O R I G I N A L   A R T I C L E

Quality of life of treated opiate addicts in the methadone maintenance program and those treated with buprenorphine

Kvalitet života lečenih opijatskih zavisnika u programu metadonskog održavanja i zavisnika lečenih buprenorfinom

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Abstract

Background/Aim. Although the characteristics of the treatment are the most researched determinants of quality of life of opiate addicts, it is indisputable that there is a certain influence of the characteristics of addicts and addiction, too. The aim of this study was to determine which addicts characteristics, as well as the characteristics of the addiction and treatment have predicative influence on the quality of life of the opiate addicts treated in the methadone maintenance program and those treated with buprenorphine. **Methods.** The epidemiological cross-sectional study was carried out in 2013 at the Clinical Center Niš, on a total of 64 opiate addicts, both sexes, aged 18 and older (32 addicts in the methadone program, chosen by random selection, and 32 addicts treated with buprenorphine, matched by sex and age). Necessary data were collected in a "face to face" interview with the examinees, based on the autonomous kind of a questionnaire, together with the use of the standardized World Health Organization (WHO) instruments: for health status, for the level of severity of addiction and for the quality of life measuring) based on which the health index (EQ-5D), Addiction Severity Index (ASI) and the quality of life index (WHOQOL-BREF) were calculated. The data were described by the methods of descriptive statistics, while the differences between groups were analyzed by applying χ^2 and t-test. Multiple regressions were used to determine the predictors. **Results**. The addicts in the methadone program showed much worse perception of quality of life than those treated in another way, although, according to the values of quality of life, they did not differ significantly. The most numerous predictors of the level of quality of life were health characteristics, characteristics of the socioeconomic position of the examinees, as well as different consequences of addiction. The influence of treatment was less noticeable. Participating in the methadone program had predicative influence on perception and the level of quality of life of the addicts in mental area and that of the environment. The influence of the characteristics of methadone treatment in physical and social area was insignificant. **Conclusion**. Variations in the perception and level of the quality of life of opiate addicts in different areas cannot be explained using only one predictor. The number of determining variables is large, and its impact complex.

Key words:
opioid-related disorders; addiction; opiate substitution treatment; methadone; buprenorphine; quality of life; treatment outcome.

Apstrakt

Uvod/Cilj. Iako su karakteristike lečenja najčešće istraživane determinante kvaliteta života opijatskih zavisnika, nesporno je da izvestan uticaj imaju i karakteristike zavisnika i zavisnosti. Cilj rada bio je da se utvrdi koje karakteristike zavisnika, zavisnosti i lečenja imaju prediktivni uticaj na kvalitet života opijatskih zavisnika u programu metadonskog održavanja i zavisnika lečenih buprenorfinom. **Metode**. Ova epidemiološka studija preseka sprovedena je na uzorku od 64 zavisnika od opijata oba pola, uzrasta 18 i više godina (32 zavisnika u programu metadonskog održavanja, izabranih metodom slučajnog odabira i 32 zavisnika lečenih buprenorfinom, odabranih prema polu i starosti), koji su lečeni u Kliničkom centru u Nišu. Potrebni podaci sakupljeni su intervjuom sa ispitanicima na bazi samostalno razvijenog upitnika, uz korišćenje standardizovanih instrumenata Svetske zdravstvene organizacije (WHO) za merenje zdravstvenog statusa, ozbiljnosti posle-dica zavisnosti, i kvaliteta života, na osnovu čega su izraču-vani: indeks zdravlja (EQ-5D), indeks težine posledica zavisno-sti (ASI) i indeks kvaliteta života (WHOQOL-BREF). Podaci su opisani metodama deskriptivne statistike; razlike između grupa analizirane su primenom χ^2 i t-testa. Za izdvajanje prediktora korišćena je multipla regresija. **Rezultati.** Zavisnici u metadonskom programu imali su značajno lošiju percepciju kvaliteta života od zavisnika lečenih buprenorfinom, iako se nisu razlikovali značajno od njih prema indeksu kvaliteta života. Najbrojniji prediktori kvaliteta života bili su karakteristike socijalnoekonomske pozicije ispitanika, zdravstvene karakteristike, kao i težina posledica zavisnosti. Uticaj lečenja bio je

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manje izražen. Učešće u metadonskom programu ima prediktivni uticaj na percepciju i indeks kvaliteta života zavisnika u psihičkom domenu i domenu okruženja. Najveći prediktivni značaj imali su trajanje i prekidi lečenja metadonom. Uticaj karakteristika metadonskog lečenja u fizičkom i socijalnom domenu bio je marginalan. **Zaključak** Varijacije u percepciji i nivou kvaliteta života opijatskih zavisnika u različitim domenima ne mogu se objasniti jednim prediktorom. Broj determinišućih varijabli je veliki, a dejstvo kompleksno.

Ključne reči:
poremećaji izazvani opioidima; opijati, supstituciona terapija; metadon; buprenorfin; kvalitet života; lečenje, ishod.

Introduction

The substitution treatment of opioid addictions can increase the quality of life of addicts[1] and reduce the Addiction Severity Index (ASI), but it is not yet clear what determines these changes[2]. The quality of life is the perception of respondents about the condition, functioning and satisfaction with various aspects in all or selected areas of life; reflects the standards, norms and expectations of the respondents in terms of the quality of life. Variations are usually associated with different treatment characteristics (length, doses, the content of treatment, psychosocial support), as well as the characteristics of health care in general and addiction characteristics.

