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Observational Study

Craving variations in patients with substance use disorder and gambling during COVID-19 lockdown: The Italian experience

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Abstract

BACKGROUND

Following the development of the coronavirus disease-2019 (COVID-19) pandemic in Italy, a strict lockdown was imposed from March 9 to May 5, 2020. The risks of self-medication through alcohol or psychoactive substance abuse were increased, as well as the tendency to adopt pathological behaviors, such as gambling and internet addiction.

AIM

To evaluate the impact of the COVID-19 pandemic and associated containment measures on craving in a group of patients suffering from substance use disorder and/or gambling disorder who were in treatment in outpatient units or in residency programs as inpatients.

METHODS

One hundred and fifty-three patients completed a structured questionnaire evaluating craving and other behaviors using a visual analogue scale (VAS).

Review Board of the Department of Neuroscience, Imaging, and Clinical Sciences of the University G. d'Annunzio of Chieti-Pescara (Prot. 042/2020) and fully complied with the guidelines of the Ethical Committee.

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Giovanni Martinotti has been a consultant and/or a speaker and/or has received research grants from Angelini, Doc Generici, Janssen, Lundbeck, Otsuka, Pfizer. Massimo di Giannantonio has been a consultant and/or a speaker and/or has received research grants from Angelini, Janssen, Lundbeck, Otsuka, Pfizer, Recordati.

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Forty-one subjects completed a pencil and paper questionnaire during the interview. The clinician provided an online questionnaire to 112 patients who had virtual assessments due to lockdown restrictions. Statistical analyses were performed using Statistica version 8.0. Quantitative parameters are presented as the mean \pm SD and qualitative parameters as number and percentage per class. The Kolmogorov-Smirnov test was used to check for normality of distributions. Analysis of variance and Duncan post hoc test were employed to analyze differences among subgroup means. The associations between variables were measured using Pearson's correlation. A *P* value of < 0.05 was considered significant.

RESULTS

The variation in craving between the present and the month before showed VAS-related reductions of craving in 57%, increases in 24%, and no significant change in 19% of the sample. The level of craving was significantly higher ($F = 4.36$; $P < 0.05$) in outpatients ($n = 97$; mean = 3.8 ± 3.1) living in their own home during the quarantine compared with inpatients ($n = 56$; mean = 2.8 ± 2.8) in residential programs. Craving for tetrahydrocannabinol was the greatest (4.94 , $P < 0.001$) among various preferred substances.

CONCLUSION

The unexpected result of this study may be explained by a perceived lack of availability of substances and gambling areas and/or decreased social pressure on a subject usually excluded and stigmatized, or the acquisition of a new social identity based on feelings of a shared common danger and fate that overshadowed the sense of exclusion and rejection in the abuser.

Key Words: Substance use disorder; Addiction; COVID-19; Craving; Psychopathology

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Core Tip: Our data suggest that craving, regardless of whether determined by substances or behaviors, was globally reduced in a period that could be highly stressogenic such as the coronavirus disease-2019 lockdown.

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INTRODUCTION

Following the development of the coronavirus disease-2019 (COVID-19) pandemic in Italy, a strict lockdown was imposed from March 9 to May 5, 2020. In the general population, problems such as depression, anxiety, post-traumatic stress symptoms, insomnia, and adjustment disorder symptoms increased[1]. The risks of self-medication through alcohol or psychoactive substances abuse were also increased, as well as the tendency to adopt pathological behaviors, such as gambling and internet addiction[2,3]. Stressors are essential in the inception and protraction of substance use disorder (SUD). Many stressors are associated with lockdown conditions such as prolonged home confinement, depression and panic related to the disease's uncertainties, working from home, and fear of job loss. People exposed to these stressors may take refuge in addictive substances, increasing SUD incidence among the general population[4] in a post-modern society that is increasingly oriented towards the use of substances, favoring the development of symptoms of psychopathological interest[5]. The COVID-19 pandemic and lockdown are risk conditions for developing internet, videogames, or other addiction, decreased physical activity and

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related health issues, altered eating habits, and disrupted circadian rhythms. King *et al* [6] and Király *et al* [7] demonstrated how these behaviors increased during the lockdown, often generated as a coping strategy to stressful situations.

