

Pattern of Substance Use and Suicide Probability in Poly-Drug Users

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ABSTRACT

Objective: The aim of this study is to examine the prevalence of suicidal thoughts and suicidal probability among sample of patients with poly-substance use disorder, and to examine the relation between pattern of drug use and suicidal thoughts. Study design: cross sectional case control study. Place and duration of study: Inpatient wards of psychiatric and surgery departments of Tanta General, and University hospitals, Egypt, from May 2015 to June 2019. Methodology: Participants were 220 subjects, aged 18-45 years. We reviewed 110 individuals who fulfilled the DSM-5 criteria of substance use disorder for three or more substances, and their data were compared with that collected from 110 control persons. Results: Suicidal cases are highly present among patients with poly-substance use disorder 25.45%. Most of suicidal cases started using illicit substances under effect of peer pressure. Tramadol and cannabis dominated the list of used substances (94.55%), (62.73%) respectively. A statistically significant association with suicidality was found with longer duration of substance use ($p < 0.001$), using cannabis ($p = 0.014$), alcohol ($p < 0.001$) and volatile ($p = 0.02$), using substances while alone ($p < 0.05$), and positive history of accidental overdose ($p < 0.05$). Suicidal cases showed significant higher scores ($P < 0.0001$) of suicide probability scale and subscales. Conclusion: This study demonstrated that abusing certain substances for long duration while being alone, in addition to history of overdose may trigger suicidal thoughts in patients with poly-substance use disorder, and that suicide probability is common consequences of poly-substance abuse

INTRODUCTION

Prevalence of actual substance abuse among youths has nearly doubled over the past decade (Fawzi, 2011). Substance abuse is associated with suicidal ideation and suicide. This is attributed to the intoxicating and disinhibiting effects of many psychoactive substances (Suwayf & El-Sayed, n.d.). Suicide rates are increasing all over the world including Arab countries (El-Tantawy, Raya, Al-Yahya, & El-Desoky, 2010).

(Lai Kwok & Shek, 2009) defined suicidal ideation as the presence of thoughts or contemplation about suicide or a wish of an individual to terminate his or her life, but there is no self-destructive action related to these thoughts.

The objective of this study is to examine the relation between pattern of drug use and suicidal thoughts, investigate probability of suicide in suicidal substance abusers. Assessment of these links is important to identify predictors for suicide in substance abusers to develop specific interventions for persons in substance abuse treatment.

METHODS

This cross-sectional case control study was conducted in inpatient wards in Egyptian Governmental (General and psychiatric) and University Hospitals in Tanta, Egypt, from May 2015 to June 2018.

Sampling technique and data collection:

According to the world drug report (2012) by United Nations Office on Drugs and Crime, prevalence of substance dependence in Egypt was about 7% (Al-Sharqi, Sherra, Al-Habeeb, & Qureshi, 2012). The presumptive prevalence of substance dependence among this study population will be similar to it.

Accordingly, the following equation was used:

$$n = (z/e)^2 p (1 - p)$$

where,

n: the sample size per group

p: the expected prevalence = 7%

z: the critical value which determine the area underlying the 95% of population on the normal distribution curve = 1.96

e: the margin of sample error tolerated = 0.05

$$n = (1.96/0.05)^2 \times (0.07) \times (1 - 0.07) = 100$$

The expected drop-out was 10%, so the total sample size will be 110 persons per group.

Cases (n=110) in this study were made up of male in-patient, aged 18 - 45 years, who met the criteria of Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) for psychiatric diagnosis of substance abuse, and who were abusing three or more substances. They were assessed after the period of detoxification and withdrawal. Patients were classified into suicidal and non-suicidal according to the presence of a lifetime history of suicidal ideation or attempt (Beck, Weissman, Lester, & Trexler, 1976).

The controls (n=110) are male subjects who never had the experience of taking illicit substances, and not suffering any current or past psychiatric disorders or serious medical disease. Controls were matched for age and residential environment and they were chosen from employees, workers in the hospitals, and their relatives and friends. Sample was selected by simple random method.

