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Work ability impairment in patients with temporomandibular dysfunction

Умањена радна способност болесника са темпоромандибуларном дисфункцијом

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Work ability impairment in patients with temporomandibular dysfunction

Умањена радна способност болесника са темпоромандибуларном дисфункцијом

SUMMARY

Introduction/Objective Temporomandibular dysfunction (TMD) is followed by oro-facial (OF) pain and psychological problems which influence patients' quality of life and working ability. Hypothesis: Working ability is affected by psychosocial status changes following temporomandibular dysfunction. The aim of this prospective study was to evaluate the impairment of working ability in patients with temporomandibular dysfunction.

Methods Forty-four patients with TMD were admitted to the Clinic for Prosthodontics, School of Dental medicine, University of Belgrade. Patients were treated with medication therapy ibuprofen, or ibuprofen and diazepam or with stabilizing maxillary occlusal splint. Clinical and functional assessment were based on diagnostic protocol Research Diagnostic Criteria for TMD. The study protocol was composed of data on clinical signs, pain scale numerical and VAS, and working ability related questionnaire (Symptoms Check List, SCL-90R). The statistical software package SPSS for Windows (18.0) was used for data processing. Univariate regression analysis was used to examine the relationship of each factor individually, multivariate regression analysis was used to examine the factors of difference. **Results** Statistically significant difference was not recorded in working ability, social life and daily activities in patients regardless of the chosen therapeutic approach. There is statistically significant difference in work ability between respondents in relation to psychosocial status p = 0.002*. Univariate regression analysis showed significant values assessing work ability, social life, and daily activities (0.010*, 0.001*, 0.029*) respectfully. In multivariant regression analysis assessment of social life was significant p=0.028*.

Conclusion Working ability is influenced by temporomandibular dysfunction proportionally to the level of psychosocial status.

Keywords: temporomandibular dysfunction; oro-facial pain; working ability

САЖЕТАК

Увод/Циљ Темпоромандибуларну дисфункцију (ТМД) прати орофацијални бол као и психолошки проблеми који утичу на квалитет живота и радну способност болесника.

Хипотеза: На радну способност утичу промене психосоцијалног статуса током темпоромандибуларне дисфункције. Циљ ове проспективне студије био је да се процени смањење радне способности код болесника са темпоромандибуларном дисфункцијом.

Методе Четрдесет четири болесника са ТМД примљена су на Клинику за протетику Стоматолошког факултета Универзитета у Београду. Болесници су лечени медикаментозном терапијом ибупрофеном, или ибупрофеном и диазепамом, или стабилизујућим максиларном оклузалном сплинтом. Клиничка и функционална процена засноване су на дијагностичком протоколу Истраживачки дијагностички критеријуми за ТМД. Протокол студије састојао се од података о клиничким знацима, нумеричке и скале бола *VAS*, и упитника везаног за радну способност (*Symptoms Check List, SCL*-90*R*). За обраду података коришћен је статистички софтверски пакет *SPSS for Windows* (18.0). Униваријантна регресиона анализа коришћена је за испитивање односа сваког фактора појединачно, а мултиваријантна регресиона анализа коришћена је за испитивање фактора разлике.

Резултати Није забележена статистички значајна разлика када је у питању радна способност, друштвени живот и свакодневне активности код болесника без обзира на изабрани терапијски приступ. Постоји статистички значајна разлика у радној способности између испитаника у односу на психосоцијални статус $p = 0{,}002$*. Униваријантна регресиона анализа показала је статистичку значајност код процене радне способности, друштвеног живота и свакодневних активности (0,010*, 0,001*, 0,029*) респективно. У мултиваријантној регресионој анализи процена друштвеног живота била је значајна $p = 0{,}028$*.

Закључак Темпоромандибуларна дисфункција утиче на радну способност пропорционално нивоу измене психосоцијалног статуса.

Кључне речи: темпоромандибулатна дисфункција; оро-фацијални бол; радна способност

INTRODUCTION

Temporomandibular dysfunction (TMD) is often followed by orofacial pain, dysfunction of masticatory muscles and temporomandibular (TM) joints. All these symptoms affect the quality

of life of patients. This unpleasant sensory experience, can affect daily activity, sleep and social activities but one of the most significant aspects is the reduction of work ability [1, 2, 3]. According to some authors, working ability is described as the ability to perform daily tasks, focus on solving problems and performing work duties [1, 2, 3]. The symptoms of temporomandibular dysfunctions, as well as the accompanying sensations related to them, prevent the efficiency of performing daily activities, which reduces the individual's ability to be productive [4, 5, 6].

