Open Peer Review on Qeios

Drug Use Disorder and Coping Mechanisms Due to COVID-19 Pandemic Measures: A Cross-Sectional Survey

Salah Al Awaidy[1], Mahmood Z. Al Abri, Sitwat Usman Langrial[2], Samir Al Adawi[3], Iman Al Hasani[3], Ronald Wesonga[3]

1 Ministry of Health, Sultanate of Oman
2 Sur University College
3 Sultan Qaboos University

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.

Abstract

Background: The COVID-19 pandemic has presented substance abuse disorder patients with numerous obstacles. There is a scarcity of data on drug use disorder during the COVID-19 pandemic in Arab nations. This study aimed to identify behavioural changes and factors associated with the effect of the COVID-19 pandemic measures among people with substance use disorders in Oman. **Methods:** Survey data on demographic and behavioural factors from a sample of 61 persons with substance use disorder who were admitted to a specialised hospital were studied. Changes in behaviour related to substance use due to the COVID-19 pandemic measures were investigated using potential demographic and modifiable factors. For the specific study evaluation, the variables studied included age, family size, marital status, employment status, suicidal thoughts, and ways of substance abuse, family responsibilities, hospitalisation tendency, and change of behaviour. **Results:** On average, the participants were 31.5 (SD= 6.82, Range: 16-48) years old. The study findings show that the consumption of morphine as the main drug compared to others (OR = 0.03, p=0.003) resulted in a reduction in the odds of feeling increased effects of COVID-19 among individuals with substance use disorder. Furthermore, the increase in effects was significant among the participants who opted to be hospitalised to reduce drug use (OR=9.97, p=0.017) and those who took overdoses (OR=8.17, p=0.008). **Conclusions:** The study indicates that due to the measures taken during the COVID-19 pandemic, individuals with drug use disorders switched to different types of drugs, such as morphine, to reduce the effects of the measures implemented during the COVID-19 pandemic. Furthermore, people with drug use disorders who took overdoses and those hospitalised were more associated with increased effects of COVID-19. The implication of the study findings is that outreach and community-based services should be made more accessible for people with drug use disorders, since this could relieve effects due to a pandemic, as was the case with COVID-19.

Salah Al Awaidy[1,*], **Mahmood Z. Al Abri**[2], **Sitwat Usman Langrial**[3], **Samir Al Adawi**[4], **Iman Al Hasani**[5], and **Ronald Wesonga**[5]

[1] *Health Affairs, Ministry of Health, Muscat, Oman*

[2] *Executive Office of Prevention Committee of Narcotic and Psychotropics, Muscat, Oman*

[3] *Department of Information Systems and Technology, Sur University College, Sur, Oman*

[4] *Department of Behavioural Medicine, College of Medicine and Health Science, Sultan Qaboos University, Muscat, Oman*

[5] *Department of Statistics, College of Science, Sultan Qaboos University, Muscat, Oman*

[*]**Corresponding Author:**

Salah T. Al Awaidy. Email:salah.awaidy@gmail.com

Tel +968 99315063, Fax +968 24946381, P.O. Box 393, PC 100, Muscat, Oman

Keywords: Drug use disorder; Morphine; COVID-19 measures; Lockdown, Outreach programmes, Oman.

1. Introduction

The global Coronavirus pandemic (COVID-19) posed significant healthcare challenges at individual and social-structural levels.[1] Although the epidemic posed a threat to everyone, the COVID-19 pandemic has presented several challenges for people with substance use disorders (SUD), including disruption of treatment services and the likelihood of relapse. Some individuals faced challenges in accessing their preferred drugs due to supply chain disruptions or changes in the illicit drug market.[2][3] This may have driven people to seek alternative or more dangerous drugs, with all the consequences that this may entail.

Individuals with SUD have been associated with an increased risk of communicable infections in the past.[4] It is also well known that people with SUD are more vulnerable to infection by the virus [5] that causes COVID-19 and its consequences due to direct challenges to respiratory health. Furthermore, individuals with SUD who got infected with COVID-19 may have found it more difficult to receive treatment due to not accessing services or simply using healthcare to address the sequelae of COVID-19. Similarly, ongoing social distancing tactics would also have created a distinct difficulty for those who need help to overcome viral infection.

According to the literature, drug intake increased during the COVID-19-related lockout compared to the period before.[6] Between April 2021 and April 2022, the CDC estimates show that more than 99,000 people died from drug overdoses in the first full year of the epidemic in the United States. Furthermore, synthetic opioids such as Fentanyl were responsible for over 75% of deaths due to overdose in the first year of the pandemic.[7] Since the epidemic began in early 2020, a surge in the abuse of numerous other drugs has been observed, including heroin, methamphetamines, and cocaine.[7] According to previous research, drug misuse did increase during the COVID-19-related lockdown compared to the period before.[8] Conceptually, COVID-19 disrupted the normal operation of trends in different behaviors, including among people with drug use disorder. Many developed creative ways of survival to adapt to the new dictated modes of life by using inferior substitutes, some of which resulted in serious side effects. Research on how individuals with SUD cope

during the COVID-19 pandemic is scarce, particularly in the Eastern Mediterranean region and Oman is no exception where recent studies have suggested an upsurge of drug misuse in the country.[8][9][10][11][12] This study aims to address this gap in the existing literature by investigating the experiences of Omanis with SUD during the COVID-19 pandemic.

