

## AN INTERACTION BETWEEN CHRONIC PROSTATITIS AND SEXUAL BEHAVIOUR

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**Keywords:** sexual function, personality traits, sexual behaviour, chronic prostatitis.

### Summary

The aim of this study was to evaluate symptoms, sexual function, personality traits and peculiarities of sexual behaviour in men with chronic prostatitis.

The study included men aged 20-45 (n=81). Investigation group included 24 men with chronic prostatitis and the control group included 52 generally healthy men. The surveys, which were not filled in properly, were excluded from the statistical analysis (n=5). All the participants completed the survey describing socio-demographic factors, chronic prostatitis symptoms (NIH-CPSI), sexual function (BMSFI) and personality traits (B5PQ).

There have been found correlations between the influences of symptoms on everyday activities, sexual drive, overall satisfaction, problem assessment, neuroticism and the score of pain. Neuroticism trait differed between the investigation group (score -  $18.88 \pm 5.32$ ) and the control group (score -  $15.39 \pm 4.83$ ) ( $p=0.007$ ). Odds ratio for suffering from chronic prostatitis (95% CI) was 5.077 (1.634-15.772) ( $p=0.005$ ) of men having dominant neuroticism trait, 3.429 (1.176-9.994) ( $p=0.024$ ) of men having  $\leq 11$  problem assessment score and 3.200 (1.124-9.113) ( $p=0.029$ ) of men having overall satisfaction score. There masturbated 44.4% of men scoring  $\geq 3$  and 100.0% of men scoring for BMSFI overall satisfaction (in age group 35 to 44) ( $p=0.038$ ). In this age group 100.0% of investigation group and 36.4% of control group masturbated ( $p=0.017$ ).

There are correlations between the symptoms of chronic prostatitis, sexual function, personal traits and peculiarities of sexual behaviour. Neuroticism is dominant trait among chronic prostatitis patients. Neuroticism, worse problem assessment and low satisfaction indicate higher chances of having chronic prostatitis. Men, aged 35-44

years, complaining of low satisfaction or being already diagnosed with chronic prostatitis are more tend to masturbate.

### Introduction

Chronic prostatitis, in other words, chronic inflammation of the prostate gland, is associated with lower urinary tract symptoms, however there are complaints of sexual dysfunction too. It is a frequent ailment in young males. 15% of adult men are suffering from chronic prostatitis. One urologist checks approximately 317 patients being diseased with chronic prostatitis [1] in one of the biggest outpatient clinic in Lithuanian capital - Vilnius Karoliniskiu outpatient clinic [1].

Despite this, etiological factors and pathophysiological mechanisms of the chronic prostatitis are not completely clear. There are stated various hypothesis, including such as pelvic floor myalgia and pressure pain thresholds extends beyond the pelvis [2, 3]. The other factors and their significance in the etiopathogenesis of the chronic prostatitis are widely studied as well. The significance of the personality traits and one's psychological condition and its contribution toward the chronic prostate inflammation has been studied for a long time. In 1934, Menninger claimed that an interface between the personality traits and chronic prostatitis was worth a discussion [4].

Men having chronic prostatitis were described as ones who were suffering from „psychoneurosis” by Grean & Dean in 1954 [5]. In the sixties, Lewin hypothesized that psychological factors play significant role in the nature of the chronic prostatitis symptoms and, maybe, in its etiology too [6]. Meanwhile in 1972, Mellan et al. took one step further by introducing a new term - „prostate neurosis” [7]. Eleven years had passed and Jansen et al. came to a conclusion that majority of the patients having chronic prostatitis complaints, despite the urological findings, are plagued with „neurotic” disorders showing symptoms such as anxiety, depression,

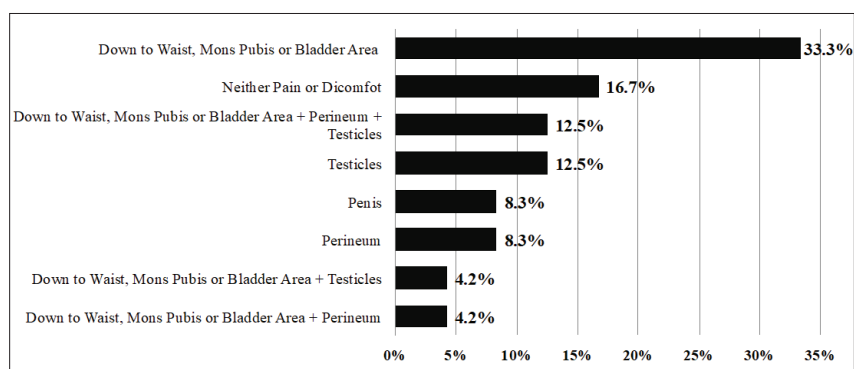
fear, and feelings of insecurity [8]. It was proved once again that the severity of psychic symptoms closely correlated with that of clinical ones in men suffering from the chronic prostatitis [9]. Also, it was published that the symptoms of the chronic prostatitis are closely related with psychosocial risk factors such as pain catastrophising, depression and anxiety [10]. In 2014, Koh et al. arrived at a conclusion that neuroticism, possibly, is the most important personality trait associated with treatments response and the severity of depression and somatization in patients with chronic prostatitis / chronic pelvic pain syndrome [11]. There are several recent studies that have focused on chronic prostatitis symptoms and psychoneurological aspects. However, there are still few publications which investigate sexual function and its peculiarities in order to find out the correlations with chronic prostatitis.