Hypothesis: Working ability is affected by psychosocial status changes following temporomandibular dysfunction.

The aim of this prospective study was to evaluate the impairment of working ability in patients with temporomandibular dysfunction.

METHODS

At the Clinic for Prosthodontics, School of Dental medicine in Belgrade, 44 patients age range 25–65 years, who showed painful temporomandibular dysfunction symptoms, were admitted as part of the study group. The clinical examination determined that the candidates met the inclusion criteria for the study: 1. Subjects with intact teeth, 2. Subjects not surgically or orthodontically treated, 3. Subjects that were not under medication therapy, 4. Presence of painful symptoms in the region of the face and jaws.

Exclusion criteria were: 1. Patients with the pain of other origin: odontogenic, neurogenic, vascular, inflammatory or related to tumor changes in the surrounding structures (ear, throat, eye, nose, sinuses), 2. Patients who had some other chronic disease that impairs the general health condition and gives a false image of temporomandibular dysfunctions, 3. patients younger than 25 and older than 65 years, 4. patients who did not consent to participate in the study.

A detailed clinical examination of the orofacial system was performed in all subjects in order to determine the presence of symptoms and signs of temporomandibular dysfunction. Patients with symptoms and signs of temporomandibular dysfunction were included in the study. All subjects were healthy and thoroughly informed about the research protocol. Clinical examination and functional analysis of the oro-facial system were based on the diagnostic protocol Research Diagnostic Criteria for TMD RDC/TMD appendix 1, one or more symptoms of muscle and/or joint painful dysfunction were recorded: 1. pain in the preauricular region, 2. pain or sensitivity when palpating the masticatory muscles, 3. limited and/or painful movements of the lower jaw, 4. deflection of the lower jaw during mouth opening and 5. presence of sound phenomena when opening the mouth. The study protocol was composed of a combination of data

on clinical signs, a pain scale numerical and VAS, and a working ability related questionnaire (Symptoms Check List, SCL-90R) appendix 2.

In the list of Axis II tests related to pain and the psychosocial status of the subjects, data were obtained based on the answers to the questions offered in the RDC/TMD protocol. In response to these questions, the respondent was asked to choose a value on the offered numerical scale from 0 to 10. Pain intensity was expressed by values 0–100, which were calculated by multiplying the mean value obtained from the answers to questions 7, 8 and 9 by 10. The answer to question number 10, which referred to the time interval (number of days) of the respondent's absence from school or work, was also scored. 0–6 days 0 points, 7–14 days 1 point, 15–30 days 2 points, 31 and more days 3 points. Changes in social contact and work ability were expressed in values 0–100 and were the result of answers to questions 11, 12, 13. The respondent chose the value on the offered numerical scale 0–10.

Mean value (daily activities, social activities and work activities) x 10, 0-29 equal 0 points, 30–49 equal 1 point, 50–69 equal 2 points, 70 and more equal 3 points. After the evaluation and summing up of the results, the patients were classified into 4 categories: 0 - temporomandibular dysfunction had no impact on social contacts or work ability in the last 6 months. I – slightly altered social contacts and work ability. II – moderately altered social contacts and work ability. III – greatly altered social contacts with moderate work incapacity. IV – greatly altered social contacts with significant work incapacity.

During the study, patients were treated in three therapeutic groups, with three therapy modalities in order to reduce the symptoms of painful temporomandibular dysfunction. Medication therapy with Ibuprofen, a combination of ibuprofen and diazepam (Brufen®, Galenika-Abbott, Belgrade, Serbia, Bensedin®, Galenika-Abbott, Belgrade, Serbia,). Administrated: Ibuprofen (400 mg, 2 times a day) and Diazepam (5mg, one hour before bedtime), or just Ibuprofen (400 mg, 2 times a day). Stabilizing occlusal splint, Maxillary stabilizing splint was made according to the following rules: the splint provided simultaneous contacts of the supporting cusps of the lower lateral teeth with the flat surface of the splint in the position of the central relation of the lower jaw. The splint is made of three-layer thermoplastic ERCOLOC-PRO film with a thickness of 3 mm. The therapy was administered over the course of a month, and the controls were once a week.

