Chronic Pain And Pain Belief In Active Military Personnel: A Cross-Sectional Study

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Abstract

Background: Chronic pain (CP) and mental disorders are common among active military personnel (AMP) due to their potential exposure to various physical and psychological stressors. The aim of this study was to evaluate pain perception and beliefs regarding their pain among AMP suffering from CP using self-reported measures, and to understand the development and persistence of pain in AMP.

Materials-Methods: Sixty male AMP outpatients suffering CP were included. All participants completed the following forms and questionnaires: Oswestry Disability Index(ODI), Visual Analogue Scale(VAS), Neck Disability Index(NDI), Bournemouth Questionnaire for neck(BQN), International Physical Activity Questionnaire(IPAQ), Hospital Anxiety and Depression Index(HADS), 36-item Short Form Survey(SF-36), Automatic Thoughts Questionnaire(ATQ), and Pain Belief Questionnaire(PBQ).

Results: The mean age of the participants was 22.85±3.50 years, the median duration and frequency of pain were 12 months and 14.5 days in a month, respectively. The median of ODI scores was 26; three of patients were evaluated as crippled while 8 patients had severe disability. The HADS and PBQ-psychological scores were high in the patient group.Positive correlations were found between pain frequency and the ODI, VAS, NDI and PBQ-psychological scores. Relationships were also shown between PBQ-psychological and the VAS and ATQ scores. Correlations between ODI scores and ATQ scores were also revealed.

Conclusions: Our results suggest that, in addition to the organic basis of pain, there is strong evidence for significant contribution from the psychological characteristics and pain-related beliefs of the patients. Physicians may choose a multi-dimensional perspective in the diagnosis and treatment of pain, especially in patients suffering from CP.

Keywords: Chronic pain, pain perception, military personnel

INTRODUCTION

Chronic pain is a multifaceted phenomenon including biological, psychological and social elements and is a significant and challenging public health concern(1). It can cause short sickness absence and work disabilities in addition to long-term absence and permanent disability in many persons.19% of adults suffer from chronic pain with serious impacts on their social and working lives as demonstrated in the 2006 European chronic pain survey(2). Many factors are associated with the development and persistence of chronic pain(3). There is a general consensus that chronic pain conditions are non-specific with little objective pathology, but research has shown somatic and psychiatric comorbidity in patients with chronic pain. Some of these are work-related; comprising of excessive physical demands or decreased job satisfaction in the workplace, while others are psychiatric and emotional risk factors; including anxiety, unrealized expectations or low mood. General population-based studies have shown a close link between chronic pain conditions and other psychiatric conditions such as, anxiety disorders, depression and posttraumatic stress disorder (PTSD)(4).

Chronic pain and mental disorders are common among military personnel due to their potential exposure to various physical and psychological factors(5).In a study conducted in 2017 involving active military personnel of the United States, it was shown that the frequency of receiving prescriptions for pain medications was 69% in 2006, 77% in 2011, and %82 in 2014 (6).Pain can also occur as a result of other conditions such as sleep disturbances, malnutrition, loneliness, depression, tobacco and alcohol use, anxiety, PTSD, and also fatigue in active military personnel(5-7).Chronic pain is very widely considered as a significant adverse factor for quality of life(4).

Besides, beliefs, cognitions, behaviors and perceptions related to pain have been widely accepted as important factors for the diagnosis, evaluation and treatment of patients suffering from chronic pain(8). Some self-reported measures can be used to

evaluate these psychometric properties and to assess pain intensity, pain-related functioning or pain severity. To date, results of studies that have investigated pain perceptions and beliefs amongactive military personnel with chronic pain have not resulted in conclusive findings.

The aim of this study was to evaluate pain perceptions and beliefs among active military personnel suffering from chronic pain using self-reported measures, and to present new evidence for the development and persistence of chronic pain in active military personnel.

