

# Association of Pain and Psychosocial Status Among Patients with Cancer

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**Abstract:** Although there is evidence that chronic pain is related to psychosocial status, and psychosocial status may affect the degree of pain symptoms, the evidence of any association in cancer patients is weak. The purpose of this study is to determine the association between pain and psychosocial status (anxiety, depression and social support) among cancer patients. This was conducted through non-empirical correlation design and questionnaire survey. The study was based on 83 participants from a hospital in Shandong Province. They were asked to complete the data collection by filling out the questionnaire online. Correlation analysis show that there is a significant positive correlation between anxiety score and pain score ( $r = 0.757$ ,  $P < 0.001$ ); There is a significant positive correlation between depression score and pain score ( $r = 0.821$ ,  $P < 0.001$ ); There is a significant negative correlation between social support score and pain score ( $r = -0.483$ ,  $P < 0.001$ ). This study demonstrates that pain in cancer patients is associated with psychosocial status (anxiety, depression, social support). This suggests that the pain problems of cancer patients can be reduced by improving their psychosocial status (anxiety, depression, social support).

**Keywords:** Cancer Pain; Psychosocial Status; Anxiety; Depression; Social Support.

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## 1. Introduction

Pain is an uncomfortable subjective experience in feeling and emotion, which is common in cancer patients [1]. According to the statistics of the World Health Organization (WHO), at least one third of cancer patients have different degrees of pain, and proportion of advanced cancer patients suffering from pain can reach 60%-90%. Therefore, cancer pain control is listed as one of the four key plans of WHO cancer treatment [2]. A lot of evidence shows that there is an obvious correlation between psychosocial factors and pain experience [3].

In all clinical settings, emotional disorders, especially anxiety and depression, play an important role in the deterioration of pain perception. More severe anxiety, depression, pain and lower quality of life are associated with level of pain in patients with cancer [4]. Depression and anxiety are common among cancer patients, accounting for about 30% - 58% according to domestic and foreign literature reports. Meldrum pointed out that if pain is not properly managed, psychological factors such as anxiety and depression can aggravate the disease [5]. The National Cancer Institute has also shown that severe or persistent pain after cancer treatment increases the risk of anxiety and depression. Feeling depression and anxiety can exacerbate cancer pain and it becomes difficult to control it. Some patients can't work because of pain [6]. The pain that cannot be alleviated deprives the patient of their comfort, greatly affects their activities, motivation, interaction with family and friends, and the quality of life as a whole.

Pain is not only regulated by sensory, emotional, and cognitive factors, but also by social factors including social connections. A recent proposal to update the definition of pain highlights the central role of social factors [7]. Social forces shape health-related outcomes, and pain is no exception [8].

Cancer is a major global issue that affects human health. The 2022 Global Cancer Statistics Report shows that there are

approximately 20 million new cancer cases and 9.7 million deaths worldwide [9]. Cancer is one of the main factors contributing to the global disease burden, and the global cancer burden will continue to increase in the next 30 years, posing a significant threat to human life safety and quality of life. Data shows that cancer accounts for about 1/6 of global deaths and nearly 1/4 of deaths caused by non communicable diseases, making it an important factor leading to premature non communicable deaths worldwide. Cancer not only shortens the life expectancy of patients, but also causes serious social and economic burdens, and has become a major global public health issue, including in China. In January 2025, the American Cancer Society released the latest cancer statistics, estimating that there will be approximately 2041910 new cancer cases and 618120 deaths in the United States by 2025. The incidence spectrum of cancer in China is different from that in the United States, and the incidence rate of lung cancer and breast cancer among young women is rising rapidly, with an average annual growth rate of more than 3% [10].

Cancer pain is a common symptom of patients with malignant tumor, which has a significant impact on the quality of life and even life safety of patients [11]. A summary of 4,000 clinical studies from years 2005-2014 shows that the total incidence rate of cancer pain is about 51%. According to different cancers and stages, the incidence rate ranged from 39% to 75% [12]. Another study showed that the proportion of cancer patients in cancer diagnosis was 35%, and the proportion in the whole treatment process was 46%. However, according to the type and stage of cancer, patients with advanced cancer had a relatively high incidence of cancer pain, about 76% [13].

Cancer pain is one of the most common complications of tumors and a painful and unbearable symptom for cancer patients. Studies have shown that 59% of patients receiving anti-tumor treatment and 64% of patients with advanced cancer will suffer from pain, and the incidence of cancerous pain is related to the location of the tumor. The incidence of

pain in patients with pancreatic cancer is about 95%, and the incidence of pain in patients with advanced lung cancer is about 80% [14]. Early, sufficient, sustained, and effective pain control is a fundamental right of patients and a duty of healthcare professionals[15].

There is overwhelming evidence that cancer patients suffer from psychosocial stress not only in the early stages after diagnosis, but also throughout the course of the disease. Cancer patients often have a variety of psychological problems and reactions, among which depression, anxiety, hostility, terror and other negative emotions are more prominent. This psychological state not only affects the immune function of patients, but also affects treatment compliance, which is extremely unfavorable for the rehabilitation of patients[16].