Most researchers agree that treatment can improve the quality of life of addicts, regardless of whether it is based on the substitution of methadone or buprenorphine[3], but they point out that the effect of treatment is not equal in all the domains of quality of life. Some point out that the methadone treatment produces the greatest effect in the psychological domain[4], the others in physical and social domain[5], and the third in the physical, psychological and the domain of environment[6–8]. Some researchers point out that methadone treatment produces significant improvements in quality of life in all four domains[9] resulting from the cumulative effect of the treatment, since the improvement in one, affects the changes in other domains of quality of life[10].

The duration of treatment is the most researched factor. Most researchers agree that the effects of methadone substitution are the highest in the first three months of treatment[4, 5], although this program has certain effects thereafter. Moreover, a large number of researchers point to the negative effects of methadone treatment in the various domains of quality of life[11–15].

The quality of life is emphasized as an important predictor of progress.

Among all determinants, only the quality of life before treatment and its early changes are statistically significantly related to remaining in the treatment at least 6 months[16]. The addicts' quality of life, before entering the treatment program is an important predictor of an early progress in longer remaining in the program of methadone sustaining[16–18]. Others point out that continuous treatment oriented to the needs of individual patients[19] is statistically significantly associated with the cease of being an addict and is the strongest predictor of changes in the quality of life[18], with significant effects on the psychological and social functioning[10].

Nearly all of the researchers agree that the changes in the quality of life may be associated with dosing[2] and that the higher dose of methadone has a greater potential to increase the quality of life and reduce undesired events during the treatment[18, 20].

The researchers point out that a certain contribution to the variations have other characteristics of addicts (demographic, socioeconomic, healthy), as well as the characteristics of addiction, but stress that their influence is sometimes difficult to separate from the contributions of the treatment.

The impact of demographic characteristics on the quality of life of drug users is difficult to separate from the contribution of other variables[21–23]. The effect of age on the quality of life of addicts in the physical domain is predictive, but it is stressed that it must be viewed in conjunction with variables such as employment, comorbidity, hospitalization, abuse, the age of first drug use[24]. Socioeconomic position is an important predictor of the quality of life of drug users[10, 21, 22, 24]. It is described as the entire set of variables, such as education, employment, family life[1, 10, 21, 22].

The influence of the environment on the quality of life level differences in the addicts included in the methadone program is often less direct, more often within the scope of many other personal factors, factors that are related to drugs and/or treatment, so it is difficult to specify it. Variations in the quality of life are described in relation to the environment influence, financial status, free time, and social activities, rather than direct heroin influence[12].

The most important predictor of the quality of life is inability of the addicts to adapt to some new life situation, bad life conditions and the absence of permanent residence as a predictor of low quality of life of the addicts[18].

The researchers point out the importance of the family, household and the relationships within, in women who have kids there is a downfall in the areas of social support, psychological and environmental domain, as well as performance[21, 22], and the importance of life conditions and social support, which especially becomes prominent when there are symptoms and trauma (violence towards women)[25].

The influence of physical and sexual harassment on the differences in the quality of life in psychological domain is something that researchers confirmed[24].

There is an obvious protective impact of the scope of social network and the existence of close friends ready to give support to an addict. Providing social support to the addicts causes great increase in the quality of life[12, 13].

Health features of the addicts are the important determining factor of the quality of life. In that sense, it is important to point out the influence of comorbidity, chronic disease, psychological distress, depression, HIV infection on the quality of life in some domains[26]. Some variations in the le-

vel of quality of life, especially physical and psychological domain, can be explained by the presence of the symptoms and traumas [25]. Use of alcohol (the amount taken in the last 30 days) can explain some variations in the environmental domain. The intensity of psychological distress and taking psychological treatment medications are associated with low quality of life [12]. Human immunodefitiency virus (HIV)+ addicts have substantially lower quality of life scores in the areas of physical health and functional abilities, as well as quality of life, related to health in general [26].

There is a high level of agreement around the addiction characteristics (the type of the drugs used, the number of taken substances, their combining, the length of drug abuse period) which an addict brings into the treatment, as a significant factor of the present quality of life and the changes which are expected. Some researchers confirmed the differences in the outcome of male and female addicts, which could be related to specific characteristics of opiate use and the initial treatment [23]. The age at the moment of the first drug abuse (an injection episode) is significantly related to the quality of life in physical domain [24]. Sedative abuse, cocaine use, the duration of cocaine use, as well as the use of the great number of substances in the last month, are much related to the quality of life in psychological domain. However, everyone claims that variations in the physical and psychological domain of the quality of life can not be explained merely by drug effects. There is no direct effect of heroin use on the quality of life [13–20]. Drug effect is felt in coeffects with some other (personal and environmental) characteristics (life circumstances, financial status, changes, perspective, taking part in some free and social activities, family and friends support) [19].

The treatment effect has often been the subject of researching the quality of life of the drug addicts. The research in opiate addicts is focused on clinical efficacy of the treatment more than the quality of life assessed from the perspective of drug users.

