

Chronic pelvic pain syndrome symptoms significantly affect medical students' well-being

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Abstract

Aims: This study aims to determine the prevalence of chronic pelvic pain syndrome (CPPS) symptoms among male-medical students in Riyadh, Saudi Arabia.

Settings and Design: It is a cross-sectional study at King Saudi Bin Abdulaziz University for Health Sciences, College of Medicine at Riyadh, Saudi Arabia.

Subjects and Methods: A total of 300 male medical students were given a hardcopy questionnaire to be filled anonymously that includes demographic characteristics, several questions regarding the health status, habits of the participants, and the National Institutes of Health Chronic Prostatitis Symptom Index for evaluating CPPS symptoms.

Statistical Analysis Used: SPSS (v21) was used for the analysis. Qualitative data presented by frequencies and percentages and quantitative data presented by median and interquartile range (Q1 to Q3). The Chi-square test and binary logistic regression were used to assess the relationship between the outcome variables with demographical data.

Results: In total 300 male medical students were surveyed, 245 medical students returned the questionnaire giving a response rate of 81.6%. The prevalence of CPPS symptoms among all participants was 57.9%. Majority of the participants does not have any associated medical/psychological conditions 152 (62%). Students with irritable bowel syndrome (IBS) or/and anxiety have statistically significant association with CPPS symptoms ($P < 0.05$). A total of 23% of students with CPPS reported being impaired with their quality of life (QOL), while 77% are satisfied.

Conclusions: The prevalence of CPPS symptoms among male medical students is high. Anxiety, IBS, and lack of activity might be associated with CPPS symptoms, which have a significant negative impact on the QOL. For the future direction, a large-scale global study should be conducted to link the effects of CPPS symptoms on male medical students well-being.

Keywords: Chronic pelvic pain syndrome, interquartile range, irritable bowel syndrome, National Institutes of Health-Chronic Prostatitis Symptom Index, quality of life, the International Classification of Diseases-9

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INTRODUCTION

Chronic pelvic pain syndrome (CPPS) is described as persistence or recurrent episodes of pelvic pain on men for more than three of the last 6 months with possible sexual or urinary dysfunction.^[1] The concept of this condition has changed over the past years. This is attributed to the ambiguity of its pathophysiology and its clinical manifestation.^[2]

The etiology of CPPS is unknown, but it has been proven that there are multiple psychological, immunological, and neurological factors contributing to it. Stress is one of the known factors that can cause CPPS.^[3] In fact, one theory behind the disease is that stress causes hypothalamic-pituitary-adrenal axis dysfunction.^[3] Furthermore, stress is also related to other medical conditions such as irritable bowel syndrome (IBS) and fibromyalgia.^[4]

One source of stress is being a medical student. According to the literature, most of the undergraduate medical students have a high stress level due to their advanced courses. This stress is a result of information overload, financial problems, and lack of leisure time.^[5] In addition, many medical students have a high level of depression and suicidal thoughts.^[6-8] With poor coping mechanism, the stress will affect students physically, emotionally, and socially.

The rationale of this study is to determine the prevalence of CPPS symptoms among male medical students, which could help in improving the quality of life (QOL) and the well-being of male medical students. Therefore, this study aims to determine the prevalence of CPPS symptoms among male medical students at Riyadh, Saudi Arabia.

SUBJECTS AND METHODS

Study area/setting

King Saud Bin Abdulaziz University for Health Sciences, College of Medicine at Riyadh, Saudi Arabia.

Study design

It is a cross-sectional study (survey).

Sample size

In total 300 male-medical students were surveyed, this is based on the number of the male-medical students at KSAU-HS, 650 students. We considered the margin of error in this study to be 5%, to increase the accuracy of the study, the confidence level is 95% and the distribution response is 50%.

Sample technique

Convenient sampling was used since it is the most feasible technique to do. The population was all male medical students, from 3rd to 6th year. Confidentiality was insured as no names or numbers were taken.

