

Infection/Inflammation

# Depression, Anxiety, Stress Perception, and Coping Strategies in Korean Military Patients with Chronic Prostatitis/Chronic Pelvic Pain Syndrome

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**Purpose:** The objective of this study was to examine the psychological features and coping strategies of patients with chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS).

**Materials and Methods:** The participants consisted of 55 military personnel suffering from CP/CPPS and 58 military personnel without CP/CPPS symptoms working at the Military Capital Hospital. The National Institutes of Health Chronic Prostatitis Symptom Index (NIH-CPSI) was used to assess CP/CPPS symptoms. The Responses to Hospital Anxiety and Depression (HAD) scale, Social Readjustment Rating Scale, and Global Assessment of Recent Stress (GARS) scale were compared between the two groups. The Weisman Coping Strategy Scale was used to assess coping ability with CP/CPPS.

**Results:** The NIH-CPSI score of the CP/CPPS group was significantly higher than that of the control group for all domains including pain, urinary symptoms, quality of life, and summed score. The Anxiety and Depression domain of the HAD showed significant differences between the two groups. There were no significant differences in the Social Readjustment Rating Scale between the two groups, but the sum of the GARS score was higher in the CP/CPPS group than in the control group. These were correlated with the pain, quality of life, and sum domains of the NIH-CPSI. The Weisman Coping Strategy Scale showed that intellectualization, redefinition, and flexibility were higher in frequency in descending order, and that fatalism, externalization, and self-pity were lower in frequency.

**Conclusions:** The CP/CPPS patients had depression, anxiety, and higher perception of stress. In particular, these were closely related to the pain and quality of life of the patients.

**Key Words:** Anxiety; Depression; Prostatitis; Psychological adaptation; Psychological stress

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## INTRODUCTION

Chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) is a common male chronic pain condition. Its prevalence ranges from 9 to 16% worldwide and from 5 to 25% in Korea [1-3]. CP/CPPS presents with various voiding symptoms, perineal or suprapubic pain, erectile dysfunction

or sexual disturbance, and psychological problems such as depression and anxiety that have a negative impact on health-related quality of life [4,5]. However, the etiology of CP/CPPS is uncertain. Various theories have been hypothesized, such as inflammation, pathogen and host-specific factors, pelvic floor tension myalgia, and differences in systemic pressure sensitivity [6-8]. It has been sug-

gested that there are significant psychological components to this condition, because most CP/CPPS patients have depression and anxiety [9]. It has also been suggested that stress is a potent factor in the development, prolongation, and perpetuation of the symptoms in the condition known generally as chronic prostatitis [10]. The severity of stress has been reported to depend on individual perception or subjective interpretation of causative factors rather than on the contents or frequency of factors causing stress [11]. That is, individual coping strategies for each stress and cognitive assessment of stress have been suggested to significantly affect stress progression [12]. Coping strategies refer to cognitive and behavioral efforts that are used to satisfy external or internal demands, and they have been known to act as regulators between stress and psychological disorders or physical diseases [13]. Therefore, in addition to stress frequency, differences in stress perception and coping strategies should be considered as factors causing or deteriorating stress symptoms in patients with CP/CPPS.

In Korea, several studies on psychological problems related to CP/CPPS have been conducted [14,15], but few studies on the relationship of coping strategies for stress have been conducted. Accordingly, this study was conducted to compare the psychological features and coping strategies of patients with CP/CPPS with those of a healthy control group, to investigate differences between the two groups, and to provide useful information for the treatment of CP/CPPS.

## MATERIALS AND METHODS

### 1. Patients

The subjects were recruited from the Military Capital Hospital urology clinic in Korea from June 2008 to August 2009. Fifty-five enlisted men diagnosed with CP/CPPS and 58 enlisted men without CP/CPPS working at the Military Capital Hospital were selected as the CP/CPPS and control groups, respectively.