The aim of this study was to identify the differences in quality of life between different groups of drug users (opiate addicts in methadone maintenance program and those treated with buprenorphine) that can be correlated with the treatment and to investigate what demographic, socioeconomic and health characteristics of the respondents and their environment, ie what characteristics of addiction and treatment determine the differences.

Methods

This epidemiological cross-sectional study was performed in July and December 2013 in accordance with the norms of the Helsinki Declaration and with the approval of the Ethics Committee of the Faculty of Medical Sciences in Kragujevac. The observed groups were addicted to opiates, of both genders, aged 18 and older, with different (demographic, socioeconomic and healthy) characteristics, which were treated at the Clinic for Mental Health at the Clinical Center Niš. Using G Power program and power parameters of the study for medium power impact, the required number of units of observation was determined. On completion of the stratification of addicts according to the method of treatment (methadone *vs* buprenorphine) from each stratum was selected a simple random sample using the table of random numbers. The stratified sample had 64 participants, divided into two groups.

The group A included 32 subjects involved in the methadone program [17 (53.12%) males, and 15 (49.88%) females, mean age 48.12 ± 3.15], and the group B of 32 subjects treated with buprenorphine [13 (40.62%) males, 19 (59.38%) females, mean age 46.94 ± 4.56]. The groups were homogeneous in age ($p = 0.233$) and gender ($p = 0.452$).

The instrument to collect data on the characteristics of the respondents was the sociodemographic questionnaire. Through interviews "face-to-face" with respondents in a medical institution, we collected data on the following issues: demographic, socioeconomic and health characteristics (gender, age, level of education, employment, marital status, children, the number and type of the disease), characteristics of the environment (housing conditions, living conditions, family characteristics and family functioning, the number of friends and relationships with friends), characteristics of health care (the choice of a doctor, the use of primary and preventive care, participation in methadone treatment, duration and type of methadone treatment, continuity and treatment interruption).

The instrument to collect data on health status (quality of life related to health) was a standardized questionnaire to measure the health status of the World Health Organisation (WHO) (WHO EQ-5D, Version 4.0; 2011). This study used both questionnaire modalities – information system (EQ-5D-5L), which focuses on five dimensions of health (mobility, self-protection, the usual activities, the presence of pain/discomfort and anxiety/depression) and visual analogue scale (EQ-5D-VAS) to which the respondent marked the assessment of the health of the worst possible to the best possible level [27]. Euro QOL EQ-5D index, that represents quantitative measures of treatment outcome of health care and aggregate measures of health and quality of life was calculated on the basic of the created data [28].

To register the seriousness of the addiction consequences in seven areas (health, professional, social, family, legal, addictive and psychiatric) functioning in the last 30 days and during the entire life of the respondents, questionnaire Addiction Severity Index (ASI) was used [29].

The overall quality of life in this study was expressed by the perception of quality of life that was measured in 4 different domains (physical functioning, psychological functioning, social functioning, environment).

The instrument for collecting data on the quality of life was a standardized questionnaire to calculate the WHOQOL-BREF index [30] which measures the overall quality of life on the basis of respondents assessment, that contributed with their standards, norms and expectations.

The quality of life was shown as the frequency of distribution of respondents by the category of perception of quality of life graphically, parallel to both groups. To determine the significance of differences, χ^2 test was used.

The level of quality of life in different domains was described by descriptive statistical parameters (mean, standard deviation, median, minimum and maximum value). Data on the level of quality of life in different domains were presented in tables, parallel to both groups. To determine the significance of differences *t*-test was used.

The focus of statistical analysis were the determinants of differences in the perception and the quality of life of opiate addicts among the characteristics of the respondents, their health and health care, environmental characteristics, depending on the characteristics and treatment.

For testing and isolation of potential factors of importance for the perception of the level of quality of addicts life, multiple linear regression was used. In the analysis we used SPSS 17.0 for Windows.

Results

The addicts in the methadone program had much poorer perception of quality of life than the addicts treated with buprenorphine. The differences between the two groups were statistically significant [(χ^2 = 29.86 degrees of freadom (DF) = 8 p = 0.000)].

Analysis of the predictors of the perception of quality of life (R^2 = 0.929 standard eror (SE) = 0.584 F = 24.250 p = 0.016) determined the predictive value of demographic (gender), socioeconomic (level of education, type of settlement) and health characteristics of respondents describing functional status (mobility, self-care, the ability to perform everyday activities), the presence of symptoms (irritability/depression) and the perception of health and the characteristics of the household in which they lived (number of household members, number of children). Among the characteristics of treatment, only the duration of methadone treatment had the predictive value (Table 1).

The respondents who lived in a household with more members and fewer children, were more educated and the males who lived in the city better perceived their quality of life. A directly proportional correlation between health status (functional capacity indicated by the frequency of the problem in terms of mobility and the ability to care for themselves, the presence of limitations in their daily activities, often signs of irritability and depression) in this study perceived better their quality of life. The overall quality of life is perceived poorer by respondents with higher ASI (the presence of severe consequences of addiction). The overall quality of life was perceived better by respondents involved in the methadone maintenance program. The higher index of quality of life in the domain of physical health can be expected in patients with fewer expressed addicts consequences (lower ASI) and a shorter time length of being an addict, just as the other researchers claim. In the methadone program addict group we established a bit higher values of the level of quality of life in the domain of physical health and environment, than in the out-of-program addicts. With the addicts off the methadone program, higher values of quality of life in the domain of physical health and social interactions were more noticeable. The described differences in the level of quality of life

between the examined groups were not statistically significant in any domain (Table 2).