The statistical software package SPSS for Windows (18.0) was used for data processing. At the beginning of the research, all variables were described using classic descriptive methods. Attributive features are described by absolute and relative numbers, and numerical measures of

central tendency (arithmetic mean and median) and variability measures (standard deviation, minimum and maximum value), as well as 95% confidence interval. The significance value was set at $p < 0.05$.

Univariate regression analysis was used to examine the relationship of each factor individually in relation to the VAS scale results after the therapy. Factors that prove to be statistically significant in the univariate model were processed by multivariate analysis. Multivariate regression analysis was used to examine the factors of difference in order to distinguish outcomes in order to evaluate the effectiveness of the therapy.

Ethics: This study was approved by the Ethics Committee of the Belgrade University School of Dental Medicine (decision number: 36/6).

RESULTS

Psychosocial parameters according to therapeutic groups are presented in Table 1.

Statistically significant difference was not recorded in working ability, social life and daily activities in patients regardless of the chosen therapeutic approach (Table 2)

Working ability, social life and daily activity of the patients in relation to different therapy modalities effects are presented in Figures 1, 2, and 3.

Work ability and psychosocial status data are presented in Table 3.

There is a statistically significant difference in work ability between respondents in relation to psychosocial status (Table 4)

Working ability in relation to psychosocial status is presented in Figure 4.

Values of working ability were lower in respondents with altered psychosocial status.

In the assessment of pain on the VAS scale, a univariate regression analysis showed significant values for work ability, social life, and daily activities (Table 5). The assessment of social life was significant as a meritoric indicator (predictor) of post-therapy pain intensity by multivariate analysis. In all subjects with TMD, regardless of the after-therapy improvement, the impact of pain on their social life is significant.

DISCUSSION

In temporomandibular dysfunction, oro-facial pain is frequently present and therefore, changes in the psychosocial status of patients. All this is reflected in changes in the behavior of patients as well as in the reduction of working ability [7, 8]. In this study, we wanted to evaluate, whether

there is a decrease in working ability in patients with temporomandibular dysfunction, in relation to the applied modality of therapy, as well as in relation to psychosocial factors. When assessing the psychosocial parameters (work ability, social life, and daily activity) based on therapy modality, no statistically significant difference was noted, meaning that different therapy modality selection did not affect the psychosocial parameters (Tables 1 and 2). When the working ability was assessed based on the psychosocial status it significantly differed depending on the level of psychosocial changes experienced by the patient. This suggests that the patients with psychosocial challenges due to the TMD had lower working ability (Tables 3 and 4). Univariate regression analysis was used to examine each factor individually in relation to the post therapy effects, assessment of work ability, social life, and daily activities showed significant values based on the VAS scale (0.010*, 0.001*, 0.029*) respectively. Factors statistically significant in the univariate model processed by multivariate analysis showed that social life was significant parameter of post-therapy effect (p = 0.028*).

Similarly, other authors suggested that the psychological factors especially the work stress may influence on the development of TMD [2, 3, 5]. Psychological factors were followed with the severity of the TMD symptoms. On the other hand, level of severity of TMD may influence psychological status of the patients. This influences not only work ability, but social life and daily activity, of a patient, which diminishes quality of life [9–12].

CONCLUSION

Working ability is influenced by temporomandibular disfunction proportionally to the level of psychosocial status.

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Conflict of interest: None declared.

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Apendix 1.

DIAGNOSTIC PROTOCOL RDC/TMD, Dworkin & LeResche (1992)

INSTITUTION.....PATIENT NO.....

NAME AND SURNAME..... GEN-

DER..... YEAR OF BIRTH..... OCCUPA-

TION..... TEL.....

Read each question carefully and circle only one answer:

1. How would you rate your general state of health: excellent, very good, good, satisfactory or bad?

excellent.....1

very good.....2

good.....3

satisfactory.....4

bad.....5

2. How would you rate the condition of your oral cavity: excellent, very good, good, satisfactory or bad?

excellent.....1

very good.....2

good.....3

satisfactory.....4

bad.....5

3. In the last 6 months, have you felt pain in the area of the face, jaw, temple, in front of the ear or in the ear itself? (Axis II)

No.....0

Yes.....1

(if you have not felt pain in the last 6 months, go to question no. 14)

4a. How many years ago did you first feel such pain? (Axis II)

..... year

(if the pain occurred for the first time in less than a year, skip the question and answer the following)