It was found through literature review that research on the psychosocial status of cancer patients is common in China. Research literature on pain in cancer patients is also common. However, the analysis of the association between pain and psychosocial status of cancer patients is not presenting the whole picture of the pain and psychosocial status association. This study investigated and analyzed the pain and psychosocial status of cancer patients, understood the level of pain and social psychological status of cancer patients, explored their correlation, and put forward suggestions for helping cancer patients adapt better to basic diseases and formulating scientific nursing measures.

From the previous clinical experiences of the researcher in handling cancer patients, the researcher observed that pain is the most common problem encountered by the clients, which may be lessened or made more intense by different psychosocial factors. The researcher admits there are lesser literatures that study the association of the two variables. The situation inspired and motivated the researcher to conduct the study.

## 2. Objects and Methods

### 2.1. Subjects

The aim of this study is to analyze the pain and psychosocial status of cancer patients, understand their pain levels and psychosocial status, explore their correlation, and provide recommendations for helping cancer patients better adapt to underlying diseases and develop scientific nursing measures.

### 2.2. METHODS

#### 2.2.1. Research Design

This study utilized a non-experimental correlation design to study the correlation between pain and psychosocial status in cancer patients at authoritative hospitals in Shandong Province, China.

#### 2.2.2. Respondents of the Study and Sampling Technique

The study utilized total enumeration sampling and respondents come from a hospital in Shandong province. These participants meet the following research criteria:

Inclusion criteria: (1) Diagnosis of cancer was confirmed by pathology or cytology and imaging; (2) Cancer patients aged 20-75 years; (3) The patients have no obvious visual and auditory impairment; (4) Ability and willingness to actively cooperate to complete the scale evaluation and able to sign the informed consent for this study; (5) The respondent is not in pain at the time of seeking consent and at the time of data gathering.

Exclusion criteria: (1) Those who have not completed all the contents of the questionnaire for any reason; (2) Illiterate; (3) Those with memory impairment, personality change, language communication impairment, hearing impairment and reasoning impairment; (4) Previous history of neurological and mental illness; (5) Those who use puzzle or other drugs that affect the nervous system within the past month; (6) Accompanied by serious physical diseases, unable to cooperate with the investigator.

In calculating sample size, total enumeration sampling was used in this study. Therefore, the number of people participating in the study needs to be determined according to the number of cancer inpatients in the hospital. Eighty-three patients with cancer were enrolled in the study.

#### 2.2.3. Research Instrument

The following research instruments were used in the study:

(1)The first questionnaire is the personal information questionnaire form consisting of age, sex, monthly household income, marital status, educational attainment, cancer stage, type of cancer, duration of cancer, treatment of cancer. Medical records were reviewed to get information about these variables.

(2)Pain assessment tools: The 0-10 numerical rating scale (NRS) was used to evaluate the pain degree of patients. The NRS was used to evaluate the pain degree, with the range of 0-10, 1-3 as mild pain, 4-6 as moderate pain, and 7-10 as severe pain. This study used continuous numerical value ranging from 0 to 10 for statistical analysis of correlation. The NRS had excellent test-retest reliability. The intraclass correlation coefficients of the NRS was 0.95, with other pain assessment tools such as VAS and VRS.

(3)Tools for assessing psychosocial status:

1)The Hospital Anxiety and Depression Scale (HADS) was designed by Zigmond and Snaith 30 years ago to measure the level of anxiety and depression in patients in the general medical population. It has become a popular tool for use in both clinical practice and research. The benefit of the HADS score is that it is simple, quick and easy to use. It simultaneously assesses anxiety and depression, two emotions that often co-exist. The association between the two subscales ranged from 0.40 to 0.74 (mean 0.56). The Cronbach's alpha for the HADS-A ranged from 0.68 to 0.93 (mean 0.83) and for the HADS-D from 0.67 to 0.90 (mean 0.82). The questionnaire consists of seven anxiety questions and seven depression questions and takes to two to five minutes to complete. While anxiety and depression questions are interspersed throughout the questionnaire, it is essential that they are scored separately. Available cut-off points for quantification. Scoring criteria: 0-7 is Normal; 8-10 is Borderline abnormal (borderline case); 11-21 is Abnormal (case). This study used continuous numerical value ranging from 0 to 21 for statistical analysis of correlation.

2) Social Support Rating Scale (SSRS). The social support rating scale was developed by Xiao Shuiyuan in 1986. The SSRS has 10 items measuring three dimensions of social support: subjective support (4 items), objective support (3 items), and support-seeking behavior (3 items). The SSRS scale can be used in two ways. First, raw scores for each of the three domains are added together to produce subjective (range: 8-32) and objective (range: 1-22) support scores, as well as support-seeking behavior scores (range: 3-12). Second, the item scores were simply summed to produce an overall support score, ranging from 12-66. This total support score was divided into three categories: low ( $\leq 22$ ), medium (23-44)

and high ( $\geq 45$ ) levels of support. The analysis in this study is based on the second model. This study used continuous numerical value ranging from 12 to 66 for statistical analysis of correlation. According to Xiao in the study of Ke. The two-month test-retest reliability of the SSRS exceeded 0.92. According to Cheng, Gao, Xie in the study of Ke et al, the SSRS has high reliability and validity and is widely used in China.

