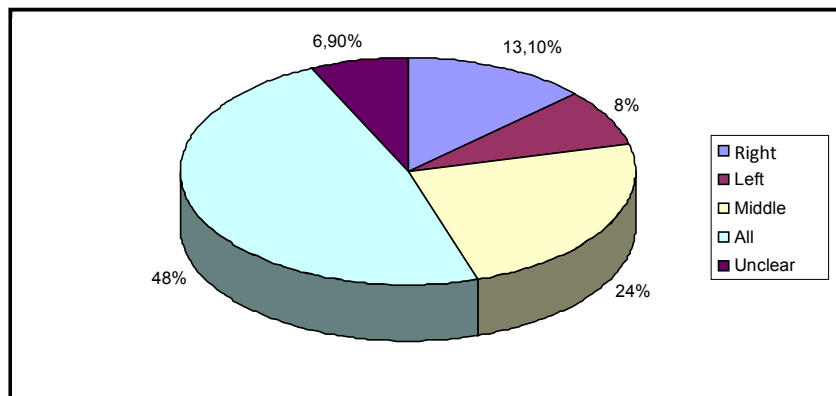


Fig. 3. Distribution of the painful sites

a year in 5.1%, 14.9%, 26.3%, and 1.1%, respectively, while 51.4% had continuous pain. When the duration of pain was assessed, 38.3% were found to have continuous pain, while pain duration was variable in 44%, and this was limited to seconds or minutes in 3.4%, to hours and days in 11.4%, and weeks and months in 1.7%. Pain free periods were reported to be variable without a discernible pattern in 72.6% of the patients, while 15.4% had no pain free period, and 12% reported painless periods varying between 1 hour and 1 month.

### 3.3 The Character of Pain

The character of pain was described using the terms ache in 18.4%, penetrating in 33.7%, like a knife stab in 12.6%, pricking in 4%, ripping in 1.1%, electric shock in 1.1%, crushing in 5.1%, tension in 6.3%, tingling in 4%, contractile in 8.6%, itchy in 1.1%, gnawing in 0.6%, sharp in 12%, tearing off in 1.1%, blunt in 5.1%, pulling

apart in 4%, squeezing in 4%, stinging in 15.4%, lightning in 1.1%, chilly in 0.6%, burning in 17.%, wound like in 0.6%, and throbbing in 6.9%. An inquiry into the severity of the pain within the past 4 weeks revealed increasing intensity in 51.4%, declining intensity in 5.1%, and no change in intensity in 43.4%.

### 3.4 The Pain Scores

VAS scores at the time of interview were 0-5 in 61.8%, and 5-10 in 38.2% (VAS 0 in 3.5%, VAS 1 in 30.3%, VAS 2 in 11.4%, VAS3 in 10.3, VAS4 in 6.3%, VAS5 in 5.7%, VAS6 in 6.3%, VAS 7 in 9.1%, VAS 8 in 5.1%, VAS 9 in 6.9%, and VAS 10 in 5.1%) (Fig. 5, Fig. 6) (Table 2).

Symptoms occurring in addition to pain included nausea in 36%, fatigue in 66.3%, loss of appetite in 56%, constipation in 11.4%, vomiting in 20%, and insomnia in 15.4%.