Analysis of the predictors of quality of life in the field of mental health revealed a predictive value of demographic (gender), socioeconomic (level of education, type of occupation, monthly income, type of settlement in which they live), health characteristics, which describe the functional status of the respondents (mobility, ability of self-care), the presence of symptoms (pain/discomfort, irritability/depression) *ie*, perception of health, health care, especially continuity (the number of visits to general practice – GP) and household characteristics (household size, building in which they live, the size of the living unit, the way of heating) (R^2 = 1.000 SE = 0.151 F = 572.779 p = 0.033).

Analysis of the predictors of quality of life in the field of mental health aligned characteristics of addiction, as well as ASI indices and the length of heroin abuse – the length of taking drugs.

Characteristics of addiction treatment that showed predictive impact on the quality of life in the field of mental health are the length of methadone treatment and interruptions in methadone treatment (Table 3).

A higher index of quality of life in the domain of physical health could be expected in patients who live in smaller apartments heated by solid fuel stoves, in small towns (villages), have no sedentary job, have incomes above the minimum, live in or out of wedlock, have higher educational attainment, have better functional ability (and fewer problems in performing daily activities) and perceive their health better, pay visits to the doctor and have regular health controls. A higher quality of life in the physical domain was revealed in addicts with lower ASI (with fewer expressed addicts consequences) and shorter period of being addicts (Table 3).

Analysis of the predictors of quality of life in the field of mental health (R^2 = 1.000 SE = 0.236 F = 360,767 p = 0.042) showed a predictive value of demographic (gender), socioeconomic (level of education, type of occupation, monthly income, type of settlement in which they live), health characteristics, which describe the functional status of the respondents (mobility, ability of self-care), the presence of symptoms (pain/discomfort, irritability/depression) *ie*, perception of health, health care, especially continuity (the number of visits to GP) and household characteristics (household size, the building in which they live, the size of the living unit, the way of heating. Analysis of the predictors of quality of life in the field of mental health aligned characteristics of addiction, as well ASIs describing different effects and consequences of addiction, except the effects on employment, and the length of heroin abuse – the length of taking drugs).

Characteristics of addiction treatment that showed a predictive impact on the quality of life in the field of mental health are the length of methadone treatment and interruptions in methadone treatment (Table 3).