4b. How many months ago did you feel that pain for the first time? (Axis II)

.....months

5. Is the pain constant, occasional, or does the pain appear only once? (Axis II) Constant.....1

Occasional.....2

Only once 3

6. Have you ever sought medical help for this?

No.....1

Yes, in the past 6 months.....2

Yes, more than 6 months ago.....3

7. How would you rate your current pain on a scale of 0-10, where the value 0 corresponds to a state without pain and the value 10 to a state of unbearable pain? (Axis II)

(no pain) (excruciating pain)

0 1 2 3 4 5 6 7 8 9 10

8. In the last 6 months, on a scale of 0-10, what was your worst pain? (Axis II)

(no pain) (excruciating pain)

0 1 2 3 4 5 6 7 8 9 10

9. In the past 6 months, what is the average value of pain experienced on a scale of 0-10? (Axis II)

(no pain) (excruciating pain)

0 1 2 3 4 5 6 7 8 9 10

10. In the last 6 months, how many days did you miss work or school because of pain in the face?

.....days

11. In the past 6 months, how much did pain interfere with your daily activities, expressed on a scale of 0-10?

(no interference) (impossibility to perform activities)

0 1 2 3 4 5 6 7 8 9 10

12. In the last 6 months, how much have your opportunities to participate in social and family life changed due to pain, expressed on a scale of 0-10?

(no changes) (major changes)

0 1 2 3 4 5 6 7 8 9 10

13. How much did the presence of pain affect your ability to work in the last 6 months (including household chores), expressed on a scale of 0-10?

(no changes) (major changes)

0 1 2 3 4 5 6 7 8 9 10

14a. Has it ever happened to you that you can't open your mouth all the way, ie. have you had the feeling that your jaw was "locked" in some position?

No.....0

Yes.....1

b. Was the limitation of mouth opening so pronounced that it prevented you from eating?

No.....0

Yes.....1

15a. Do you hear a popping sound when you open or close your mouth or when you yawn?

No.....0

Yes.....1

b. Do you hear a grinding noise when opening, closing or yawning?

No.....0

Yes.....1

c. Have you been told or noticed that you grind your teeth or clench your jaw during sleep?

No.....0

Yes.....1

d. Do you grind your teeth or clench your jaw during the day?

No.....0

Yes.....1

e. Do you feel pain or have a feeling of stiffness in your jaw in the morning after waking up?

No.....0

Yes.....1

f. Do you have "ringing" or any noises in your ears?

No.....0
Yes.....1

Mr. Have you noticed a change in your bite when you bite down on your back teeth?

No.....0
Yes.....1

16a. Have you had any other joint diseases (rheumatoid arthritis, lupus)?

No.....0
Yes.....1

b. Has anyone in your family had similar joint diseases?

No.....0
Yes.....1

c. Have you had or do you have swelling and pain in the area of the jaw joints?

No.....0
Yes.....1

d. Does the pain you feel in the area of the jaw joints last longer than a year?

No.....0
Yes.....1

17. a. Have you recently had an injury in the area of the face and jaws?

No.....0
Yes.....1

b. Did you have pain before the injury?

No.....0
Yes.....1

18. Have you had a headache in the past 6 months?

No.....0
Yes.....1

19. What type of activity does the existing problem limit or prevent? (Axis II)

	No	Yes
a. chewing	0	1
b. drinking liquids	0	1
c. taking solid food	0	1
d. taking soft food	0	1
e. laughing	0	1
f. brushing teeth and washing face	0	1
g. yawning	0	1
h. swallowing	0	1
i. speech	0	1
j. facial appearance	0	1

20 a. Do you use any medications?

No.....0
Yes.....1

b. How long have you been using the medication? .....

c. What kind of medicines do you use?

d. What dose of medicine are you using?.....

e. Do you take medicine regularly?

No.....0

Yes.....1

Apendix 2.

Symptoms Check List, SLC-90 (Axis II)

Circle only one of the offered numbers given with the offered questions.