MATERIAL AND METHODS

Study design

This descriptive cross sectional study was carried out from December 2018 to July 2019 at the Department of Physical Medicine and Rehabilitation, Famagusta State Hospital, Famagusta, Cyprus. Chronic pain diagnosis was based on clinical history and examinations with radiological imaging in patients who reported having pain for more than 3 months. Participants with a history of psychiatric diseases, cardio-vascular or cerebro-vascular disease, neurological diseases, malignancies, and those with a family history of psychiatric diseases were excluded from the study. 70 outpatients suffering from chronic pain who visited the hospital for physical examinations were selected randomly for inclusion in to the study. 5 patients were excluded according to exclusion criteria 3 patients were excluded because they did not complete questionnaires. Addition all 2 patients who did not provide accurate or reliable responses to questionnaires were excluded at the end of study. Thus, 60 male outpatients suffering from chronic pain were enrolled in the current study. All patients participating in the study were active military personnel. Participants did not receive any reward or compensation for participating.

Ethical issues

The study was conducted in accordance with the ethical standards stated in the Declaration of Helsinki and was approved by the Research Ethics Committee. Written and verbal informed consent was obtained from individuals prior to their participation in this study.

Measures

Clinical information including age, educational, employment and marital status, frequency and duration of pain, and the characteristics and course of disease were obtained from patients' medical files. All patients participating in the study received and completed the self-reported questionnaires and forms that are explained in detail below.

The Oswestry Disability Index (ODI, also known as the Oswestry Low Back Pain Disability Questionnaire) was used to evaluate a patient's permanent functional disability. ODI is thought to be the 'gold standard' of low back functional assessment tools(9). Each question of the ODI is graded on a scale of 0 to 5 points, and ODI results range from 0 to 50. Each patient's ODI score was then calculated as a percentage (Patient score / Maximum possible score x100). Higher ODI scores indicate higher disability.

The severity of the pain was self-assessed by using a linear visual analogue scale (VAS). The VAS is one of the most frequently used measures to determine subjective pain intensity in chronic pain patients. It is explained to the patients as:0 means no pain whatsoever and 10 means worst possible pain(10).

The Neck Disability Index (NDI) was used to evaluate the self-rated disability of patients with neck pain(11). Each question of the NDI is rated on a scale of 0 to 5 points, while the overall NDI ranges from 0 to 50 points. Higher NDI scores reflect that that the patient has higher perceived disability due to neck pain.

The Bournemouth Questionnaire for neck (BQN) disability is a reliable and responsive short-form tool used to evaluate patients' neck conditions with questions about pain, disability and psychosocial issues(12). The BQN covers 7 fields: pain, physical function (inadequacy of daily life activities (ADL), disability in social activities, anxiety, depression, avoidance of work-related fear (at home and at work) and pain control. Higher BQN scores reflect higher severity and greater impact on a patient's life. Highest possible score is 70 points.

International Physical Activity Questionnaire (IPAQ) has been used to assess physical activity and to determine the level of activity (in minutes) during the last 7 days based on 4 intensity levels: 1) vigorous-intensity activities such as aerobics, 2) moderate-intensity activities such as leisure cycling, 3) walking, and 4) sitting(13).The following coefficients are applied before calculation to obtain overall activity: walking = 3.3 metabolic equivalents (MET), moderate intensity-physical activity = 4.0 MET, vigorous physical activity = 8.0 MET. Total physical activity is calculated and used as the final score. Lower IPAQ scores reflect physical inactivity.

Hospital Anxiety and Depression Index (HADS) was used to measure clinically significant anxiety and depressive symptoms in patients(14).HADS consists of 14 items that are separated into two subscales, anxiety and depression. Responses to each item are graded on a four-point scale, while the maximum score is 21 points for each subscale(anxiety and depression). Scores ranging from0 to 7 mean 'normal', 8 to 10 show borderline or mild anxiety/depression, while a score of 11 or higher is considered to demonstrate an considerable psychological morbidity in both subscales.

The SF-36is a short form used to evaluate the general health status of patients by measuring eight health-related quality of life domains including physical functionality (PF), social functionality (SF), role limitation due to physical problems (RP), role limitation due to emotional problems (RE), mental health (MH), energy and vitality (VT), physical pain (BP) and general health perception (GH)(15).For each quality of life domain, the score is calculated and converted to a scale of 0 (worst) to 100 (best) using standard SF-36 scoring algorithms.

The Automatic Thoughts Questionnaire (ATQ)was used to measure the frequency of depressive thoughts and consists of 15 items that evaluate the frequency of the occurrence of dysfunctional and irrational automatic negative thoughts about the respondent (16).The questions are answered on a 5-point Likert scale (1: none, 5: almost always) with regard to the respondents condition during the last four weeks. Higher ATQ scores indicate a higher frequency of negative automatic thoughts.