#### 2.2.4. Data Collection

This study strictly followed the principle of informed consent, and data collection was mainly based on online questionnaires. The questionnaires were published and collected through the "Questionnaire Star" platform. Before distributing the questionnaires, participants were explained the purpose and significance of the questionnaire survey, and informed of the methods and precautions for filling out the questionnaire.

#### 2.2.5. Data Analysis

The researchers used SPSS 27.0 software to analyze the data. Metric data were expressed as mean and standard deviation, while count data were expressed as frequency and percentage. Analysis of variance (ANOVA) used to test whether the means of two or more groups are significantly different. T-test was used to measure the differences in the influence of different sex and other factors on pain and

psychosocial status: (anxiety, depression and social support) during the cancer patients. Pearson Product of Moment Correlation was used to measure the correlation or association between the pain and psychosocial status: (anxiety, depression and social support) among cancer patients.

#### 2.2.6. Ethical Considerations

(1) Respecting intellectual property rights, all questionnaires used in this study have been authorized by the original authors.

(2) Respect the privacy rights of the research subjects. During the investigation process, all collected data will be kept absolutely confidential and will only be used for research purposes. It will not be leaked. The research data will be entered in encoded form and will not involve any confidential information.

(3) Prior to the study, the purpose of this research was introduced to the research subjects and consistent information was provided to all participants. All participants in this study voluntarily participated.

(4) The survey questionnaire is scientific and humanized, and the answers involved will not cause physical or mental harm to the research subjects.

### 3. Results

#### 3.1. Demographic Information of Respondent

Table 1. Demographic Information of Respondents

Characteristic	Frequency(n=83)	Percentage (%)
Sex		
Male	39	47.0%
Female	44	53.0%
Age		
20–45 years	32	38.6%
46–60 years	36	43.4%
61–75 years	15	18.1%
Marital status		
Single	14	16.9%
Married	57	68.7%
Separated	6	7.2%
Widowed	6	7.2%
Educational attainment		
Junior High School and below	29	34.9%
High school	29	34.9%
Bachelor's degree	19	22.9%
Master's Degree and above	6	7.2%
Monthly Household Income		
<3000 RMB	9	10.8%
3000–5000 RMB	43	51.8%
5001–10000 RMB	24	28.9%
>10000 RMB	7	8.4%
Cancer Stage		
T1 N0 M0	8	9.6%
T2 N0 M0	17	20.5%
T2 N1 M0	3	3.6%
T2 N2 M0	10	12.0%
T3 N2 M0	10	12.0%
T3 N2 M1	15	18.1%
T3 N3 M0	9	10.8%
T3 N3 M1	9	10.8%
T4 N3 M1	2	2.4%
Type of Cancer		
Head and Neck	9	10.8%
Digestive Tract	22	26.5%
Lung	23	27.7%
Genitourinary	12	14.5%
Breast	17	20.5%
Duration of Cancer		
1-6 months	35	42.2%
7-12 months	29	34.9%
13-24 months	13	15.7%
25 - 48 months	4	4.8%
> 48months	2	2.4%

Table 1 Continued

Characteristic	Frequency(n=83)	Percentage (%)
Treatment Methods		
Simple Operation	20	24.1%
Chemotherapy alone	6	7.2%
Surgery + radiotherapy	2	2.4%
Surgery + chemotherapy	30	36.1%
Surgery + radiotherapy + chemotherapy	21	25.3%
Radiotherapy + chemotherapy	2	2.4%
Symptomatic treatment	2	2.4%
Type of Pain Management		
Non-opioid	21	25.3%
Opioid	14	16.9%
Opioid and non-opioid	16	19.3%
Opioid and adjuvant	14	16.9%
Opioid, adjuvant and non-opioid	10	12.0%
Herbal Medicine	3	3.6%
Acupressure	3	3.6%
Acupuncture	2	2.4%
Level of Pain		
Mild	15	18.1
Moderate	29	34.9
Severe	39	47.0
Level of Anxiety		
Normal	6	7.2%
Borderline	10	12.0%
Abnormal	67	80.7%
Level of Depression		
Normal	13	15.7%
Borderline	15	18.1%
Abnormal	55	66.3%
Level of Social Support		
Low	6	7.2%
Moderate	50	60.2%
High	27	32.5%

Table 1 shows the profile of the participants in terms of age, sex, per capita monthly household income, marital status, educational attainment, cancer stage, type of cancer, duration of cancer, treatment of cancer, and type of pain management. In addition, the results show that of the 83 eligible participants, 68 (81.9%) have moderate to severe pain; 67(80.7%) have anxiety;55(66.3%) have depression; 6 (7.2%) have low-level social support, 50(60.2%) have moderate-level social support and 27 (32.5%) have high-level social support. As shown in Table 1.