### 2. Study design

The patient group included patients diagnosed with CP/CPPS via medical interview, digital rectal examination, urinalysis, and prostate secretion examination after prostate massage or urinalysis after prostate massage (VB3) after visiting the hospital owing to voiding symptoms and chronic pelvic pain. The definition of CP/CPPS was used as described in the National Institutes of Health (NIH) consensus [16]. All the men enrolled in this study were required to have a National Institutes of Health Chronic Prostatitis Symptom Index (NIH-CPSI) total score of 15 or higher, with symptoms persisting for at least 3 consecutive months. Exclusion criteria included pyuria, symptoms suggestive of benign prostatic hyperplasia, history of seizures, neurogenic bladder or significant abnormalities on baseline blood tests, or any history of mental illness. Control groups in this study had no history or evi-

dence of mental abnormalities, genitourinary disease, or chronic pain conditions. All participants gave written confirmed consent and ethical approval was obtained before the study. The Korean version of the NIH-CPSI [17], a 9-item index, was used to assess CP/CPPS symptoms. The NIH-CPSI consists of three domains including pain, urinary symptoms, and quality of life. The Hospital Anxiety and Depression (HAD) [18] scale was used to determine the levels of anxiety and depression that the patients experienced. It consists of two seven-item indexes, one for anxiety and the other for depression, that are used to measure emotional disturbance. This study used the standardized HAD scales that Oh et al. [19] translated and validated in Korean. The Global Assessment of Recent Stress (GARS) scale, which consists of eight items assessing the recent 1-week stress perception [20] and that Koh and Park [21] translated and validated in Korean, was used for stress assessment. The Social Readjustment Rating Scale [22], which consists of 43 items assessing the presence and frequency of stress factors that are continuously painful to patients and the frequency of the recent 1-year stress events and that Hong and Jeong [23] translated and validated in Korean, was used to assess stress frequency. The Weisman questionnaire [24] that Koh translated in Korean [25] was used to assess coping strategies for stress. It consists of 15 coping strategies, and patients indicate on a 5-point Likert scale the frequency with which they use each coping style. The results were analyzed to 3 categories dependent on whether the patients had coping strategies.

### 3. Statistical analysis

T-tests were conducted to compare the demographic characteristics and each scale of the patient group with those of the control group. Pearson correlation coefficients were measured to investigate the correlation between CP/CPPS symptoms and perception to stress in the patient group. The results were considered statistically significant when  $p < 0.05$ . Statistical analyses were performed by using SPSS ver. 12.0 (SPSS Inc., Chicago, IL, USA).

## RESULTS

### 1. Demographic characteristics of the subjects

The mean age of the 55 patients was  $22.5 \pm 2.6$  years. The patient group consisted of one married patient (1.8%) and 54 single patients (98.2%), and their mean level of education was  $12.43 \pm 1.76$  years. The mean age of the control group (58 subjects) was  $21.7 \pm 2.1$  years. The control group consisted of 3 married patients (5.2%) and 55 single patients (94.8%), and their mean level of education was  $12.85 \pm 1.92$  years. No significant differences in the demographic characteristics of the subjects were found between the two groups ( $p > 0.05$ ) (Table 1).

### 2. National Institutes of Health Chronic Prostatitis Symptom Index

As shown in Table 2, the pain scores were  $8.49 \pm 3.81$  and

**TABLE 1.** General characteristics of the subjects

Characteristic	CP/CPSP patients (n=55)	Controls (n=58)	p-value
Age (yr)	22.5±2.6	21.7±2.1	0.074
Education (yr)	12.43±1.76	12.85±1.92	0.22
Marital status			
Single	54 (98.2)	55 (94.8)	0.618
Married	1 (1.8)	3 (5.2)	
Religion			0.059
None	25 (45.5)	27 (46.6)	
Catholic	4 (7.2)	10 (17.2)	
Protestant	22 (40.0)	12 (20.7)	
Buddhism	4 (7.2)	9 (15.5)	

Values are presented as mean±SD or number (%).  
CP/CPSP, chronic prostatitis/chronic pelvic pain syndrome.