0.....not at all

1.....very little

2.....moderately

3.....expressed

4.....exceptionally

In the past few months, how often have you been upset by:

a. headaches 0 1 2 3 4

b. loss of interest in sex or sexual pleasure 0 1 2 3 4

c. fainting or dizziness 0 1 2 3 4

d. pain in the region of the heart and chest 0 1 2 3 4

e. feeling of loss of energy or stagnation, slowness 0 1 2 3 4

f. thoughts about death or dying 0 1 2 3 4

g. loss of appetite 0 1 2 3 4

h. tearfulness 0 1 2 3 4

i. self-blame due to some events 0 1 2 3 4

j. back pain 0 1 2 3 4

k. feelings of loneliness 0 1 2 3 4

l. indifference (melancholy) 0 1 2 3 4

m. excessive worries about something 0 1 2 3 4

n. lack of interest in the environment 0 1 2 3 4

o. feeling of pain and disgust in the stomach 0 1 2 3 4

p. muscle pain 0 1 2 3 4

q. difficulty falling asleep (it takes you a long time to fall asleep) 0 1 2 3 4

r. difficulty in breathing (hard to catch your breath) 0 1 2 3 4

s. hot-cold shifts 0 1 2 3 4

t. stiffness or feeling of "numbness" in some part of the body 0 1 2 3 4

u. presence of a "lump" in the throat 0 1 2 3 4

v. feelings of hopelessness 0 1 2 3 4

w. feeling of weakness in some part of the body 0 1 2 3 4

x. feeling of heaviness in arms and legs 0 1 2 3 4

y. thoughts about ending your life 0 1 2 3 4

z. excessive intake of food 0 1 2 3 4

aa. waking up early in the morning 0 1 2 3 4

bb. restless and interrupted sleep 0 1 2 3 4

cc. feels that everything is "hard" 0 1 2 3 4

dd. feeling "caught in a clip" 0 1 2 3 4

ff. feelings of guilt 0 1 2 3 4

Table 1. Psychosocial parameters according to therapeutic groups

Psychosocial therapy parameters modality		Mean	Med.	SD	Min.	Max.	95% CI
Work ability	ibuprofen	1.75	1	2.113	0	7	0.62–2.88
	splint	0.9	0	2.100	0	9	-0.08–1.88
	ibuprofen + diazepam	2.13	1	2.232	0	6	0.26–3.99
Social life	ibuprofen	2.13	1	1.996	0	6	1.06–3.19
	splint	1.3	0.5	2.029	0	8	0.35–2.25
	ibuprofen + diazepam	2.5	2	2.268	0	6	0.6–4.4
Daily activity	ibuprofen	3.94	3	2.568	0	9	2.57–5.31
	splint	2.45	2	2.139	0	8	1.45–3.45
	ibuprofen + diazepam	3.13	2.5	1.458	2	6	1.91–4.34

Table 2. Psychosocial parameters in relation to the type of therapy

Psychosocial parameters (X ± SD)	Therapy modality			Significance[a]
	ibuprofen + diazepam	Splint	ibuprofen	
Work ability	2.13 ± 2.232	0.9 ± 2.1	1.75 ± 2.113	p = 0.069
Social life	2.5 ± 2.268	1.3 ± 2.029	2.13 ± 1.996	p = 0.144
Daily activity	3.13 ± 1.458	2.45 ± 2.139	3.94 ± 2.568	p = 0.091

*Statistically significant;
[a]Kruskal–Wallis test

Table 3. Work ability and psychosocial status

Psychosocial status		Mean	Med.	SD	Min.	Max.	95% CI
Work ability	Normal	0.25	0	0.447	0	1	0.01–0.49
	Moderately altered	1.57	1	1.964	0	7	0.68–2.47
	Significantly altered	3.71	2	3.094	0	9	0.85–6.58

Table 4. Work ability and psychosocial status

Observed parameters (X ± SD)	Psychosocial status			Significance[a]
	Normal	Moderately altered	Significantly altered	
Work ability	0.25 ± 0.447	1.57 ± 1.964	3.71 ± 3.094	p = 0.002*

*Statistically significant;
[a]Kruskal–Wallis test

Table 5. Uni- and multivariate regression analysis in relation to VAS

Observed parameters	Univariate		Multivariate $R^2 = 0.528$	
	#B (95%CI)	Significance	B (95%CI)	Significance
Work ability	3.211 (0.818–5.604)	0.010*	-3.024 (-7.327–1.279)	0.162
Social life	4.088 (1.732–6.444)	0.001*	4.517 (0.516–8.517)	0.028*
Daily activity	2.600 (0.287–4.912)	0.029*	0.186 (-2.314–2.687)	0.881