Written Informed consents were obtained from the participants.

Information from family members were gathered in some cases.

Participants were examined after detoxification and were subjected to:

- Psychiatric history and mental state examination.
- Full physical examination, routine laboratory tests (CBC, blood chemistry, thyroid function, liver function and urine analysis) and ECG are done in order to exclude serious organic pathology. Urine toxicology screen for illicit substance abuse is also done.
- Modified Semi-structured Questionnaire for the drug intake and the assessment of socio-demographic data in which we used the original sheet constructed by (Kovacs & Garrison, 1985) plus a suitable semi-constructed interview of modified Ain Shams University case sheet (Setiawan & Muslim, 2021)
- The Arabic version of Suicidal probability scale (Al-Awsat, 2008), It is prepared and standardized by (Kaminer & Bukstein, 2008), for assessment of suicidal probability.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using software statistical computer package (SPSS) version 16. For quantitative data, the mean and standard deviation were calculated. For qualitative data, comparison between two groups and more was done using Chi-square test (2). For comparison between means of two groups of parametric data, student t-test was used. For comparison between more than two means, the F value of analysis of variance (ANOVA) was calculated, where Tamhane's T2 test for unequal variances was performed to compare between each two means if F value was significant. p-value less than 0.05 was considered as significant.

RESULTS

The sample consisted of 110 cases (28 suicidal cases and 82 non suicidal cases) and 110 controls. It was found that: Suicidal thought and probability was high among poly-substance users (25.45%), and (10%) of cases have history of at least one suicide attempt. The difference between mean age of all cases (29.78 \pm 6.58) and controls (31.01 \pm 7.98) was not significant (p=0.215). (not tabulated).

Table I: Age of participants

Age	Controls (n=110) Mean (\pm SD)	Cases (n=110)		P
		Non-suicidal (n=82) Mean (\pm SD)	Suicidal (n=28) Mean (\pm SD)	
	31.01 \pm 7.98	28.23 \pm 5.66	34.32 \pm 7.08	0.003** _{a,c}

According to post-hoc tests:

a= statistical significant difference between control and non-suicidal groups

b= statistical significant difference between control and suicidal groups

c= statistical significant difference between non-suicidal and suicidal groups

*p-value <0.05= significant

**p-value <0.01= highly significant

***p-value <0.001= very highly significant

Table I shows that one way ANOVA test revealed that Mean age of non-suicidal group (28.23 \pm 5.66) was significantly lower (p=0.003) than that of the mean age of the other two groups (suicidal 34.32 \pm 7.08 , controls 31.01 \pm 7.98) and this was confirmed by post-hoc test (Tamhane's T2).

Table II: Comparison for patterns of substance intake by non-suicidal and suicidal cases:

	Non-suicidal n=82		Suicidal n=28		P-value
Causes of initiating substance use. No, (%)					
Curiosity	21	25.61	8	28.57	0.262
Peer pressure	28	34.15	11	39.29	
Psychic & physical energy	8	9.76	2	7.14	
Imitation	8	9.76	0	0.00	
Escape	17	20.73	7	25.00	
Age of onset of substance use, No (%)					
\leq 18	38	46.34	15	53.57	0.509
>18	44	53.66	13	46.43	

Duration of substance use in years), mean (±SD)		6.1	3.89	12.57	7.5	<0.0001**
Types of illicit substances used. No (%)						
Tramadol	Positive	76	92.68	28	100.00	0.056
	Negative	6	7.32	0	0.00	
Cannabis	Positive	46	56.10	23	82.14	0.014*
	Negative	36	43.90	5	17.86	
Alcohol	Positive	16	19.51	16	57.14	<0.0001**
	Negative	66	80.49	12	42.86	
Volatile substance	Positive	1	1.22	3	10.71	0.034*
	Negative	81	98.78	25	89.29	
Minor tranquilizer	Positive	27	32.93	13	46.43	0.200
	Negative	55	67.07	15	53.57	
Circumstances of using illicit substances. No (%)						
Alone		1	1.22	7	25.00	<0.0001**
With friends		42	51.22	5	17.86	
Both		39	47.56	16	57.14	
History of accidental overdose. No (%)						
Positive		2	2.44	5	17.86	0.008**
Negative		80	97.56	23	82.14	

