Predictors of Suicidal Thoughts among Substance Abuse Patients: Problem-Solving Ability and Hopelessness

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Abstract

Background: Substance abuse has become a serious health issue. Ineffective problem solving among Substance abuser can lead to hopelessness and loss of control to commit suicide. This study was aimed to investigate the ability to solve problems and hopelessness as predictors of suicidal thoughts among patients with drug abuse. A descriptive research design was utilized in this study**.** A purposive sample of 162 patients with substance abuse disorder was selected from El-Azazi Hospital for Mental Health in Abo-Hamad City, Sharkia Governorate. Participants completed the Socio-demographic and clinical data sheet, Drug Abuse Screen Test, Problem-Solving Inventory, The Beck Hopelessness Scale, and Suicide Probability Scale. The results revealed that the majority of studied participants had suicidal thoughts. More than one-third of them had severe level of drug abuse, mild level of hopelessness and was unable to solve their problems. There were statistically significant positive correlations between suicidal thought, problem solving ability, and feeling of hopelessness. Hopelessness, drug abuse, patients' age, and monthly income were significant predictors for suicidal probability among drug abuse patients. Therefore, it is recommended to conduct an intervention programs for drug abuse patients to strengthen their problem-solving ability and develop adaptive coping strategies.

Key words: Suicidal thoughts, substance abuse, problem solving, hopelessness.

Introduction:

Substance abuse is a social international problem. There has been substantial rise in substance abuse in Egypt since the 1970s **(Hamdi et al., 2016)**. The World Health Organization (WHO) confirmed that the prevalence of substance abuse in individuals between the ages of 15 and 64 years in Egypt was 0.8% (0.64 & 1.3 percent in the female and male population, respectively) **(WHO, 2015)**. Opioids have been the substances of major problems in 44 percent of the substance dependence cases in recent studies (tramadol tablets were the main dependence substances in 30 percent of the sample, 12 % heroin, and 2% nalbuphine) **(Mohamed et al., 2015**). A "national survey" carried out in 2007 found that six million (8.5%) Egyptians were drug users and the majority of them were between 15 and 25 years of age and that addicts are considered criminals rather than patients in need for treatment **(El-Awady et al., 2017).**

Substance use disorders are a chronic disease characterized by drug seeking and compulsion and control difficulty despite harmful effects **(Hamdi et al., 2016)**. It is considered a "relapsing"

disorder because under-recovery from it prevents people returning to substance use even after years of abstaining from taking the drug (**Lewis**, **2017**). A substance used disorders' patients' contract serious infections, suffer from poor physical and psychological wellbeing, social difficulties, criminality, and are at a high risk of premature death (**UNODC, 2016).** Substance use disorders are associated with an increased danger of suicidal thought and behavior. Alcohol, for example plays a role in every five suicides (**WHO**, **2015**).

Suicide refers to the act of intentionally killing oneself. Suicidal ideation refers to any thoughts of death, intention to kill oneself, or plan to end one's life (**WHO**, **2015**). Suicide is a major health problem, and the worldwide suicide mortality rate is 1.4% of all deaths. Most suicides are related to psychiatric disorders, e.g. depression, and substance use disorders (**Bachmann**, **2018**). Suicide is a complex behavior that is likely to be the product of an association between biological factors, including genetic tendency, and several environmental and psychosocial variables (**Bando et al**., **2012**).

Substance use disorders overwhelm lives by causing physiological, psychological, and social problems. Concerning physiological issues, brain abnormalities such as; changes in cortical (pre-frontal cortex), and sub-cortical (limbic system) regions involving the neuro-circuitry, and troubled neurotransmitter pathways like dopamine, serotonin and this can lead to dramatic increases in the wish to get the drugs and failure to stop them even when life is affected negatively (**Woodcock et al**., **2015**).

Concerning psychological problems, it included depression, suicidal attempts, aggressive behaviors, and cognitive functioning problems. Social problems such as patients laid, cheated people, and couldn't be trusted, patients gave up straight friends and hung with the wrong people, and their families are hurt, upset, and worried about their patients. Regarding their work performance; those patients were late a lot, didn't do a good job, and even got fired once. Moreover, patients broke spiritually, might have legal problems, or performed crimes, as a result of this, they felt they were not clean, their ambition and good values were robbed (**Whiteford et al**., **2015**).

Previous studies reported that, addicted people have some problems in the skills that are essential to cope with problems, and thus, consider drug abuse as a way of coping with problems resulting from difficult intrapersonal or interpersonal situations to decrease unwanted emotions. Problem-solving ability is one of the factors that determining the effects of negative life events and states to the attitudes, skills, and abilities that allow an individual to choose an efficient and adaptive solution to any life problem. Problem-solving capabilities have a developing nature and include effective decision making, flexibility and the ability to inspect different solutions for social and cognitive problems (**Eslami-Saaraab et al**., **2018**).