2. Method

2.1. Data Sources and Sampling

This was a cross-sectional study stemming from the observational analytical arm of an epidemiological study design that used data collected from people with drug use disorders admitted at the Al Massara Hospital, a tertiary care hospital, Muscat Governorate, Oman. The study site is the only tertiary hospital for psychiatry in Oman, with a bed capacity of 221 beds and comprehensive services for people with alcohol and drug misuse.[13]

2.2. Study survey

Survey data on demographic and behavioural factors from a sample of 61 (n = 61) patients admitted to health centres was collected and analysed. The change in behaviour among people with SUD caused by the COVID-19 pandemic was investigated by assessing the following potential factors, including: age, family size, marital status, employment status, suicidal thoughts, way of drug abuse, family responsibility, hospitalisation tendency, and change of behaviour.

A question on the copying mechanism(s) adapted by the study participants was asked to identify the level or extent of the COVID-19 effect. The question was a multiple response type with an option for others to be specified, if such an option was not listed among the response categories.

2.3. Sample size calculation

The sample size of 73 was calculated using the Cochran formula for the unknown population. Based on the assumption that 95% of patients with SUDs were affected by the COVID-19 epidemic, estimates were made at a 95% CI with an acceptable error margin of 5%. The sample size (n) was calculated using the standard sample calculation formula for the proportion.

$$n = \left(\frac{Z^{\alpha}_{2}}{\epsilon}\right)^2 pq = \left(\frac{1.96}{0.05}\right)^2 (0.95)(0.05) = 73$$

The realised sample of 61 of the 73 study participants was enrolled, implying a response rate of 84% was achieved, despite the limitations caused by the unpredictable effects of COVID-19. The study used a questionnaire to collect data from a random sample of consenting patients who reported at the hospital with cases related to drug use disorder until a sample of 61 was obtained.

2.4. Statistical Analysis

Data were analysed using descriptive and inferential statistics by generating frequency tables and Chi-square tests at the bivariate level, while at the multivariate level, the logistic regression model was fitted to assess factors associated with the change in behaviour among people with SUD caused by the COVID-19 pandemic. Associations were determined as being statistically significant at the predetermined 0.05 level of significance. Using the principle of parsimony, only those factors with a *p*-value less than 0.3 at the bivariate level of analysis were selected for inclusion in the logistic regression analysis.[14][15] The factors evaluated were classified as demographic or behavioural, that is, those identified to be directly related to drug use disorder. The rationale for selecting binary logistic regression was its ability to identify and test the hypothesis that there is no relationship between the potential predictors identified and the effect of the COVID-19 pandemic on drug abuse.[16] The study outcome was a binary variable, with two categories, that is indicating COVID-19 effect (1) and No COVID-19 effect (0). All statistical analyses were performed using the R programming language.[17]

The researcher used interview data that was gathered from human individuals. Every patient gave their consent. The research was conducted during the COVID-19 pandemic; therefore, the ethical approval process could not be finalized, however, the institute director still examined and approved the study's execution. Verbal and written informed consent was obtained from each patient. The Helsinki Declaration is upheld by this research.

3. Results

3.1. Description of study participants

A total sample of 61 people with SUD fully responded to the study, which constitutes a response rate of 90%. The majority of them were unemployed (69%, n=42) [Figure 1 (A)], while most of the respondents were single (72%, n=44), the others (28%, n=17) were married or divorced [Figure 1 (B)]. However, 77% (n=47) of participants with drug use disorder (SDU) lived unaccompanied, implying that only 23% (n=14) had at least one family member (Figure (2, C)). Similarly, 77% (n=47) of the participants with drug use disorder did not have descendants. (Figure (2, D)).