Data collection methods, instruments used, and measurements

A hardcopy questionnaire that include two sections: Demographic characteristics and several questions regarding the health status and habits of the participants in the first section. The second section includes the National Institutes of Health-Chronic Prostatitis Symptom Index (NIH-CPSI) for evaluating CPPS symptoms which were given to the participants to be filled anonymously. The NIH-CPSI was developed by Litwin *et al.*^[9] It is psychometrically valid index of symptoms and QOL impact for men with chronic prostatitis.^[9] It is a nine question survey that explores the three primary domains of chronic prostatitis: Pain, urinary symptoms, and QOL.^[9] QOL was classified to satisfied (delighted, pleased, and mostly satisfied) and impaired (mixed, mostly dissatisfied, unhappy, and terrible).

Data management and analysis plan

The data were entered using Microsoft Excel and then exported to the SPSS version 21 (Statistical Package for Social Sciences, Armonk, New York, USA) for the analysis. Qualitative data presented by frequencies and percentages and quantitative data presented by the median and interquartile range (IQR) (Q1 to Q3). The Chi-square test and binary logistic regression were used to assess the relationship between the outcome variable with demographical data. Because of nonparametric distribution of the data, the Mann-Whitney U-test was used to compare between the categorized variables and numerical ones.

RESULTS

Out of 300 male medical students, 245 male medical students returned the questionnaire giving a response rate of 81.6%. Table 1 summarizes the baseline characteristics of the students who participated in the study. Most of the respondents had grade-point average (GPA) more than 3.5/5 and not been diagnosed with any medical/psychological conditions, whereas 47 (19%) have IBS, 12 (4.9%) have depression, and 33 (13.4%) have anxiety. Most of the participants were nonsmokers 193 (78.7%). However, half of the participants do not exercise regularly. Moreover, half of the participants always drink coffee/tea 125 (51%), whereas 76 (31%) of participants sometimes eat spicy food.

Table 1: Baseline characteristics of respondents

| Data | n (%) |
|--------------------------------|------------|
| Age | |
| 18-25 | 214 (87.3) |
| 26-30 | 26 (10.6) |
| 31-35 | 5 (2.0) |
| Undergraduate year | |
| 3 rd | 29 (11.8) |
| 4 th | 71 (29.0) |
| 5 th | 62 (25.3) |
| 6 th | 83 (33.9) |
| GPA | |
| 4.50-5.00 | 110 (40.8) |
| 4.00-4.49 | 88 (35.9) |
| 3.50-3.99 | 24 (9.7) |
| 3.00-3.49 | 4 (1.6) |
| <3.00 | 1 (0.4) |
| Self-reported disease/disorder | |
| None | 152 (62) |
| Irritable bowel syndrome | 47 (19.2) |
| Depression | 12 (4.9) |
| Anxiety | 34 (13.5) |
| Exercise | |
| Not regularly exercise | 121 (49.4) |
| Once a week | 38 (15.5) |
| 2-3 days a week | 52 (21.2) |
| 5-7 days a week | 34 (13.9) |
| Smoking | |
| No | 193 (78.8) |
| Yes | 52 (21.2) |
| Coffee/tea consumption | |
| Never | 7 (2.9) |
| Rarely | 19 (7.8) |
| Sometimes | 29 (11.9) |
| Often | 24 (9.8) |
| Usually | 40 (16.4) |
| Always | 125 (51.2) |
| Spicy food consumption | |
| Never | 19 (7.8) |
| Rarely | 58 (23.7) |
| Sometimes | 76 (31.0) |
| Often | 49 (20.0) |
| Usually | 29 (11.8) |
| Always | 14 (5.7) |

GPA: Grade-point average

The prevalence of CPPS symptoms among all participants was found to be 57.9% (95% confidence interval 0.52–0.64). However, the degree of severity among respondents with CPPS symptoms is various. In all, 79.5% of them have mild symptoms, 15% have moderate symptoms, and 5% have severe symptoms.