Up to now there are no Lithuanian publications on interaction between the chronic prostatitis and sexual function, personality traits and sexual behaviour. Because of the relevance and novelty of the topic, it was chosen as an objective of our study - to evaluate an interaction between symptoms, sexual function, personality traits and peculiarities of sexual behaviour among men diagnosed with chronic prostatitis.

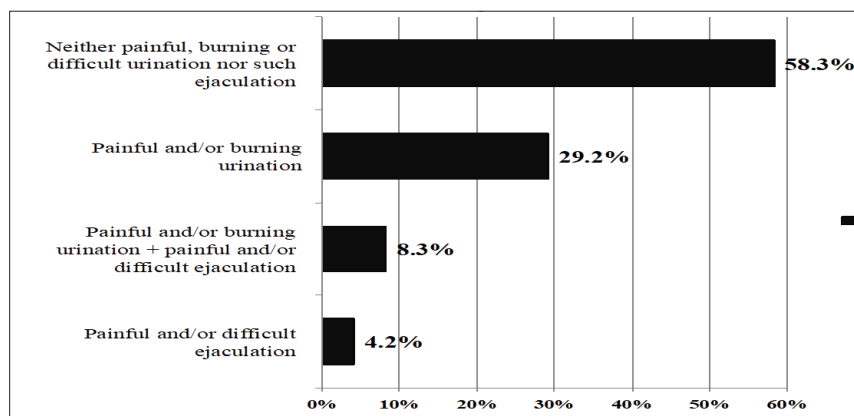
**The aim of this study** - to evaluate symptoms, sexual function, personality traits and peculiarities of sexual behaviour in men with chronic prostatitis.

### Materials and methods

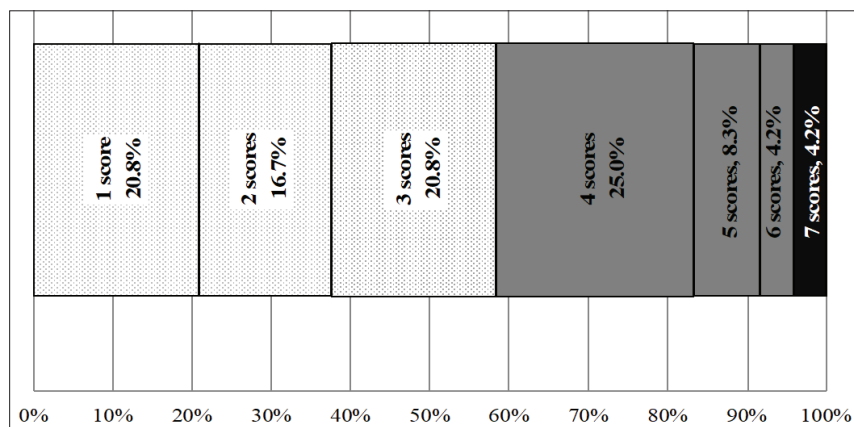
The study was conducted between 4th of June 2014 and 1st of January 2020. The research related to human use has been complied with all the relevant national regulations, institutional policies and in accordance the tenets of the Helsinki Declaration, and has been approved by the authors' institutional review board or equivalent committee.



**Figure 1.** The bar chart represents pain and/or discomfort localizations indicated by men with chronic prostatitis. The horizontal axis (X-axis) indicates percentage of respondents who complained of pain and/or discomfort in a particular area. In all cases  $p < 0.05$ .



**Figure 2.** The bar chart represents dysuria and painful ejaculation prevalence among men with chronic prostatitis. The horizontal axis (X-axis) indicates percentage of respondents who complained of painful, burning urination and/or painful, difficult ejaculation. In all cases  $p < 0.05$ .



**Figure 3.** The graph represents pain intensiveness among men with chronic prostatitis. There were used the 11 - point numeric rating scale (NRS) (0 score - no pain; 1, 2, 3 scores - minor pain; 4, 5, 6 scores - moderate pain; 7, 8, 9, 10 scores - severe pain). The horizontal axis (X-axis) indicates percentage of respondents who complained of a particular intensiveness pain. In all cases  $p < 0.05$ .

The ethical approval (No. BEC - MF - 506) was obtained on the 4th of September 2014 from The Centre for Bioethics at The Lithuanian University of Health Sciences.

The prospective cohort study was carried out on random group of male individuals (aged 20 - 45; mean age was  $32.4 \pm 9.8$  years) attending the Outpatient Clinic at The Hospital of Lithuanian University of Health Sciences Kauno Klinikos. Informed consent has been obtained from all individuals included in this study. The study included 81 participants. The investigation group (IG) ( $n = 24$ ) was composed of men diagnosed with chronic prostatitis and being taken care by an urologist. The control group (CG) ( $n = 52$ ) was composed of generally

healthy men who did not have chronic prostatitis symptoms, had never been diagnosed with this disease and were visiting general practitioner for an annual check-up.