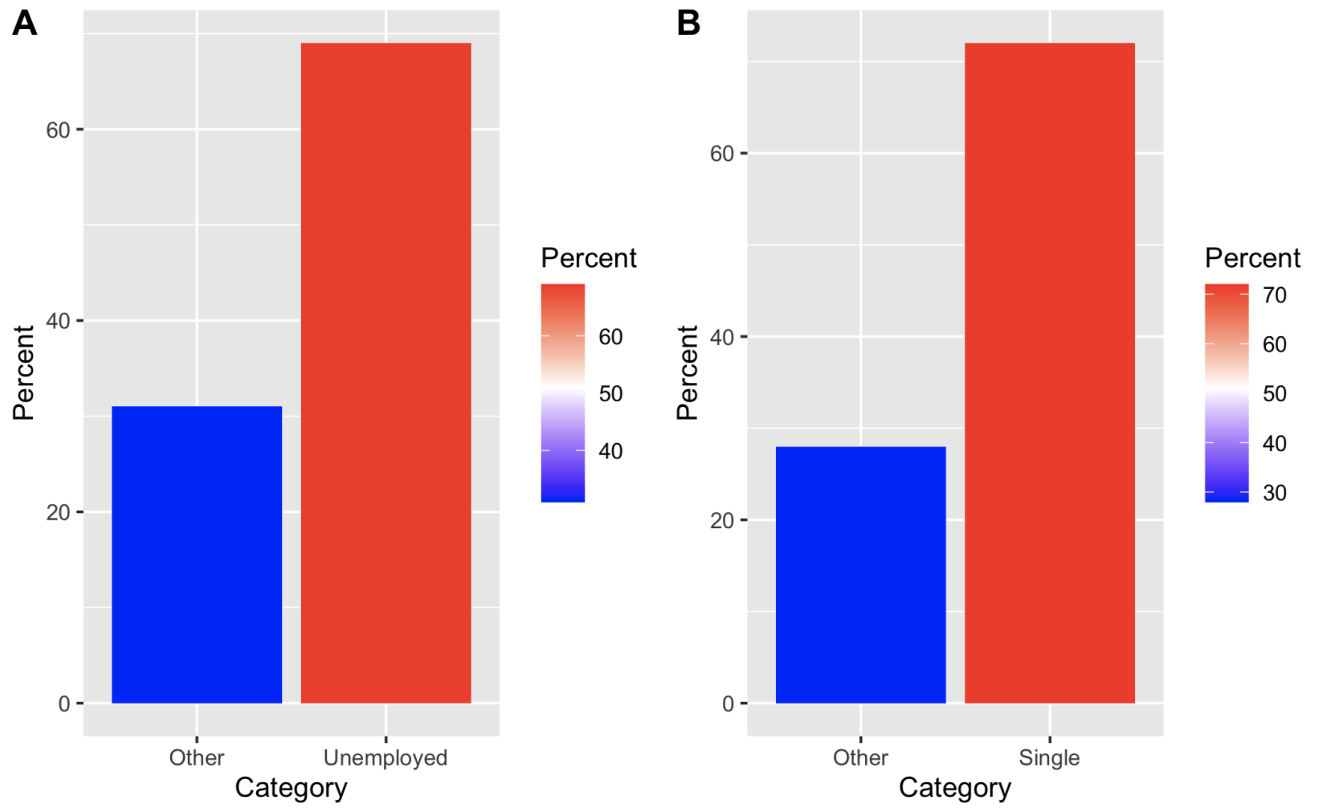

Figure 1. Distribution of Employment Status (A) and Marital Status (B)

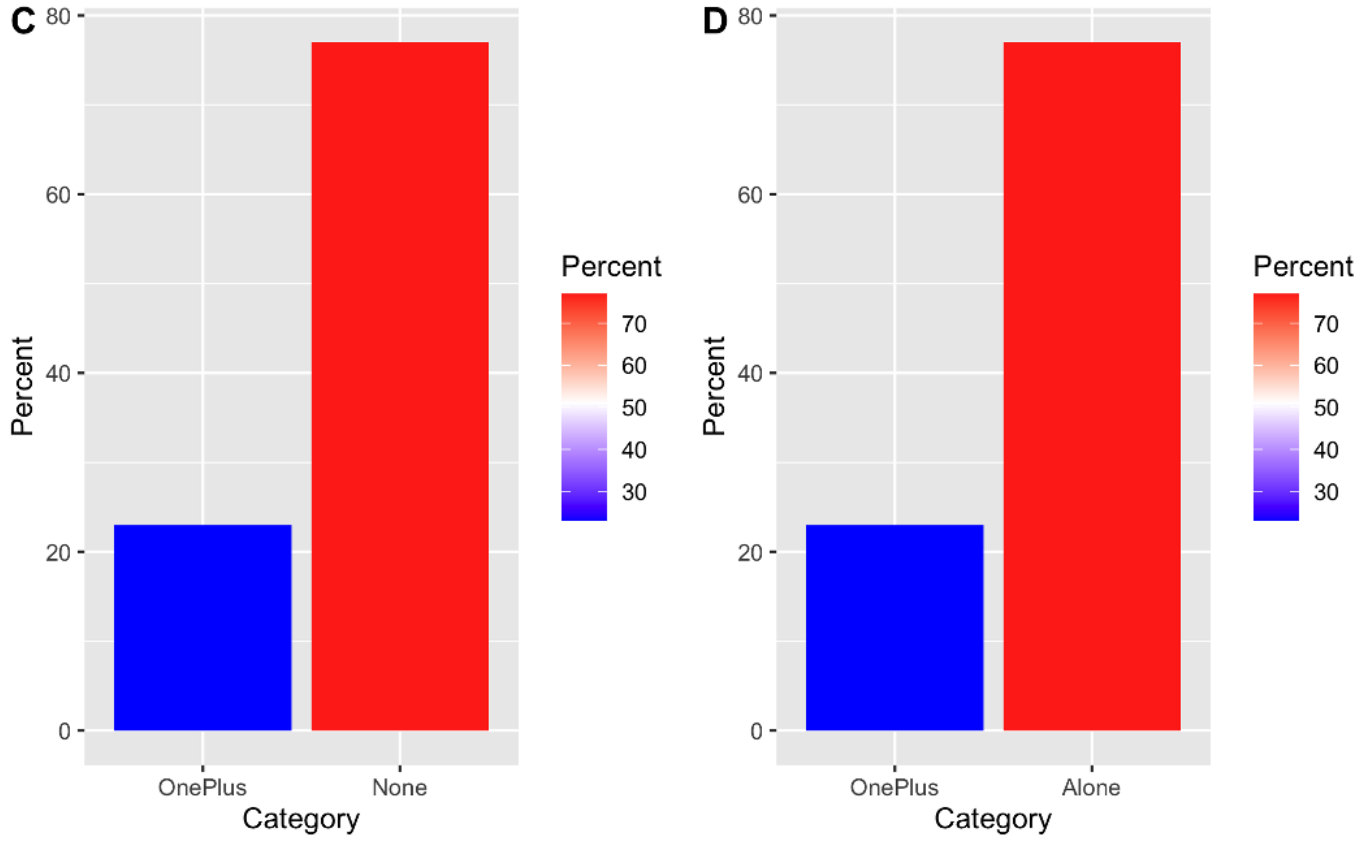

Figure 2. Distribution of Number of Family Members (C) and Number of Sons (D)

Most of the participants (92%, n=56) with drug use disorder used injections to administer drugs compared to all other methods of drug use (Figure (3, E)). Although various types of drugs were used, the main type used among the sampled patients was Morphine (78%, n=48) compared to all other main types. The distribution by the other types of drugs used indicated that 23% (n=14) used Crystal, 32% (n=20) used Hashish and 46% (n=28) used psychotropic drugs, which was found to be a common drug used by people with SUD (Figure (4, G)). The reasons for drug use (Figure 4 (H)) indicate that most of the patients took drugs just to have the experience (66%, n=40), while the rest (34%, n=21) took drugs because of several other factors related to the social influence.