**TABLE 2.** Comparison of NIH-CPSI scores in patients and controls

	CP/CPSP patients (n=55)	Controls (n=58)	p-value
Pain score	8.49±3.81	0.67±2.03	≤0.001 <sup>a</sup>
Urinary symptom score	4.98±2.85	0.58±1.22	≤0.001 <sup>a</sup>
Quality of life impact score	7.96±2.11	3.11±2.76	≤0.001 <sup>a</sup>
Total	21.44±6.84	4.28±4.67	≤0.001 <sup>a</sup>

Values are presented as mean±SD.  
NIH-CPSI, National Institutes of Health Chronic Prostatitis Symptom Index; CP/CPSP, chronic prostatitis/chronic pelvic pain syndrome.  
<sup>a</sup>:p<0.01.

0.67±2.03 in the patient and control groups, respectively. In addition, the urinary symptom scores were 4.98±2.85 and 0.58±1.22 and the quality of life impact scores were 7.96±2.21 and 3.11±2.76 in the patient and control groups, respectively. The total scores of the aforementioned domains were 21.44±6.84 and 4.28±4.67 in the patient and control groups, respectively. The scores were all significantly higher in the patient group than in the control group (p<0.01).

### 3. HAD scale

As shown in Table 3, the HAD scale was 5.06±4.50 and 2.61±2.79 for the anxiety domain and 4.57±4.30 and 2.78±3.27 for the depression domain in the patient and control groups, respectively. The scores were all significantly higher in the patient group than in the control group (p<0.01, p<0.05).

### 4. GARS scale

As shown in Table 4, the stress perception score and scale summation for 8 items such as “work, job & school,” “interpersonal,” “changes in relationship,” “sickness or in-

**TABLE 3.** Comparison of HAD scale scores

	CP/CPSP patients (n=55)	Controls (n=58)	p-value
HAD scale			
Anxiety	5.06±4.50	2.61±2.79	≤0.001 <sup>a</sup>
Depression	4.57±4.30	2.78±3.27	0.013 <sup>b</sup>

Values are presented as mean±SD.  
HAD, hospital anxiety and depression; CP/CPSP, chronic prostatitis/chronic pelvic pain syndrome.  
<sup>a</sup>:p<0.01, <sup>b</sup>:p<0.05.

**TABLE 4.** Comparison of stress perception

Stress items	CP/CPSP patients (n=55)	Controls (n=58)	p-value
Work, job & school	3.90±2.25	1.34±2.17	≤0.001 <sup>a</sup>
Interpersonal	2.90±1.67	1.25±1.65	≤0.001 <sup>a</sup>
Changes in relationship	2.41±2.29	0.92±1.58	≤0.001 <sup>a</sup>
Sickness or injury	3.16±2.47	1.29±1.85	≤0.001 <sup>a</sup>
Financial	3.37±2.52	1.32±1.63	≤0.001 <sup>a</sup>
Unusual happenings	1.87±1.95	0.92±1.10	0.0017 <sup>a</sup>
Change or no change in routine	2.74±2.27	0.98±1.38	≤0.001 <sup>a</sup>
Overall global	3.5±2.03	1.23±1.78	≤0.001 <sup>a</sup>
Sum	23.87±13.19	9.29±11.24	≤0.001 <sup>a</sup>

Values are presented as mean±SD.  
CP/CPSP, chronic prostatitis/chronic pelvic pain syndrome.  
<sup>a</sup>:p<0.01.

**TABLE 5.** Comparison of frequency of stressors

	CP/CPSP patients (n=55)	Controls (n=58)	p-value
During preceding 1 yr			
Positive	0.67±0.63	0.54±0.62	0.27
Neutral	0.80±0.80	0.52±0.61	0.038
Negative	1.91±1.71	1.80±1.64	0.72

Values are presented as mean±SD.  
CP/CPSP, chronic prostatitis/chronic pelvic pain syndrome.

jury,” “financial,” “unusual happenings,” “change or no change in routine,” and “one-week overall global” were all significantly higher in the patient group than in the control group (p<0.01).

### 5. Social readjustment rating scale

When the recent 1-year stress factors were classified into positive, neutral, and negative events according to the characteristics of the events and compared with each other, no significant difference in the frequency of positive, neutral, or negative events was found between the patient and control groups (p>0.05) (Table 5).