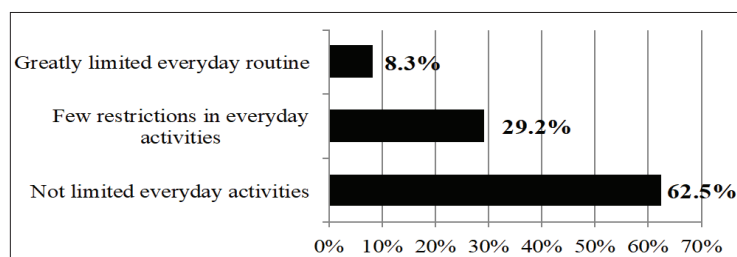
Both groups (IG and CG) were anonymously questioned using following surveys: the survey describing socio-demographic factors, NIH Chronic Prostatitis Symptom Index (NIH - CPSI) [1], Brief Male Sexual Function Inventory (BMSFI) [12] and Big 5 Personality Questionnaire (B5PQ) [13]. The surveys, which were not filled in properly, were excluded from the statistical analysis ( $n = 5$ ).

### Statistical analysis

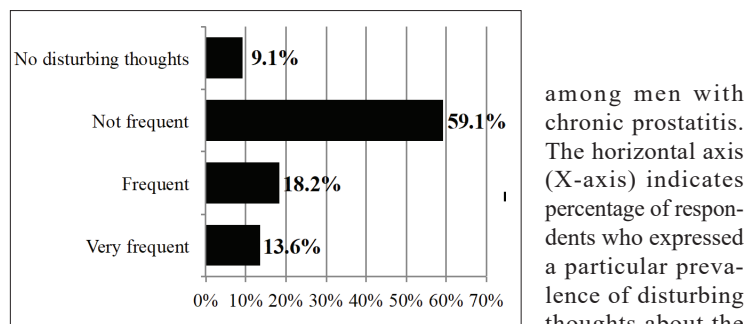
Statistical analysis was performed using Microsoft Office Excel spreadsheet and IBM SPSS (Statistical Package for the Social Science) Statistics 20.0 software package, a statistically significant result was attained when a p-value was less than 0.005. Sample size was calculated by performing power analysis using software package STATISTICA 6.0. We determined the sample sizes of IG ( $n_1 = 24$ ) and CG ( $n_2 = 49$ ) and error of the first kind  $\alpha = 0.05$ . According to these settings, we calculated the power of a test - it was more than 0.8. The difference between two groups (IG and CG) was calculated using Student's test and the Chi-square test. The relationship between the variables was calculated using Pearson's Correlation Coefficient and performing linear regression analysis.

### Results

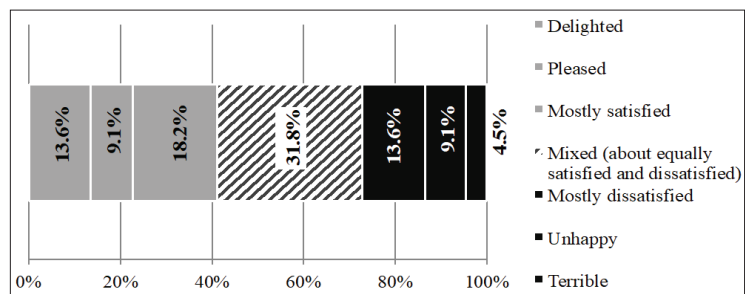
After performing a statistical analysis of the data collected from the NIH Chronic Prostatitis Symptom Index (NIH - CPSI) surveys, we evaluated the chronic prostatitis symptoms within the IG and the CG. Pain in a lower part of the loins, in the pubic area or in the bladder area occurred in 54.2% of the IG, testicular pain in 29.2% of the IG, perineal pain in 25.0% of the IG and pain in the penis occurred in 8.3% of the IG (in all cases  $p < 0.05$ ) (see Fig. 1). 29.2% of the IG reported pain during urination, 4.2% of the IG reported pain during ejaculation, 8.3% of the IG reported pain in both cases (during urination or ejaculation) and 58.3% of IG reported pain during neither urination nor ejaculation (in all cases  $p < 0.05$ ) (see Fig. 2). The pain intensiveness results



**Figure 4.** The bar chart represents influence of chronic prostatitis symptoms on everyday activities. The horizontal axis (X-axis) indicates percentage of respondents who expressed a particular significance level of influence of the symptoms on their everyday routine. In all cases  $p < 0.05$ .



**Figure 5.** The bar chart represents prevalence of disturbing thoughts about chronic prostatitis symptoms among men with chronic prostatitis. The horizontal axis (X-axis) indicates percentage of respondents who expressed a particular prevalence of disturbing thoughts about the symptoms. In all cases  $p < 0.05$ .



**Figure 6.** The graph represents life quality with current chronic prostatitis symptoms. The horizontal axis (X-axis) indicates percentage of respondents who expressed a particular life quality living with the current symptoms. In all cases  $p < 0.05$ .

were reported as follows (there were used the 11 - point numeric rating scale (NRS)): 58.3% of the IG reported minor (1 - 3), 37.5% - moderate (4 - 6) and 4.2% - severe (7 - 10) pain (in all cases  $p < 0.05$ ) (see Fig. 3).

The chronic prostatitis symptoms did not limit everyday activities for 62.5% of the IG, there were few restrictions in everyday activities for 29.2% of the IG and 8.3% of the IG complained of greatly limited everyday routine (in all cases  $p < 0.05$ ) (see Fig. 4). The prevalence of the disturbing thoughts about the chronic prostatitis symptoms was following: 13.6% very frequent, 18.2% frequent, and 59.1% not frequent, 9.1% of the IG had no disturbing thoughts (in all cases  $p < 0.05$ ) (see Fig. 5).

