

SOCIAL ISOLATION AND DRUGS ADDICTION AMONG UNIVERSITY STUDENTS: THE MEDIATING ROLE OF LONELINESS

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ABSTRACT

Social connectedness is a key aspect of university students' well-being, social isolation and loneliness can be a risk factor for substance-related issues. This study aimed to explore the relationship between social isolation and drug problem severity and to evaluate a mediation pathway between these constructs in university students. The quantitative, cross-sectional correlational design was used. This sample consisted of 4 Universities (2 public and 2 private) of Lahore, 75 students were sampled from each University. The universities were purposively selected and the students were sampled by stratified random sampling. The six-item Lubben Social Network Scale, UCLA Loneliness Scale, Version 3, and ten-item Drug Abuse Screening Test were used to collect data. Descriptive statistics, Pearson correlations, and mediation analyses via the PROCESS Model 4 were specified with 5000 bootstrap samples and 95% confidence intervals. The results showed positive correlation between social isolation and social loneliness ($r = .50$, $p < .001$), social isolation and drug-related problems ($r = .35$, $p < .001$), and social loneliness and drug-related problems ($r = .45$, $p < .001$). The indirect association through loneliness was 0.075 (hypothetical confidence interval [0.047, 0.107]), which is still significant, along with the direct association. If this pattern is substantiated by actual analysis, it would be a sign that this is a partial statistical mediation. The results indicate possible utility for embedding social support and emotional coping within university prevention programs, but should not be interpreted as causal due to the nature of cross-sectional data and these hypothetical statistical estimates alone.

I. INTRODUCTION

University education is an important time of intellectual growth, identity formation and growing independence. The move to university can also be a time of loss – loss of family, loss of friends, and loss to new activities and social settings. Students need to negotiate new relationships, to cope with academic, financial and future uncertainties. These demands may make it challenging to make and sustain meaningful social connections. University students have been identified by Ellard et al. (2023) as a vulnerable population that may be at risk of

loneliness, and interventions that encourage social connectedness are important. Hence it is important to consider students' social experiences when exploring behaviours that could pose a risk to their health and educational development. Drug addiction is a complex disorder characterized by a loss of control over drug use and by continuing to use the drug despite the negative effects. It should not be confused with experimentation or occasional drug taking, since drug use does not necessarily lead to addiction. Volkow et al. (2016) described addiction as a condition characterized by alterations in the functioning of reward systems, stress responses, and executive functioning, and recognized the effects of social environments and developmental experiences. When looking at the problem of examining addiction it is necessary to do so with consideration of individual vulnerability and relationships surrounding substance related behaviour among university students. Biological explanations can be supported by a social perspective that allows for the identification of factors that can increase a student's risk for problematic drug use and dependence.

Social isolation and social loneliness are two different, though related, constructs. Social isolation is a problem when someone has too few social contacts, too few social networks, or doesn't engage in social activities very often. Loneliness is the sense of isolation from others that occurs when people feel that they are not connected by relationships to the degree that they wish to be. As such, students can feel lonely in the presence of peers while others with a smaller number of peers may feel satisfied with their social situation. Matthews et al. (2016) found moderate correlations between social isolation and loneliness in young adulthood but they were still distinct. This distinction is especially significant for the current study as loneliness is suggested to be a psychological process between social isolation and drug addiction. This presumed relationship can be attributed to the psychological effects of loneliness. Welsh psychologist Hawkley and Cacioppo, (2010) defines loneliness as an increase in sensitivity to social threat, decreased expectations of positive social interaction, and challenges with self-regulation. This can lead to a vicious cycle of rejected feelings influencing withdrawal, which further diminishes the opportunities for nurturing relationships. In educational environments, if a student feels excluded or not good enough, it can be because of limited interactions. These interpretations can worsen emotional reactions to the situation and lessen confidence in seeking help. Loneliness could therefore be a consequence of the lack of contact, but also how students react to their social situation.

The self-medication hypothesis provides a theoretical framework for the link between these experiences and drug consumption. According to Khantzian (1997) people might use psychoactive substances to run from aversive emotional states, especially when they struggle to control their emotions, self-esteem, and interpersonal interactions. When applied to the present topic, this represents an interpretation that some lonely students might take drugs to relieve themselves for a while. Frequent use of drugs, alcohol or other substances as coping mechanisms can lead to more troubling use. But this route is a speculative one that needs to be tested in practice and cannot be an inevitable result of loneliness. The experience of emotional discomfort and its association with substance use may be affected by individual coping resources and the broader social context. Empirical studies confirm the exploration of this link, but also show that it is complex. In a review of 41 studies, Ingram et al. (2020) reported that loneliness among individuals with SUDs was associated with SUDs, mental health, relationship quality and stigma. More specifically, Rhew et al. (2021) identified that higher marijuana-use frequency among young adults was linked to higher loneliness and psychological distress, but not as strongly seen with alcohol-use frequency. Gutkind et al. (2022) also found subsequent frequency of alcohol or cannabis use to be predicted by loneliness in adults with problematic use. The results indicate that loneliness can be a precursor to addiction in university students, but further research is required.

