The Relationships between Self-Care and Pain Perception: Experience in Iranian Patients with Cancer

Amir Hossein Goudarzian,[1] Fatemeh Zamani,[2] Mahdi Babaei Hatkehlouei,[3] Masoumeh Bagheri Nesami,[4,*] and Sima Beik[5]

[1]BSc of Nursing, Student Research Committee, Mazandaran University of Medical Sciences, Sari, IR Iran
[2]Nursing Student, Student Research Committee, Mazandaran University of Medical Sciences, Sari, IR Iran
[3]Dentistry Student, Student Research Committee, Mazandaran University of Medical Sciences, Sari, IR Iran
[4]Department of Medical- Surgical Nursing, Pediatric Infectious Diseases Research Center, Mazandaran University of Medical Sciences, Sari, IR Iran
[5]MSc of Biostatistics, Mazandaran University of Medical Sciences, Sari, IR Iran

[*] *Corresponding author*: Masoumeh Bagheri Nesami, Department of Medical- Surgical Nursing, Pediatric Infectious Diseases Research Center, Mazandaran University of Medical Sciences, Sari, IR Iran. Tel/Fax: +98-9113513043, E-mail: anna3043@gmail.com

Abstract

Background: The present study aimed to investigate the relationship between self-care and pain control in patients with cancer.

Methods: In this cross-sectional study (October to December, 2015) 380 cancer patients were admitted to one of the hospitals affiliated to Mazandaran University of Medical Sciences (Sari, Iran) entered to the study using simple random sampling. Data was collected by a demographic questionnaire, self-care scale and McGill pain questionnaire. The statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, IL, USA) was utilized for data analysis by descriptive and infernal statistic tests (Spearman's correlation and Generalized Linear models).

Results: Males in the study ($48.39 \pm 13 \pm 39$; CI95: 46.41 - 50.38) were older than females (45.33 ± 18.44; CI95: 42.79 - 47.87). Based on the results of the processing of the Generalized Linear Models, there was not a significant relationship between pain perception and self-care in cancer patients (P > 0.05). But there was a significant relationship between pain perception and its two subsets of physical self-care (B = -1.102, P < 0.001) and emotional self -care (B = 0.823, P < 0.001).

Conclusions: Considering the adverse effects of chronic pain treatment process and secondary problems, more comprehensive studies must be done about the effects of self-care behaviors on the perception of pain so that effective steps can be taken to intervene and promote the health of these patients.

Keywords: Self-Care, Cancer, Pain Perception, Iran

1. Background

Cancer is the second leading cause of death in most industrialized countries. Reports indicate global growth of cancer patients up to 16 million people in 2002 (1). According to the world health organization's report, it is estimated that the number of deaths due to cancer in the United States of America increase to more than 800 thousand people and it is expected that this trend continues to be upward (2). In Iran, from 1985 to 2005 the number of cancer patients has increased by 3.3 times (3).

Cancer as the most common chronic diseases is often associated with chronic pain (4). Cancer pain can has many different causes, including tumor growth and spread, effects of therapies such as chemotherapy, radiotherapy and surgery, and underlying diseases (5). The prevalence of pain varies from 5% in patients with leukemia to 85% in patients with primary bone tumors (6). There are several ways to treat and relieve pain in these patients, but these methods do not seem sufficient to manage their pain (7).

Many people believe that to organize (such as reducing complications and symptoms) patients with chronic diseases, self-care should be taken (8). Self-care, according to Orem includes learned behaviors done to maintain or promote health, to prevent diseases or to treat them (9). In studies conducted by McCain et al. it was suggested that cardiovascular training can be effective in controlling and reducing symptoms of fibromyalgia including pain reduction and improvement of mental indicators of patients (10, 11). Also, according to studies, aerobic exercise is introduced as a reducing agent which improves patients' moods and those of healthy people (10, 12). This is while in some studies no significant relationship was found between physical care and pain (13, 14). Of course, pain is a natural mechanism to protect the body against injuries

and helps to diagnose a critical illness (15). So a deeper knowledge about the effect of physical activity on pain perception and its process on the treatment of patients and the consequences of its behavior is required (16-18). According to available databases, it seems that no study on self-care behaviors associated with pain perception in cancer patients has been done despite the high prevalence of this disease in Iran (19).

2. Objectives

The present study aimed to investigate the relationship between self-care and pain control in patients with cancer. The following hypotheses were considered in this study: 1) Self-care behaviors are significantly associated with pain perception, 2) subsets of self-care (physical, psychological, emotional and spiritual) are significantly associated with pain perception, and 3) The demographic variables are associated with pain perception.