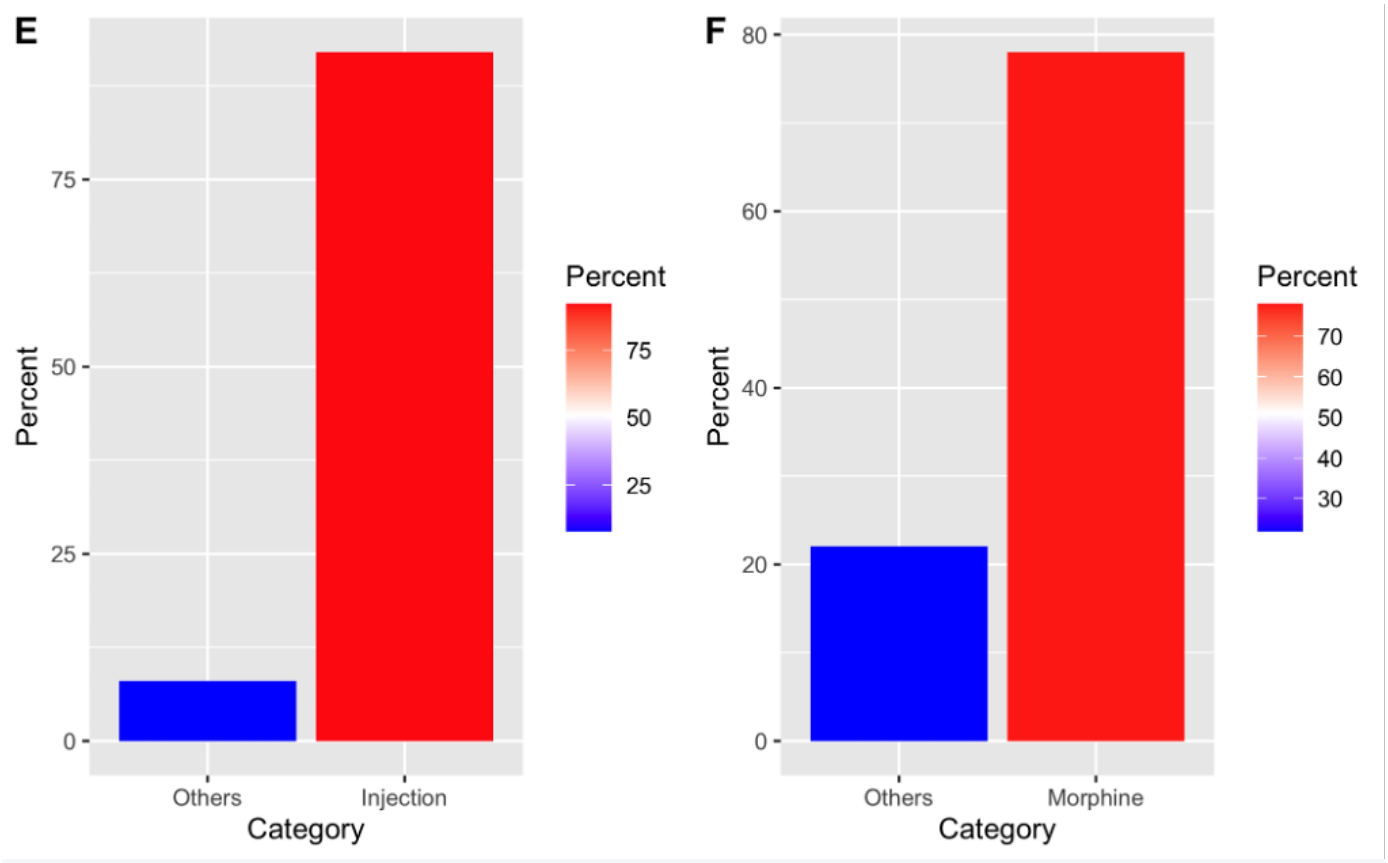

Figure 3. Distribution of Method of Abuse (E) and Major Type of Drug (F)