There was a statistically significant difference in pain domain and urinary scores between the degrees of severity among respondents ($P < 0.001$). The median of pain domain score was 6, (IQR: 4–7, $P < 0.001$) for moderate and 9 (IQR: 7–11, $P < 0.001$) for severe form. On another hand, the median of urinary domain score was reported to be 2.5 (IQR: 1–5) for moderate and 5 (IQR: 3–9) for severe form. Moreover, urinary domain score in all students with CPPS symptoms (Med = 1, IQR: 1–3, $P < 0.001$) was higher than pain domain score.

In term of the location of the pain, 22 students with CPPS symptoms experienced pubic pain, 17 of them had pain in testicles and 10 of them had pain during urination.

Male medical students were classified into two categories; with CPPS symptoms and without. Then, different characteristics of the two categories were investigated and compared for further analysis, as depicted in Table 2. CPPS symptoms were not significantly associated with age, medical student level, GPA, consumption of coffee/tea, and spicy food. However, CPPS symptoms score was significantly higher in the students who have self-reported disease.

Binary logistic regression is illustrated in Table 3. Students with IBS or/and anxiety are more likely to experience CPPS symptoms. In addition, lack of activity (exercise <2 days a week) were recognized as the significant predictor for having CPPS symptoms.

A total of 13% of total male medical students reported being impaired QOL, whereas 77% are satisfied. However, 23% of male medical students with CPPS symptoms have impaired QOL. By using the Mann–Whitney test, the median of pain score of students with impaired QOL was 4 (IQR: 1–7, $P < 0.001$) compared with those with satisfied QOL, median of 2, (IQR: 1–4, $P < 0.001$). Of note, no male medical students without CPPS symptoms reported impaired QOL. By using the Chi-square test, there is the association between the increase in severity and impair of QOL ($P < 0.001$).

DISCUSSION

The present study attempted to determine the prevalence of CPPS symptoms among male-medical students. The rationale of this study is to assess the CPPS symptoms prevalence among male medical students and its effect on QOL as it seems to be highly prevalent among them. Most of the students with CPPS symptoms have a mild form of severity, but a significant percentage of them have impaired QOL. Moreover, pain domain score is significantly increased as the severity becomes worse. Ejike and Ezeanyika,^[10] similarly, revealed that men with chronic prostatitis symptoms had a mean pain domain score higher than those without the symptoms.^[10] From another study, it is apparent that CPPS symptoms of any form of severity impairs QOL.^[11] Moreover, it is the first study to demonstrate the prevalence of CPPS symptoms and its effect on QOL among male medical students.

By using NIH-CPSI, the result of this study indicates that almost 58% of male medical students at our center

Table 2: Comparison of selected demographic factors in students without and with chronic pelvic pain syndrome symptoms