*Significant p-value at <0.05

** Significant p-value at <0.01

Table II shows comparison for patterns of substance intake by non-suicidal and suicidal cases. It showed that most of suicidal cases started using illicit substances under effect of peer pressure and the difference between the two groups is statistically insignificant ($p > 0.05$). 53.57% of suicidal cases started using illicit substances before age of 18 while 53.66% of non-suicidal cases started it after age of (Rosenthal, 2010); the difference between the two groups is insignificant ($p > 0.05$).

There is significant longer duration of dependence in suicidal cases compared to non-suicidal cases ($p < 0.0001$). There is significantly higher percentages of suicidal cases compared with non-suicidal cases regarding cannabis, alcohol, and volatile use ($p < 0.05$).

There is significantly higher percentage of non-suicidal cases compared with suicidal cases regarding using substances with friends, and significantly higher percentage of suicidal cases compared with non-suicidal cases regarding using substances while they are alone ($p < 0.05$). And there is significantly more suicidal cases compared with non-suicidal cases regarding positive history of accidental overdose ($p < 0.05$).

Table III: Suicidal Probability Scale (SPS) and subscales for controls, non-suicidal and suicidal cases.

	Controls n=110		Non-suicidal n=82		Suicidal n=28		P-value	ANOVA		Tuke y's tset P3
	Mean	±SD	Mean	±SD	Mean	±SD		P 1	P 2	
(SPS)	41.26	6.09	58.01	11.88	107.50	16.45	<0.0001**	<0.0001**	<0.0001**	<0.0001**
SPS.hopelessness	10.55	2.08	16.94	6.46	33.86	8.13	<0.0001**	<0.0001**	<0.0001**	<0.0001**
SPS.Suicidal Ideation	11.64	7.7	11.38	2.11	31.29	3.11	<0.0001**	0.948	<0.0001**	<0.0001**
SPS.Negative Self Esteem	10.08	2.29	15.32	3.78	18.46	5.39	<0.0001**	<0.0001**	<0.0001**	<0.0001**
SPS.hostility	9.73	1.56	14.01	5.42	23.89	5.24	<0.0001**	<0.0001**	<0.0001**	<0.0001**

P1= statistical difference between control and non-suicidal groups

P2= statistical difference between control and suicidal groups

P3= statistical difference between non-suicidal and suicidal groups

* Significant p-value at <0.05

** Significant p-value at <0.01

Table III shows Suicidal Probability Scale (SPS) and subscales for controls, non-suicidal, and suicidal groups. Suicidal cases got statistically significant higher scores compared to the other two groups regarding SPS, and all subscales ($p < 0.05$).

Post-hoc tests revealed significant lower scores in control group compared to non-suicidal cases group regarding SPS, hopelessness, negative self esteem, and hostility ($p < 0.05$).

Discussion

Suicidal ideation is an important phase in the suicidal process, preceding suicide attempts and completed suicide. Suicide "is a huge but largely preventable public health problem", according to the World Health Organization (WHO). Suicidal behavior results in nearly one million fatalities every year and billions of dollars in economic costs (Rosenthal, 2010).

Drug and alcohol problems generate other circumstances in a person's life, which may worsen depression or produce mental agitation. Divorce, loss of job, legal trouble, and financial difficulties which often grow from a dependence on alcohol or drugs and can bring about thoughts of suicide (Grohol, 2012).

The present study has shown that suicidal patients, who had experienced at least one suicidal thought, were highly present among poly-substance users 25.45% as compared to the control group that contains none, and there were 10% of substance abusers with history of at least one suicide attempt. The results of this study agree with the findings of previous researchers (Felts M. et.al.) linking substance abuse to suicide (Soueif et al., 1986).