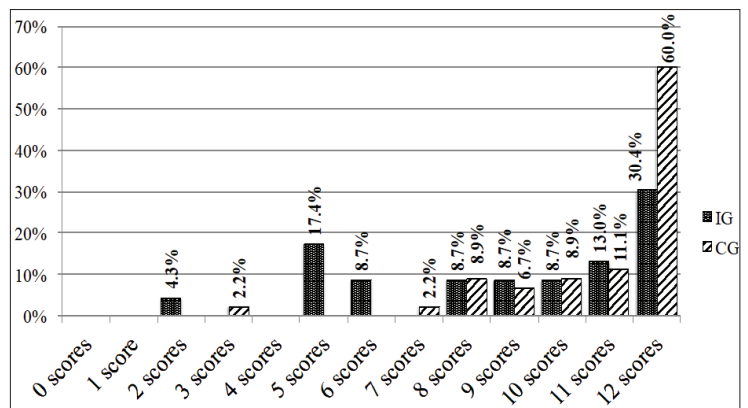
If current chronic prostatitis symptoms had persisted for a lifetime, the quality of life would have been appreciated in a positive way by 40.9% of the IG, would have been determined as mid-dling by 31.8% of the IG and would have been determined as negative quality of life by 27.2% of the IG (in all cases  $p < 0.05$ ) (see Fig. 6).

For the evaluation of the sexual function within the IG, we performed a statistical analysis of the data collected from the Brief Male Sexual Function Inventory (BMSFI) surveys. It was obtained that the results of three functional domains - sexual drive, erection and ejaculation - did not differ significantly between groups (the IG and the CG) ( $p > 0.05$ ), however, self - assessing the sexual function related problem 30.4% of the IG and 60.0% of the CG scored 12 (no problem) scores in the BMSFI problem assessment domain ( $p = 0.019$ ) (see Fig. 7).

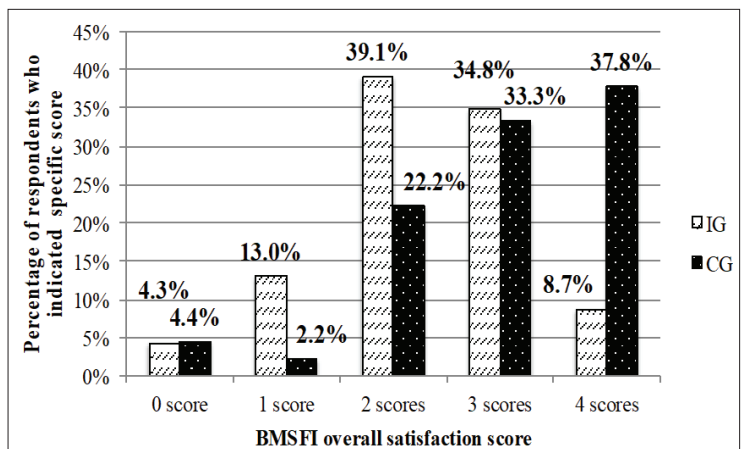
The BMSFI overall satisfaction domain scores within both groups: 0 scores (very unsatisfied) - 4.3% (the IG) and 4.4% (the CG), 1 score - 13.0% (the IG) and 22.2% (the CG), 2 scores - 39.1% (the IG) and 33.3% (the CG), 3 scores - 34.8% (the IG) and 37.8% (the CG), 4 scores - (very satisfied) 8.7% (the IG) and 37.8% (the CG) ( $p = 0.042$ ) (see Fig. 8). In the BMSFI, a cut off value defining problem assessment was 11 (sensitivity - 69.6%, specificity 60.0%, the area under the ROC curve - 69.3%) (Figure 9); 69.6% of the IG respondents and 40.0% of the CG respondents scored  $\leq 11$  scores ( $p = 0.021$ ). In the BMSFI, a cut off value defining overall satisfaction was 3 (sensitivity - 56.5%, specificity - 71.1%, the arear under the

ROC curve - 69.3%) (see Fig. 9); 30.8% of the IG respondents and 69.2% of the CG respondents scored  $\geq 3$  scores ( $p = 0.021$ ).

After performing a statistical analysis of the data collected from the Fig. 5 Personality Questionnaire (B5PQ)), we got that neuroticism trait differs significantly between the IG and the CG, other personality traits did not significantly differed between the two groups ( $p > 0.05$ ). The neuroticism trait score was ( $18.88 \pm 5.32$ ) in the IG and ( $15.39 \pm 4.83$ ) in the CG ( $p = 0.007$ ) (see Fig. 10). In the B5PQ, a cut off value defining neuroticism trait was 20 (sensitivity - 45.8%, specificity 85.7%, the area under the ROC curve - 68.0%) (see Fig. 11); 45.8%



**Figure 7.** The bar chart represents prevalence of distinct BMSFI Problem Assessment scores among investigation group (IG) and control group (CG). The horizontal axis (X-axis) indicates BMSFI Problem Assessment scores (12 scores - no problem) and the vertical axis (Y-axis) indicates percentage of respondents who indicated a particular BMSFI Problem Assessment score,  $p = 0.019$ .