In patients with pre-existing mental disorders, the symptomatology may flare up or worsen, generating increased suicidal ideation as a possible consequence [8-10]. Substance users and gamblers are groups at risk of developing psychopathological symptoms in a lockdown situation. The phenomenon is likely due to various reasons, including: (1) The limited availability of illegal substances on the black market; (2) the insufficient presence of active treatment programs and the low availability of substitute drugs; and (3) the greater psychopathological susceptibility and lower resilience in a period of reduced economic resources and financial hardship [11,12].

In this study, we evaluated the impact of the COVID-19 pandemic and associated containment measures on craving, a prominent risk factor for relapse [12] in a group of patients suffering from SUD and/or gambling disorder (GD) who were in treatment in outpatient units or in residency programs as inpatients.

MATERIALS AND METHODS

This study was commissioned by the Italian Society of Psychiatry and conducted at the University "Gabriele d'Annunzio" of Chieti-Pescara during the Italian lockdown phase that lasted from March 3 to May 5, 2020. Recruitment centers were randomly chosen among all the structures providing services for SUD and GD patients in regions of Northern (Piemonte, Lombardia), Central (Lazio, Marche), and Southern Italy (Abruzzo, Calabria) (see Appendix A: List of recruitment centers). Randomization procedures were computerized (see Appendix B: Explanation of randomized procedures). Three online meetings were held to train clinicians to the administration of the questionnaire, before the study started. In each recruitment center, a clinician introduced the survey to all the eligible subjects. No compensation was provided for participation in the study. Of the 253 subjects recruited, 153 (mean age 39.8; 77.8% male) gave their consent and anonymously completed the questionnaire. Forty-one subjects completed a pencil and paper questionnaire during the interview. The clinician provided an online questionnaire to 112 patients who had virtual assessments due to lockdown restrictions. Questionnaires were anonymous and each subject was identified through a unique code with no other identifying data. Anonymity was maintained by placing the completed questionnaires in a box by the subject himself, so that the clinician could not associate the subject with his/her questionnaire. All participants provided informed consent. The inclusion criteria were: (1) Diagnosis of SUD or GD according to The Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders; and (2) being older than 18 years. The exclusion criteria were: (1) Diagnosis of dementia; and (2) refusal to give informed consent.

Our survey was organized into two sections. In the first section, we collected anamnestic and clinical variables (see Appendix C: List of anamnestic and clinical variables). In the second section, using a visual analogue scale (VAS), we asked the subjects to indicate the craving level for the primary substance of abuse and how much their craving and habits have changed from the beginning of lockdown. We chose to use the VAS because of its immediacy and extensive utilization to evaluate craving in addicted patients [13,14]. We investigated changes of: (1) Craving for substances and gambling; and (2) quality of life and life habits (Table 1). A VAS ranging from 0 (I do not use it/I do not do this anymore) to 10 (I use it/I do this much more than before) was employed. To assess changes in quality of life, we utilized a VAS ranging from 0 (my life is much worse than before) to 10 (my life is much better than before) (see Appendix D: Questionnaire).

Statistical analyses were performed using Statistica version 8.0. Quantitative parameters are presented as the mean \pm SD and qualitative parameters as number and percentage per class. The Kolmogorov-Smirnov test was used to check for normality of distributions. Analysis of variance and Duncan post hoc test were employed to analyze differences among subgroup means. The associations between variables were measured using Pearson's correlation. A *P* value of < 0.05 was considered significant.

RESULTS

Among 153 subjects that completed the questionnaire, the primary substances of abuse or pathological behavior are reported in Table 1.

Table 1 Primary substance of abuse/pathological behavior

Substance/pathological behavior	<i>n</i>	%
Cocaine	66	43.1
Alcohol	39	25.5
THC	24	15.7
Gambling	12	7.9
Heroin	9	5.7
Ketamine	1	0.7

THC: Tetrahydrocannabinol.

Sixty-seven (43.8%) of the participants reported a comorbid psychiatric condition, especially mood disorders (depression, bipolar disorder) and anxiety. In this subsample, a psychopharmacological treatment was reported by 94% of subjects. The variation in craving between the present and the month before showed VAS-related reductions of craving in 57%, increases in 24%, and no significant change in 19% of the sample (Figure 1).

The level of craving was significantly higher ($F = 4.36$; $P < 0.05$) in outpatients ($n = 97$; mean = 3.8 ± 3.1) living in their own home during the quarantine compared with inpatients ($n = 56$; mean = 2.8 ± 2.8) in residential programs. Craving for tetrahydrocannabinol was the greatest (4.94 , $P < 0.001$) among various preferred substances (Figure 2).