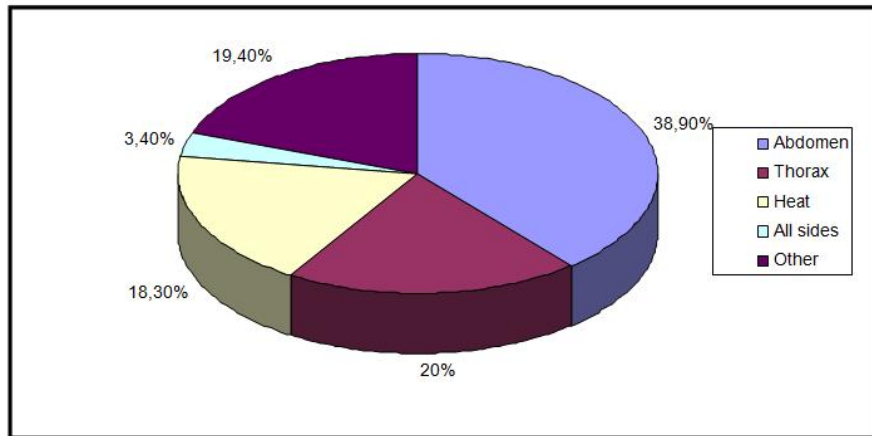


Fig. 4. Distribution of the painful sites

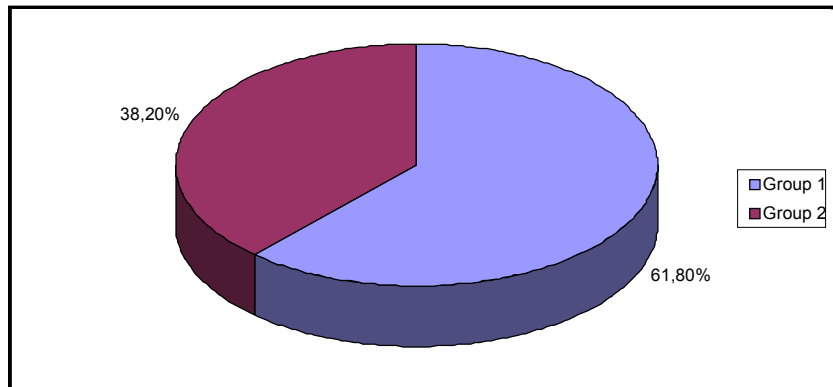
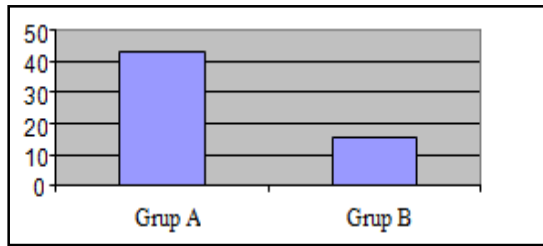


Fig. 5. Patient groups based on VAS scores



**Fig. 6. Physical functions according to VAS scores**

### 3.5 The Use of Analgesics

No use of analgesics was reported by 20.6% of the patients, while 5.7%, 21.7%, 7.4%, 7%, 4.6%, 25.1%, and 9.1% were on morphine, tramadol (contramal), fentanyl (duragesic), fentanyl plus tramadol, fentanyl plus morphine, morphine plus tramadol, and morphine plus tramadol plus fentanyl, respectively. Patients were categorized into two groups based on VAS scores as follows: Group 1 (VAS score 0-5) and Group 2 (VAS score 5-10). Ninety-four percent of patients with no use of analgesics, 90% of morphine users, 65% of tramadol users, 46% of fentanyl users, 50% of fentanyl plus tramadol users, 37% of fentanyl plus morphine users, 59% of morphine plus tramadol users, and 62% of morphine plus tramadol plus fentanyl users were in Group 1.

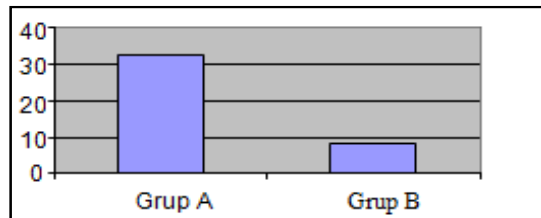
A history of cancer surgery was present in 34.3%, and a family history of cancer was present in 12%. Chemotherapy and radiotherapy were given to 83.4% and 32.6% of the patients, respectively.

### 3.6 The Quality of Life

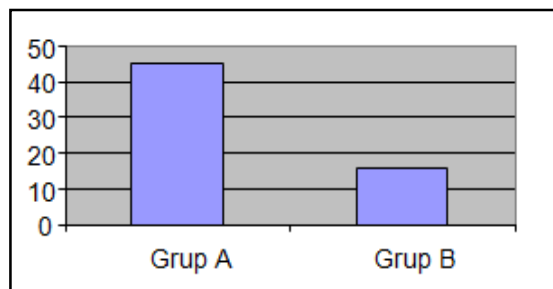
Sixty-five percent of the patients deemed their health moderate or poor, while 35% reported a good or very good health status. As compared to past year 9.7% of the patients regarded their health status as “better”, while 12.6% reported no change, and 77.7% reported worsening. The proportion of patients who reported a limitation of activities requiring power 81.7% due to their current health status, while no such limitation was reported by 17.1%. Limitation of daily activities such as washing or grooming was reported by 68%, while 32% reported no such effects. An interruption of daily activities in the past 4 weeks due to physical health was reported by 71.4% of the patients, while 76.6% reported a reduction in the type of activities, 77.1% reported difficulty in activities, and 77.7% reported being able to perform less activity than before.

Proportion of patients reporting extremely severe, very severe, severe, moderate, low and no pain within the past 4 week period were 16%, 18.9%, 9.1%, 18.3%, 25.1, and 12.6%, respectively. Pain was reported to significantly interfere with normal activities in 45.8%.

Quality of life assessments by Short Form 36 was also performed according to pre-defined VAS score sub-groups: those with a VAS score between 0 and 5 comprised Group A (Pain Group 1) and those with a VAS score between 5 and 10 comprised Group B (Pain Group 2). Physical function scores in Group A and B were 43.09±3.89 and 15.78±3.69, respectively. The daily activity score in relation to physical health status in Group A and B were 45.4 ± 4.55 and 15.75 ± 4.42, respectively (Fig. 7). The emotional scores were 59.8 ± 3.28 and 60.64 ± 4.96 in Group A and B, respectively (Fig. 8). Social function scores in the respective groups were 47.03 ± 6.1 and 20.61 ± 6.59 (Fig. 10). All comparisons in these parameters yielded significant differences (Fig. 7-10).