In this respect, and based on the Suicide Readiness Model, **Schotte and Clum (1987)** have highlighted the relationship between negative mental stress, cognitive closure, vulnerability in connection with problem-solving skills on one hand and disappointment in rising suicidal thoughts or commenting suicide on the other hand. According to the above model, an individual who is characterized by lack in divergent thinking is cognitively unprepared to encounter and

overcome a high level of mental pressures in life and is likely to get disappointed in such situations. Weakness in problem-solving skills triggered by high life pressure raises the risk of depression, hopelessness, and suicidal behavior.

In this regard, **Quiñones et al**., (**2015**) found that the level of passive problem solving is high in persons with a history of suicide attempt. Using intervention and teaching problem solving skills to avoid suicide attempts in people with moderate to serious brain injury is viewed as satisfying and useful and free of negative effects method by the participating patients **(Barnes et al., 2017).** Various researches have shown a negative relationship between addiction and the problem-solving skill. Their results found that addicted individuals have lower problem-solving capabilities (**Parker et al**, **2008**).

The problem-solving method offers a range of potentially effective solutions to solve problem situations, which increases the probability of selecting the most effective solution among such alternatives. Social problem-solving training can manage critical needs, expression skills, and conflict-solving skills and can increase social communication, self-efficacy, and self-management skills. Training in social problem-solving can address basic needs, interpersonal skills, and conflict solving skills and can improve their abilities in social communication, self-efficacy and self-management **(Jean et al., 2015).**

Nurses should predict substance abuse and consider its risk factors. The psychiatric mental health nurse should properly assess patients and immediately report any signs and symptoms of addiction. Sudden changes in behaviors and personality, social isolation, poor work performance, obsession with substances abused, and sudden weight changes are among the commonly reported symptoms of substance abuse (**Rayan**, **2017**).

Problem-solving skill forms the basis of nursing practices and especially psychiatric nursing, which are in direct contact with substance addicts and their families (**Karabulutlu et al., 2011**). Using successful problem-solving strategies, nurses who providing care for people seeking treatment for their dependency may help these individuals and their families/relatives to overcome the difficulties they may face after treatment. So its crucial for nurse in different practical setting to help the families/relatives use these problem-solving strategies to deal with risk factors related to suicide and hopelessness that they can face all through their lives.

Significance of the study

According to the Ministry of Health report on drug addiction, in Cairo, 1.4 million people were addicted to drugs, particularly heroin and/or tramadol; and in Sharkia governorate governorate, it reached 12.5% (**Viney**, **2017**). According to Fund for Drug Control and Treatment of Addiction (**FDCTA**, **2018**) the percentage of drug abuse in Egypt is 10.4 percent Independently, substance use raises the risk of suicidal behavior (**Bohnert**, **Ilgen**, **Louzon**, **2017**). Acute and chronic substance abuse can impair judgment, weaken impulse control, and disrupt neurotransmitter pathways, leading to suicidal tendencies through disinhibition (**Pompili**, **Serafini**, & **Innamorati**, **2010**).

The level of hope is closely linked to a problem-solving ability of individuals and their actions. Therefore, ineffective problem-solving can trigger psychological contradictions and

hopelessness. Insufficiency in problem-solving skills causes conflicts in interpersonal relationships, meaning, depressive status drives the individual towards suicide. The feeling of hopelessness stems from frequent failures to solve problems and insufficient problem solving skills. Those who are inclined to commit suicide often feel hopeless and lose control (**Oğuztürk et al**., **2011**). This research will shed the light on successful management of problem affecting patients with substance abuse and assist to manage their health as optimally as possible.

Aim of the Study:

To investigate the ability to solve problems and hopelessness as predictors of suicidal thoughts among patients with drug abuse.

Subjects and Methods

Research Questions:

1. What are the levels of hopelessness and problems solving ability among patients with drug abuse?

2. Are there suicidal thoughts among patients with drug abuse?

3. What are suicidal thoughts' predictors among patients with drug abuse?

Research Design:

A descriptive study design was utilized in this study.

Subjects:

A purposeful sample of patients with drug abuse (162) present at the inpatient units and outpatient clinics at El-Azazi Hospital for Mental Health at the time of the study, who meet the inclusion criteria.

Inclusion criteria:

- Age greater than 15 years old.
- Both gender
- All educational levels.
- Patients with mental retardation or psychiatric disorders were excluded from the study.