The higher index of quality of life in the psychological domain was found in the male addicts with higher education, higher income and more profitable occupation, those who

Table 1

Predictors of perception of the quality of life of opiate addicts

Predictors	Addicts n (%)	Quality of life perception				
		very bad n (%)	bad n (%)	acceptable n (%)	good n (%)	very good n (%)
Gender						
male	30 (46.9)	2 (6.67)	5 (16.67)	10 (33.33)	11 (36.66)	2 (6.67)
female	34 (53.1)	4 (11.76)	13 (38.24)	14 (41.18)	3 (8.82)	0 (0.00)
β (*p*)		-1.753 (0.007)				
Education						
primary education	15 (23.4)	3 (20.00)	6 (40.00)	5 (33.33)	1 (6.67)	0 (0.00)
moderate (3 and 4 year)	46 (71.9)	3 (6.52)	12 (26.09)	18 (39.13)	12 (26.09)	1 (2.17)
more and higher	3 (4.7)	0 (0.00)	0 (0.00)	1 (33.33)	1 (33.33)	1 (33.33)
β (*p*)		1.403 (0.024)				
Number of children						
without	26 (40.6)	2 (7.69)	4 (15.39)	10 (38.46)	8 (30.77)	2 (7.69)
one	25 (39.1)	3 (12.00)	8 (32.00)	9 (36.00)	5 (20.00)	0 (0.00)
two or more	13 (20.3)	1 (7.69)	6 (46.16)	5 (38.46)	1 (7.69)	0 (0.00)
β (*p*)		-0.808 (0.047)				
Number of household members						
two	12 (18.7)	2 (16.67)	5 (41.67)	4 (33.33)	1 (8.33)	0 (0.00)
three	21 (32.8)	2 (9.52)	9 (42.86)	7 (33.33)	3 (14.29)	0 (0.00)
four	20 (31.2)	1 (5.00)	3 (15.00)	10 (50.00)	5 (25.00)	1 (5.00)
five or more	11 (17.3)	1 (9.09)	1 (9.09)	3 (27.27)	5 (45.45)	1 (9.09)
β (*p*)		4.245 (0.011)				
Type of settlement						
village	8 (12.5)	1 (12.50)	4 (50.00)	3 (37.50)	0 (0.00)	0 (0.00)
settlement	30 (46.9)	3 (10.00)	11 (36.67)	11 (36.67)	5 (16.66)	0 (0.00)
town	26 (40.6)	2 (7.69)	3 (11.54)	10 (38.46)	9 (34.62)	2 (7.69)
β (*p*)		0.981 (0.035)				
Medical Composite Score						
good (5)	44 (68.8)	5 (11.36)	13 (29.54)	17 (38.64)	9 (20.46)	0 (0.00)
mediocre (6–10)	15 (23.4)	1 (6.67)	4 (26.66)	6 (40.00)	3 (20.00)	1 (6.67)
bad (> 10)	5 (7.8)	0	1	1	2	1
β (*p*)		-2.694 (0.011)				
Index of quality of life (EQ-5D-VAS)						
bad (50)	15 (23.4)	3 (20.00)	6 (40.00)	4 (26.67)	2 (13.33)	0 (0.00)
mediocre (50–75)	17 (26.6)	2 (11.76)	7 (41.18)	6 (35.3)	2 (11.76)	0 (0.00)
good (75 and more)	32 (50.0)	1 (3.12)	5 (15.62)	14 (43.75)	10 (31.26)	2 (6.25)
β (*p*)		-1.602 (0.014)				
ASI / Depending on the severity of consequences						
the easiest 20)	20 (31.3)	2 (10.00)	4 (20.00)	7 (35.00)	6 (30.00)	1 (5.00)
moderately (20–30)	26 (40.6)	2 (7.69)	8 (30.76)	9 (34.62)	6 (23.08)	1 (3.85)
the hardest (30 and more)	18 (28.1)	2 (11.11)	6 (33.33)	8 (44.45)	2 (11.11)	0 (0.00)
β (*p*)		-2.672 (0.015)				
Duration of methadone treatment						
out of treatement (group B)	32 (50.0)	3 (9.37)	6 (18.75)	14 (43.75)	7 (21.88)	2 (6.25)
up to 24 months	5 (7.8)	0 (0.00)	4 (80.00)	1 (20.00)	0 (0.00)	0 (0.00)
24–48 months	16 (25.0)	2 (12.50)	6 (37.50)	4 (25.00)	4 (25.00)	0 (0.00)
48–72 months	8 (12.5)	1 (12.50)	2 (25.00)	3 (37.50)	2 (25.00)	0 (0.00)
through 72 months	3 (4.7)	0 (0.00)	0 (0.00)	2 (66.67)	1 (33.33)	0 (0.00)
β (*p*)		2.977 (0.007)				