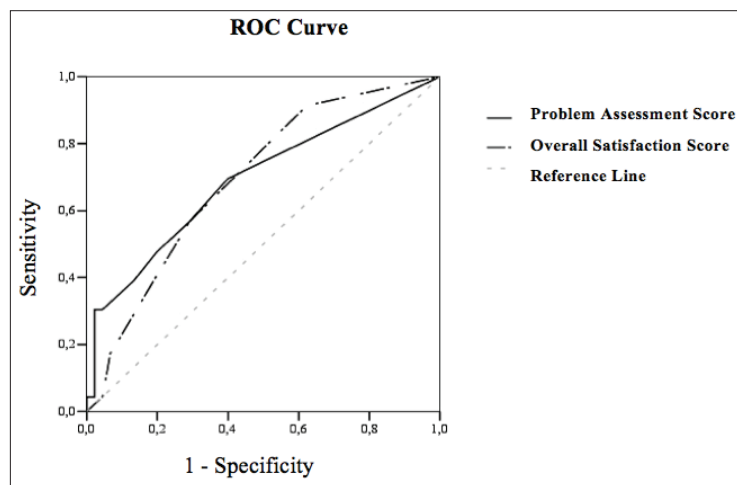


**Figure 8.** The bar chart represents prevalence of distinct BMSFI Overall Satisfaction scores among investigation group (IG) and control group (CG). The horizontal axis (X-axis) indicates BMSFI Overall Satisfaction scores (4 scores - very satisfied, 0 scores - very dissatisfied) and the vertical axis (Y-axis) indicates percentage of respondents who indicated a particular BMSFI Overall Satisfaction score,  $p = 0.042$ .

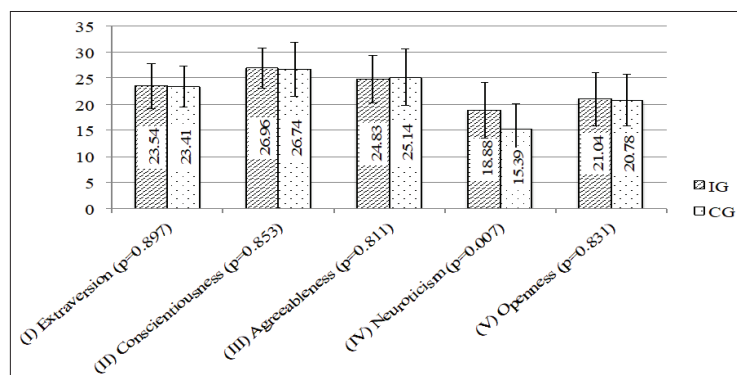


of the IG respondents and 14.3% of the CG respondents scored  $\geq 20$  scores ( $p = 0.003$ ).

Statistically significant correlations were found. There is a negative correlation between an influence of chronic prostatitis symptoms on everyday activities and: the BMSFI sexual drive score ( $r = -0.265$ ,  $p = 0.029$ ) (see Fig. 12), the BMSFI overall satisfaction score ( $r = -0.251$ ,  $p = 0.039$ ) (see Fig. 13), the BMSFI problem assessment score ( $r = -0.241$ ,  $p = 0.048$ ) (see Fig. 14). There is a negative correlation between the BMSFI overall satisfaction score and the B5PQ neuroticism trait score ( $r = -0.273$ ,  $p = 0.025$ ) (see Fig. 15). Also, there is a negative correlation between the prevalence of disturbing thoughts about chronic



**Figure 9.** In the BMSFI a cut off value defining Problem Assessment was 11 (sensitivity - 69.6%, specificity 60.0%, the area under the ROC curve - 69.3%); 69.6% of the investigation group (IG) respondents and 40.0% of the control group (CG) respondents scored  $\leq 11$  ( $p = 0.021$ ). In the BMSFI a cut off value defining Overall Satisfaction was 3 (sensitivity - 56.5%, specificity - 71.1%, the area under the ROC curve - 69.3%); 43.5% of the IG respondents and 71.1% of the CG respondents scored  $\geq 3$  ( $p = 0.021$ ).



**Figure 10.** Neuroticism trait (NT) (B5PQ) differed significantly between the IG and the CG, the NT score was  $18.88 \pm 5.32$  in the IG and  $15.39 \pm 4.83$  in the CG ( $p = 0.007$ ). The vertical axis (Y-axis) indicates means of scores of particular traits within each group respondents.

prostatitis symptoms and: the BMSFI problem assessment score ( $r = -0.290$ ,  $p = 0.018$ ) (see Fig. 16), the BMSFI overall satisfaction score ( $r = -0.305$ ,  $p = 0.013$ ) (see Fig. 17). There is a positive correlation between the B5PQ neuroticism trait score and the NIH-CPSI pain severity score ( $r = 0.263$ ,  $p = 0.026$ ) (see Fig. 18).

Odds ratios were found. Odds ratios for suffering from chronic prostatitis (95% CI) was: 5.077 (1.634 - 15.772) ( $p = 0.005$ ) of men having dominant neuroticism trait, 3.429 (1.176 - 9.994) ( $p = 0.024$ ) of men having the BMSFI problem assessment score  $\leq 11$ , 3.200 (1.124 - 9.113) ( $p = 0.029$ ) of men having the BMSFI overall satisfaction score  $< 3$ .

Evaluating the peculiarities of sexual behaviour among the groups, there was found a statistically significant difference between the IG and the CG in the prevalence of masturbation. In age group 35 to 44, 44.4% of men who scored  $\geq 3$  scores for the BMSFI overall satisfaction masturbated, while the percentage of those who scored  $< 3$  scores and masturbated counted for 100.0% ( $p = 0.038$ ). In this age group even 100.0% of the IG masturbated and only 36.4% of those who were included in the CG ( $p = 0.017$ ) see Fig. 19).