Sample size:

- Assuming that the number of patients with substance abuse at El-Azazi Hospital for Mental Health is 400 patients, the prevalence of suicidal ideation among patients with drug abuse is 17.1% **(Botega et al., 2015),** the total sample size is 152 patients at a confidence level of 95%, 10% is added for non-response, therefore the total sample size is 162 patients calculated by Epi info version 7 [**Center for Disease Control and Prevention (CDC), 2013**].

Setting:

This study was carried out at El-Azazi Hospital for Mental Health in Abo-Hamad City, Sharqia Governorate, which is affiliated to the Ministry of Health. This hospital offers care mainly for people from the lower and middle socioeconomic classes. It contains 250 beds for patients with mental illness and patients with drug abuse. It consists of 11 departments classified into four parts which are: (Part 1) Three outpatient clinics; one for patients with psychiatric disorder, one for patients with drug abuse and the third for children with mental illness; (Part 2) Inpatient psychiatric units; three for men and one for women; (Part 3) One unit for electroconvulsive therapy; and (Part 4) Three units for drug abuse male patients (one unit for detoxication and two units provide rehabilitation services and psychotherapy

for those patients). The outpatient clinic delivers care from [8:00 a.m. to 1:00 p.m.] 2 days/week for patients with drug abuse. The drug abuse units accept about 10 new patients each week and deliver follow up care to about 400 patients.

Tools of Data Collection:

Five tools were used to collect the data for this study. These were:

1- Socio-demographic and clinical data sheet: It includes, age, gender, age at the beginning of substance abuse, residence,, educational level, occupation, marital status, monthly income, length of hospitalization, number of prior admissions, duration of treatment, and type of drug abuse.

2- Drug Abuse Screening Test (DAST-10) (Skinner 1982): It was utilized to assess patients' drug abuse during the previous 12 months. It is composed of 20 questions.

Scoring system:

Patients respond to each question in the form of "Yes" (1) or "No" (0). Drug dependency is detected when the total score of DAST-10 was more than three points. The drug abuse problems are classified into 5 levels according to the DAST-10, the overall score as follow: (0) no problems, (1–5) low problems, (6–10) moderate problems, substantial problems (11–15), and severe problems (16–20). This scale is a valid and reliable instrument in the evaluation of drug abuse. It demonstrates a good level of reliability in this study as Cronbach Alpha was 0.61.

3-Problem-Solving Inventory (PSI): This scale was developed by **Heppner & Petersen, (1982)** to assess the participant perceptions of their problem-solving behaviors and attitudes. It is 32-items including three subscales: Problem Solving Confidence (11 items), Approach-Avoidance Style (16 items), and Personal Control (5 items).

Scoring system:

Each item was scored on a Likert scale of 5-points ranging from 1 "I always behave like that"; to 5 "I never behave like that". A high score reflects the failure to efficiently solve problems, while a lower score indicates effective problem-solving ability. Items 1, 2, 3, 4, 11, 13, 14, 15, 17, 21, 25, 26, 30 and 34 were reversed items. These items were reversed in estimating the total scale's score. The scale has been found to have a good level of reliability in this study as Cronbach's alpha was 0.92.

4- The Beck Hopelessness Scale (BHS): (Beck and Steer, 1961):

This scale was utilized to determine individuals' pessimistic attitudes and anticipations about the future. It is made up of 20-items, divided into three subscales; Feeling about the Future, Loss of Motivation, and Future Expectations.

Scoring system:

Each item was scored as "Yes" (1) or "No" (0) based on what the individual feels at the present time. The overall scores were ranged from (0) to (20). A higher score denotes a higher level of hopelessness. This scale was categorized according to the severity of hopelessness feelings into no or minimal when the total score was 0 – 3, mild when the total score was 4 – 8, moderate when the total score was 9 – 14, and severe when the total score was 15 – 20. The scale has 9 reversed items which were graded as (1) when the patient's response is no and (0) when his/her response was yes. This scale

has been shown to have a good level of validity and reliability as the Cronbach's alpha was found to be 0.9.

5- Suicide Probability Scale (SPS): this scale was developed by **Cull and Gill (1982)** to assess the behaviors and attitudes of people at risk of suicide. It was made up of 36 points classified into four subscales; hopelessness (12 points), suicide ideation (8 points), negative self-evaluation (9 points), and hostility (7 points).

Scoring system:

This scale was rated into 4-points Likert scale ranging from (1) none to (4) all of the time. The entire score was ranged from 36 to 144, with a high score indicates a greater possibility of suicide.