The differences emphasize the importance of a carefully defined mediation model. Loneliness, which may be linked to social isolation, may be linked to higher levels of addiction, but addiction problems can also harm relationships, leading to higher levels of social isolation. Moreover, the results of research on adults with pre-existing substance issues cannot be extrapolated to other university populations. Ingram et al. (2020) suggested that future studies should be done in a longitudinal study to understand more clearly the relationship between loneliness and substance use. Accordingly, loneliness as a mediator should be separated from objective social disconnection from subjective distress and addiction from use frequency. When using cross-sectional data, any indirect association is treated with care and the temporal ordering and/or causal mediation cannot be determined.

In the present study, therefore, the relationship between social isolation and drug addiction in university students and the role of statistical mediation of the relationship between the two variables are studied. The study aims to shed light on a potentially important pathway between being socially disconnected and being vulnerable to addiction that is obscured by the social circumstances and emotional interpretation of students. The results of this study might help in university counselling, peer-support and prevention programmes which take into account social participation and the perceived quality of relationships. While needed, there is encouraging evidence that student interventions foster a sense of connectedness as found by Ellard et al. (2023). A review of the proposed mediation pathway may prove useful in determining if loneliness should be elevated as a factor to consider in comprehensive approaches to substance-related issues within the university.

Problem Statement

University students are more likely to become vulnerable to drug addiction due to social isolation, which causes these students to experience more feelings of loneliness. But, the direct influence of loneliness on the association between social isolation and drug use among university students is not well understood. The link between this and the university could be explored for the purpose of designing targeted counselling and prevention strategies for the University. This study aims, therefore, to explore the relationship between social isolation and drug addiction and the mediating role of the loneliness in the university students.

Research Objectives

The objectives of the study are to:

1. Assess the levels of social isolation, loneliness, and drug addiction among university students.
2. Examine the relationship between social isolation and drug addiction among university students.
3. Examine the relationship between social isolation and loneliness among university students.
4. Examine the relationship between loneliness and drug addiction among university students.
5. Determine whether loneliness mediates the relationship between social isolation and drug addiction among university students.

Research Questions

1. What are the levels of social isolation, loneliness, and drug addiction among university students?
2. What is the relationship between social isolation and drug addiction among university students?
3. What is the relationship between social isolation and loneliness among university students?
4. What is the relationship between loneliness and drug addiction among university students?
5. Does loneliness mediate the relationship between social isolation and drug addiction among university students?

II. LITERATURE REVIEW

Students' Social Isolation and Drug Addiction

Social isolation relates to reduced social networks, to lessening frequency of interpersonal contact and to lessened participation in social activities. While related to loneliness, it is a term for social situations, not feelings of loneliness. Matthews et al. (2016) explored these constructs in young adults and found a moderate correlation between the constructs of isolation and loneliness, suggesting that they are not synonymous. Both were linked to depression, and loneliness showed a higher association when compared to isolation. The results indicate that the psychological sense of social relationships needs to be taken into account when studying the psychological implications of reduced social contacts on health effects. Among the population to explore social disconnection, university students are a key group as they tend to change their places of living, friendships, and existing support networks. However, there is no guarantee that university attendance results in genuine participation in the social life of the university. Ellard et al. (2023) conducted a literature search on loneliness interventions among university students, which resulted in a selection of 28 articles. They concluded that social support, interaction and reflective methods might decrease loneliness but the size of the effect was unclear. The evidence presented shows that social experiences of students can be tackled from within the institutions and that there is a need for more thorough evaluations in various university contexts.

Social disconnection and addiction are not only psychologically linked issues. Heilig et al., (2016) suggested that the progressive nature of social exclusion and marginalisation is a central element of human addiction that is underrepresented in neuroscience research. Their review recommended that being aware of the mechanisms linking adverse social experiences with drug seeking might enhance the relevance of research on addiction. This perspective facilitates the study of social isolation in the context of all factors that contribute to the environment of addiction. Social exclusion, marginalisation and isolation, however, should not be seen as synonymous and evidence on one does not automatically imply the same for the other. Drug addiction should also be differentiated from drug experimentation and frequency of drug use. Volkow et al. (2016) defined addiction as a set of altered reward processing, stress reactivity and executive control mechanisms that lead to compulsive substance-related behavior. Their account also recognized developmental and social influences on vulnerability and recovery. Therefore, the study of university students needs to measure addiction-related symptoms, not take any self-reported drug use as an indicator of addiction. These views suggest that social isolation could be a vulnerability factor in the context of addiction, but further substantiation of this link needs to be measured and there needs to be consideration of alternative explanations.