Pain Belief Questionnaire (PBQ)was used to assess the patients' pain belief and consists of two subscales that the authors defined as 'organic' (8 items) and 'psychological' (4 items) (17). The organic beliefs subscale (PBQ-O) evaluates physical injury or physiological pain that threatens the patient's health status and the perceived cause ofpain (pain-damage) and also its management (control and training/activity issues). The psychological pain beliefs subscale (PBQ-P) assesses intrinsic factors and emotions that affect the experience of pain and may potentially threaten wellness. Higher scores indicate worse pain perception and negative beliefs. PBQ-P scores have been shown to be related with psychological state, anxiety and depression.

Statistical Analyses

All analyses were performed on SPSS v21. For the normality check, the Kolmogorov-Smirnov test with Lilliefors correction was used. All data were given as median (minimum - maximum) for continuous variables and frequency (percentage) for categorical variables. Spearman Correlation Coefficients were calculated for the assessment of relationships between variables. Statistical significance was set at the $p<0.05$ level.

RESULTS

A total of sixty male outpatients suffering from chronic pain were included in the study. The mean age of patients was22.85 ± 3.50 years.The demographic characteristics, educational status, jobs status in the military and marital status are shown in Table 1.

The median pain duration and pain frequency of patients were 12 months and 14.5 days in a month, respectively.The median AS, NDI, IPAQ and BQN scores in patients were 6,19, 20 and 360, respectively. The median ODI score was 26, with three patients identified to have crippling pain and 8 patients with severe back pain. The HADS scores were high in patient group (15 for anxiety and 13 for depression). Forty-five patients had abnormal scores for anxiety and 43 patients had abnormal scores for depression. The median scores of thePBQ were: 25.5 for the organic scale (PBQ-O) and 15 for psychological scale (PBQ-P). The summary of the study group's scores are depicted in Table 2.

Correlation analyses between patients' characteristics and scale / questionnaire scores are shown in Table 3. Positive correlations were found between age and emotional well-being on SF-36 scores and also between marital status and general health status on SF-36 scores. We also showed a positive correlation between pain frequency and scores from the ODI, VAS, NDI and PBQ-P. Further relationships were revealed between PBQ-P and VAS and ATQ scores, most evident in the negative self-concept and confusion and escape fantasies subsections (Table 4). We also found correlations between ODI scores and ATQ scores (Table 4). Correlation analyses between SF-36 subscales, as a measure of overall health, and the results of other scales are shown in Table5.

DISCUSSION

The current study aimed to investigate the potential relationships between various pain and psychological assessment methods in patients suffering from chronic pain. We performed examinations specifically in active military service members in order to be able to have a similar group of patients at baseline (in regard to workplace stress, daily routines and habits) that would provide a chance to understand the change of pain perceptions and beliefs. We demonstrated that pain scales were significantly related to psychological conditions in this group of active military personnel that had been diagnosed with chronic pain.

The International Association for the Study for Pain has defined chronic pain as uncontrollable pain persisting for more than 3 months during a normal healing process that does not require treatment with medications or any other type of interventions(18). Chronic pain has been thought to a biopsychosocial condition affected by many factors including cognitive, emotional and biological parameters that affect the patients' pain perception(19). Ithas been found to be related to female gender, non-Caucasian race, low socioeconomic status, high stress level, disruptions in physical activity, sleep, mood and affective conditions such as depression and anxiety; all of which suggest multi-dimensional contributions and characteristics(18-20).Response to chronic pain related beliefs, cognitive processes, appraisals, attitudes and pain-related thought may cause catastrophic pain-related anxiety and fear, problems in self-control and feeling of helplessness(21, 22). Long-term intense chronic pain may cause avoidance of occupational activity as well as other physical activity and depression due to fear and anxiety linked to pain(23). It may also negatively affect patients' life quality and functional/ social state, ultimately resulting in physical and psychological chronic disability(24). Consistent with the literature, we found high scores of HADS-anxiety and HADS-depression as well as PBQ-P in active military members suffering chronic pain. Our results confirm that emotional variables, including fear, anxiety, depression and psychological factors play a significant role in pain experience and response. Our results also show that anxiety and depression are common in military service personnel with almost 3 quarters of respondents demonstrating clinically relevant scores.