### 3.2. Comparison of Cancer Pain and Psychosocial Status Across Different Characteristics

Based on the comparison results of cancer pain and psychosocial status among patients with different characteristics in Table 2, the analysis is as follows: In terms of sex, male patients showed significantly higher scores for anxiety ( $16.38 \pm 3.68$ ), depression ( $15.20 \pm 5.04$ ), and pain ( $7.15 \pm 2.36$ ) compared to females ( $13.07 \pm 4.55$ ;  $11.52 \pm 4.85$ ;  $5.25 \pm 2.19$ ) ( $p < 0.001$ ), while their social support scores ( $36.95 \pm 11.43$ ) were significantly lower than those of female patients ( $40.18 \pm 12.04$ ). Age group analysis revealed that the 61-75 years age group had the highest scores for anxiety ( $16.93 \pm 3.24$ ), depression ( $17.07 \pm 4.43$ ), and pain ( $7.93 \pm 2.19$ ), with statistically significant differences in depression and pain among groups ( $p < 0.05$ ). There were no significant differences in social support scores across age groups. Marital status had the most significant impact on social support ( $p < 0.001$ ). Married patients reported the highest social support scores ( $42.89 \pm 10.82$ ), while separated ( $28.50 \pm 6.78$ ) and widowed ( $22.17 \pm 2.99$ ) patients had significantly lower levels of social support, showing notable differences compared to single patients ( $32.86 \pm 8.04$ ). Educational

attainment significantly influenced depression scores ( $p = 0.019$ ). Individuals with junior high school education or below had the highest depression scores ( $15.28 \pm 4.86$ ), while those with a master's degree or above had the lowest depression scores ( $11.00 \pm 1.41$ ), showing significant differences from other groups. Monthly income level significantly affected both anxiety and depression scores ( $p < 0.05$ ). Individuals with monthly incomes below 3000 RMB had the highest anxiety ( $18.56 \pm 2.70$ ) and depression ( $18.22 \pm 4.35$ ) scores, significantly higher than those in the 3000-10000 RMB income groups. No significant differences were found in social support and pain across income groups. More advanced cancer stage was associated with higher anxiety, depression, and pain scores, and lower social support scores ( $p < 0.01$ ). Patients with T4N3M1 stage had the highest anxiety scores ( $19.50 \pm 0.71$ ), while those with T3N3M0 and T3N3M1 stages had the highest depression scores ( $17.78 \pm 1.99$ ;  $18.44 \pm 2.07$ ) and the lowest social support scores ( $27.56 \pm 4.33$ ;  $31.44 \pm 11.98$ ). Regarding cancer type, lung cancer patients had the highest anxiety ( $17.43 \pm 3.26$ ), depression ( $16.91 \pm 4.43$ ), and pain ( $8.30 \pm 1.69$ ) scores, while breast cancer patients had the lowest scores across these domains ( $10.29 \pm 4.93$ ;  $8.24 \pm 4.89$ ;  $3.59 \pm 1.91$ ) and the highest social support scores ( $48.65 \pm 11.58$ ). Patients with a disease duration exceeding 48 months had the highest pain scores ( $9.50 \pm 0.71$ ), while those with 1-6 months duration had the highest social support scores ( $45.69 \pm 11.42$ ). Anxiety and depression scores showed an initial increase followed by a decreasing trend with longer disease duration. Among treatment methods, patients receiving simple operation showed the best psychosocial outcomes, with the lowest anxiety ( $10.65 \pm 4.55$ ), depression ( $8.35 \pm 4.96$ ), and pain ( $4.10 \pm 2.36$ ) scores, and the highest social support scores ( $47.50 \pm 11.79$ ). Patients receiving radiotherapy combined

with chemotherapy showed the worst outcomes across all measures. Regarding pain management approaches, patients receiving non-opioid treatment had the lowest anxiety ( $10.05 \pm 3.83$ ), depression ( $8.00 \pm 3.86$ ), and pain ( $3.38 \pm 1.28$ ) scores, and the highest social support scores ( $47.38 \pm 11.87$ ). Patients receiving opioid combined with adjuvant and non-opioid treatments had the highest anxiety and depression

scores.

In summary, patients who are male, older, less educated, with lower income, advanced cancer stage, specific cancer types (such as lung cancer), specific treatment regimens, and those using opioid medications experience more severe cancer pain and psychosocial issues, requiring special attention and personalized interventions.