## Discussion

Pain in a lower part of the loins, in the pubic area or in the bladder area was the most prevalent pain symptom. If several pain localizations appeared, they have always been in combination with pain localized in a lower part of the loins, in the pubic area or in the bladder area. Men suffering from chronic prostatitis were usually presented with minor pain. More than half of men being diagnosed with chronic prostatitis had no complaints about voiding and / or ejaculation and chronic prostatitis symptoms did not restrict everyday activities. Despite of this, the chronic prostatitis symptoms significantly deteriorated life quality for nearly one third of the patients. Unbiased rates of sexual function had no statistically significant differences between the IG and the CG, however, those who were present with chronic prostatitis, self-assessed their sexual function worse, their sex life satisfaction was lower.

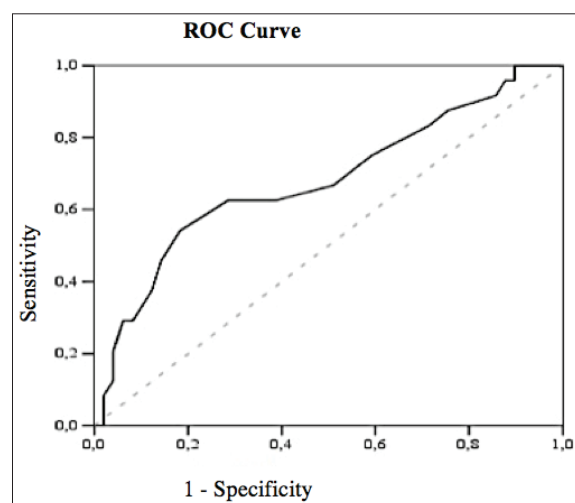
The bigger an impact of chronic prostatitis symptoms on everyday life was made, the lower sex drive, the lower overall satisfaction in sex

life and the worse self - assessment on sexual function appeared. The higher prevalence of thoughts about chronic prostatitis symptoms appeared, the more issues related to sexual function were catastrophized and the lower overall satisfaction in sex life appeared. The catastrophizing was emphasized in the other publications about chronic prostatitis as well [10].

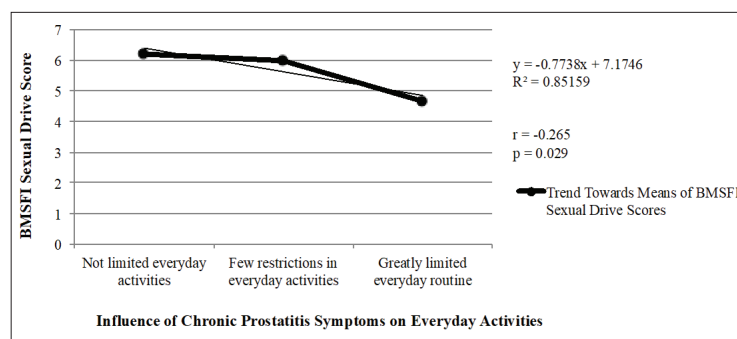
The neuroticism trait was more highly expressed among men suffering from chronic prostatitis than among generally healthy males, the other personality traits did not differ significantly. The neuroticism trait - is one of the five dimensions, characterized by anxiety, fear, moodiness, worry, envy, frustration, jealousy, and loneliness [8, 14]. Individuals who score high on neuroticism are more likely than the average to experience depressed mood [15]. They respond more poorly to stressors, are more likely to interpret ordinary situations as threatening, and minor frustrations as hopelessly difficult [16]. The relation between the neuroticism dimension and the chronic prostatitis symptoms, which was found in our study, was mentioned in the other recent studies. Our study's results have agreed with the results of the other authors. [8, 11]. In our study it was obvious that the bigger the score of the neuroticism trait has been presented, the lower sex life satisfaction has been obtained and the intensifier pain has occurred. The other authors, also, emphasized the importance of the lower pain threshold in the etiopathogenesis of the chronic prostatitis [3]. The neuroticism, low self - assessment of sexual function and low overall sex life satisfaction increase the odds ratio for suffering from the chronic prostatitis. More frequent masturbation occurs among men aged 35 - 44 years and showing low overall sex life satisfaction and / or having chronic prostatitis. There are very little scientific publications researching an interaction between the masturbation and the chronic prostatitis. There is a need to implicate a bigger sample size in order to obtain more statistically significant results.

## Conclusions

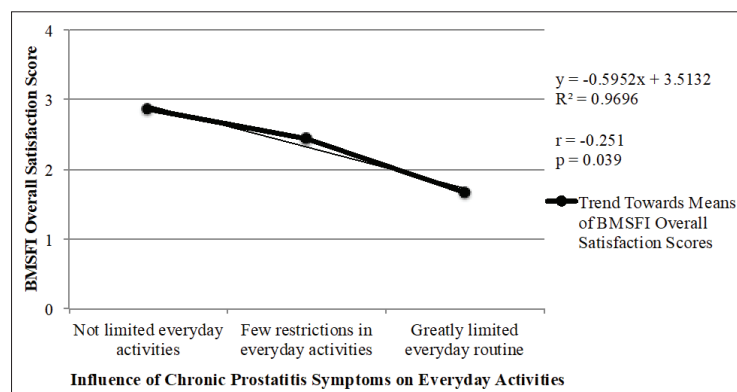
It has been found an interaction between symptoms, sexual function, personality traits and peculiarities of sexual behaviour among men diagnosed with chronic prostatitis. The neuroticism trait is dominant among men suffering from the



**Figure 11.** ROC analysis: a cut off value defining B5PQ Neuroticism Trait - 20 scores (sensitivity - 45.8%, specificity 85.7%, the area under the ROC curve - 68.0%),  $p = 0.003$ .