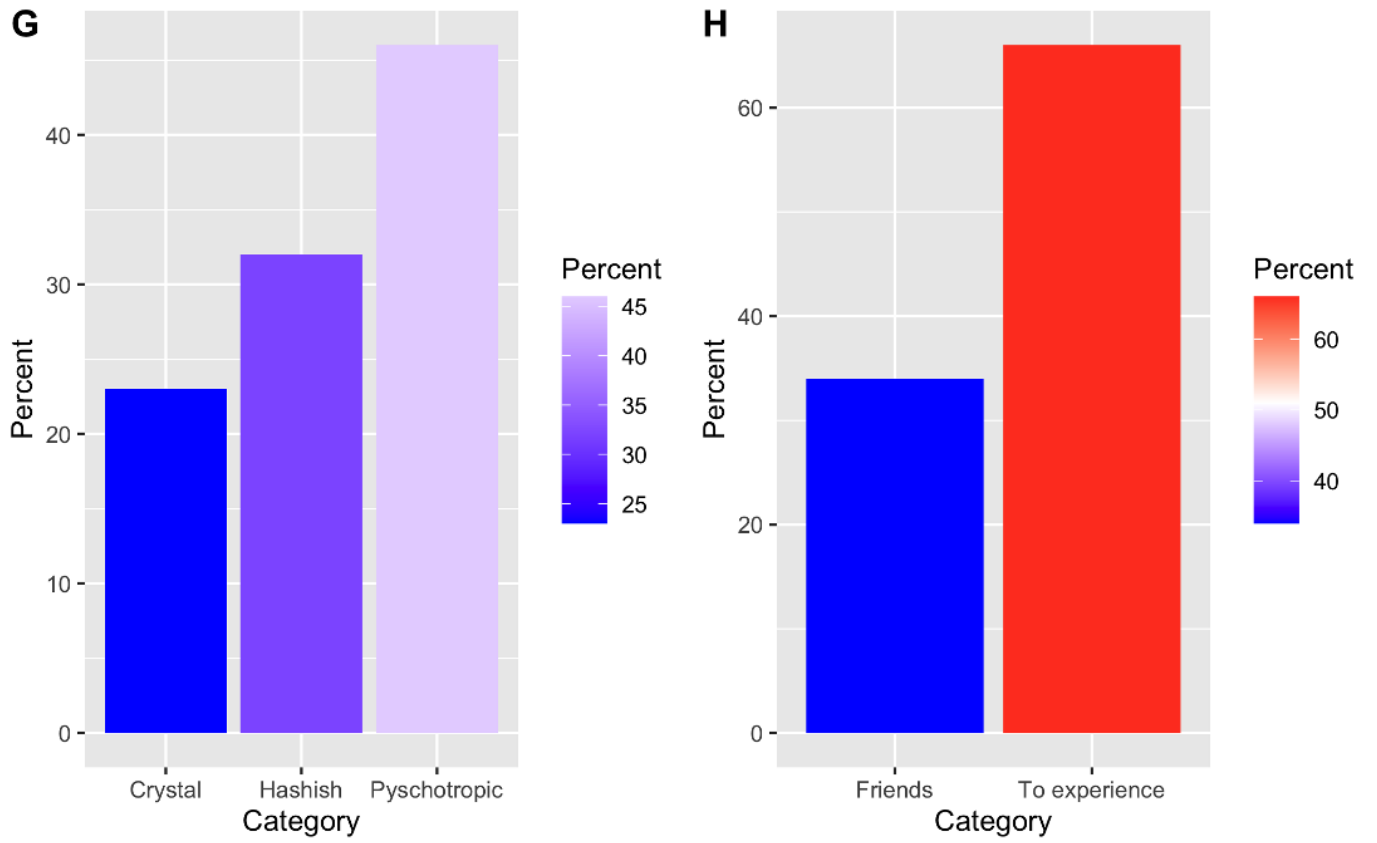

Figure 4. Distribution of Type of Drug (G) and Reason for Drug Abuse (H)

The behavioural changes among participants with drug use disorder, especially during the COVID-19 pandemic are presented [Figure (5)]. Of the total, 41% (n=25) of the individuals with drug use disorder were infected with COVID-19, approximately 50%, n=30 attempted to kill themselves, while 67%, n=41 were hospitalized. Most of the participants with drug use disorder (98%, n=60) tried to take other drugs available and reported that these drugs were generally available during the pandemic (98%, n=60). However, other effective behavioural changes included taking overdose (44%, n=27), sleeping out of home (60%, n=37), escaping from home during drug search (80%, n=49) and some even preferred to report to the concerned healthcare authorities so that they could be helped stop drug abuse (20%, n=12).