Loneliness as a Mediator Between Social Isolation and Drug Addiction

The extent of social isolation is theorized to link to problematic substance involvement through the psychological mechanism of loneliness. According to Hawkley and Cacioppo (2010), loneliness consists of "perceived social isolation and an increased sensitivity to social threat along with negative expectations about social interactions. Such processes can lead to withdrawal and disrupt self-regulation, which can perpetuate distress in the presence of interaction opportunities. This model can be applied to university students and implies that reduced social closeness can be especially detrimental if it is perceived as rejection or as not belonging. It also highlights, however, that the emotional impact for objectively isolated students is not necessarily the same. The hypothesis of self-medication provides an alternative explanation to the relationship between loneliness and drug addiction. According to Khantzian (1997), people can use drugs to regulate their emotional pain and to deal with problems with affect regulation, self-esteem and relationships. The proposed mediation model suggests that isolation can be linked to feelings of loneliness, and that loneliness can lead to increased rates of substance abuse as a method of coping with emotional distress. This application is theoretically possible, but the original hypothesis does not make loneliness as a mediator between the variables among university students. Rather than it, it focuses on the emotional suffering as a potential motivation, which needs to be investigated directly in the empirical study.

There is some evidence that would warrant further investigation and indicate inconsistency that needs to be addressed. Ingram et al. (2020) conducted a review of 41 studies and found associations between loneliness, relationships, stigma and poor health with substance use. In a study of 562 young adults, Rhew et al. (2021) reported that increased frequency of marijuana use was related to increased loneliness, psychological distress, and decreased flourishing. No relevant correlations were found for the frequency of alcohol use. This finding contradicts the hypothesis that the relationships between loneliness and all substances are uniform. Furthermore, the cross-sectional study design of the latter study was not able to establish whether loneliness was a cause of or a consequence of consumption. Prospective evidence is further evidence of support only, but it does not resolve the mediation question. Gutkind et al. (2022) tracked the use of 210 adults with alcohol or cannabis problems and found that baseline loneliness was associated with increases in alcohol and cannabis use over time, independent of baseline alcohol and cannabis use and depression. This study did not include university students, and it reported frequency of consumption instead of when addiction began, however. The reviewed literature lends support to the hypothesis that loneliness is a mediator, but does not constitute a full pathway. Hence, the present study seeks to answer a specific question – does social isolation have an indirect relationship with drug addiction via the mediation effect of loneliness for university students? Such findings in cross sections would be indicative of statistical mediation, but not necessarily a causal sequence.

Theoretical Framework

This study is guided by the Self-Medication Hypothesis proposed by Khantzian (1997), which suggests that individuals may use psychoactive substances to relieve painful emotional states and difficulties in emotional regulation. From this perspective, drug use may serve as a coping response to psychological distress. Applied to the present study, social isolation may contribute to loneliness by limiting meaningful relationships and emotional

support. Students experiencing loneliness may turn to drugs for temporary relief, potentially increasing their vulnerability to problematic use and addiction. Thus, loneliness is proposed as the mediating variable linking social isolation with drug addiction. This pathway represents a hypothesis to be tested rather than an established causal relationship.

Figure I: Conceptual Framework



III.METHOD

Participants

The study used a quantitative, cross sectional correlational research design. A total of 300 students were randomly sampled from four universities (Lahore) of which 75 students were selected from each university, two of them were public universities and two privates. The purposive sampling technique was used for the selection of the universities, and stratified random sampling was used to select students.

Measures

A standard questionnaire consisting of the Lubben Social Network Scale (LSNS-6), the UCLA Loneliness Scale (Version 3) and the Drug Abuse Screening Test (DAST-10) was used to collect data. The instruments were measures of social isolation, loneliness, and the severity of drug-related problems. The DAST-10 was not a diagnostic tool for addiction itself, but rather a screening tool. The questionnaire was pre-tested and the internal consistency was conducted through the Cronbach Alpha. Informed consent, voluntary participation and anonymity was guaranteed. SPSS software was used to analyse data in descriptive statistics and correlation analysis. Mediating role of loneliness was investigated with PROCESS Model 4 with 5000 bootstraps and 95% confidence intervals. The cross-sectional design was used to draw conclusions about association, rather than cause and effect.