**Figure 12.** There is a negative correlation between an influence of chronic prostatitis symptoms on everyday activities and the BMSFI sexual drive score ( $r = -0.265$ ,  $p = 0.029$ ).

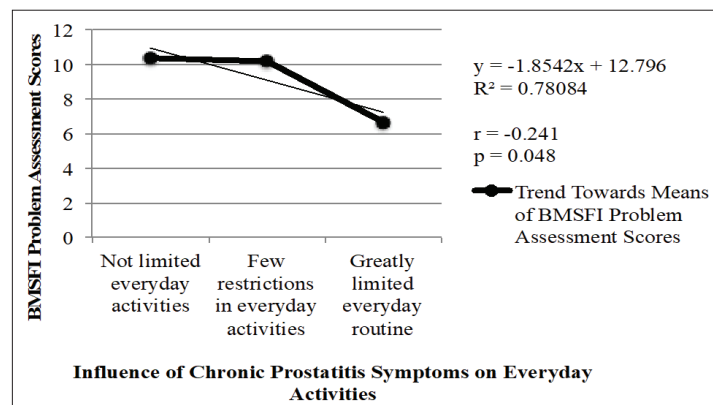


**Figure 13.** There is a negative correlation between an influence of chronic prostatitis symptoms on everyday activities and the BMSFI overall satisfaction score ( $r = -0.251$ ,  $p = 0.039$ ).

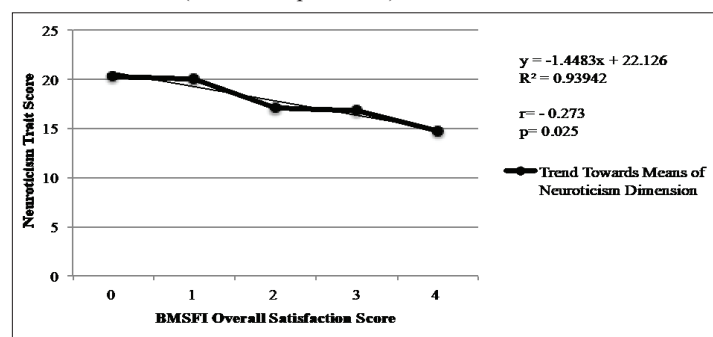
chronic prostatitis. The neuroticism, low sexual function score and low overall sex life satisfaction are increasing chances to be diagnosed with chronic prostatitis. Men aged 35 - 44 years and having

low overall sex life satisfaction or having chronic prostatitis tend to masturbate more often.

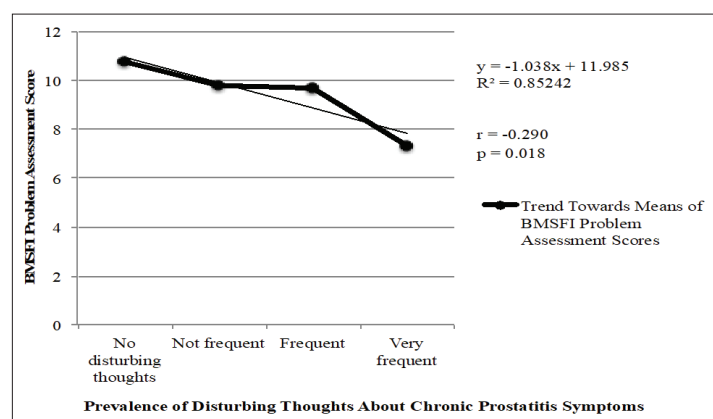
**Conflicts of interest statement:** Authors state no conflict of interest.



**Figure 14.** There is a negative correlation between an influence of chronic prostatitis symptoms on everyday activities and the BMSFI problem assessment score ( $r = -0.241$ ,  $p = 0.048$ ).



**Figure 15.** There is a negative correlation between the BMSFI overall satisfaction score and the B5PQ neuroticism trait score ( $r = -0.273$ ,  $p = 0.025$ ).



**Figure 16.** There is a negative correlation between the prevalence of disturbing thoughts about chronic prostatitis symptoms and the BMSFI problem assessment score ( $r = -0.290$ ,  $p = 0.018$ ).

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### LĖTINIO PROSTATITO IR SEKSUALINIO ELGESIO SĄVEIKA

G. Pečiulytė, G. Jonušienė, L. Žemaitis, D. Skaudickas

Raktažodžiai: seksualinė funkcija, asmenybės bruožai, seksualinis elgesys, lėtinis prostatitas.