**Fig. 7. Ability to perform physical-health related tasks according to VAS scores**



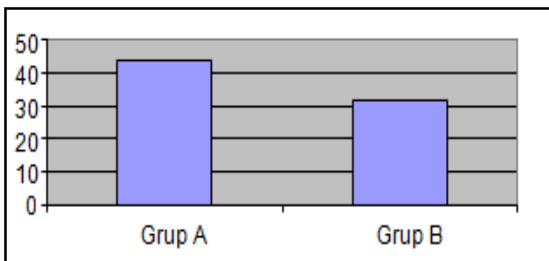
**Fig. 8. Ability to perform emotional-health related tasks according to VAS scores**

**Table 1. Pain**

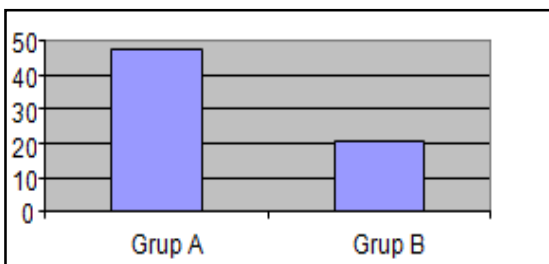
Abdominal pain	38.9 %
Chest pain	20.0 %
Headache	18.3 %
Diffuse body pain	3.4 %
No pain	1.1 %

**Table 2. VAS scores and analgesic therapy**

VAS 0-5	61.8% of the patients	VAS 5-10	38.2% of the patients
VAS 0		3.5% of the patients	
VAS 1		30.3% of the patients	
VAS 2		11.4% of the patients	
VAS 3		10.3% of the patients	
VAS 4		6.3% of the patients	
VAS 5		5.7% of the patients	
VAS 6		6.3% of the patients	
VAS 7		9.1% of the patients	
VAS 8		5.1% of the patients	
VAS 9		6.9% of the patients	
VAS 10		5.1% of the patients	
No drug		94% of the patients	
Morphine		90% of the patients	
Tramadol		65% of the patients	
Fentanyl		46% of the patients	
Fentanyl+Tramadol		50% of the patients	
Morphine+Tramadol+Fentanyl		62% of the patients	



**Fig. 9. Energy level of the patients according to VAS scores**



**Fig. 10. Social function status of the study patients according to VAS scores**

Each of the 8 domains on life quality was divided into 2 sections. Group 1 consisted of scores between 0 and 50 and Group 2 consisted of scores between 50 and 100, within a total range score between 0 and 100. Vomiting was present in 22% of patients in Pain Group 1 and in 17% of patients in Pain Group 2, with no statistical significance. Sweating was present in 21% and 9% of these two groups, respectively. Pain was present in 19% and 11% of the patients in Pain Group 1 and Pain Group 2, respectively, again

with no significant difference. Of the patients with insomnia, 22% were in Group 1 and 78% were in Group 2, with no significant correlation between pain and insomnia.

#### 4. DISCUSSION

Cancer pain is a complex symptom with a certain degree of heterogeneity depending on the physical capacity, daily activities, emotional and physiological status, and social life of the patients. Pain is the most common symptom in cancer. Several factors such as the type of the primary tumor, disease stage, presence/absence of metastases, proximity of the tumoral tissues to the neural structures, and psychological status of the patient play a role in the occurrence and severity of pain, which is a subjective symptom characterized by a number of components. In these patients the severity, localization, and factors associated with lessening or worsening pain should be defined to guide the clinicians in determining whether a specific pain syndrome is present [8-10]. In a study by Caraceni and colleagues, the examination of the character of the pain showed that the pain perceived as electric shock or burning sensation was most likely due to the underlying neuropathic mechanism [11], which has been found to represent approximately 40% of all pain syndromes. In our study group, 98.9% of the patients reported pain, while 1.1% were pain-free. In a study by Goudas and co-workers, the prevalence of pain among patients receiving cancer treatment was between 33 and 50%, while this figure could be as high as 70% among

those with terminal disease [12]; also, 40% continued to experience pain despite treatment.