**Table 2.** Comparison of Cancer Pain and Psychosocial Status Across Different Characteristics

Characteristics	Group	Anxiety (M±SD)	Depression (M±SD)	Social Support (M±SD)	Pain (M±SD)	t/F	p
Sex	Male	16.38 ± 3.68	15.20 ± 5.04	36.95 ± 11.43	7.15 ± 2.36	t=3.622	<0.001
	Female	13.07 ± 4.55	11.52 ± 4.85	40.18 ± 12.04	5.25 ± 2.19		
Age	20–45 years	13.56 ± 5.15	11.66 ± 5.53	37.91 ± 12.48	5.34 ± 2.70	F=3.063	0.052
	46–60 years	14.61 ± 3.95	13.08 ± 4.58	40.61 ± 10.09	6.11 ± 1.94		
	61–75 years	16.93 ± 3.24	17.07 ± 4.43	35.60 ± 13.97	7.93 ± 2.19		
Marital status	Single	15.43 ± 3.72	13.64 ± 4.77	32.86 ± 8.04 ab	6.07 ± 2.76	F=2.248	0.089
	Married	13.95 ± 4.56	12.65 ± 5.61	42.89 ± 10.82 b	6.04 ± 2.54		
	Separated	15.33 ± 5.32	13.83 ± 2.86	28.50 ± 6.78 a	6.00 ± 1.55		
	Widowed	18.50 ± 1.98	17.50 ± 2.17	22.17 ± 2.99 a	7.50 ± 1.23		
Educational attainment	Junior High School and below	15.79 ± 3.71	15.28 ± 4.86 b	39.31 ± 12.36	6.86 ± 2.22	F=2.409	0.073
	High school	13.28 ± 5.24	11.31 ± 5.64 ab	40.69 ± 12.92	5.83 ± 2.59		
	Bachelor's degree	15.58 ± 3.89	13.84 ± 4.89 ab	35.37 ± 9.87	6.05 ± 2.48		
	Master's Degree and above	12.50 ± 3.73	11.00 ± 1.41 a	36.17 ± 8.13	4.50 ± 2.07		
Monthly Household Income	<3000 RMB	18.56 ± 2.70 b	18.22 ± 4.35 b	31.00 ± 12.46	8.00 ± 1.73	F=3.105	0.031
	3000–5000 RMB	13.93 ± 4.39 a	12.56 ± 5.16 a	40.77 ± 12.13	5.86 ± 2.54		
	5001–10000 RMB	14.13 ± 4.50 a	12.63 ± 5.00 a	38.92 ± 9.51	5.92 ± 2.21		

Characteristics	Group	Anxiety (M±SD)	Depression (M±SD)	Social Support (M±SD)	Pain (M±SD)	t/F	p
	>10000 RMB	15.57 ± 4.61 ab	13.29 ± 5.19 a	34.71 ± 13.43	6.29 ± 2.87		
Cancer Stage	T1 N0 M0	10.50 ± 4.57 a	9.13 ± 5.17 a	42.50 ± 14.35 bc	3.13 ± 1.36 a	F=6.845	<0.001
	T2 N0 M0	11.24 ± 3.98 ab	8.82 ± 4.57 a	45.88 ± 9.88 c	4.82 ± 2.86 ab		
	T2 N1 M0	17.00 ± 3.00 ab	15.33 ± 4.73 bc	30.67 ± 7.37 ab	7.33 ± 2.08 ab		
	T2 N2 M0	13.10 ± 5.24 ab	11.90 ± 4.84 ab	42.50 ± 12.36 bc	5.40 ± 2.01 ab		
	T3 N2 M0	15.20 ± 2.53 ab	13.20 ± 3.52 abc	36.70 ± 8.64 abc	6.00 ± 1.33 ab		
	T3 N2 M1	15.67 ± 3.20 ab	14.47 ± 4.58 bc	40.20 ± 11.73 abc	6.80 ± 1.94 ab		
	T3 N3 M0	18.33 ± 1.73 ab	17.78 ± 1.99 c	27.56 ± 4.33 a	7.78 ± 0.97 b		
	T3 N3 M1	18.44 ± 2.46 ab	18.44 ± 2.07 c	31.44 ± 11.98 ab	8.67 ± 1.41 b		
	T4 N3 M1	19.50 ± 0.71 b	18.50 ± 2.12 c	35.50 ± 3.54 abc	8.50 ± 0.71 b		
Type of Cancer	Head and Neck	13.56 ± 4.90 ab	13.00 ± 4.95 ab	40.22 ± 7.46 ab	5.33 ± 2.35 ab	F=9.155	<0.001
	Digestive Tract	15.23 ± 2.91 b	13.55 ± 3.93 b	37.91 ± 12.21 ab	6.27 ± 1.96 bc		
	Lung	17.43 ± 3.26 b	16.91 ± 4.43 b	34.09 ± 9.23 a	8.30 ± 1.69 c		
	Genitourinary	15.08 ± 3.26 b	13.00 ± 4.09 ab	33.50 ± 10.82 a	6.00 ± 1.41 b		
	Breast	10.29 ± 4.93 a	8.24 ± 4.89 a	48.65 ± 11.58 b	3.59 ± 1.91 a		
Duration of Cancer	1-6 months	12.71 ± 4.57 ab	11.00 ± 5.80 a	45.69 ± 11.42 b	5.23 ± 2.71 a	F=4.767	0.002
	7-12 months	15.72 ± 3.93 ab	14.90 ± 4.02 ab	34.72 ± 8.56 ab	6.62 ± 2.09 ab		
	13-24 months	16.69 ± 3.64 ab	14.62 ± 4.41 ab	31.92 ± 10.11 a	6.54 ± 1.85 ab		