Patients with a dual diagnosis ($n = 67$; mean craving VAS = 3.9) did not show a significant difference in the levels of craving [$F(1; 150) = 2.43$, $P > 0.121$] with respect to patients without psychiatric comorbidities ($n = 86$; mean craving VAS = 3.1).

Overall, we observed an increased consumption of coffee and cigarettes in about half of the sample. In contrast, symptoms indicative of behavioral addictions and other substances' consumption remained almost stable (Table 2). Changes in life habits are shown in Table 2. Reduced quality of life due to COVID-19 driven by the lockdown was present in 51% of the patients; 25.5% declared no significant changes, and, surprisingly, 23.5% increased quality of life. Low levels of quality of life correlated with high craving scores ($r = -0.226$, $P = 0.005$).

DISCUSSION

In this study, the recruited group of patients with a diagnosis of SUD represents a real-life sample that reflects the Italian addiction scenario, including patients known by local services of seven different representative Italian regions. The evaluation of craving scores during the first phases of the COVID pandemic represents a relevant point, given the presence in that period of strict lockdown restrictions. Although other studies evaluated the psychopathological burden of alcohol and substance users during the strict lockdown[15,16], the specific evaluation of craving represents a novel and relevant aspect, given the crucial role of craving in treatment strategies. Different studies[17,18] have proposed that, together with negative affect states, cognitive factors, interpersonal problems, and lack of coping, craving is one of the leading risk factors for relapse[19]. Our data suggest that craving, regardless of whether determined by substances or behaviors, was globally reduced in a period that could be highly stressogenic. This data was unexpected, and is in contrast with other studies reporting increased levels of anxiety, depression, and psychotic symptoms during the early phase of the COVID-19 pandemic[20,21]. Moreover, in alcohol and substance users, other detrimental factors can act synergistically during the pandemic period: Psychological discomfort from social isolation, restricted freedom, and a quantitative and qualitative reduction in the addiction services' assistance and in the stretching of their service.

In order to explain this controversial data, we propose the hypothesis of a perceived lack of availability of substances and gambling areas. Practical difficulties in sources of supply, such as the unavailability of the usual dealing spaces, may have interrupted the development of the craving priming. Craving is usually determined by the possibility to obtain a substance. When external measures limit this possibility, craving

Table 2 Changes in consumption habits, behavioral addictions, and daily activities

	Reduced		Unchanged		Increased	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Changes in consumption habits						
Alcohol	22	14.4	103	67.3	28	18.3
Coffee	10	6.5	78	51.0	65	42.5
Cigarettes	7	4.6	75	49.0	71	46.4
Cannabis	22	14.4	118	77.1	13	8.5
Cocaine	24	15.7	122	79.7	7	4.6
Opioids	7	4.6	143	93.5	2	1.3
Benzodiazepines and similar medical drugs	7	4.6	120	78.4	25	16.3
Gambling offline	14	9.2	132	86.3	6	3.9
Gambling online	12	7.8	133	86.9	7	4.6
Shopping online	7	4.6	123	80.4	19	12.4
Eating	10	6.5	65	42.5	77	50.3
Videogames	8	5.2	115	75.2	29	19.0
Changes in time spent for the following activities						
Instant messaging with friends and relatives	6	3.9	66	43.1	79	51.6
Social network (for fun, reading)	7	4.6	72	47.1	73	47.7
Video calls with friends and relatives	8	5.2	60	39.2	84	54.9
Collecting online information about the current situation	9	5.9	81	52.9	62	40.5
Old and new hobbies	14	9.2	75	49.0	63	41.2
Sports	30	19.6	74	48.4	48	31.4
Watching movies, TV shows	9	5.9	51	33.3	92	60.1
Watching pornographic material	12	7.8	108	70.6	32	20.9
Hours of sleep each day	27	17.6	42	27.5	83	54.2

itself could be dramatically reduced, as the case of the strict lockdown. Second, we hypothesize the presence of decreased social pressure on a group of subjects who are usually excluded and stigmatized. Social exclusion is indeed a psychosocial stress factor[22] that can increase craving and drug use[23]. As social identification is the self-definition of a person in terms of group membership[10], the period of lockdown because of the COVID-19 pandemic can favor personal feelings of being part of a group facing a common danger and sharing a common fate. Therefore, this new social identity might overshadow the sense of exclusion and rejection in the abuser, ultimately with the positive outcome of reducing craving and substance abuse. This possibility is consistent with data from a survey released by the Israel Democracy Institute that showed how the sense of belonging and unity increased during the COVID-19 outbreak among groups usually sidelined[24]. In this direction, the use of a specific strategy such as telepsychiatry acquires great importance for careful monitoring of the patient's clinical and psychopathological conditions, in order to prevent relapses and to promote social integration[25].