| | Without CPPS (n=103), n (%) | With CPPS (n=142), n (%) | P |
|--------------------------|-----------------------------|--------------------------|------|
| Age (years) | | | |
| 18-25 | 89 (41.6) | 125 (58.4) | 0.43 |
| 26-30 | 13 (50) | 13 (50) | |
| 31-35 | 1 (20) | 4 (80) | |
| Years | | | |
| 3 | 12 (41.4) | 17 (58.6) | 0.8 |
| 4 | 33 (46.5) | 38 (53.5) | |
| 5 | 26 (41.9) | 36 (58.1) | |
| 6 | 32 (38.6) | 51 (61.4) | |
| GPA | | | |
| 4.50-5.00 | 47 (42.7) | 63 (57.3) | 0.75 |
| 4.00-4.49 | 38 (43.2) | 50 (56.8) | |
| 3.50-3.99 | 11 (45.8) | 13 (54.2) | |
| 3.00-3.49 | 1 (25) | 3 (75) | |
| <3.00 | 1 (100) | 0 (0) | |
| Self-reported diseases | | | |
| Non | 75 (49.3) | 77 (50.7) | 0.02 |
| Irritable bowel syndrome | 13 (27.7) | 34 (72.3) | |
| Depression | 6 (50) | 6 (50) | |
| Anxiety | 9 (27.3) | 25 (72.7) | |
| Exercise | | | |
| Not regularly exercise | 59 (48.8) | 62 (51.2) | 0.09 |
| Once a week | 10 (26.3) | 28 (73.7) | |
| 2-3 days a week | 21 (40.0) | 31 (59.6) | |
| 5-7 days a week | 13 (38.2) | 21 (61.8) | |
| Smoking | | | |
| Nonsmoker | 84 (43.5) | 109 (56.5) | 0.37 |
| Smoker | 19 (36.5) | 33 (63.5) | |
| Coffee/tea consumption | | | |
| Never | 3 (42.9) | 4 (57.1) | 0.95 |
| Rarely | 8 (42.1) | 11 (57.9) | |
| Sometimes | 13 (44.8) | 16 (55.2) | |
| Often | 11 (45.8) | 13 (54.2) | |
| Usually | 14 (35) | 26 (65) | |
| Always | 54 (43.2) | 71 (56.8) | |
| Spicy food consumption | | | |
| Never | 10 (52.6) | 9 (47.4) | 0.83 |
| Rarely | 21 (36.2) | 37 (63.8) | |
| Sometimes | 34 (44.7) | 42 (55.3) | |
| Often | 21 (42.9) | 28 (57.1) | |
| Usually | 11 (37.9) | 18 (62.1) | |
| Always | 6 (42.9) | 8 (57.1) | |

CPPS: Chronic pelvic pain syndrome, GPA: Grade-point average

Table 3: Possible risk factor/association of chronic pelvic pain syndrome symptoms

| | P | PR | 95% CI |
|----------------------------|------|------|-----------|
| Self-reported disease | | | |
| Non* | | | |
| IBS | 0.01 | 2.66 | 1.29-5.34 |
| Depression | 0.97 | 0.97 | 0.3-3.16 |
| Anxiety | 0.02 | 2.6 | 1.13-5.95 |
| Exercise | | | |
| Do not exercise regularly* | | | |
| Once a week | 0.02 | 2.78 | 1.21-6.42 |
| 2=2-3 days a week | 0.3 | 1.44 | 0.73-2.84 |
| 3=5-7 days a week | 0.24 | 1.6 | 0.73-3.55 |

*Reference group. CI: Confidence interval, PR: Prevalence ratio, IBS: Irritable bowel syndrome

have CPPS symptoms. Locally, there is no study to determine the prevalence of CPPS symptoms in the general population. Therefore, the comparison of the prevalence of CPPS symptoms between this study

population (male medical students) and local population is impossible. However, there are many international studies in which they determined the prevalence of CPPS symptoms among their population, although none of them determined the prevalence of CPPS symptoms among male medical students. In a cross-sectional survey of men age 20–74 years using NIH-CPSI in two counties in Canada, they found the prevalence of chronic prostatitis-like symptoms to be almost 10%.^[12] Ejike and Ezeanyika^[10] in a randomly selected population in Nigeria found that 12.21% were identified as having prostatitis-like symptoms.^[10] The prevalence of prostatitis in 1424 Japanese men was reported as 4.9%.^[13] From the aforementioned studies, it is apparent that the prevalence of CPPS symptoms of male-medical students in this study is much higher than the general population. This can be related to the high anxiety level among medical students. After performing univariate

logistic regression, students with anxiety are 2.6 times more likely to exhibit CPPS. Chung and Lin^[14] found that people with CPPS symptoms had a significantly higher prevalence of prior anxiety disorder than the matched controls (11.5% vs. 5.7%).^[14] Although their study design was case control and this study is cross sectional, their findings were consistent with our findings.