3. Methods

In this cross-sectional study (October to December, 2015) 380 cancer patients that were admitted to one of the hospitals of Mazandaran University Medical Sciences (Sari, Iran) were entered to the study using random sampling. In this interval of four months, about 600 patients were admitted to the oncology ward of these hospitals. The rate of patient participation was 63.3 %.

The adequacy of the sample size was calculated to be 380 based on a two-sided significant degree α=0.05 and test power of 80 (d = 0.3) by G*power 3.0.10 software. Inclusion criteria included age (18 years or older), cancer treatment with radiation, chemotherapy or surgery. Exclusion criteria included taking antidepressants in the last 6 months, the transfer of patients to other hospitals and occurrence of acute medical conditions (such as loss of consciousness).

After explaining the purpose of the study and how to complete the questionnaire, informed consent form was signed by qualified patients. Then the necessary explanation regarding the objectives of the study was given to patients and the questionnaires were distributed. Explanation was given to the patients if a question was vague. It should be noted that this explanation was only in order to avoid ambiguity and any kind of bias.

3.1. Data Collection Tools

Data was collected by a socio-demographic questionnaire, self-care tools and McGill pain questionnaire (MPQ). The socio-demographic questionnaire includes age, sex, education level, economic status, history of drug use, family history of cancer and stage of the cancer.

Self-care questionnaire (adapted from checklists published by the ministry of health, treatment and medical education) contained 34 parameters which include 4 general scales of physical self-care, psychological self-care, emotional self-care, and spiritual self-care (20). The scoring method was based on Likert's 5 scales from 1 to 5 (in this case, I do not have a plan, never, rarely, sometimes or always) (21). In this test, the scores range from 34 to 170 and the scores of 34 - 67, 68 - 101, 102 - 135 and 136 - 170 indicate poor, average, good and excellent level of self-care, respectively. Bagheri-Nesami et al. (2015) by investigating this tool on the elderly, calculated its reliability with Cronbach's alpha to be 0.83 (22). Also, in another study, the reliability of this instrument was calculated to be 0.841 with class correlation coefficient (22). In this study, content validity was approved with reading of the tool by 5 oncology experts and acquiring their opinions. The reliability of this tool on cancer patients was calculated to be 0.792 with the aid of Cronbach's alpha.

McGill pain questionnaire contains 78-word descriptive of the 20 subclasses forming in three main sensory, affective and evaluative domains (23). The patients were asked to identify the best description of their pain with selecting just one word from each group. If all options of a group did not provide a proper description of a patient's pain, patients would select no option from that group. When patients chose more than one option in each group, the highest rating (maximum pain) was considered for the final analysis (24). The score of each group was collected separately to calculate the final score. MPQ total score described as "pain rating index based on the scores taken from the words" is the sum of the scores of each group (25). Scores range varied from 0 (when no word is selected) to 78 (maximum pain when selected in each group) (24). Dworkin et al. (2015), using Cronbach's alpha, have calculated the reliability of this instrument to be 0.77. In the present study, using Cronbach's alpha, the reliability of this tool was calculated to be 0.94.

3.2. Ethical Considerations

This study was confirmed by the ethics committee of Mazandaran University of Medical Sciences. Patients were informed about the goals and stages of the study; so that their participation was voluntary. Patients passed the study's stages in a quiet room. To ensure that a wide range of patients involved in the study, a trained researcher who was a member of the study provided the supplies. All patients' information was undetectable by assigning a code to each patient.

3.3. Statistical Analysis

The statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, IL, USA) was utilized for data analysis. First descriptive statistics for continuous variables were shown as means with standard deviation (SD) and n (%) for the categorical variables. Single dummy variables were created for sex, education (Illiterate, diploma and higher), socio-economic status (lower income reference versus middle or upper income level), cancer stage (1 to 4), history of drug use (yes or no), history of cancer in family (yes or no) and past medical history (yes or no). Then univariate tests were conducted using the Mann-Whitney U test and variables with P < 0.3 were considered. Spearman's correlations were used to probe the relationship between self-care and pain perception. Finally the predictors associating with pain perception were determined using Generalized Linear models (GLM) with bonferroni correction for pair-wise comparisons. Statistical significance was set at P < 0.05.