Our data also indicates that residential treatment in containment facilities during the quarantine is an effective procedure that positively impacts craving levels, probably reinforcing the first hypothesis regarding the unavailability of the substance as a means to reduce craving.

In line with other studies, our data showed an increase in the consumption of coffee and cigarettes. Increased cigarette use could be explained as a natural response to stressful events, especially as a consequence of depressive symptoms; the consumption of coffee could be determined by the tendency towards sugary foods and drinks, in order to find quick relief in stressful times[26,27].

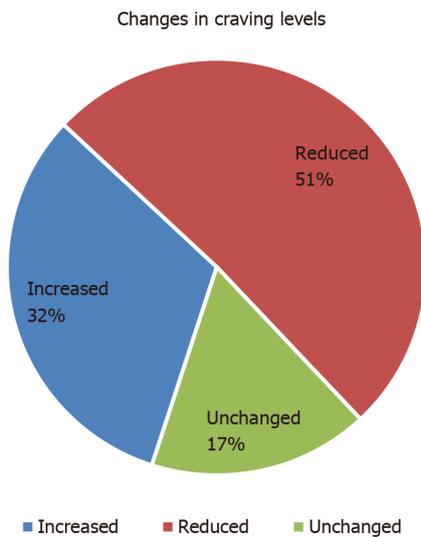


Figure 1 Changes in the levels of craving for the primary substance of abuse/gambling among 153 addicted subjects.

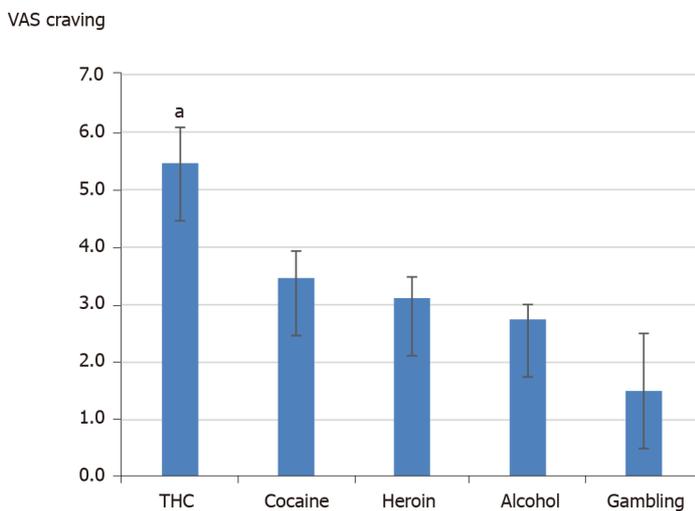


Figure 2 Craving visual analogue scale during quarantine period, with significantly higher craving for tetrahydrocannabinol vs other substances/gambling (ANOVA with Duncan post-hoc test; $^aP < 0.05$; means and standard errors of means). VAS: Visual analogue scale; THC: Tetrahydrocannabinol.

It is also interesting to note that a relevant part of the sample reported reduced quality of life during the strict lockdown, with a negative correlation between craving and perceived quality of life. This data leads us to hypothesize that despite a substantial reduction in the perceived quality of life, the levels of craving have in any case been reduced, as a counter-proof of how much the unavailability of the substance and the increase in social integration may have had a direct positive effect on the reduction of craving.

Limitations

The main limitation of our study is the high prevalence of cocaine abusers. This demographic feature is different from other treatment-seeking cohorts where alcohol is generally the main substance of abuse. This discrepancy is probably because our recruitment centers are specialized in the treatment of cocaine use disorder. Another limitation of the study is the use of a VAS instead of validated scales. We chose to use VAS because of its immediacy to homogenize and accelerate the completion of the questionnaire, making it suitable also online during the virtual assessments due to lockdown restrictions. Our results are difficult to generalize because of the brief time of observation, and further studies are needed.