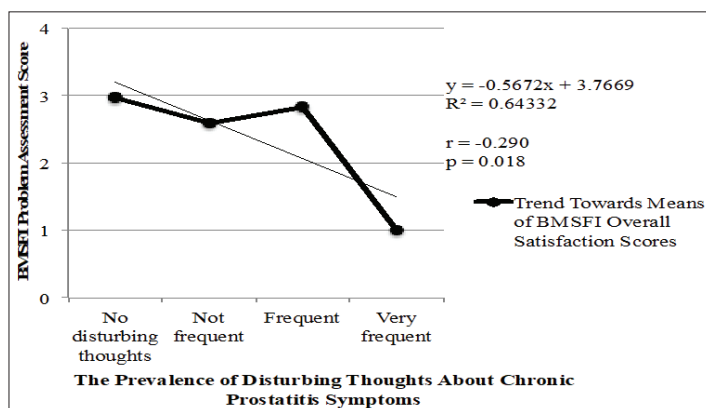
Santrauka

Darbo tikslas – įvertinti lėtinio prostatito simptomatikos, seksualinės funkcijos, asmenybės bruožų ir seksualinio elgesio ypatumų sąsajas.

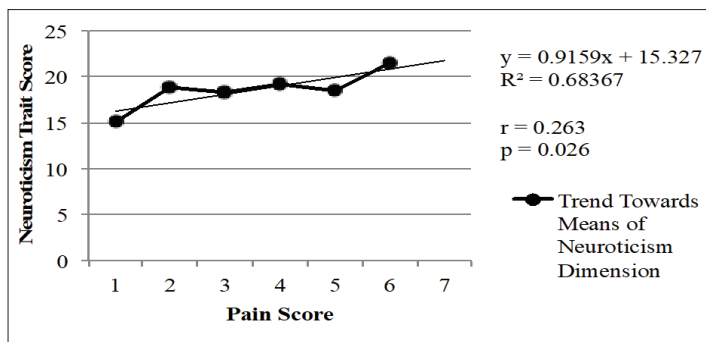
Tyrimo dalyvavo vyrai ( $n=81$ ) nuo 20 iki 45 metų. Tiriamojame grupėje 24 vyrai, kuriems nustatyta lėtinio prostatito diagnozė. Kontrolinėje grupėje – 52 sveiki vyrai. Į statistinę analizę neįtraukti 5 dalyvavusieji ( $n=5$ ), netinkamai užpildę klausimynus. Tyrimui naudoti klausimynai, skirti įvertinti socialinius-demografinius veiksnius, lėtinio prostatito simptomus (NIH-CPSI), seksualinę funkciją (BMSFI) ir asmenybės bruožus (B5PQ).

Nustatėme koreliacijas tarp lėtinio prostatito simptomų įtakos kasdieniui veiklai, lytinio potraukio, bendro pasitenkinimo lytiniu gyvenimu, problemos įverčio, minčių apie simptomus dažnio, neuroziškumo dimensijos ir skausmo balo. Neuroziškumo dimensijos įvertis skyrėsi tarp tiriamosios ( $18,88 \pm 5,32$ ) ir kontrolinės grupių ( $15,39 \pm 4,83$ ) ( $p=0,007$ ). Dominuojanti neuroziškumo dimensija lėtinio prostatito rizikos šansų santykį didino 5,077 (95 proc. PI 1,634-15,772),  $p=0,005$ . BMSFI, esant problemos įverčiui  $\leq 11$  balų, lėtinio prostatito rizikos šansų santykis padidėjo 3,429 (95 proc. PI 1,176-9,994),  $p=0,024$ , o esant bendram pasitenkinimui lytiniu gyvenimu  $<3$  balai, lėtinio prostatito rizikos šansų santykis padidėjo 3,200 (95 proc. PI 1,124-9,113),  $p=0,029$ . 35-44 metų vyrų amžiaus grupėje masturbavosi 100% tiriamosios ir 36,4% kontrolinės grupės ( $p=0,017$ ) tiriamųjų.

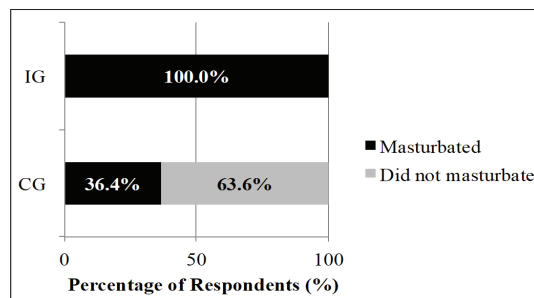
Nustatytos sąsajos tarp lėtinio prostatito simptomatikos, seksualinės funkcijos, asmenybės bruožų bei seksualinio elgesio ypatumų. Neuroziškumo dimensija yra dominuojanti tarp sergančiųjų lėtiniu prostatitu. Neuroziškumas, blogas seksualinės funkcijos įsivertinimas ir žemas ben-



**Figure 17.** There is a negative correlation between the prevalence of disturbing thoughts about chronic prostatitis symptoms and the BMSFI overall satisfaction score ( $r = -0.305$ ,  $p = 0.013$ ).



**Figure 18.** There is a positive correlation between the B5PQ neuroticism trait score and the NIH-CPSI pain severity score ( $r = 0.263$ ,  $p = 0.026$ ).



**Figure 19.** In age group 35 to 44 even 100.0% of IG masturbated and only 36.4% of those who were included in CG ( $p = 0.017$ ).

dras pasitenkinimas lytiniu gyvenimu didina šansą sirgti lėtiniu prostatitu. 35-44 metų vyrai, turintys žemą bendrą pasitenkinimą lytiniu gyvenimu ar sergantys lėtiniu prostatitu, labiau linkę masturbuotis.

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