Suicidal group recorded significant higher mean age 34.32 (± 7.08) than non-suicidal patients ($p = 0.003$). This result was inconsistent with previous study which reported that older age was protective against suicidal ideation.¹⁵ This difference in our study can be explained by the fact that older age individuals may have longer duration of drug use, more physical illness and more accumulated social and financial troubles that can contribute to provocation of suicidal thoughts among them.

Our study revealed that Most of the cases started using illicit substances due to curiosity and under effect of peer pressure that could be explained by modeling or forming a type of social pressure.

This endorses other study, which mentioned that one of the most important risk factors for using substance is peer pressure (Fahmy, 1989).

The present study is also supported by the findings of Amanpreet Singh that most of drug users initially consumed drugs for curiosity. There were 44% of addicts in his study who stated that they had strong curiosity toward drug use and this curiosity acted as propagator for their drug use (Youssef, Fahmy, Haggag, Mohamed, & Baalash, 2016).

Almost half of poly-drug dependents in our sample started using it after age of 18; and the mean duration of substance use was 7.75 ± 5.76 years in the cases.

Tramadol and cannabis dominated the list of substances abused in the present study, tramadol abusers reached 94.55% of all cases, followed by cannabis abuse (62.73%). A vast majority of the cases started using illicit substances specially Tramadol under effect of peer pressure.

Our results are matching with a study by Abbas RA (2013) on cleaners in Sharqia Governorate; whose results showed that the prevalence of substance abuse, particularly tramadol and cannabis (Bango), was significantly higher in the studied sample (Park, Cho, & Moon, 2010). This is also in agreement with Hosam El-Sawy who reported that cases of substance dependence who attended the drug dependence clinic at the Neuropsychiatry center,

Tanta University were more likely to use tramadol, followed by cannabis and benzodiazepines (Felts, Cherner, & Barnes, 1992).

An increasingly alarming phenomenon of Tramadol (Tramal, Amadol, Tramax, Contramal, Trama SR, Ultradol, Tramundin) abuse have been heavily demonstrated in the recent years. Wide range of usage of tramadol can be attributed to easy accessibility and cheap cost (Salamoun et al., 2008).

The alleged usages of Tramadol had contributed greatly to its popularity and massive use especially among youth and middle aged groups as a remedy for premature ejaculatory function and for extended orgasm and increase sexual pleasure (Singh, 2010).

In our study on poly-substance dependent in-patients in psychiatric department, Alcohol ranked the fourth among the list of substance abused, while in previous study in Egypt, lifetime prevalence rates revealed that alcohol was mainly the predominant substance of choice among all categories, with secondary school students reporting the highest amount of consumption (Abbas, Hammam, El-Gohary, Sabik, & Hunter, 2013). This was confirmed also by a study by Reda Abdel-Razek Ahmed on drug abuser students at Suez Canal University where Alcohol predominate among them to reach the highest score among illicit abused drugs (al'Absi, DeAngelis, Fiecas, Budney, & Allen, 2022). This difference between previously mentioned studies and ours; can be justified by the difference of the sources from which samples were taken.

However, (Qureshi & Al-Habeeb, 2000) recorded that amphetamine use disorders are the most common drug of use among patients admitted to hospitals in Saudi Arabia.

The complex interplay of factors such as drug availability and affordability, control policies and low enforcement, social attitudes and sanctions, service accessibility and acceptability may explain the difference of types of drugs abused among different communities and the difference in the types and pattern of abuse.

In our study, there was 7.273% of cases reported using substances when they are alone and 6.36% had a history of overdose.

In our study there was no significant relation of the age of beginning of substance abuse and suicidal thoughts or behaviors ($p=0.264$). But duration of substance intake was the important factor which showed very high significance ($p<0.0001$), the mean of duration was found to be significantly higher (10.58 years) in the suicidal group which is consistent with previous study by (Landheim, Bakken, & Vaglum, 2006) who reported that suicidal probability was significantly higher in group with longer duration of substance use .

However, in another study, clinical characteristics of attempters among poly-substance abusers and alcoholics were examined by (A.S. Landheim). He reported that a substance use disorder with duration of ≥ 15 years and an early onset (< 18 years of age) were independently associated with being a suicide attempter after controlling for Axis I disorders (Rutter & Behrendt, 2004).