β – regression coefficient; *p* – probability; ASI – Addiction Severity Index.

Table 2

Descriptive statistical parameters of the quality of life index

Category	Descriptive statistical parameters						
	x̄	SD	CV (%)	Med	SE	Min	Max
Physical health							
group A	23.72	3.57	15.05	24	0.63	16	32
group B	22.12	3.35	15.14	22	0.593	15	29
Mental health							
group A	18.78	4.35	23.16	19	0.768	10	27
group B	20.53	4.41	21.48	20.5	0.780	10	30
Social relations							
group A	9.40	2.82	30.00	9.5	0.497	4	15
group B	10.22	2.35	22.99	10	0.416	6	15
Environment							
group A	28.03	4.77	17.02	27.50	0.843	17	38
group B	27.44	4.75	17.31	27.00	0.839	21	39

Group A – addicts in methadone treatment; Group B – addicts treated with buprenorphine; x̄ – mean value; SD – standard deviation; CV – coefficient of variation; Med – median; SE – standard error; Min – minimal; Max – maximal.

Predictors of the quality of life of opiate addicts

Predictors	Addicts n (%)	Quality of life domains, n (%)			
		mental health	physical health	social relations	environment
Gender					
male	30 (46.9)	24.32 (2.17)	21.03 (3.41)	10.07 (1.35)	27.781 (3.75)
female	34 (53.1)	21.72 (3.57)	19.81 (3.31)	9.99 (2.82)	28.11 (3.77)
β (p)		-1.031 (0.015)	-1.334 (0.014)	-	-
Education					
primary	15 (23.4)	21.12 (3.35)	19.53 (4.41)	9.92 (2.92)	27.91 (4.75)
intermediate (3 and 4 years)	46 (71.9)	22.43 (3.22)	21.08 (4.35)	10.36 (2.44)	28.03 (4.77)
more and higher	3 (4.7)	23.71 (3.57)	22.21 (4.26)	10.41 (2.25)	28.73 (4.41)
β (p)		1.053 (0.018)	1.269 (0.019)	-	-
Interest					
managers officials	7 (10.9)	22.84 (3.35)	20.97 (4.41)	10.02 (2.35)	27.66 (3.75)
VKV, KV workers	36 (56.2)	23.78 (3.57)	20.41 (4.35)	10.40 (2.82)	28.03 (3.77)
PKV, NKV workers	17 (26.6)	19.92 (3.35)	19.33 (4.41)	10.32 (2.35)	27.94 (3.61)
Housewives, students, unable to work	4 (6.3)	17.72 (3.57)	18.78 (4.35)	9.91 (1.82)	28.12 (3.97)
β (p)		-1.061 (0.018)	-0.815 (0.029)	-	-
Monthly income per member of the family household					
without receiving	19 (30.16)	21.37 (3.25)	18.22 (4.22)	9.31 (2.36)	27.74 (3.55)
minimum	27 (42.86)	23.72 (3.52)	18.78 (4.25)	9.40 (2.81)	28.01 (3.57)
above the minimum income	17 (26.98)	23.92 (3.15)	20.13 (4.11)	10.01 (2.30)	28.13 (3.71)
β (p)		0.990 (0.029)	0.723 (0.049)	-	-
Marital status					
unmarried	24 (37.5)	21.01 (2.93)	19.76 (4.17)	9.19 (2.37)	28.94 (4.75)
divorced	14 (21.9)	22.22 (3.57)	18.98 (4.35)	9.90 (2.82)	27.03 (4.77)
married/extramarital community	26 (40.6)	23.92 (3.35)	20.01 (4.41)	10.12 (2.35)	26.85 (3.42)
β (p)		0.784 (0.028)	-		-1.306 (0.027)
Number of household members					
to two members	12 (18.75)	22.52 (3.38)	17.78 (4.35)	9.01 (2.28)	27.97 (4.22)
3 members	21 (32.81)	23.22 (3.70)	20.03 (4.54)	10.32 (2.23)	28.49 (4.52)
4 members	20 (31.25)	22.91 (3.51)	20.21 (4.21)	10.98 (2.35)	29.02 (4.38)
5 and more	11 (17.19)	23.64 (3.05)	20.53 (4.23)	10.99 (2.68)	28.22 (4.41)
β (p)		-	4.896 (0.018)	2.139 (0.033)	-
Type of settlement					
village	8 (12.5)	23.92 (3.57)	18.07 (4.14)	9.81 (2.39)	27.03 (4.75)
settlement	30 (46.9)	22.87 (3.32)	18.78 (4.05)	9.40 (2.82)	28.03 (4.27)
town	26 (40.6)	22.02 (3.71)	20.23 (4.41)	10.22 (2.35)	29.10 (4.14)
β (p)		-0.444 (0.046)	0.942 (0.027)	-	0.905 (0.035)
Condition of house					
house with garden	32 (50.0)	22.61 (3.39)	18.31 (4.32)	10.21 (2.47)	28.23 (4.76)
Apartment	32 (50.0)	23.72 (3.27)	20.28 (4.31)	9.90 (2.81)	27.74 (4.65)
β (p)		-	1.109 (0.030)	-	-
Surface area in which they live					
20 m^2	41 (64.0)	24.08 (3.34)	18.52 (4.18)	10.22 (2.35)	27.44 (4.75)
21–40 m^2	14 (21.9)	23.72 (3.57)	18.78 (4.35)	9.40 (2.82)	28.03 (4.77)
41 and more m^2	9 (14.1)	22.12 (3.35)	20.50 (4.41)	10.07 (2.11)	27.99 (4.82)
β (p)		-0.543 (0.048)	0.976 (0.034)	-	-
Warming up the space in which they live					
steam. central or floor heating	20 (31.2)	22.12 (3.35)	18.62 (4.45)	10.22 (2.35)	27.44 (4.75)
furnaces electric	19 (29.7)	23.71 (3.57)	18.78 (4.35)	9.40 (2.82)	28.03 (4.77)
stoves	25 (39.1)	24.43 (3.32)	20.53 (4.41)	9.92 (2.19)	27.93 (4.56)
β (p)		0.625 (0.042)	0.850 (0.039)	-	-
Health status / Functional status (Rank)					
good (up to 5)	45 (70.3)	24.59 (3.39)	20.53 (4.41)	10.92 (2.35)	27.44 (4.75)