4. Results

4.1. Patients' Demographic Profile

Demographic characteristics of 380 patients with cancer are summarized in Table 1. Males (48.39 ± 13 ± 39; CI95: 46.41 - 50.38) are older than females (45.33 ± 18.44; CI95: 42.79 - 47.87).

69.7 % of patients were at an early stage of disease (Stage I - II disease) and 31.3 % were in an advanced stage of cancer (Stage III-IV disease). 29.5 % had a family history of cancer, and 38.7% had a history of drug use. The mean total score of positive and negative religious coping and depression, was (24.14 ± 5.45; CI95: 23.59 - 24.69), (18.22 ± 3.25; CI95: 18.12 - 18.74) and (18.43 ± 3.11; CI95: 17.89 - 18.55), respectively. 69.9 % of patients under treatment had higher depression in early stages of the disease.

4.2. The Relationship Between Self-Care and Its Sub-Sets with Pain Perception

Based on the results obtained from the processing of the Generalized Linear Models, there was not a significant relationship between pain perception and self-care in cancer patients (P > 0.05). But there was a significant relationship between pain perception and its two subsets of physical self-care (B = -1.102, P < 0.001) and emotional self-care (B = 0.823, P < 0.001) (Table 2).

Table 1. Sample Characteristics of Cancer Patients Included in the Study

Characteristic	No. (%)
Sex	
Male	175 (46.1)
Female	205 (53.9)
Economic Status	
Weak	110 (28.9)
Average	204 (53.7)
Good	66 (17.4)
Education	
Illiterate	210 (55.3)
Diploma	138 (36.3)
BS	22 (5.8)
MSs and above	10 (2.6)
Material Status	
Single	51 (13.4)
Married	329 (86.6)
Cancer stage	
One	132 (34.7)
Two	133 (35)
Tree	92 (24.2)
Four	23 (6.1)
Family history of cancer	
Yes	112 (29.5)
No	268 (70.5)
Depression	
Down	261 (68.7)
Up	119 (31.3)
Past medical history [a]	
Cardiac diseases	46 (12.1)
Respiratory diseases	34 (8.9)
Gastric diseases	41 (10.78)
Urinary diseases	26 (6.84)
History of cigarette smoking	
Yes	71 (18.7)
No	309 (81.3)
Age [b]	46.74 (16.328)
Self-Care [b]	131.72 (12.45)
Pain [b]	21.61 (13.55)

[a] Number of patients who had these diseases.
[b] Values are expressed as mean (SD).

4.3. The Relationship Between Pain Perception and Demographic Variables

In addition, according to Table 3, there was a significant relationship between pain perception and economic status (P < 0.05), age (B= -0.225, P < 0.001), sex (B = -4.41, P = 0.001), Family history of cancer (B = -13.21, P < 0.001), history of drug use (B = 7.438, P < 0.001) and the third stage of the cancer (B = -10.77, P < 0.001) in patients with cancer.

Table 2. Relationship Between Pain and Sub-Scales of Self-Care in Cancer Patients (N = 380)

Variable	B	SE	95% CI		P Value
Physical Self-care	-1.102	0.1527	-1.401	52.061	0.000[a]
Psychological Self-care	0.225	0.2301	-0.226	0.960	0.327
Emotional Self-care	0.823	0.1894	0.452	18.887	0.000[a]
Spiritual Self-care	0.007	0.1404	-0.268	0.002	0.962

[a] Statistically significant at $P \leq 0.05$.

5. Discussion

This study aimed to determine the relationship between self-care and pain perception in cancer patients in Iran. According to the results, there was a significant relationship between pain perception and physical activity. The results of Kallen (2000), Tesarz et al. (2012), Kuphal et al. (2007) and Cherkin et al. (1998) were in line with the present study (26-29). It seems that this relationship is due to the impact of physical activity as an effective, safe and non-invasive factor for pain management (30) while a Swedish study was conducted to determine the effect of exercise and physiotherapy on low back pain in the patients. The study was conducted on 323 patients of 18 to 60 years of age. The pain was measured by visual analogue scale (VAS). No significant relationship between physical activity and perception of pain was reported (13). According to the above description, this difference could be due to the type of disease and religious and cultural differences of patients that will have a potential effect on the perception of patients (31).