In this current study, there is a strong association between IBS and CPPS symptoms, also from previous case–control study, they found that CP/CPPS was significantly associated with IBS regardless of age group.^[15] By using the International Classification of Diseases as diagnosed criteria for IBS, it also was reported that IBS in 22.4% of patients with CP/CPPS.^[16] These previously reported results are similar to our findings, despite of the difference in study design. There are many clinical and scientific theories behind the association of IBS and CPPS symptoms. During the bladder filling, a decline in the interval to contraction was caused by irritation of the bowel with an inflammation.^[17] This is attributed to the overlap of peripheral nerves between the urinary and gastrointestinal systems.^[17] It has been illustrated that visceral hyperalgesia is another potential cause of the association between IBS and CPPS symptoms.^[18] In these conditions, the normal threshold of sensory stimulations is decreased; therefore, normal stimuli are perceived as a sensation of fullness and a need to urinate or defecate.^[18]

Although it was not statically significant, the frequency of CPPS symptoms was increased among students with advanced GPA. This can be explained by an increase in the anxiety level among student with higher GPA.^[19] CPPS symptoms could be a manifestation of anxiety which is a complex of physical, emotional, and psychomotor impairments.

Univariate logistic regression showed that lack of exercise <2 days/week is significantly associated with CPPS symptoms. This result is comparable to what Zhang *et al.* (2015)^[20] found when investigating the risk factors for prostatitis-like symptoms.^[19] However, CPPS symptoms are more common among smoker students in this study ($P = 0.40$). Similarly, Zhang *et al.* (2015)^[20] reported that male smokers have more prostatitis-like symptoms.^[20] However, in another case–control study of risk factors in men with CPPS, they found that there is no difference between men with CPPS symptoms and control in terms of current cigarette use.^[21] Furthermore, our findings show that coffee/tea and spicy food consumption has no apparent impact on the frequency of CPPS symptoms among our participants. Pontari *et al.*,^[21] however, found that men with CPPS symptoms were less likely to consume caffeine.^[21] This may be explained by patients reduce their intake because of the clinical advice or

as result of worsening symptoms. In addition, Herati *et al.*^[22] studied the influence of food and beverage on the symptoms of the CPPS. They found that caffeinated drink exacerbates CPPS symptoms.^[22]

As NIH-CPSI has a score for pain location (0–6), our results revealed that pubic pain is more frequent among the students with CPPS symptoms. Tan *et al.*,^[11] on the other hand, reported that men with CPPS symptoms have more tendency to have pain with micturition rather than pubic pain.^[11] By investigating the difference of pain domain scores based on the severity, this study shows that as the severity increases, the pain scores increase as well ($P < 0.001$). This outcome is consistent with previous study.^[10] However, pain domain score was smaller than urinary domain score among students with CPPS symptoms which is similar to Ejike and Ezeanyika study.^[10]

Despite the fact, this cross-sectional study has the advantage of determining the prevalence of CPPS symptoms among male-medical students, it is subjected to several limitations. First, the NIH-CPSI questionnaire was not primarily originated to diagnose CPPS, although it had a significant discriminatory power and might be used in identifying students with CPPS symptoms. Second, the survey was distributed a week before the final examination in which the stress among students might be high. In addition, participants were not clinically evaluated to rule out other causes of the symptoms. Furthermore, this study lacks the diversity as the sample has been collected in a single university.

CONCLUSIONS

In conclusion, this study presents the first estimate of CPPS symptoms prevalence among male medical students. The prevalence of CPPS symptoms among male medical students is high. Anxiety, IBS, and lack of activity might be associated with CPPS symptoms, which have a significant negative impact on the QOL. Therefore, promoting modification of lifestyle and help-seeking behavior for those who are in need is crucial and should be promoted in medical schools.^[23] For the future direction, a large-scale global study should be conducted to link the effects and causes of CPPS symptoms among male-medical students to improve medical student well-being.

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Conflicts of interest

There are no conflicts of interest.

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