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ORIGINAL ARTICLE

ASSESSMENT OF THE PRESENCE OF ANHEDONIA DURING THE COVID-19 PANDEMIC IN STUDENTS OF THE FACULTY OF MEDICINE OF THE UNIVERSITY OF NIŠ

PROCENA PRISUSTVA ANHEDONIJE U TOKU COVID-19 PANDEMIJE KOD STUDENATA MEDICINSKOG FAKULTETA UNIVERZITETA U NIŠU

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Abstract

Introduction: Anhedonia is a psychopathological condition that is defined as the loss of the ability to experience pleasure. It is described as the loss of a fundamental dimension of human experience. The COVID-19 pandemic created the conditions for the development of anhedonia, bringing limitations, less positive experiences, limited planning, human contacts, limited movement and the constantly threatening danger of a bad outcome.
Aim: The study aimed to determine the state of anhedonia in the population of medical students during the COVID-19 pandemic and to determine whether there is a difference in the degree of anhedonia in the group of subjects suffering from COVID-19 infection compared to the group of subjects not suffering from COVID-19 infection.
Material and methods: The research was conducted using a questionnaire created on the Google platform (Google Forms). The link for the questionnaire was distributed via social media in the period January/February 2022. Total of 191 students from the Faculty of Medicine University of Niš participated in the research. An assessment of the state of anhedonia was performed using the Snaith-Hamilton Pleasure Scale (SHAPS). The statistical significance of the differences between the groups was determined using the Student's t-test.
Results: Based on the obtained results, it was concluded that the degree of anhedonia in the subjects is significantly low (score less than 2) for almost all dimensions of satisfaction, except for training, where a slight increase in anhedonia is observed (score is 2.13).
Conclusion: The obtained results show that no indicators have been found that show the presence of anhedonia in the student population in the examined period of the COVID-19 pandemic. No differences in the state of anhedonia were found in the group of subjects who suffered from COVID-19 infection compared to students who did not suffer from COVID-19 infection.

Keywords:
anhedonia,
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Sažetak

Uvod: Anhedonija predstavlja psihopatološko stanje koje se defiše kao gubitak sposobnosti doživljavanja zadovoljstva. Opisuje gubitak fundamentalne dimenzije ljudskog iskustva. Pandemija COVID-19 stvorila je uslove za razvoj anhedonije, donela je ograničenja, manje pozitivnih iskustava, ograničenje planiranja, ljudskih kontakta, ograničenje kretanja i stalno preteću opasnost lošeg ishoda.

Cilj: Cilj istraživanja je utvrđivanje stanja anhedonije u populaciji studenata medicine u periodu COVID-19 pandemije i utvrđivanje da li postoji razlika u stepenu anhedonije u grupi subjekata koji su bolovali od COVID-19 infekcije u odnosu na grupu subjekata koji nisu bolovali od COVID-19 infekcije.

Materijal i metode: Istraživanje je sprovedeno pomoću upitnika koji je formiran na Gugl platformi (*Google Forms*). Link za upitnik je distribuiran putem socijalnih medija u periodu januar - februar 2022. godine. U istraživanju je učestvovao 191 student Medicinskog fakulteta Univerziteta u Nišu. Procena stanja anhedonije izvršena je korišćenjem Snejt-Hamiltonove skale zadovoljstva (engl. *Snaith-Hamilton Pleasure Scale* - SHAPS). Statistička značajnost razlika između grupa određivana je primenom Studentovog t-testa.

Rezultati: Dobijeni rezultati sprovedenog istraživanja pokazali su da stanje anhedonije u ispitivanoj grupi subjekata nije prisutno. Na osnovu dobijenih rezultata zaključujemo da je kod ispitanika stepen anhedonije značajno nizak (skor je manji od 2) za skoro sve dimenzije zadovoljstva sem za treniranje, gde se primećuje blagi porast anhedonije (skor je 2,13).

Zaključak: Dobijeni rezultati pokazuju da nisu nađeni indikatori koji pokazuju prisustvo stanja anhedonije u populaciji studenata u ispitivanom periodu COVID-19 pandemije. Nisu nađene razlike stanja anhedonije u grupi subjekata koji su bolovali od COVID-19 infekcije u odnosu na studente koji nisu bolovali od COVID-19 infekcije.