*Statistically significant;
#unstandardized coeficient B

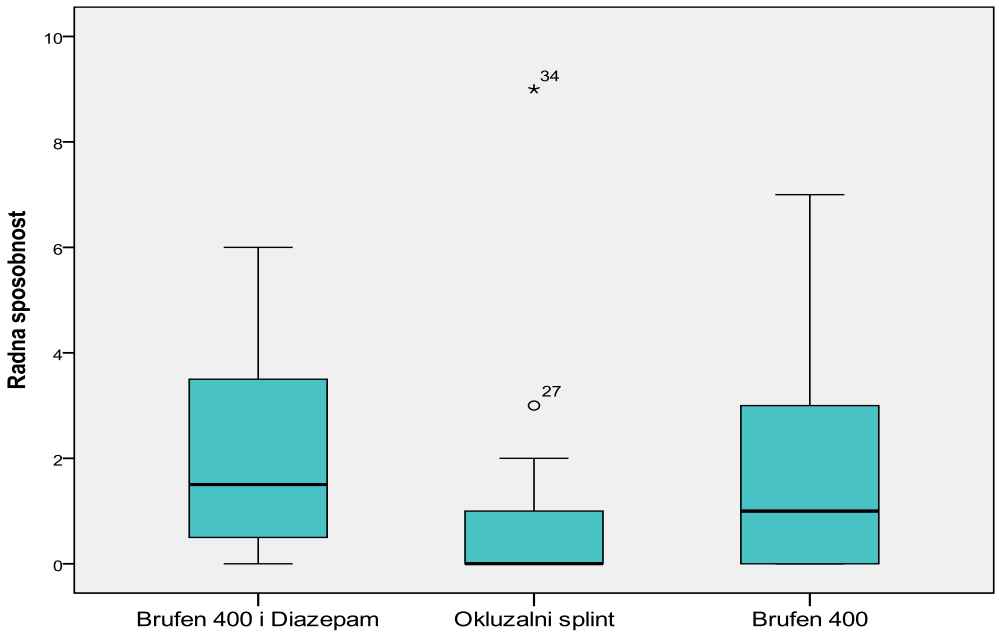

Figure 1. Work ability and therapy modality

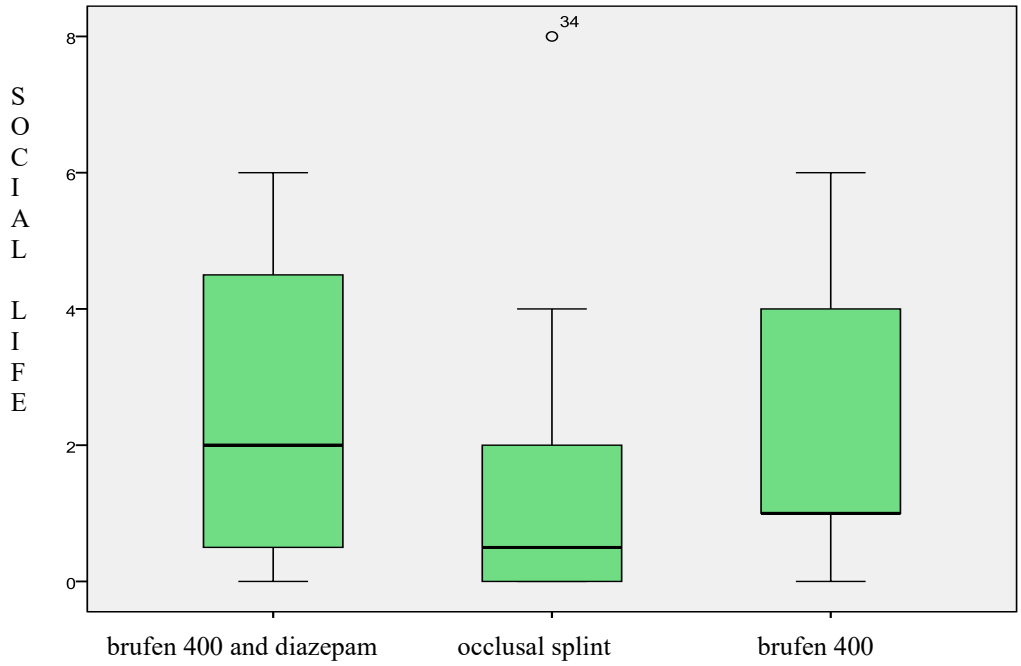