We also found an inverse correlation between PBQ-P scores and SF-36, while negative self-concept scores were positively correlated with ATQ scores. These results indicate that negative beliefs about pain may negatively impact general health,

self-efficacy, and the performance of patients. We also found positive correlations between pain frequency and VAS scores and PBQ-P scores. We suggest that pain severity and its duration is associated with increased risk of negative belief about the pain. We believe our results may also suggest that the presence of negative beliefs about pain may be an important step in its transition to chronic pain; thus causing negative treatment outcomes in the treatment of such pain.

SF-36 has been shown to be sensitive to social factors such as financial stability, employment and educational status as well as disease-associated status in population-based surveys(15). In previous studies, SF-36 scores were also found to be relatively low in military personnel(15, 25). Consistent with the literature, we found lower SF-36 scores in our patient group compared to a previous study that was also conducted on Turkish population by Demiral et al.(15). They had observed that social risk factors (employment status, lower education and financial difficulties) were associated with worse health profiles (15). Low SF-36 scores may also be potentially related to the exposure of military service members to both physical and psychological factors.We found negative associations between general health status scores and emotional well-being scores on the SF-36 and ATQ scores.Besides, negative correlations were found between role functioning/physical scores on the SF-36 and BQN scores, HADS Depression scores and PBQ-P scores. Our results were consistent with previous studies.

The fact that significant stressors, such as sleep disturbances, malnutrition, loneliness, depression, anxiety, PTSD and fatigue, are common in military personnel may be a cause for worse quality of life and health status.We found that marriage positively influenced general health status on the SF-36 scores; whereas age and emotional well-being status had the opposite effect. These results were also consistent with previous studies. These consistencies show that, as in any other group of patients, emotional support from social surroundings and family are crucial for the quality of life and general health of military personnel suffering from chronic pain. Furthermore, we found negative correlations between VAS scores and SF-36 scores including the role-functional/physical, energy/fatigue and pain subscales. We also revealed negative correlations between ODI scores and the SF-36 subscales of general health, emotional well-being, energy/fatigue and pain.These findings infer that an increased disease severity may cause significant detrimental effects on patients ‘quality of life.

ODI is a reliable and useful self-reported scale that evaluates functional impairment and perceived disability during daily activities.ODI scores were found to be relatively low in the patient group (compared to age and sex adjusted norms), similar to previous studies (26,27). In a study conducted in the UK on military personnel with persistent low back pain, ODI scores were reportedly improved after 3 weeks of cognitive functional therapy(26). We also found positive correlations between ODI scores and ATQ scores, includingthe personal maladjustment, loneliness/isolation and giving up/helplessness sections. This indicates that an increase in pain levels may stimulate negative cognitions in the form of negative automatic thoughts. Patients with pain can avoid participating in new interactions and activities new initiatives and improve that will affect behavioral profile and may consequently increase the likelihood of depression.

Even though we performed a great number of self-assessed measures in this study, thereare several important limitations to mention. The first limitation is associated with the use of self-reported data,as questionnaires are applied with the assumption that participants will answer correctly; however, increasing the number of measures could have resulted in a lesser than usual accuracy in their results. Secondly, the present study includes a relatively small sample size with only young adult males. Previous studies have shown that age, gender and other social differences very significantly affect chronic pain, so we included only young male active military personnel in order to homogenize the sample. Some patients did not provide accurate and reliable responses to questionnaires and we excluded them at the end of study, which is the primary cause for a lower than desirable number of participants. Further studies with larger samples are recommended. Thirdly, we examined only outpatients and did not include patients hospitalized due to chronic pain, which may have reduced the frequency of higher level severity in those who were suffering from chronic pain after serious injuries in combat or training. Thus, the subjects may not be representative of the general population of military personnel suffering from chronic pain.

CONCLUSION

This cross-sectional study demonstrates that pain levels were significantly associated with psychological conditions, as measured by HADS-anxiety, HADS-depression and PBQ-P that were generally worse than the general population in active military service personnel suffering from chronic pain. The results indicate that chronic pain causes many functional and social limitations and provides evidence that it is associated with psychological factors and the pain-related beliefs of patients. Therefore, physicians must acquire a multi-dimensional perspective in the diagnosis and treatment of pain. We believe that they may also benefit from utilizing pain scales that are associated with psychological conditions, particularly when dealing with the chronic pain of active military personnel.

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