Ključne reči:
anhedonija,
COVID-19

Introduction

Anhedonia is a psychopathological condition defined as a loss of the ability to experience pleasure (1). It is described as the loss of a fundamental dimension of human experience (2). Anhedonia occurs in numerous psychiatric and neurological disorders, and it can be found in the general population and is a risk factor for the development of mental disorders (3-5). Anhedonia represents the loss of the ability to experience pleasure in the presence of a reward, but it also includes loss of reward anticipation, loss of initiative, cessation of decision-making, and generation of goal-directed behavior. Anhedonia is associated with a motivational deficit. In periods of difficult life circumstances, such as the COVID-19 pandemic, maintaining motivation and orientation towards the future is of crucial importance for the student population.

Anhedonia is a common feature of addiction, Parkinson's disease, eating disorders, risky behaviors, and suicide. It is primarily considered a core symptom of depressive disorder. The absence of reactivity and anhedonia is indicative of melancholic depression and can serve as a predictor of response to antidepressants (5).

In the description of the clinical presentation of Hamilton's anhedonia, it is noted that the description of anhedonia also includes other phenomena: decreased attention, decreased functioning, loss of energy, guilt, indecision and giving up (6).

Anhedonia can be measured in various ways, including behavioral, electrophysiological, and hemodynamic methods that rely on interviewing and self-reporting in major depressive disorder (MDD). However, in clinical practice and research, self-report questionnaires are more commonly used due to their simplicity and practicality. There are several instruments available for measuring anhedonia, such as the 61-item Chapman Physical Anhedonia Scale (PAS) and its revised form, the Revised Physical Anhedonia Scale (R-PAS), the Favcett-Clark Pleasure Scale (FCPS), and the Snaith-Hamilton Pleasure Scale (SHPS or SHAPS) (7).

The COVID-19 pandemic has created the conditions for the development of anhedonia, it has brought restrictions, fewer positive experiences, a limitation of planning, human contact, a limitation of movement, and the ever-looming danger of a bad outcome.

Examining the capacity to experience pleasure during the period of the COVID-19 pandemic is a topic that deserves analysis (8).

Research aims

The primary goal of the research is to determine the state of anhedonia in the population of students of the Faculty of Medicine University of Niš during the period of the COVID-19 pandemic.

The secondary aim of the research is to determine whether there is a difference in the degree of anhedonia in the group of subjects who suffered from the COVID-19 infection compared to the group of subjects who did not suffer from the COVID-19 infection.

Material and methods

The research was conducted using a questionnaire created on the Google platform (Google Forms). The link for the questionnaire was distributed via social media in the period January - February 2022. Total of 191 students of the Faculty of Medicine University of Niš participated in the research. Three study groups were included (**table 1**): medicine (167 respondents, 87.4%), dentistry (15 respondents, 7.9%), and pharmacy (9 respondents, 4.7%). The sample consists of 42 male respondents (22%) and 149 female respondents (78%). The average age of the respondents was 23.6 years. The largest number of respondents were born in 1998 (61 respondents, 31.9%) and 1999 (32 respondents, 16.7%). There were 56 (29.3%) respondents younger than the specified age, while there were 42 (22.1%) respondents born in 1997 and earlier.

Table 1. Structure of the sample concerning the study group.

Study group	The number of respondents
Medicine	167
Dentistry	15
Pharmacy	9
In total	191

Of the surveyed students, 105 (55%) said that they had suffered from a COVID-19 infection, while 86 (45%) students said that they had not suffered from a COVID-19 infection (**table 2**).

Table 2. Sample structure in relation to past COVID-19 infection.

		The number of respondents
Past COVID-19	NO	86 (45%)
	YES	105 (55%)
	In total	191 (100%)

Research instrument

Anhedonia was assessed using the Snaith-Hamilton Pleasure Scale (SHAPS) (9). The questionnaire consists of 14 questions and the answers are scored in four categories: 1. Definitely agree, 2. Agree, 3. Disagree, 4. Strongly disagree. The SHAPS instrument includes four domains of hedonic experience: interest-leisure, social interactions, sensory experiences, and food-drink. The total score of the instrument is in the range of 14 - 56. A higher score reflects a higher degree of anhedonia, i.e. a lower degree of satisfaction. A score on each question of 2 or less constitutes a normal score, while a score of 3 or more is defined as abnormal.