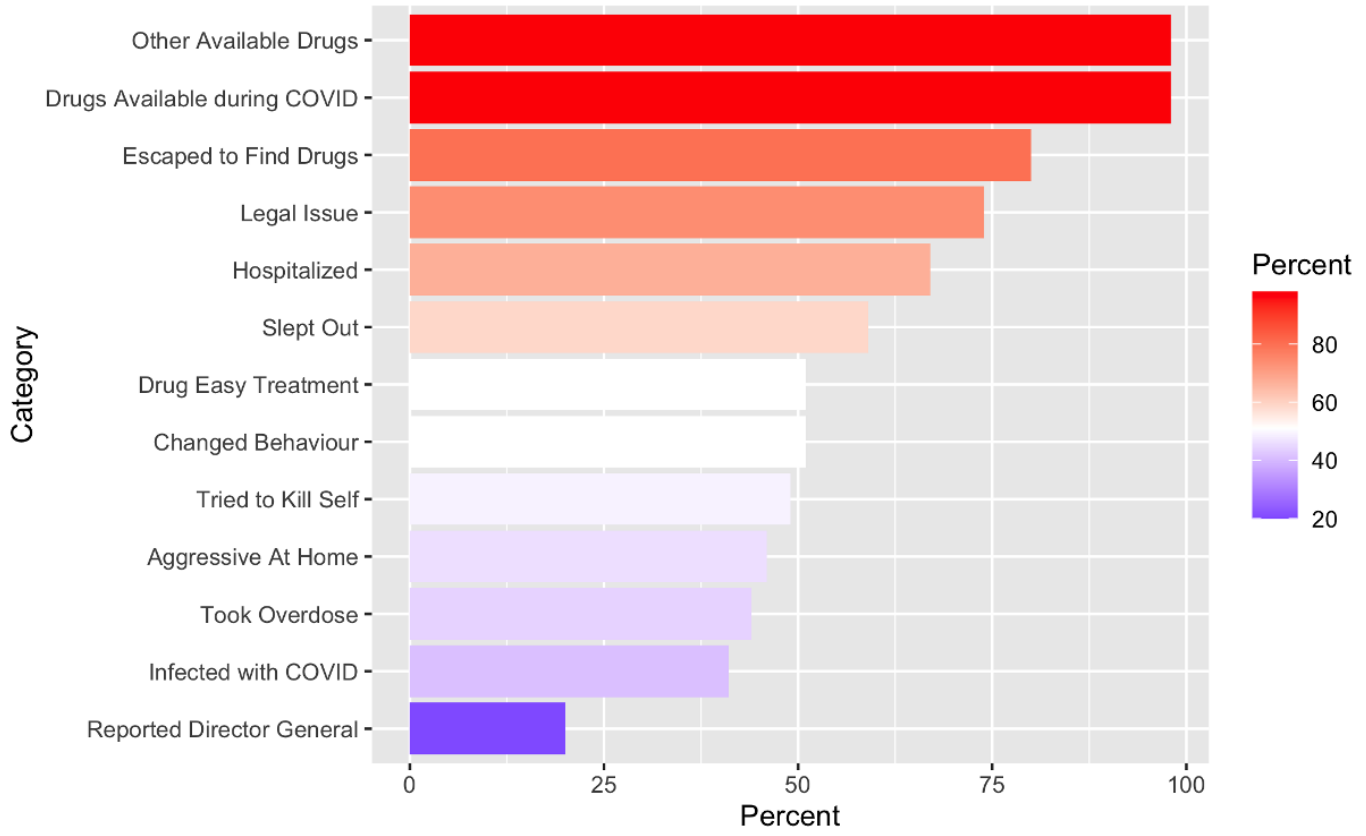

Figure 5. Behavioral changes among patients with drug use disorder

3.2. Modifiable factors associated with the COVID-19 pandemic among persons with SUD

Although the most abused drug was identified as Morphine, our findings suggest that due to the effect of COVID-19, most people with drug use disorder switched to other drugs (n=14, 45% versus (n=17, 55%). Similarly, among those who reported the effect of COVID-19, there was an increase in escaping home during lockdowns to find drugs (n=29,94%), preference for hospitalisation to reduce drug abuse (n=25,81%) and taking overdose (n=19,61%). The other factors, though not statistically significant, resulting from the COVID-19 effect among participants with drug use disorder include; having suicidal thoughts and exploring different channels to obtain drugs.

In Table 2 we present detailed findings on the effect of the COVID-19 pandemic on drug use and the associated factors among patients with drug use disorder using the logistic regression model. As indicated before, the dependent variable was whether COVID-19 affected the way people with drug use disorder behaved, where 51% (n=31) of the respondents reported an effect. Our proposed model predictors included all the factors presented in Table 1 with probability values less than 0.3. In the final model, taking Morphine as the main drug compared to other drugs (β= -3.50, p=0.003), resulted in a significant reduction in the chances of feeling the effect of COVID-19, while the increased effects were significant between these two predictors, that is; being hospitalised to reduce drug abuse (β= 2.30, p=0.017) and overdose (β= 2.10, p=0.008). However, these findings were the same in magnitude and direction for both the proposed and final models, respectively.

Table 1. Factors Associated with effect of COVID-19 among Persons with Drug Use Disorder

Characteristic	No, COVID-19 Effect, N = 30	Yes, COVID-19 Effect, N = 31[1]	p- value[2]
Tried to kill self	12 (40%)	18 (58%)	0.200
Drug Type			0.025
Other	8 (27%)	17 (55%)	
Morphine	22 (73%)	14 (45%)	
Marital Status			0.300
Other	10 (33%)	7 (23%)	
Single	20 (67%)	24 (77%)	
Drugs available in covid-19	29 (97%)	31 (100%)	0.500
Escape to find drugs	20 (67%)	29 (94%)	0.008
Sleep out to find drugs	15 (50%)	21 (68%)	0.200
Hospitalized to reduce drug effect	16 (53%)	25 (81%)	0.023
Took over dose	8 (27%)	19 (61%)	0.006
Legal issue	20 (67%)	25 (81%)	0.200
Infected with COVID-19 due to Drug Abuse	14 (47%)	11 (35%)	0.400

[1] *n (%)*

[2] *Pearson's Chi-squared test; Fisher's exact test*

Table 2. Modifiable Factors among Persons with Drug Use Disorder during COVID-19 pandemic

DV: YES, COVID-19 Effect	Proposed Model			Final Model		
Characteristic	Parameter	95% CI[1]	p-value	Parameter	95% CI[1]	p-value
Main Drug						
Other	-	-		-	-	
Morphine	-3.5	-6.2, -1.6	0.002	-3.5	-6.2, -1.6	0.003
Tried to kill self						
no	-	-		-	-	
yes	1.0	-0.42, 2.6	0.200			
Marital Status						
Other	-	-		-	-	
Single	1.7	0.10, 3.5	0.050	1.6	0.00, 3.4	0.066
Hospitalized to reduce Drugs						
no	-	-		-	-	
yes	2.0	0.21, 4.2	0.045	2.3	0.60, 4.5	0.017
Escaped to Find Drugs						
no	-	-		-	-	
yes	1.4	-0.44, 3.8	0.200			
Took over dose						
no	-	-		-	-	
yes	1.9	0.37, 3.7	0.022	2.1	0.67, 3.8	0.008
Sleep out to find drugs						
no	-	-		-	-	
yes	1.4	-0.05, 3.0	0.071	1.3	-0.03, 2.9	0.067

CI = Confidence Interval, Reference category

4. Discussions

Substance use disorder (SUD) develops over long-term administration of various ‘addictive’ drugs, which can lead to physical, psychological, and social effects.[18][19] The negative effects of SUD can become even more difficult during a pandemic due to restrictions on mobility. This can make it harder for SUD individuals to manage their condition and obtain the necessary support and treatment. It underscores the importance of addressing the unique needs of this population during public health crises such as the COVID-19 pandemic.