Today, it is certain that all humans have constant pain tolerance threshold but pain tolerance is strongly influenced by physical and psychological factors (32, 33). Coping skills can facilitate pain control (34). It can be assumed that psychological factors may affect the present results because they are never directly observed and measured. According to the survey conducted, measures such as physical activity are more effective on chronic pain (13). Jafari and colleagues (2014) stated that it seems that sport practices will not have a significant effect on acute pain as it was confirmed in his empirical study on laboratory mice (14). Cancer patients often suffer from chronic and debilitating pain; therefore, physical self-care can ultimately improve their quality of life (35). It is known that acute and chronic pain mechanisms are different in terms of the route and neurotransmitters which are released fast and slowly from the end of pain fibers (36). So, perhaps it can be said that the effect of the sport exercises, in this study and similar studies, on the release of the transmitters involved in acute

and chronic pain have been different and sport exercise in the long run (chronic phase) have been more likely to be able to release more opioid peptides and reduce pain by affecting central system of pain management (internal analgesia system).

Another important result of this study is the fact that there was a significant relationship between pain perception and emotional self-care which is consistent with the result of Linton (2011) (37). Bushnell et al. (2013) in a review study have stated that control and use of cognitive and emotional skills (psychological factors) could have a desirable effect on pain (38). Of course, in general the key point of this study is that no significant correlation was found between total self-care of patients and pain perception. Self-care has several sub-groups that are distinct from each other (22). Also pain perception and socioeconomic status, cancer stage, age, gender, medical history and family history of cancer were significantly correlated which is in line with the results of Sherman et al. (2011) (39) while the study of Shaban et al. (2004) reported no association between the stage of cancer and pain perception (40). In another study, a significant relationship was found between self-care and pain perception in patients with heart disease (41). Among the possible causes of these discrepancies one can refer to differences in the types of patients, cultural differences and methodology attributed Studies.

5.1. Limitations of the Study

The most important limitation of this study: 1) cultural differences which was not controllable in this study, 2) Impatience and lack of accuracy when completing the questionnaire due to disease-related treatment. Therefore, it is suggested that because of the importance of this issue, these kinds of studies in the future be performed more frequently with greater extent and greater accuracy on patients with various categories of cancers.

5.2. Application of the Results

Pain as one of the consequences of cancer must be one of the important nursing diagnoses in health care centers. Given the prevalence of pain in these patients, finding ways to reduce pain is necessary. Considering the significant effect of physical and emotional self-care on pain perception, it is anticipated that training can have beneficial effects on pain perception in these patients.

5.3. Conclusion

According to the results, no significant relationship was found between the total of self-care behaviors and pain perception. But a significant inverse relationship between

Table 3. Relationship Between Pain and Its Covariates in Cancer Patients (N = 380)

Variable	B	SE	95% CI		P Value
Education					
Illiterate	0.077	3.8680	-7.505	7.658	0.984
Diploma	-0.069	3.6957	-7.312	7.174	0.985
BS	-3.906	4.1926	-12.123	4.311	0.352
MSc and upper	0[a]				
Economic Status					
Weak	4.382	1.9035	0.651	8.113	0.021[b]
Average	3.886	1.7622	0.432	7.340	0.027[b]
Good	0[a]				
Cancer stage					
One	-2.878	2.8827	-8.528	2.772	0.318
Two	1.251	2.6026	-3.850	6.352	0.631
Tree	-10.77	2.8713	-16.400	-5.144	0.000[b]
Four	0[a]				
Past medical history					
Cardiac diseases	-0.742	0.35	-1.652	0.19	0.23
Respiratory diseases	-0.865	0.423	-1.341	0.114	0.129
Gastric diseases	-0.980	0.487	-2.221	0.15	0.092
Urinary diseases	0[a]				
Age	-0.225	0.0572	-0.337	15.444	0.000[b]
Sex	-4.410	1.4685	-7.288	9.018	0.003[b]
Marital Status	-3.486	2.2878	-7.970	2.322	0.128
Drug history	7.438	1.7642	3.980	17.774	0.000[b]
Family history of cancer	-13.21	1.3843	-15.926	91.093	0.000[b]
Self-Care	-0.055	0.0528	-0.158	1.081	0.298

[a] Set to zero because this parameter is redundant.
[b] Statistically significant at $P \leq 0.05$.

physical self-care behaviors and a significant positive relationship between emotional self-care behaviors with the level of pain perception in patients with cancer was discovered. Considering the adverse effects of chronic pain treatment process and secondary problems, more comprehensive studies must be done on the effects of self-care behaviors on the perception of pain so that effective steps can be taken to intervene and promote the health of these patients.

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Footnotes

Authors' Contribution: None declared.

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