Data entry and tabular presentation were performed using the MS Office Excel program, and calculations were performed using the SPSS program, version 15.0 (10). The statistical significance of differences between groups was determined using the Student's t-test.

Results

The following table (**table 3**) presents the values of the parameters of anhedonia in the studied population.

Table 3. Descriptive-statistical data of the examined dimensions.

The satisfaction dimension	AM	SD	Min	Max
TV/Radio	1.80	.82	1.00	4.00
The family	1.31	.55	1.00	3.00
Hobbies	1.65	.82	1.00	4.00
Food	1.71	.96	1.00	4.00
Bath/Shower	1.47	.75	1.00	4.00
The smell of flowers	1.78	1.01	1.00	4.00
Laughter	1.49	.80	1.00	4.00
Training	2.13	1.07	1.00	4.00
Reading	1.82	.91	1.00	4.00
Favorite drink	1.49	.80	1.00	4.00
Little things	1.41	.71	1.00	4.00
Landscapes	1.34	.66	1.00	4.00
Helping others	1.31	.56	1.00	3.00
Compliments	1.54	.75	1.00	4.00

Based on the obtained results from **table 3**, it was concluded that the degree of anhedonia in the respondents is significantly low (score is less than 2) for almost all dimensions of satisfaction, except for training, where a slight increase in anhedonia is observed (score is 2.13).

The survey results indicate that during the lockdown, respondents reported the least satisfaction with training, indicating a high degree of anhedonia in this activity. On the other hand, respondents reported the lowest degree of anhedonia when spending time with family and helping others, indicating higher levels of satisfaction in these areas. Interestingly, the majority of respondents reported experiencing the greatest satisfaction when spending time with family and helping others.

The following table (**table 4**) shows the results of the comparison of the group of students who suffered from the COVID-19 infection and the group of students who did not suffer from the COVID-19 infection in terms of the expression of the investigated dimensions. A parametric t-test was used to compare groups.

Table 4 reveals that the presence of anhedonia in some dimensions of pleasure was more pronounced among individuals who had contracted COVID-19 compared to those who had not, particularly in activities such as watching TV/radio, hobbies, enjoying food, smelling flowers, drawing, drinking, enjoying small things, landscapes, and helping others. However, for some dimensions of pleasure, the presence of anhedonia was less pronounced after a prolonged COVID-19 infection, such as spending time with family, enjoying a warm bath/shower, laughing, working out, and giving compliments. Nevertheless, these

Table 4. Comparison of the group of respondents with a history of COVID and a group that did not have a history of COVID concerning the examined dimensions (t-test).

Dimension	Past COVID-19	N	AM	SD	t	df	p
TV/Radio	YES	105	1.87	.81	1.304	189	.194
	NO	86	1.72	.82			
The family	YES	105	1.29	.55	-.657	189	.512
	NO	86	1.34	.56			
Hobbies	YES	105	1.72	.86	1.287	189	.200
	NO	86	1.56	.77			
Food	YES	105	1.74	1.00	.486	189	.627
	NO	86	1.67	.92			
Bath/shower	YES	105	1.44	.74	-.473	189	.637
	NO	86	1.50	.77			
The smell of flowers	YES	105	1.79	1.02	.155	189	.877
	NO	86	1.76	1.01			
Laughter	YES	105	1.47	.73	-.403	189	.687
	NO	86	1.52	.87			
Training	YES	105	2.12	1.03	-.175	189	.861
	NO	86	2.15	1.12			
Reading	YES	105	1.83	.91	.267	189	.789
	NO	86	1.80	.93			
Favorite drink	YES	105	1.54	.86	.860	189	.391
	NO	86	1.44	.72			
Little things	YES	105	1.45	.75	.933	189	.352
	NO	86	1.36	.64			
Landscapes	YES	105	1.42	.78	2.128	189	.351
	NO	86	1.23	.47			
Helping others	YES	105	1.36	.60	1.310	189	.192
	NO	86	1.25	.51			
Compliments	YES	105	1.51	.68	.607	189	.544
	NO	86	1.58	.84			

small differences did not show a statistically significant distinction.