Characteristics	Group	Anxiety (M±SD)	Depression (M±SD)	Social Support (M±SD)	Pain (M±SD)	t/F	p
	25 - 48 months	18.75 ± 1.71 b	18.50 ± 1.92 b	28.75 ± 11.82 a	7.75 ± 1.50 ab		
	> 48months	10.50 ± 0.71 a	9.50 ± 0.71 a	36.50 ± 10.61 ab	9.50 ± 0.71 b		
Treatment Methods	Simple Operation	10.65 ± 4.55 a	8.35 ± 4.96 a	47.50 ± 11.79 a	4.10 ± 2.36 a	F=5.799	<0.001
	Chemotherapy alone	15.00 ± 4.15 ab	13.33 ± 4.03 ab	30.00 ± 4.65 b	7.50 ± 2.43 ab		
	Surgery + radiotherapy	19.50 ± 2.12 b	20.00 ± 1.41 b	35.50 ± 19.09 ab	8.00 ± 2.83 ab		
	Surgery + chemotherapy	15.03 ± 3.83 ab	13.93 ± 4.02 ab	37.20 ± 11.94 ab	6.17 ± 1.90 ab		
	Surgery + radiotherapy + chemotherapy	16.86 ± 3.20 b	15.43 ± 4.51 ab	35.38 ± 9.01 b	7.00 ± 2.03 ab		
	Radiotherapy + chemotherapy	19.00 ± 1.41 b	21.00 ± 0.00 b	44.50 ± 0.71 ab	10.00 ± 0.00 b		
	Symptomatic treatment	14.50 ± 2.12 ab	14.50 ± 4.95 ab	30.00 ± 1.41 ab	7.50 ± 3.54 ab		
Type of Pain Management	Non-opioid	10.05 ± 3.83 ab	8.00 ± 3.86 ab	47.38 ± 11.87 c	3.38 ± 1.28 a	F=15.449	<0.001
	Opioid	17.07 ± 2.87 bc	16.43 ± 4.94 bc	35.00 ± 10.72 abc	8.07 ± 1.90 b		
	Opioid and non-opioid	15.63 ± 2.68 bc	15.06 ± 3.71 abc	41.94 ± 10.45 abc	7.06 ± 1.48 ab		
	Opioid and adjuvant	16.71 ± 3.15 bc	14.86 ± 3.88 abc	33.14 ± 8.20 ab	6.86 ± 2.03 ab		
	Opioid, adjuvant and non-opioid	19.20 ± 1.48 c	18.10 ± 1.52 c	28.20 ± 6.07 a	7.60 ± 0.84 b		
	Herbal Medicine	14.00 ± 1.00 abc	10.00 ± 1.00 abc	30.67 ± 0.58 ab	4.33 ± 0.58 ab		
	Acupressure	10.00 ± 1.00 ab	7.00 ± 2.00 a	43.33 ± 15.63 bc	5.00 ± 4.36 ab		
	Acupuncture	8.00 ± 2.83 a	10.50 ± 0.71 abc	42.50 ± 2.12 bc	6.50 ± 3.54 ab		

Table 2 Notes:

M: Mean; SD: Standard Deviation

t/F: t-value for comparisons between two groups (Sex); F-value for comparisons among three or more groups.

p-value:  $p < 0.05$  indicates a statistically significant difference between groups.

Letter notation (e.g., a, b, ab, bc): Indicates the results of multiple comparisons between groups based on post-hoc tests.

Means sharing a common letter are not significantly different at the 0.05 level.

Degrees of freedom (df):

Sex:  $df = 81$  (Anxiety, Depression, Pain);  $df = 81$  (Social Support, not significant)

Age:  $df = 2,80$  (Anxiety, Social Support, not significant);  $df = 2,80$  (Depression, Pain, significant)

Marital Status:  $df = 3,79$  (Anxiety, Depression, Pain, not significant);  $df = 3,79$  (Social Support, significant)

Educational Attainment:  $df = 3,79$  (Anxiety, Social Support, Pain, not significant);  $df = 3,79$  (Depression, significant)

Monthly Income:  $df = 3,79$  (Social Support, Pain, not significant);  $df = 3,79$  (Anxiety, Depression, significant)

Cancer Stage:  $df = 8,74$  (Significant for all variables)

Type of Cancer:  $df = 4,78$  (Significant for all variables)

Duration of Cancer:  $df = 4,78$  (Significant for all variables)

Treatment Methods:  $df = 6,76$  (Significant for all variables)

Type of Pain Management:  $df = 7,75$  (Significant for all variables)

### 3.3. Association Between Level of Pain and Psychosocial Status (Anxiety, Depression, Social Support)

The correlation analysis revealed significant relationships between pain levels and psychosocial status among cancer patients. Specifically, a strong positive correlation was found between pain and anxiety scores ( $r = 0.757$ ,  $p < 0.001$ ), indicating that higher pain levels are associated with increased anxiety. Similarly, a very strong positive correlation was observed between pain and depression scores ( $r = 0.821$ ,  $p < 0.001$ ), suggesting that elevated pain levels are closely

related to more severe depression symptoms. Conversely, social support demonstrated a significant moderate negative correlation with pain levels ( $r = -0.483$ ,  $p < 0.001$ ). This inverse relationship indicates that patients with lower social support tend to experience higher levels of pain, while those with stronger social support systems report less pain.