Suicidal Probability Scale (SPS) and subscales

The present study showed a relationship between suicidal thoughts, and measures on SPS, and all subscales (Hopelessness, Suicidal ideation, Negative self esteem, Hostility). This indicates that poly-drug users having current suicidal thoughts are carrying already more features of suicidal persons with more feelings of hopelessness, liability for hostility, worse self evaluation, and more ideas about suicide with subsequent higher probability to commit suicide. These findings could be explained by sense of despair and hopelessness associating self devaluation that addicts used to feel either for bad social stigma about his condition or for many troubles induced by his drug use.

A comparison between heroin dependents and controls in previous study by *Walaa M. Sabry 2004* supported our findings; it revealed high significant difference as regard the suicidal probability, and sub-scales, with higher scores in suicidal group.

Our results were matching with *Philip Rutter` s* study on drug users, who also recorded that SPS and four subscales had a correlation with suicidality (Rutter & Behrendt, 2004). It also goes with a study conducted on patients identified with alcohol or drug abuse, which reported one of the most important observed correlates to any suicidal and self-injurious behavior and any suicidal ideation, was hopelessness.

Hopelessness is a significant indicator of depression and potential for suicide. Hopelessness and its clinical manifestations can be situational or transient. Accurate assessment of suicide risk should include an indication of current levels of hopelessness (Lai Kwok & Shek, 2009).

Other investigators, *Beck AT, et al.* have supported the positive relationships among hopelessness, depression, and suicidal intent in substance abusing suicide attempters. Hopelessness was found to correlate more strongly than depression with suicidal intent among them and to be a key determinant of suicidal intent in alcoholic suicide attempters (Beck et al., 1976).

Researchers in the previous studies explored that poor self-evaluation can lead to self-loathing and to consideration of suicide specially if combined with drug use.

Hostility has long been associated with suicide. Schneidman (1969) defined self-injury as hostility turned inward. In another study, hostility among study sample has been associated with punitive self-injury and suicidal thoughts.

CONCLUSION

This study demonstrated that abusing certain substances for long duration while being alone, in addition to history of overdose may trigger suicidal thoughts in patients with poly-substance use disorder, and that suicide probability is common consequences of poly-substance abuse.

REFERENCES

- Abbas, R. A., Hammam, R. A., El-Gohary, S. S., Sabik, L. M., & Hunter, M. S. (2013). Screening for common mental disorders and substance abuse among temporary hired cleaners in Egyptian Governmental Hospitals, Zagazig City, Sharqia Governorate. *The International Journal of Occupational and Environmental Medicine*, 4(1), 13–26.
- al'Absi, Mustafa, DeAngelis, Briana, Fiecas, Mark, Budney, Alan, & Allen, Sharon. (2022). Effects of regular cannabis and nicotine use on acute stress responses: chronic nicotine, but not cannabis use, is associated with blunted adrenocortical and cardiovascular responses to stress. *Psychopharmacology*, 239(5), 1551–1561.
- Al-Awsat, A. (2008). *Saudi Arabia: Suicide Rate on the Rise*.
- Al-Sharqi, Abdullah Mohammed, Sherra, Khaled Saad, Al-Habeeb, Abdulhameed Abdullah, & Qureshi, Naseem Akhtar. (2012). Suicidal and self-injurious behavior among patients with alcohol and drug abuse. *Substance Abuse and Rehabilitation*, 91–99.
- Beck, Aaron T., Weissman, Arlene, Lester, David, & Trexler, Larry. (1976). Classification of suicidal behaviors: II. Dimensions of suicidal intent. *Archives of General Psychiatry*, 33(7), 835–837.
- El-Tantawy, Ashraf, Raya, Yasser, Al-Yahya, Abdulhameed, & El-Desoky, Ihab. (2010). Amphetamine Abuse among Patients with First Episode of Acute Psychosis. *Current Psychiatry*, 17(1), 73–81.