Based on the results of the t-test, it was concluded that there are no statistically significant differences between the group of respondents with previous COVID-19 infection and the group of respondents who did not have previous COVID-19 infection in terms of the expression of any of the investigated dimensions.

Internal consistency analysis

Cronbach's alpha coefficient was calculated to assess the internal consistency of the scale. The analysis produced the following results:

- Cronbach's Alfa (raw_alpha): 0.83
- Standardized Alpha (std.alpha): 0.84
- Average Correlation Between Items: 0.15

95% Confidence Interval for Alfa:

- Feldt: 0.80 - 0.86
- Duhachek: 0.80 - 0.87

Interpretation

Cronbach's alpha of 0.83 indicates good internal consistency between items in the scale. Standardized alpha (0.84) supports this claim, showing that internal consistency remains stable even when items are standardized. The average correlation between items is relatively low (0.15), suggesting that although the scale is reliable, the items may not be highly correlated with each other. The confidence interval for alpha further confirms the reliability of the scale, with values consistently above the acceptable threshold of 0.70.

Conclusion

The scale demonstrates adequate internal consistency and reliability for measuring the desired construct. However, the low average correlation between items suggests possible variability in how well items measure the same underlying concept, which could be further explored in future research.

Discussion

The obtained results showed that the condition of anhedonia was not present in the examined group of subjects (**table 3**).

The obtained results are in accordance with the data from the literature. The obtained parameter values are in accordance with the values obtained in the study of the state of anhedonia of the Charité University in Berlin. Similar parameter values were obtained in the

population of students and healthy adults in the period before the pandemic and the period during the pandemic, and the values of the obtained parameters of the SHAPS instrument correspond to the values obtained in this work (8). The results are consistent with the results of a meta-analysis of the effects of lockdown on mental health, which showed a small significant effect on mental health including depression, but did not find changes in positive psychological functioning (11).

The parameters that show the most retained hedonic capacity, although they do not reach statistical significance in the examined sample, refer to experiencing satisfaction in the family and satisfaction in helping others (**table 3**).

The obtained results are in accordance with the data from the literature, which states that in the period of crisis, family ties have a protective effect (12) as well as that helping others is the most adaptive way to overcome difficulties and develop resilience (13).

The obtained results are in accordance with the theoretical concepts that state that in periods of high stress and crisis, there is an activation of frozen adaptive capacities, which the person did not even know he possessed, which maintain mentally healthy functioning. The obtained results can be explained from the psychodynamic (14) and neurochemical (15) aspects.

The obtained results showed that there is no statistically significant difference in the degree of anhedonia in the group of subjects who suffered from COVID-19 infection compared to the group of subjects who did not suffer from COVID-19 infection (**table 2**). The obtained results are not in accordance with the results published in the literature showing a high frequency of anhedonia in subjects after COVID-19 infection (16) with the fact that the authors state that further monitoring of the phenomenon and research is needed.

Considering the effects of the COVID-19 infection on the nervous system (17) and the complex neural basis of anhedonia and the emotional-motivational system, it is believed that the obtained results are important and encouraging and represent the basis for further research and work.

The advantage of this research consists in the number of respondents that allows for obtaining reliable results, and the limitations consist in the lack of results on the state of anhedonia in a given group of respondents before the pandemic period.

A study involving 88 college students was also conducted, which investigated differences in the presence of anhedonia and sleep before and during the pandemic. The results of this study showed a marked presence of anhedonia in students as well as reduced sleep quality during the first months of the pandemic (18).

Another study aimed to investigate the occurrence of fatigue and anhedonia following a period of COVID-19 infection. The study involved 200 patients, and the presence of anhedonia was assessed using the SHAPS scale. The study found that both fatigue and anhedonia were more pronounced after the post-pandemic period (19).

Conclusion

The obtained results show that no indicators were found that showed the presence of anhedonia in the student population during the examined period of the COVID-19 pandemic. No differences were found in the state of anhedonia in the group of subjects who suffered from a COVID-19 infection compared to students who did not suffer from a COVID-19 infection.

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