**TABLE 6.** Relationship between NIH-CPSI and GARS scale in the CP/CPPS patients

Stress perception	NIH-CPSI			
	Pain	Urinary symptom	Quality of life	Total
GARS scale sum	0.337	0.208	0.458	0.426
p-value	0.013 <sup>a</sup>	0.132	≤0.001 <sup>b</sup>	0.002 <sup>b</sup>

NIH-CPSI, National Institutes of Health Chronic Prostatitis Symptom Index; GARS, Global Assessment of Recent Stress; CP/CPPS, chronic prostatitis/chronic pelvic pain syndrome.

<sup>a</sup>:p<0.05, <sup>b</sup>:p<0.01.

### 6. Correlation of NIH-CPSI with GARS scale in the patient group

The pain, quality of life, and sum domains of the NIH-CPSI were shown to have a significantly positive correlation with the total GARS scale score in the patient group (p=0.013, p<0.001, and p<0.001, respectively) (Table 6).

### 7. Coping strategies

In the CP/CPPS patient group, the most commonly used coping strategy was intellectualization, meaning “collecting as much information as possible,” which accounted for 81.8% (Table 7). Redefinition, meaning “accepting his/her problems and looking for something to cope well,” and flexibility, meaning “trying to compromise with other feasible alternatives” followed intellectualization. Meanwhile, rarely used coping strategies included fatalism, meaning “accepting problems inevitably and feeling frustrated”; externalization, meaning “criticizing other people or objects”; and self-pity, meaning “scolding him/herself and expiating,” which accounted for 21.8%, respectively.

## DISCUSSION

CP/CPPS is a common disease diagnosed at urological outpatient clinics. Current treatment methods include alpha-blocker therapy, nonsteroidal anti-inflammatory drugs, and antibiotics for the control of the patient’s pain, but their efficacy is limited [26]. CP/CPPS manifests various symptoms, such as pelvic pain, urinary problems, sexual dysfunction, and psychological problems. These symptoms are significantly distressing and sometimes burdensome to the patients. That is, although CP/CPPS may be an important stress source, stress management has been little considered in Korea. Accordingly, this study was conducted to investigate the stress perception, responses to, and coping strategies for stress of CP/CPPS patients and their correlation with the severity of prostatitis.

The HAD scale is an instrument that is reliable and valid for measuring the anxiety and depression of patients [27]. When the HAD scale was compared in this study, both depression and anxiety scales were higher in the CP/CPPS group than in the control group. This indicates that psychological disorders are part of CP/CPPS symptoms, and that

**TABLE 7.** Coping strategies of CP/CPPS patients (n=55)

Items	Yes	Uncertain	No	No response
Intellectualism	81.8	10.9	5.4	1.8
Shared concern	61.8	20.0	16.3	1.8
Reversal of affect	69.1	16.3	12.7	1.8
Suppression	45.4	34.5	18.1	1.8
Displacement	43.6	34.5	20.0	1.8
Confrontation	63.6	27.2	7.2	1.8
Redefinition	74.5	20.0	3.6	1.8
Fatalism	21.8	27.2	49.1	1.8
Acting-out	58.1	23.6	14.5	1.8
Flexibility	70.9	21.8	5.4	1.8
Tension reduction	45.4	7.2	45.4	1.8
Isolation	32.7	12.7	52.7	1.8
Externalization	21.8	23.6	52.7	1.8
Compliance	23.6	32.7	41.8	1.8
Self-pity	21.8	20.0	56.3	1.8

CP/CPPS, chronic prostatitis/chronic pelvic pain syndrome.

depression and anxiety could act as contributing factors to CP/CPPS. However, the causality of depression and anxiety with CP/CPPS was unclear in this study, and a further study is required.

The definition of stress is somewhat controversial owing to the ambiguity of the term; some researchers define it as external stimuli, and others define it as responses to external stimuli. Thus, the definition has not yet been established. In fact, because stress varies depending on individuals, it is difficult to accurately define and examine it. Lipowski [28] reported that stress refers to meaningful internal and external stimuli perceived by individuals and defined it as something that induces emotions and eventually causes physiological changes threatening individual health and survival. That is, this definition emphasizes that stress is more influenced by individual interpretation and assessment than by the event itself. Thus, to investigate the correlation of diseases with stress, not only the events causing stress in the daily living of individuals and their frequency but also the stress perception assessment, responses to, and coping strategies for stress of the individuals should be considered. Accordingly, not only the frequency of stress that occurred in the CP/CPPS patients but also their perception level and coping strategies for stress and the correlations between them were investigated in this study. The 1-week stress perception level; work, job & school; interpersonal; changes in relationship; sickness or injury; financial; unusual happenings; change or no change in routine; overall global; and GARS scale summation scores were all significantly higher in the CP/CPPS group than in the control group. This result indicates that the perception of daily living stress is higher in CP/CPPS patients than in healthy people, and that CP/CPPS could act as a source of stress in daily living and that stress perception could become a factor affecting CP/CPPS. When the frequency of stress events accumu-