- Fahmy, Magda Taha Kamal El Din. (1989). Heroin abuse, a study of its psychodemographic, and clinical aspects among Egyptian inpatients; MD Thesis in psychiatry. *Ain Shams University*.
- Fawzi, Marwa M. (2011). Medicolegal aspects concerning tramadol abuse. the new Middle East youth plague: an Egyptian overview 2010. *Journal of Forensic Research (OMICS)*, 2(04), e-130.
- Felts, W. Michael, Chernier, T., & Barnes, Robert. (1992). Drug use and suicide ideation and behavior among North Carolina public school students. *American Journal of Public Health*, 82(6), 870–872.
- Grohol, J. M. (2012). Personality traits differ between suicidal, nonsuicidal people with schizophrenia. *Compr Psychiatry*, 6, 30.
- Ḳaminer, Yifrah, & Bukstein, Oscar Gary. (2008). *Adolescent substance abuse: Psychiatric comorbidity and high-risk behaviors*. Taylor & Francis.
- Kovacs, Maria, & Garrison, Betsy. (1985). Hopelessness and eventual suicide: A 10-year prospective study of patients hospitalized with suicidal ideation. *American Journal of Psychiatry*, 1(42), 559–563.
- Lai Kwok, Sylvia Y. C., & Shek, Daniel T. L. (2009). Social problem solving, family functioning, and suicidal ideation among Chinese adolescents in Hong Kong. *Adolescence*, 44(174).
- Landheim, A. S., Bakken, Kjell, & Vaglum, P. (2006). What characterizes substance abusers who commit suicide attempts? Factors related to Axis I disorders and patterns of substance use disorders. *European Addiction Research*, 12(2), 102–108.
- Park, Sang Mi, Cho, Sung il, & Moon, Sang Sik. (2010). Factors associated with suicidal ideation: role of emotional and instrumental support. *Journal of Psychosomatic Research*, 69(4), 389–397.
- Qureshi, Naseem A., & Al-Habeeb, T. A. (2000). Sociodemographic Parameters and Clinical Pattern of Drug Abuse in Al-Qassim Region--Saudi Arabia. *Arab Journal of Psychiatry*, 11(1), 10–21.
- Rosenthal, Richard N. (2010). *Managing Depressive Symptoms in Substance Abuse Clients During Early Recovery: Treatment Improvement Protocol*. DIANE Publishing.
- Rutter, Philip A., & Behrendt, Andrew E. (2004). Adolescent suicide risk: Four psychosocial factors. *Adolescence*, 39(154), 295–303.
- Salamoun, Mariana M., Karam, A. K., Okasha, A. T., Attasai, L., Mneimneh, Z. M., & Karam, Elie G. (2008). Epidemiologic assessment of substance use in the Arab world. *Arab J Psychiatry*, 19(2), 100–125.
- Setiawan, Adi, & Muslim, Pramudia Mulyono. (2021). *Interkoneksi Proses Bisnis Perbendaharaan pada Bendahara Umum Negara dengan Satuan Kerja selaku Kuasa Pengguna Anggaran*. Direktorat Sistem Perbendaharaan, Direktorat Jenderal Perbendaharaan
- Singh, Amanpreet. (2010). Strategies adopted by wives of addicts: A sociological study of women in rural Punjab, India. *International Journal of Sociology and Anthropology*, 2(8), 162.
- Soueif, M. I., Darweesh, Z. A., Hannourah, M. A., El-Sayfd, A. M., Yunis, F. A., & Taha, H. S. (1986). The extent of drug use among Egyptian male university students. *Drug and Alcohol Dependence*, 18(4), 389–403.
- Suwayf, Muṣṭafá, & El-Sayed, A. M. (n.d.). Extent and patterns of drug use among students and working-class men in Egypt. (*No Title*).
- Youssef, Ismail M., Fahmy, Magda T., Haggag, Wafaa L., Mohamed, Khalid A., & Baalash, Amany A. (2016). Dual diagnosis and suicide probability in poly-drug users. *J Coll Physicians Surg Pak*, 26(2), 130–133.