acceptable (6–10)	14 (21.9)	23.72 (3.57)	18.78 (4.35)	9.40 (2.82)	28.03 (4.77)
bad (more than10)	5 (7.8)	22.12 (3.35)	18.37 (4.15)	9.05 (2.73)	27.99 (4.76)
β (p)		-0.588 (0.013)	-3.028 (0.017)	-1.815 (0.024)	-
Health index/perception of health (EQ-5D-VAS)					
bad (50)	15 (23.4)	22.03 (3.35)	20.53 (4.41)	10.22 (2.35)	27.44 (4.51)
acceptable (50–75)	17 (26.6)	23.24 (3.21)	18.78 (4.35)	9.40 (2.82)	28.03 (4.36)
good (75 and more)	32 (50.0)	24.19 (3.70)	18.50 (4.43)	9.45 (3.02)	28.21 (4.45)
β (p)		1.078 (0.028)	-0.795 (0.049)	-	-
Number of general practitioner visits					
up to three times	34 (53.1)	21.90 (3.45)	19.58 (4.15)	10.22 (2.35)	27.11 (4.71)
4–6	16 (25.0)	23.62 (3.70)	20.32 (4.01)	9.40 (2.82)	28.03 (4.27)
7 and more	14 (21.9)	23.98 (3.35)	21.53 (4.21)		29.29 (4.44)
β (p)		0.948 (0.026)	0.649 (0.049)	-	1.443 (0.028)
The reason for visits to general practitioners					
health check	13 (20.3)	24.19 (3.39)	18.97 (4.41)	10.12 (2.34)	27.44 (4.15)
prescribing drugs	24 (37.5)	23.72 (3.51)	20.03 (4.35)	9.49 (1.82)	28.03 (4.07)
administration	27 (42.2)	22.06 (3.33)	19.89 (4.35)	10.01 (4.22)	27.90 (4.43)
β (p)		-1.091 (0.026)	-	-	-
How long they have been addicts					
up to 5 years	9 (14.1)	23.92 (3.57)	18.78 (4.01)	10.12 (2.31)	26.91 (4.46)
5–10	21 (32.8)	23.12 (3.35)	19.53 (4.35)	9.80 (2.28)	28.11 (4.32)
10–15	19 (29.7)	22.06 (3.57)	20.26 (3.41)	10.04 (2.56)	28.94 (4.25)
16 and more	15 (23.4)	21.22 (3.35)	20.88 (2.35)	9.96 (2.78)	28.99 (4.47)
β (p)		-0.724 (0.023)	0.503 (0.041)	-	0.651 (0.038)
ASI / Depending on the severity of consequences					
the easiest 20)	20 (31.3)	24.38 (3.57)	20.65 (4.41)	10.22 (2.35)	28.13 (4.77)
acceptable(20–30)	26 (40.6)	22.02 (3.35)	18.77 (4.35)	9.39 (2.82)	27.44 (4.75)
the hardest (30 and more)	18 (28.1)	21.55 (3.08)	18.01 (4.33)	8.12 (2.23)	26.01 (3.92)
β (p)		-1.255 (0.013)	-1.079 (0.018)	-0.870 (0.020)	-1.850 (0.039)
Duration of methadone treatment					
out of treatment (group B)	32 (50.0)	22.12 (3.35)	20.53 (4.41)	10.22 (2.35)	27.44 (4.75)
Up to 24	5 (7.8)	23.97 (3.17)	18.32 (4.10)	8.89 (2.22)	28.33 (4.34)
24–48	16 (25.0)	23.89 (3.25)	18.69 (4.19)	9.47 (2.51)	27.38 (4.72)
48–72 months	8 (12.5)	23.59 (3.07)	19.02 (4.34)	9.35 (2.66)	28.83 (4.56)
trough 72 months	3 (4.7)	22.73 (3.03)	19.37 (4.52)	10.02(2.72)	28.67 (3.92)
β (p)		-	2.310 (0.022)	-	-
Interruptions in treatment					
yes	16 (21.9)	23.11 (2.31)	20.93 (4.41)	10.02 (2.35)	28.53 (4.07)
no	48 (78.1)	23.92 (2.57)	18.81 (4.35)	9.76 (2.82)	26.54 (4.25)
β (p)		-	-0.755 (0.025)	-	-0.892 (0.027)

β – regression coefficient; p – probability; ASI – Addiction Severity Index.

live in the city, in larger houses heated by solid fuel stoves, surrounded by a large number of household members. The quality of life in the psychological domain is higher in drug addicts with fewer problems with taking care of themselves, with less frequent symptoms such as pain and discomfort, even when they perceive their health as poor, if they behave protectively (and often pay a visit to a doctor). A higher quality of life in the field of mental health was found in those with longer period of being addicts, with fewer consequences (lower ASI index), who were involved in the methadone program which they rarely abandoned.

Analysis of the predictors of quality of life in the domain of social relations ($R^2 = 0.992$ SE = 1.370 F = 4.402 $p = 0.036$) determined the predictive value of functional status (ability to self-care) and environment characteristics (number of household members). Except as noted, the predictive va-lue of other characteristics (demographic, socioeconomic, healthy characteristics of respondents and characteristics of their health care) were not determined.

The predictors of quality of life in the domain of social health aligned the consequences of addiction, too (ASI indexes).

Characteristics of treatment have no predictive effect on quality of life in the domain of social relations (Table 3).

A higher level of quality of life in the domain of social health can be expected in patients with a lower ASI, with no functional limitations, who live in a household with more members.

Analysis of the predictors of quality of life in the domain of environment ($R^2 = 0.983$ SE = 3.498 F = 1.884 $p = 0.050$) determined the predictive importance of the characteristics of the socioeconomic position of the respondents (ma-

rital status, type of settlement in which they live), characteristics that describe the health care of patients, especially continuity (the number of visits to the GP, the main reason for the visit) as well as household characteristics (possession and use of computers), but not the demographic characteristics of respondents.

ASIs that describe the specific effects of addiction, as well as other characteristics that describe dependence (the length of taking drugs) had a predictive effect on the quality of life in the field of environment.

A higher level of quality of life in the domain of environment can be expected in patients with fewer consequences of addiction (lower ASI), longer period of being addicts, rarely interrupted participation in the methadone program, who normally ask doctor for help, live in urban areas, married or in a *de facto* relationship (Table 3).

Discussion

Although there is no statistically significant difference in the index of quality of life, the addicts in the methadone program perceive the quality of life significantly worse than the addicts treated with buprenorphine.

The differences produce a significantly greater participation of the categories of the respondents who perceive their quality of life as poor in the group A (addicts in the methadone program) and significantly greater participation of the categories of respondents who perceive the quality of life as very good in the group B (addicts of methadone program). It seems that the reasons for these differences lie not only in the characteristics of methadone treatment, bearing in mind that analysis has a predictive value of a large number of other characteristics that describe addicts and addiction.