Figure 2. Social life and therapy modality

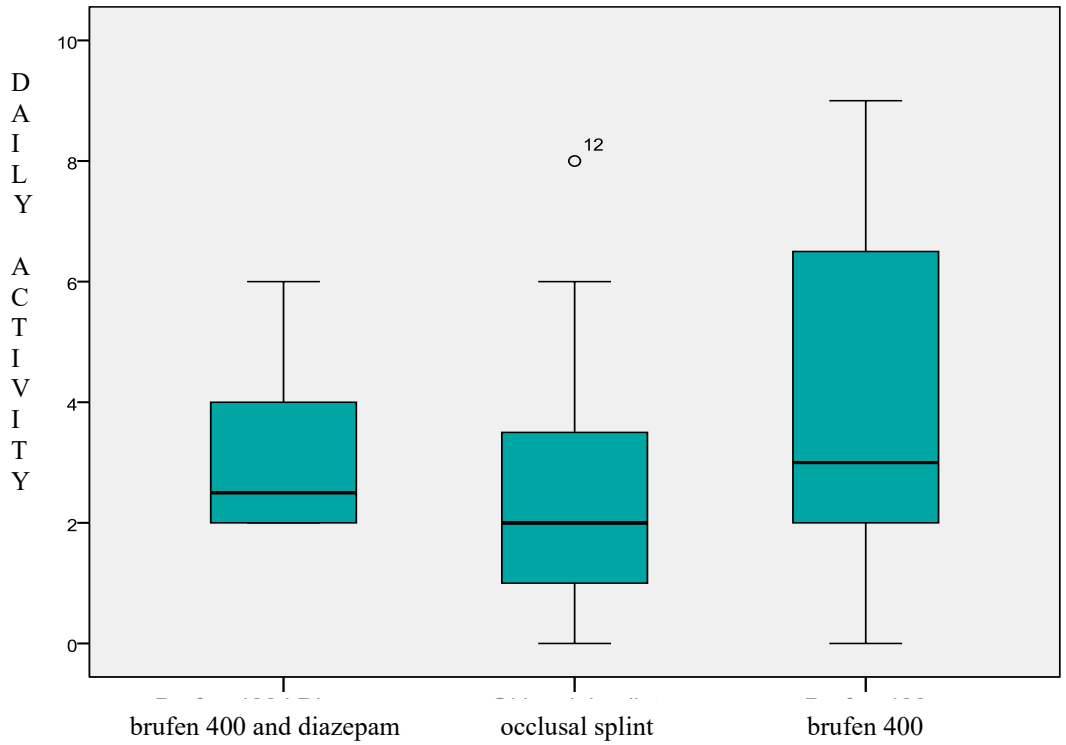

Figure 3. Daily activity and therapy modality

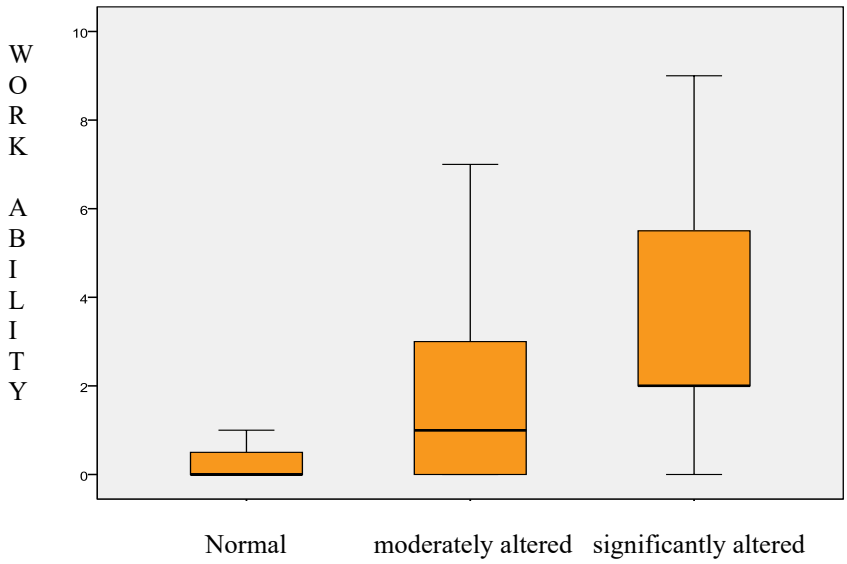

Figure 4. Work ability and psychosocial status