This study aimed at exploring factors associated coping strategy among Omani with SUD during COVID-19 pandemic and to identify the shift in the potential factors associated with drug usage. We tested the following potential factors against the COVID-19 effect, which are; the main type of drug use, suicidal thoughts, marital status, hospitalization, escaping home during lockdowns to find drugs, taking an overdose and sleeping out to find drugs. The choice of these factors was made based on several investigations carried out by other studies.[20][21][22] Among these factors, the following were found to

have significantly changed among persons with drug use disorder in Oman; the main drug, hospitalization and overdose. According to the findings, individuals with SUD who took Morphine as their main drug were three (OR=0.03, p=0.003) times less likely to report that COVID-19 affected their pattern of abuse than those who took other drugs.[19][23] This finding implies that the source of supply of Morphine remained almost unchanged, but that of other drugs was reduced, hence the observed effect. On the other hand, when SUD patients are hospitalised, the chances of drug abuse are reduced. The study revealed that hospitalised individuals with SUD were 9.97 (OR=9.97, p=0.017) times more likely to have been affected by COVID-19 than those not affected.[18][20] Furthermore, the overdose was found to be directly associated with the effect of COVID-19 in such a way that those who took the overdose were 8.17 (OR=8.17, p=0.008) times more likely to have been affected by COVID-19 than those who did not.[19][24] Taking an overdose was associated with quenching the drug thirst now such that one takes longer to need more. It is a common technique adopted by individuals with SUD during times of drug scarcity.

4.1. Study limitation

The study's sample size may appear limited at first glance. However, it is worthwhile to note that the choice of a smaller sample was deliberate and well-suited to the study's objectives. Instead of aiming for a larger and more general representation of the national population with SUDs, the study specifically focused on individuals who were admitted to SUD treatment. This precise targeting allowed for a closer examination of the behaviors and factors related to this specific group. Second, the outcome measures were not derived from the established questionnaire. It was specifically designed to suit socio-cultural issues relevant to Oman. Future studies should examine the present survey for its psychometric properties. Thirdly, it is important to note that this study is facility-based, which means it focused on individuals within a healthcare setting. For future research, there is an opportunity to expand the scope by including a broader representation of the community. This is especially pertinent because a significant portion of people with SUD tend to remain outside the purview of healthcare services. Expanding research beyond healthcare facilities could provide a more comprehensive understanding of the prevalence and behaviours of SUD in the general population.

5. Conclusion

The specific objective of our study was to identify behavioural changes and factors associated with the effect of the COVID-19 pandemic among people with drug use disorder in Oman. Several potential factors related to the effect of COVID-19 were tested, including; the main type of drug abuse suicidal thoughts, marital status, hospitalisation, escape home during lockdowns to find drugs, taking an overdose, and sleeping out to find drugs. Our study identifies that individuals with SUD who took Morphine as their main drug were less likely to report that COVID-19 affected their pattern of drug abuse. However, behavioural factors such as hospitalization and taking overdose were very likely to impact a significantly positive on persons with SUD due to COVID-19 pandemic. In conclusion, one would recommend to promote community-based services and making them more accessible to patients with drug use disorder during the COVID-19 pandemic. Availing other drugs through outreach programmes would probably reduce the tendencies towards overdose as

well as hospitalization, and subsequently a reduction in the effect due to any future pandemics among persons with drug use disorder.

Statements and Declarations

Acknowledgements

The authors wish to acknowledge all those who were instrumental in the data collection process.

Data Sharing Statement

The datasets used in study are available from the corresponding author upon reasonable request.

Funding

No funding used

Disclosure

The authors report no conflicts of interest in this work.

References

1. ^*Halms, T., Strasser, M., Kunz, M., & Hasan, A. (2022). How to reduce mental health burden in health care workers during COVID-19? – a scoping review of guideline recommendations. Frontiers in psychiatry, 12, 770193. doi: 10.3389/fpsyt.2021.770193*
2. ^*Narasimha VL, Butner JL, Hanafi E, Farokhnia M, Bhad R, Chalabianloo F, et al. Harm reduction and abstinence-based models for treatment of substance use disorders during the COVID-19 pandemic: a global perspective. BJPsych International. 2022 Aug;19(3):66-69. doi: 10.1192/bji.2022.1.*
3. ^*Volkow, N. D. (2020). Collision of the COVID-19 and addiction epidemics. Annals of internal medicine, 173(1), 61-62. doi: 10.7326/M20-1212*
4. ^*McCarthy, N. L., Baggs, J., See, I., Reddy, S. C., Jernigan, J. A., Gokhale, R. H., Fiore, A. E. (2020). Bacterial infections associated with substance use disorders, large cohort of United States hospitals, 2012–2017. Clinical Infectious Diseases, 71(7), e37-e44. doi: 10.1093/cid/ciaa008*
5. ^*Hyman, S.E.; Malenka, R.C.; Nestler, E.J. Neural mechanisms of addiction: The role of reward-related learning and memory. Annu. Rev. Neurosci. 2006, 29, 565–598. doi: 10.1146/annurev.neuro.29.051605.113009*
6. ^*Mathieu, C., Pambrun, E., Bénard-Laribière, A., Noize, P., Faillie, J. L., Bezin, J., et al. (2022). Impact of the COVID-19 pandemic and its control measures on cardiovascular and antidiabetic drugs use in France in 2020: A nationwide*

repeated cohort study. European Journal of Epidemiology, 37(10), 1049-1059. doi: 10.1007/s10654-022-00912-2