Those who live in a household with more members and fewer children, have more education, and males in the city, in this study, perceive their quality of life better. The differences between addicts males and females can be explained in terms of gender specificity of men, already pointed to in other studies [2, 15]. Our findings also confirm observations about the importance of social networks [11, 15, 17] for the quality of life of drug users, as evidenced by the predictive value of a great households [14, 17]. In most households, there are all conditions for the significant support regarding instrumental (material, emotional) assistance, as well as conditions for the development of the sense of security (perception of support if needed). On the contrary, a proportional correlation between the number of children and the perception of quality of life can be explained by age (younger addicts have fewer children) and a few obligations towards children in the life of each man, even addicts. Other studies show similar results [1, 2].

A directly proportional correlation between health status (functional capacity indicated by the frequency of the problem in terms of mobility and the ability to care for themselves, the presence of limitations in their daily activities, often have signs of irritability and depression) and health perceptions, on one hand and the quality of life perception on the other, also supports the findings of other researchers

regarding the connection between health and the quality of life [14, 15].

Closely related is the established importance of the consequences of addiction. The overall quality of life is perceived poorer by respondents who have higher ASI index (the presence of severe consequences of addiction). These results correlate with the findings of other researchers on the impact of consequences of addiction on the quality of life, which is realized directly [16] or in conjunction with other characteristics of the respondents [14, 15, 17].

The overall quality of life is perceived by better respondents involved in the methadone maintenance program, which confirms the findings of other researchers on the importance of long methadone treatment [3, 7–9, 11–14, 18, 20–27]. On the contrary, interruptions of treatment showed no predictive value.

The higher index of quality of life in the domain of physical health could be expected in patients with fewer expressed addicts consequences (lower ARI) and a shorter time length of being an addict, just as the other researchers claim [14, 15]. The results obtained in this study confirm the importance of functional capacity (lower frequency of problems in carrying out daily activities), better perception of health (higher grades of health), continuity of care (often paying visits to a doctor and regular health controls), which correlate with the findings of other researchers on determining the impact of symptoms and chronic problems [5, 14, 15] on the quality of life in the physical domain. The importance of living conditions, also emphasized by other researchers [14, 15, 18] confirmed the results of this research on determining the impact of housing conditions: addicts who live in smaller homes with central heating, reside in small towns, do physical work, have higher incomes, live in and out of wedlock, belong to categories with higher education – have a higher quality of life in the physical domain. Living conditions determine the gender-specific context [1, 2, 16] which can be explained by the predictive significance of gender, *ie*, a higher quality of life for male addicts. Characteristics of treatment are associated with an index of quality of life in the area of physical health.

A significant predictive effect on the index of quality of life regarding mental health has the length of drug abuse and the complex consequences of addiction, as well as the urban environment. A higher quality of life in this area could be expected in those with fewer expressed addicts' consequences (lower ASI), with fewer problems with taking care of themselves, fewer functional limitations (pain, discomfort), who perceive their own health better. The higher index of quality of life in the field of mental health have even those with longer period of being addicts, if they are more involved in the methadone program which they rarely abandon, and behave in a protective way (more often turn to doctor for help). This finding confirms the assumption about the length of the contribution and importance of the continuity of the methadone program, also claimed by the others [10, 20]. A higher quality of life in the psychological domain determines the number of features of urban social and economic position (higher education, higher income, occupation, life in the city, living in a home with larger area heated by solid fuel, a grea-

ter number of household members), as well as the (male) gender. Predictive effects of gender can be explained from a gender perspective: our findings confirm the observations on the impact of drugs, which is realized in cooperation with those of other (personal and environmental) characteristics (life situation, financial condition, changes in perspective, participation in leisure and social activities, support environment) that describe the position of male addicts in Serbian society [6].

Analysis of the predictors confirmed the predictive value of psychosomatic preservation of addicts and characteristics of family households in the quality of life in the domain of social relations. The addicts with better habitus (health status, and functional abilities) and less emphasized consequences of addiction (ASI of the consequences of addicts) have better social relationships with the environment. Characteristics of family households (households with more family members provide better social support) also contribute to it, which has already been discussed. Contrary to expectation, the characteristics of the treatment have no predictive effect on the index of quality of life in the domain of social relationships.

A higher level of quality of life in the domain of environment is determined by the characteristics of addiction (serious consequences of addiction, the length of drug abuse), but also treatment continuity (intermittent). These results correlate with the findings of other studies [7, 11]. Better relations in the region are typical for addicts who are referred to their environment (living in urban settings, in and out of wedlock), with developed patterns of protective behaviors (health check). Other researchers also indicate the importance of inclusion [2, 14, 22].

Conclusion

Treatment can improve the quality of life of opiate addicts, regardless of whether it is based on substitution of methadone or buprenorphine, but the effect of treatment is not equal in all the domains of quality of life.

Variations in the perception and the level of quality of life in different domains can not be explained by one predictor.

The number of the determined variables is large, and their action is complex.

The most common predictors of quality of life are health characteristics, the characteristics of the socioeconomic position of the respondents, as well as the various consequences of addiction.

The effect of treatment on the quality of life is less pronounced.

The highest predictive values among the characteristics are the duration of treatment and interruptions in methadone treatment. The overall quality of life is perceived better by respondents involved in the methadone maintenance program.

Future study on opiate addicts should be focused more on the quality of life assessed from the perspective of drug users.

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