These findings suggest that pain management in cancer patients should address not only physical symptoms but also psychological factors, particularly anxiety and depression, while strengthening social support networks to potentially alleviate pain experience. The results reject the null hypothesis that there is no significant association between pain levels and psychosocial status in cancer patients.

**Table 3.** Association Between Level of Pain and Psychosocial Status

Variable	M	SD	r	p-value
Pain	6.14	2.450	-	-
Anxiety	14.63	4.460	0.757*	<0.001
Depression	13.25	5.247	0.821*	<0.001
Social Support	38.66	11.797	-0.483*	<0.001

Note: \*Significant at .05 level.

## 4. Discussions

The mean of severe as a level of pain of is 34.91(47.0%), and higher than in the other level of pain groups, indicating that more respondents experience severe pain. This finding is supported by many studies. Previous studies have found that cancer or treatment-related pain affects most cancer patients, and pain is a very common symptom in cancer patients [6,12]. The proportion of pain degree of cancer patients in this study is higher than that in previous studies, which may be caused by different cancer types, cancer degree and individual pain tolerance.

In terms of level of anxiety the mean of abnormal level of anxiety is 67(80.7%), higher than in the other two groups, indicating that more respondents have abnormal level of anxiety. Some scholars have done relevant research. The incidence of anxiety and depression in cancer patients is about 15%. Cancer patients have serious and lasting anxiety because of certain physical inducements as a precursor. Many patients have been treated. Although the condition of the tumor has been controlled, his anxiety disorder has not

improved or even become more serious[17].

In terms of level of depression, the mean of abnormal level of depression is 55 (66.3%), higher than in the other two groups, indicating that more respondents have an abnormal level of depression. This study is supported by many studies. Previous studies have shown that most cancer patients have more or less depression. The reason why cancer patients have depression in this study may be that cancer patients bear more physical and psychological stress than ordinary people. More physical discomfort and psychological stress are often more likely to lead to depression[18].

In terms of level of social support, the mean of moderate level of social support 50 (60.2%), higher than in the other two groups, indicating that more respondents have moderate level of social support. Zhang et al found that elderly cancer patients had the largest proportion of moderate social support, which was similar to this study's results. The high proportion of moderate social support may be due to the implicit way in which Chinese people express support and love. Although participants can feel the support of family and friends, the patients may not feel enough support because their expression

is not obvious[19]. Therefore, family, friends and communities should be encouraged to express their support, care, help and love to cancer patients

The results of correlation analysis shows that the anxiety score of patients is significant positive correlation with their pain score. This finding is supported by other researchers[20], whose research shows that the experience of pain increases the level of anxiety, which in turn enhances the feeling of pain and turns it into intractable chronic pain. The cause of pain is usually due to excessive anxiety and tension, resulting in increased adrenal hormone secretion, resulting in autonomic nerve dysfunction, and then the symptoms of physical pain. It is suggested that cancer patients treat their diseases correctly and actively seek the help and support of family, doctors, nurses and psychologists when necessary. Secondly, it is suggested that cancer patients maintain a positive attitude and happy mood, so as to reduce the generation of anxiety.

The results of correlation analysis shows that the depression score of patients is significant positive correlation with their pain score. This finding is supported by other researchers which showed that pain and depression interact and often occur simultaneously[21]. Chronic pain can lead to depression and aggravate the experience of depression. Depression can make patients feel more pain, and then affect the quality of life and social function. Nursing staff should pay attention to the mental health of cancer patients and conduct psychological counseling regularly when necessary to help patients avoid absorbing negative emotions. Further, they can encourage family members to understand and care for patients, actively understand disease-related information, better provide psychological comfort and life care for patients, and communicate with patients.

The results of correlation analysis shows that the score of social support of patients is significant negative correlation with their pain score. This finding is supported by Yue et al[22]. found that the important role of social support in pain has been proved in all kinds of pain patients. Some studies have shown that perceived support plays an important role in the recovery of chronic pain patients. Chronic pain patients with high-level social support not only improve their depression, but also reduce their pain intensity. Family, friends and community can advocate for the patients to give them more material and spiritual support and help. At the same time, they should cultivate and enhance patients' subjective perception of these social support, and improve patients' utilization of social support.