CONCLUSION

Our data suggest that craving was globally reduced in a period that could be highly stressogenic. This unexpected result may be explained by: (1) A perceived lack of availability of substances and gambling areas that interrupted the development of the craving priming; and (2) the presence of a decreased social pressure. Our results can lay the groundwork for future treatment policies in the direction of strategies that limit the availability of the substance and in parallel towards strategies that aim at greater social integration of subjects affected by addiction disorders.

ARTICLE HIGHLIGHTS

Research background

Following the development of the coronavirus disease-2019 (COVID-19) pandemic in Italy, a strict lockdown was imposed from March 9 to May 5, 2020. In the general population, problems such as depression, anxiety, post-traumatic stress symptoms, insomnia, and adjustment disorder symptoms increased. The risks of self-medication through alcohol or psychoactive substances abuse were also increased, as well as the tendency to adopt pathological behaviors, such as gambling and internet addiction.

Research motivation

Substance users and gamblers are groups at risk of developing psychopathological symptoms in a lockdown situation. The phenomenon is likely due to various reasons, including: (1) The limited availability of illegal substances on the black market; (2) the insufficient presence of active treatment programs and the low availability of substitute drugs; and (3) the greater psychopathological susceptibility and lower resilience in a period of reduced economic resources and financial hardship.

Research objectives

The objective of this study was to evaluate the impact of the COVID-19 pandemic and associated containment measures on craving in a group of patients suffering from SUD and/or gambling disorder (GD) who were in treatment in outpatient units or in residency programs as inpatients.

Research methods

In this cross-sectional study, 153 patients completed a structured questionnaire evaluating craving and other behaviors using a visual analogue scale (VAS). In each recruitment center, a clinician introduced the survey to all the eligible subjects. No compensation was provided for participation in the study. Of the 253 subjects recruited, 153 (mean age 39.8; 77.8% male) gave their consent and anonymously completed the questionnaire. Forty-one subjects completed a pencil and paper questionnaire during the interview. The clinician provided an online questionnaire to 112 patients who had virtual assessments due to lockdown restrictions. Questionnaires were anonymous and each subject was identified through a unique code with no other identifying data. Anonymity was maintained by placing the completed questionnaires in a box by the subject himself, so that the clinician could not associate the subject with his/her questionnaire. All participants provided informed consent. The inclusion criteria were: (1) Diagnosis of SUD or GD according to The Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders; and (2) being older than 18 years. The exclusion criteria were: (1) Diagnosis of dementia; and (2) refusal to give informed consent.

Research results

Sixty-seven (43.8%) of the participants reported a comorbid psychiatric condition, especially mood disorders (depression, bipolar disorder) and anxiety. In this subsample, a psychopharmacological treatment was reported by 94% of subjects. The variation in craving between the present and the month before showed VAS-related reductions of craving in 57%, increases in 24%, and no significant change in 19% of the sample. The level of craving was significantly higher ($F = 4.36$; $P < 0.05$) in outpatients ($n = 97$; mean = 3.8 ± 3.1) living in their own home during the quarantine compared with inpatients ($n = 56$; mean = 2.8 ± 2.8) in residential programs. Craving for tetrahydrocannabinol was the greatest (4.94 , $P < 0.001$) among various preferred substances. Patients with a dual diagnosis did not show a significant difference in the levels of

craving [$F(1; 150) = 2.43, P > 0.121$] with respect to patients without psychiatric comorbidities ($n = 86$; mean craving VAS = 3.1). Reduced quality of life due to COVID-19 driven by the lockdown was present in 51% of the patients; 25.5% declared no significant changes, and, surprisingly, 23.5% increased quality of life. Low levels of quality of life correlated with high craving scores ($r = -0.226, P = 0.005$).

Research conclusions

Our data suggest that craving, regardless of whether determined by substances or behaviors, was globally reduced in a period that could be highly stressogenic. This data leads us to hypothesize that despite a substantial reduction in the perceived quality of life, the levels of craving have in any case been reduced, as a counter-proof of how much the unavailability of the substance and the increase in social integration may have had a direct positive effect on the reduction of craving.

Research perspectives

Our results can lay the groundwork for future treatment policies in the direction of strategies that limit the availability of the substance and in parallel towards strategies that aim at greater social integration of subjects affected by addiction disorders.

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