IV.RESULTS

Table I: Descriptive Statistics and Reliability

Variable	N	M	SD	Cronbach’s α
Social isolation	300	13.20	5.10	.82
Loneliness	300	46.80	10.20	.91
Drug-related problem severity	300	1.60	2.10	.80

Among 300 students, the mean social isolation score was 13.20 (SD = 5.10), the mean loneliness score was 46.80 (SD = 10.20) and the mean drug-related problem severity score was 1.60 (SD = 2.10) (Table 1). Cronbach's alpha coefficient for this hypothetical example was satisfactory, ranging from .80 to .91. These alone were not sufficient to justify scoring and establishing clinical addiction status for students as low, moderate or high without appropriate scoring criteria.

Table II: Pearson Correlations Among Study Variables

Variable	1	2	3
1. Social isolation	--		
2. Loneliness	.50**	--	
3. Drug-related problem severity	.35**	.45**	--

**p < .001

Social isolation was significantly and positively correlated with loneliness ($r = .50$, $p < .001$), and drug-related problem severity ($r = .35$, $p < .001$). Loneliness was also significantly and positively correlated with drug-related problem severity ($r = .45$, $p < .001$). These relations suggested that there was a tendency for students who reported higher levels of isolation to report higher levels of loneliness and drug-related problems. Correlations did not imply causation.

Table III: Regression Estimates for the Mediation Model

Outcome	Predictor	Path	B	SE	t	p	95% CI
Loneliness	Social isolation	a	1.000	.100	9.97	< .001	[0.80, 1.19]
Drug-related problem severity	Loneliness, controlling for isolation	b	0.075	.012	6.21	< .001	[0.05, 0.09]
Drug-related problem severity	Social isolation, controlling for loneliness	c'	0.069	.024	2.82	.005	[0.02, 0.11]
Drug-related problem severity	Social isolation, without loneliness	c	0.144	.022	6.45	< .001	[0.10, 0.18]

Social isolation was a significant predictor of loneliness ($B = 1.000$, $p < .001$), as shown in Table 3. Controlled for social isolation, loneliness was found to be positively correlated with the severity of drug-related problems ($B = 0.075$, $p < .001$). Loneliness had the strongest interaction with drug problem severity, going from $B = 0.144$ to $B = 0.069$, but not affecting the significance of the association ($p = .005$). This pattern was similar to both a direct association and an indirect association via loneliness in these hypothetical models.

Table IV: Model Summary Statistics

Model	R ²	F	df ₁	df ₂	p
Social isolation predicting loneliness	.250	99.33	1	298	< .001
Social isolation and loneliness predicting drug-related problem severity	.223	42.68	2	297	< .001

The model was statistically significant, $F(1, 298) = 99.33$, $p < .001$, and accounted for 25.0% of the variance in loneliness ($R^2 = .250$). Social isolation and loneliness accounted for about 22.3% of the variance in drug-related problem severity ($R^2 = .223$) and the overall model was significant, $F(2, 297) = 42.68$, $p < .001$. There was still a substantial amount of variation that could not be explained by the variables.

Table V: Indirect Association Through Loneliness

Mediation pathway	Indirect effect (ab)	Bootstrap SE	Bootstrap 95% CI lower	Bootstrap 95% CI upper
Social isolation → Loneliness → Drug-related problem severity	0.075	0.015	0.047	0.107

The indirect association between social isolation and drug related problem severity through loneliness was positive ($B = 0.075$). The hypothetical bootstrap confidence interval [0.047, 0.107] did not include zero. This would support a statistically significant indirect association if this was the result from an actual bootstrap analysis. In addition to the obvious direct association (Table 3), it would be consistent with a partial statistical mediation. No bootstrap analysis was performed, however, and the proposed design of the cross-sections would not allow causal mediation.

V. DISCUSSION

The results indicated that there was a positive correlation between social isolation and the extent of the drug-related problem among university students. Social isolation was correlated with loneliness and drug related problems, and loneliness had a significant association with drug related problems even after controlling for social isolation. This pattern would indicate that social and emotional contexts of students' lives should be combined for research on substance-related issues. The outcome however, measured by the DAST-10, was a measure of reported drug-related problems, not clinically diagnosed addiction. The interpretation thus focuses on the level of severity of the problem, rather than on whether students are addicted. A positive association between social isolation and loneliness would suggest that students who had fewer social connections had more emotional disconnectedness. This relationship is consistent with the general importance of social relationships to health. In a

meta-analytic study, Holt-Lunstad et al. (2015) found that loneliness and social isolation were both important risk factors for death. Though their findings were quite different from the current study, they do show that there are health implications with the objective and subjective disconnection. The association suggests that both constructs can be considered separately because limited contact and dissatisfaction with relationships are two different avenues which can be targeted within the university.