Table 14-16 shows the association between independent variables (pain) and dependent variables (anxiety, depression, social support). However, dependent variables (anxiety, depression, social support) may also affect independent variables (pain level). This phenomenon in epidemiology is called reverse causation. Marquis first put forward the concept of reverse causality in the process of studying the association between breastfeeding and childhood development disorders in 1997[23], that is, under a specific condition, the risk factors of the disease are not related to the performance of general epidemiological risk factors, but related to the opposite aspects, which is contrary to the epidemiological law of the general population. Previous studies have pointed out that physical symptoms such as pain can be affected by psychosocial factors. The psychosocial factors that affect pain include marital status, social support, bereavement pain, family and work environment, social status and social integration. For example, people who are stressed

out due to family or work stress may have lower pain thresholds. Conversely, if a friend is around the patient, their pain threshold may be higher. But other studies have pointed out that anxiety is linked to enhanced pain response in chronic pain[24]. Cancer pain seriously affects the patient's mood, sleep, activity ability, even contact with family and friends, and seriously affects the patient's quality of life. These past literatures prove that there is indeed a reverse causal relationship between the degree of pain and psychosocial status in this study. Reverse causality does cause research deviation. Therefore, on the one hand, we should try our best to eliminate these negative effects in future research, and we can solve the reverse causality through simultaneous equations. In addition, some scholars have tried to deal with the possible reverse causality problems through the analysis of influence channels or mechanisms. There are other methods to solve this reverse causality: regression equation, VAR model, IV variable, Heckman model and so on. On the other hand, we should also maintain a skeptical attitude and confirm that this skepticism has promoted the progress of science. As BMJ magazine said, "although evidence-based medicine has defects, it is the best research system that researchers now have."

In addition, the cross-sectional research method used in this paper also has its own limitations. A cross-sectional study among teachers in Penang, Malaysia, found the relationship between psychosocial factors and self-reported musculoskeletal pain[25]. Fisker et al[26].found that disability, pain and psychosocial variables were correlated in a cross-sectional design. In the past, a cross-sectional study was used to examine the pain severity and interference of chronic pain patients in the early stage of social alienation tasks, and to determine the characteristics of the most affected individuals. The study also found that psychosocial factors were associated with greater pain severity and interference during social distance. These studies have similar limitations that are worth discussing. Since their study was a cross-sectional design, it was not possible to determine the causal relationship. There is the possibility of recall bias because the tools used are self-reported and subjective. This study also has methodological limitations, because according to the current cross-sectional research results, it is impossible to explain any causal or temporal relationship. In a longitudinal study, Hurwitz, Morgenstern and Yu attempted to investigate the temporal causal relationship between pain and psychological distress. They found that these two factors are mutually causal: the degree of pain predicts subsequent psychological distress, which then affects the degree of low back pain and disability[27]. In the past decades, this notion has led to the broad acceptance and implementation of several alternative approaches to cross-sectional designs that (are believed to) address some of its limitations. Future research should use longitudinal design in a larger sample, including real-time collection of pre evaluation and post evaluation, to limit the problems surrounding recall bias.

Overall, cross sectional study is the best method to determine the prevalence rate, which helps to determine the correlation. On this basis, longitudinal study can be used to conduct more rigorous research on the causal relationship between pain degree and psychosocial status.

## 5. Conclusion

This study demonstrates that pain in cancer patients is associated with psychosocial status (anxiety, depression,

social support). This suggests that the pain problems of cancer patients can be reduced by improving their psychosocial status (anxiety, depression, social support). It means that alleviating anxiety and depression and adequate social support have a positive effect on reducing patients' pain.

## 6. Recommendations

Recommendations based on the findings of the study:

Through this study on the association between cancer patients' pain degree and psychosocial status, the author believes that the following aspects should be paid attention to in order to achieve effective nursing intervention on cancer pain and patients' psychology:

First, strengthen nurse patient communication and establish a good nurse patient association: nurse patient association is the premise of psychological counseling. When communicating with patients, nurses should follow the principle of understanding, guide patients to have a correct understanding of the disease, give patients more care and love, and encourage them to regain the courage to overcome the disease.

Second, strengthen the psychological nursing of cancer pain patients: cancer pain patients need more psychological support and have more contact time with patients, which can provide psychological support for patients and play an important role in their psychosocial adaptation; nurses make patients feel valued and concerned by strengthening patrol inspection; pay attention to the changes of their emotions, guide them to vent their negative emotions, and give understanding, support and care at the same time; and guide patients to reduce their psychological burden and maintain a comfortable mood, so as to improve the utilization of psychological support.

Third, improve the patient's social support system. For hospitalized patients, in addition to medical staff being important supporters of patients, they should also give full play to and make use of family support and other social support roles such as friends, colleagues and units. They should care about patients materially and mentally, give more support and help, especially comfort and care patients psychologically and reduce their psychological pressure. At the same time, we should constantly cultivate and enhance patients' subjective perception of these social support and improve their utilization of social support. Different patients have different needs and feelings for social support types, thus nurses should provide targeted support according to patients' different psychological, cultural background, social situation and personality, so that patients can feel the care, respect and understanding from others and society to the greatest extent.

Fourth, nurses should pay attention to the nursing of patients with moderate and severe pain. In addition to strictly following the doctor's advice, they should also do a good job in active communication with patients, pain evaluation, observation of adverse drug reactions and health education, so as to strengthen the pain control effect of cancer patients, improve the utilization of social support and improve the quality of life of patients.

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