lated in the CP/CPPS patients over 1 year was investigated, no significant difference in the frequency of positive, neutral, and negative events was found between the patient and control groups ( $p > 0.05$ ). That is, this comparison showed that the CP/CPPS group had a high perception level to stress regardless of the stress frequency.

The NIH-CPSI has been accepted by the International Prostatitis Collaborative Network as a standard and valid instrument for evaluating men with CP/CPPS symptoms [29]. When the results of the NIH-CPSI were compared between the CP/CPPS group and the control group, the pain score, urinary symptom score, and quality of life impact score were higher in the CP/CPPS group than in the control group, and the mean total score was also higher in the CP/CPPS group than in the control group. Furthermore, because the pain score, quality of life impact score, and total score of the NIH-CPSI increased in the CP/CPPS group, a significantly positive correlation of the aforementioned scores with the total GARS scale was shown. In particular, a higher positive correlation of 1-week stress perception level with the pain score and quality of life impact score was shown compared with the urinary symptom score. A previous study reported that the pain intensity of the NIH-CPSI was a stronger predictor affecting quality of life compared with the urinary symptom score [5], and that the NIH-CPSI total score provided a good outcome measure of prostatitis symptoms because the pain and quality of life impact scores were more responsive to change, but the urinary symptom scale was less responsive [30]. In this study, the pain score, quality of life impact score, and total score were correlated with the increased stress perception of the CP/CPPS patients, but the urinary symptom score was less correlated with the stress perception of the CP/CPPS patients. Although a sequential relation between CP/CPPS and stress perception has not been identified in this study, increased pain and deteriorated quality of life owing to CP/CPPS seem to be closely associated with stress factors. Furthermore, assessments of the coping strategies of patients for stress, pain, and quality of life should be also conducted in the treatment of and approaches to CP/CPPS.

In this study, the CP/CPPS patients mainly used reasonable coping strategies such as intellectualization and redefinition, where patients accept their problems and cope well, and flexibility, where patients try to compromise with other feasible alternatives. Meanwhile, fatalism, externalization, and self-pity were rarely used. Weisman [24] reported that intellectualism, shared concern, displacement, confrontation, redefinition, and compliance are the most effective coping strategies. In this study, the CP/CPPS patients were shown to have generally used positive and effective coping strategies. This suggests that patients proactively pursue knowledge and are positive to the assistance of experts rather than being frustrated by their problems and criticizing their status in order to resolve their problems.

The potential limitations of our study are as follows: 1) the subject number was insufficient because the patients

who participated in this study were from a military hospital and their age bracket was limited; thus, the subjects do not represent all CP/CPPS patients. 2) Psychiatric interview and assessment were excluded and self-reporting survey scales were used, which could have the bias of respondents and errors. 3) The Weisman coping strategy scale translated into Korean has been used in several Korean studies, but the Korean version has not yet been validated.

A further prospective study is required on a large scale to investigate the correlation of CP/CPPS with stress, depression, and anxiety and differences in coping strategies between CP/CPPS patients and a control group with the consideration of additional factors.

## CONCLUSIONS

The CP/CPPS patients had symptoms such as depression and anxiety and had a high level of stress perception regardless of the frequency of stress events. In particular, the stress perception of the CP/CPPS patients was closely associated with the pain and quality of life of the patients. In conclusion, CP/CPPS is likely to be closely associated with stress factors. Assessment of and control of stress factors are required in the treatment of CP/CPPS patients.

## CONFLICTS OF INTEREST

The authors have nothing to disclose.

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