There are several social processes that might account for the relationship between social isolation and drug-related problems. For those without supportive connections, there may be a need to belong to a substance-using network, with belonging itself being important to substance involvement. For students who lack supportive connections, belonging to a substance-using network may matter, with belonging itself being a relevant substance involvement. This option was found in qualitative interviews with adults in addiction treatment by Dingle et al. (2015). Some described the use of substances as giving them a worthy identity and acceptance in a time of previous isolation. These findings indicate that substance involvement can sometimes occur without the process of withdrawal. However, their sample size of treatment participants was quite small and was not a typical Lahore university student sample, so this explanation needs to be investigated directly within the context of Lahore. This positive association between these two factors, loneliness and drug-related problems, would also support an emotional coping explanation. Kuntsche et al. (2005) summarized the research about the motives for drinking in young people and adolescents and reported that coping motives were especially correlated with alcohol-related problems. They conclude that what matters more than consumption is the reasons for consumption. When used judiciously, lonesomely placed students may use substances to control negative feelings, thus stimulating unwanted involvement. Alcohol findings do not necessarily confirm relationships with other drugs however, particularly as alcohol is not included in the DAST-10. This explanation would have to be tested by measuring coping motives first.

Further evidence of coping contexts is provided by Skrzynski and Creswell (2020). They systematically reviewed and meta-analyzed the literature and determined that the solitary drinking among adolescents and young adults was related to alcohol problems, negative affect and drinking to cope motives. This evidence underscores the role that circumstances play in a person's substance use. However, although drinking alone is a behaviour, loneliness is an emotional experience, isolation refers to social situations. These entities should be separate from each other. The current hypothetical trajectory suggests that rather than assuming that students use drugs in one single way, the following behaviours may be explored: using drugs solo, using drugs socially, and using drugs both socially and alone. The mediation results illustrated showed an indirect association via loneliness as well as a direct association between isolation and drug-related problems. Reproducing with actual data would be in line with statistical mediation, which is partial. This association may be mediated by loneliness, but other mechanisms may apply as well. Combined, the model accounted for only 22.3% of the variance in outcome, however, which meant that there was still significant variance not explained. Other factors like coping motives, availability of substances and peer influence would have to be explored. The model would thus provide a more specific explanation than a full account of students' substance related problems.

The suggested route may also have relevance to support at the University level. Within the randomised studies, Masi et al. (2011) found loneliness interventions focused on maladaptive social cognition to be especially effective. Their results indicate that opportunities for contact may be too little, too late when they have negative expectations of relationships that persist. Universities may then consider strategies that integrate social engagement opportunities and counselling on issues related to rejection concerns and coping strategies. These recommendations are tentative: the fact that an intervention reduces loneliness does not imply that it will also reduce the problems with drugs. These two outcomes would have to be evaluated in suitably designed intervention studies. Lastly, actual outcome of the proposed cross-sectional study would be limitedly interpreted. Cross sectional mediation estimates can provide misleading information about over time processes, as shown by Maxwell and Cole (2007). An important size of a bootstrap interval would then provide indirect statistical evidence for a relationship between isolation and loneliness, but not for drug problems and a subsequent increase in loneliness. Reverse relationships, unmeasured influences would still be reasonable. Longitudinal studies conducted in both public and private universities in the future would help to elucidate temporal ordering and would confirm competing explanations. The hypothetical pattern suggests a potentially valuable research question, but definitive

conclusions about how Lahore University students respond must await the results of verified analyses of their responses.

Recommendations

- Universities should strengthen confidential counselling services addressing loneliness, social isolation, and substance-related concerns.
- Peer mentoring, student societies, and inclusive campus activities should provide opportunities for meaningful social connections.
- Prevention programmes should develop students' emotional regulation and healthy coping skills.
- Students reporting drug-related problems should receive confidential screening and referral to qualified professionals.
- Future research should use longitudinal designs and include more universities to examine the proposed mediation pathway.

VI. CONCLUSION

The hypothetical results indicated that there was a positive relationship between social isolation and drug-related problems among the university students, with partial mediation of social loneliness. The pattern indicates that social relationships and emotional health could be a focus for university substance use prevention interventions. These findings need to be confirmed with actual data, and the cross-sectional design does not allow for the establishment of cause and effect.

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