A global increase has been occurring in the number of patients with cancer, with 9 million new cases of cancer diagnosed annually, half of them being diagnosed in the developing world. Advances in the field of cancer surgery, therapeutic agents and other therapeutic modalities have resulted in improved survival and decreased mortality rates in cancer patients. As a result of these improvements, quality of life of cancer patients has gained increasing importance. In a study from the US, 50% of all patients receiving cancer care at home reported experiencing pain on a daily basis, and this figure may even reach 85%. An assessment of patient sub-groups defined on the basis of VAS scores suggests that pain has an adverse effect on the entire life quality spectrum from physical to social domains. Accordingly, patients with a VAS score  $\geq 5$  had worse quality of life scores than those with a VAS of less than 5 in all domains [13]. Again in a study from a US oncology unit patients with a baseline pain score of  $> 4$  out of 10 total points were included and a variety of life quality and pain scales were utilized. Patients were followed up for a total duration of 3 weeks after initiation of analgesic regimens. Existing pain was reduced by more than 80% within the first week, accompanied by a significant decline in the stress levels and significant improvement in the quality of life. This study showed that it may be possible to achieve a better quality of life and better psychological status when cancer pain is appropriately managed [14]. In our study, pain had a negative impact on the quality of life, which was assessed in 8 sub-categories (physical functions, social functions, role limitations in association with physical functions, role limitations due to emotional problems, mental health, energy/vitality, pain, and general health perception). Also the presence of other factors such as fatigue, nausea, vomiting, insomnia, and sweating was associated with a negative effect on the quality of life of cancer patients as compared to those without such factors. Dott and colleagues in their study involving a total of 112 women with breast cancer who received chemotherapy and radiotherapy, compared the symptoms such as pain, fatigue, sleep disorder, or depressive mood on functional status and quality of life at baseline, termination of cancer treatment, and at study end (nearly 1 year after study onset). Patients were also grouped according to the severity of symptoms as follows: mild (no symptoms or 1 symptom), moderate (2

symptoms), severe (3 or 4 symptoms), and very severe ( $> 4$  symptoms) symptomatology. The assessment of the functional status and quality of life in these groups showed significantly lower functional status and quality of life among those with very severe symptoms than other groups [15]. Everdingen et al. [16] examined the physical and psychological determinants of the quality of life in 1429 cancer patients grouped according to tumor type and treatment status. Group 1 consisted of patients who received curative treatment, while Group 2 consisted of palliative care patients, and the patients with no treatment comprised Group 3. EORTC-C30 was used for life quality assessments, while depression and anxiety were measured using other scales. An increase in the symptom prevalence occurred across the patient groups from group 1 to group 3. While vomiting and irritability represented the symptoms that were avoided least, fatigue and worry were the symptoms that were avoided most. Also, the quality of life was highest in group 1 and lowest in group 3.

These authors concluded that fatigue, loss of appetite, constipation, depression, and anxiety were independent factors that had a negative impact on the quality of life [16]. In a study from Rehabilitation Unit of the Cancer Center, Texas University, the physical performance of the patients was assessed. In addition to 109 patients with cancer, 105 patients admitted to other units comprised the control group. Performance assessments were based on the use of 9 different tests, in which the patients were asked to perform a variety of movement tasks, while other scales were utilized to evaluate pain, function, and fatigue. A significant difference in physical performance was found between cancer patients and controls, with cancer patients having significantly lower physical performance. It was suggested that the more frequent occurrence of pain and fatigue in cancer patients could be associated with the reduced physical performance [17]. In our study, one other factor with an impact on the quality of life was insomnia. Patients experiencing insomnia had significantly lower quality of life scores than those without insomnia. In the study by Granslaya and colleagues involving metastatic breast cancer patients, irregular sleep was found to be associated with depression, pain, and stress [18]. Also, Fortner and co-workers showed an association between irregular sleep and quality of life when they compared patients with breast cancer and non-



cancer patients. It was evident from the findings that 61% of the breast cancer patients had severe sleep disturbance, which was caused mainly by pain, nausea, or high fever. Others have failed to observe a significant improvement of the quality of sleep after medical or behavioral interventions [19]. In our study, 56.6% of the patient population were currently receiving anti-depressant medications at the time of study. These agents are commonly utilized in chronic painful conditions and have a certain degree of analgesic effect, which is thought to be related with their serotonergic and dopaminergic properties. Their use is particularly recommended in neuropathic pain [20,21].

The analgesic medications and methods were applied for cancer pain. However, there was inadequate treatment of the cancer pain in many patients and their quality of life was affected [22,23].

We believe that insignificant associations observed in this study may also prove to be significant in larger populations. Further studies are warranted to provide a more comprehensive assessment of the multitude of factors that have an effect on the quality of life of cancer patients.

## 5. CONCLUSIONS

Pain is one of the most common symptoms in the patients with cancer. The management of the cancer pain depends on a comprehensive assessment. The adequacy of pain management can be related to the patient's quality of life. The quality of life is currently, considered as a primary outcome of the treatment and clinical trials planning. Pain in the cancer patients should be treated adequately, as it may adversely affect the patient's daily activities and quality of life.

## CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

## ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the authors.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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