7. [a, b]*Zaami, S., Marinelli, E., & Varì, M. R. (2020). New trends of substance abuse during COVID-19 pandemic: an international perspective. Frontiers in Psychiatry, 11, 700. doi: 10.3389/fpsyt.2020.00700*
8. [a, b]*Al-Hinaai H, Al-Busaidi I, Al Farsi B, Al Saidi Y. The Prevalence of Substance Misuse and its Effects among Omani College Students: A Cross-sectional Study. Oman Med J. 2021 Jan 31;36(1):e224. doi: 10.5001/omj.2021.04.*
9. [^]*Al Abri MZ, Farag MAH, Al Mosawi AS, Al Awaidy ST. Socio-Demographic Characteristics and Patterns of Substance Use Disorder in Oman: A retrospective study of the National Registry Surveillance Programme between 2004 and 2018. Sultan Qaboos Univ Med J. 2020 Nov;20(4):e296-e303. doi: 10.18295/squmj.2020.20.04.004.*
10. [^]*Ahmed F, Zhao F, Faraz NA. How and When Does Inclusive Leadership Curb Psychological Distress During a Crisis? Evidence From the COVID-19 Outbreak. Front Psychol. 2020 Aug 6;11:1898. doi: 10.3389/fpsyg.2020.01898.*
11. [^]*Murthy, P., & Narasimha, V. L. (2021). Effects of the COVID-19 pandemic and lockdown on alcohol use disorders and complications. Current opinion in psychiatry, 34(4), 376.*
12. [^]*Al Wahaibi N, Al Lawati A, Al Ruqeishy F, Al Khatri A, Al-Farsi Y, Juma TMA, et al. The characteristics and patterns of utilization of healthcare services among Omanis with substance use disorders attending therapy for cessation. PLoS One. 2019 Jan 31;14(1): e0210532. doi: 10.1371/journal.pone.0210532.*
13. [^]*Al Massara hospital, Oman. https://www.moh.gov.om/en/web/almassara-hospital*
14. [^]*Mickey, R. M., & Greenland, S. (1989). The impact of confounder selection criteria on effect estimation. American journal of epidemiology, 129(1), 125-137. doi: 10.1093/oxfordjournals.aje.a115101*
15. [^]*Bendal, R. B., & Afifi, A. A. (1977). Comparison of stopping rules in forward regression. J Am Stat Assoc, 72(357), 46-53. doi.org/10.2307/2286904*
16. [^]*Schober, P., & Vetter, T. R. (2021). Logistic regression in medical research. Anesthesia and analgesia, 132(2), 365. doi: 10.1213/ANE.0000000000005247*
17. [^]*Ihaka, R., & Gentleman, R. (1996). R: a language for data analysis and graphics. Journal of computational and graphical statistics, 5(3), 299-314. doi.org/10.2307/1390807*
18. [a, b]*Listos J, Łupina M, Talarek S, Mazur A, Orzelska-Górka J, Kotlińska J. The mechanisms involved in morphine addiction: an overview. International journal of molecular sciences. 2019 Sep 3; 20(17):4302. doi: 10.3390/ijms20174302*
19. [a, b, c]*Wei Y, Shah R. Substance use disorder in the COVID-19 pandemic: a systematic review of vulnerabilities and complications. Pharmaceuticals. 2020 Jul 18;13(7):155. doi: 10.3390/ph13070155*
20. [a, b]*Mellis AM, Kelly BC, Potenza MN, Hulsey JN. Factors associated with drug overdoses during the COVID-19 pandemic. Journal of Addiction Medicine. 2022 Jan 1;16(1):e67-9. doi: 10.1097/ADM.0000000000000816.*
21. [^]*Wang QQ, Kaelber DC, Xu R, Volkow ND. COVID-19 risk and outcomes in patients with substance use disorders: analyses from electronic health records in the United States. Molecular psychiatry. 2021 Jan;26(1):30-9. doi: 10.1038/s41380-020-00880-7*
22. [^]*Spagnolo PA, Montemitro C, Leggio L. New challenges in addiction medicine: COVID-19 infection in patients with alcohol and substance use disorders—the perfect storm. American Journal of Psychiatry. 2020 Sep 1;177(9):805-7. doi: 10.1176/appi.ajp.2020.20040417*

23. ^*Palamim CV, Boschiero MN, Faria AG, Valencise FE, Marson FA. Opioids in COVID-19: Two Sides of a Coin. Frontiers in Pharmacology. 2021;12. doi.org/10.3389/fphar.2021.758637*

24. ^*Wakeman SE, Green TC, Rich J. An overdose surge will compound the COVID-19 pandemic if urgent action is not taken. Nature medicine. 2020 Jun;26(6):819-20. doi: 10.1038/s41591-020-0898-0*