The risk of suicide is categorized into 3 levels as follow: Severe when the overall score is (75-100), moderate when the overall score is (50-70), mild when the overall score is (25-49), the score of (0-24) presents in a normal person with no suicidal risk. This scale shows a good level of reliability as Cronbach Alpha was found to be 0.87 in this study.

Pilot study:

The researchers performed a pilot study on 10% of the studied patients before starting the actual study. It was done to evaluate the study questionnaire clarity, easiness, and feasibility, as well as to estimate the needed time to complete the questionnaire. Based on the pilot study findings, some modifications were performed in the questionnaire mainly rephrasing and using easier semantic for the statements. Patients who took part in the pilot study were excluded from the main study sample.

Content validity & reliability

The content validity of the tools utilized in this study was established by five experts in psychiatric and mental health nursing, psychiatric medicine, and statistics. They revised the tools for applicability, clarity, comprehensiveness, understanding, relevance, and ease for implementation. The researchers translated the study tools into Arabic language using the translation-back translation technique to ensure their original validity. The reliability of the utilized tools was estimated by Cronbach's alpha test in the statistical package for social sciences (SPSS), version 20.0. They showed a good level of reliability.

Fieldwork:

After obtaining the required permission to conduct the study, the researchers met with the manager and head nurses of the hospital to clarify the aim of the research to them, obtain their consent and gain their cooperation to proceed into data collection. The researchers interviewed the selected patients in order to attain their verbal consent to participate in the study after being informed about its aim.

Prior to starting data collection, the researchers attempted to develop a trusting relationship with the selected patients. They interviewed each patient individually and explained each statement to him/her then filled in the selected answers of the patient. Each sheet required about 45-60 minutes to be completed depending on the patient's level of understanding and ability to answer each question. Data collection was completed in about three months (two days/week) from the beginning of January to the end of March 2020.

Administrative and ethical considerations:

The researchers submitted an official letter issued from the Dean of the Faculty of Nursing, Zagazig University to the Director of the selected hospital to obtain his permission to carry out the study. The voluntary involvement of the patients in the study has been ascertained as well as their right to withdraw from the study at any stage without giving any reason. Confidentiality of the collected data was confirmed and patients were assured that it would be only used for the research purpose.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using statistical computer package for the social sciences (SPSS), version 20.0 (SPSS Inc., Chicago, IL, USA). Qualitative data were delineated as number and percentage, and for quantitative data, mean and SD was computed. When appropriate, Chi-square or Fisher's exact test was utilized to compare percent of categorical variables. Correlation between various study variables was estimated by using Pearson's correlation coefficient, (+) sign indicates direct correlation and (-) sign indicates inverse correlation, also values close to 1 indicate strong correlation and values close to 0 indicate weak correlation. All tests were two sided. Significance was adopted when the P-value is less than 0.05 while a P-value greater than or equal to 0.05 was considered non-significant (NS).

Logistic regression which is a predictive analysis was used to describe data and explain the relationship between one dependent binary variable and one or more independent variables. It is the suitable regression analysis if the dependent variable is dichotomous (binary).

Results

Table (1) shows that the age of studied **subjects** ranged between 17-51 with a mean ± SD 31±7.5. As regards gender, most of studied patients (98.8%) were male. More than two thirds were living in urban areas (70.4%). As well as, near three fifths of them were free workers (59.3%), having insufficient income (56.8%) and had secondary education (60.5%). The age at the beginning of addiction was less than 20 years in more than two thirds (69.1%) of studied patients. Majority of studied patients (84.0%) were previously addicted to all substances (alcohol, cannabis, tramadol & heroin). The same table also reveals that, the mean duration of hospitalization of studied patients was 22.5±26 days. While the mean number of hospitalization was 1.59±1.4 and the mean duration of treatment was 30.9±41.3 months.

Table (2) reveals that, near three fifths (58.0%) of studied patients were substantial drug abused with a mean score of 14.2±2.7. As well, near two fifths (39.5%) of studied patients were mild in feeling of hopelessness with a mean score of 9.1±5.6. Less than half (45.1%) of studied patients have mild risk in suicide probability with a mean score of 85.6±16.2. However near half (48.1%) of patients were markedly unable to solve problem with a mean score of 104.4±17.4.

Table (3) indicates that there were highly statistically significant relationships between drug abused screening test and marital status, age at beginning of addiction, and types of addiction ($P < 0.001$), while there was significant relationship with job ($P <$

0.05). The highest percent ages of severe drug abused were among patients younger than 20 years at starting addiction, divorced, manually workers, and addicted alcohol, cannabis and tramadol (33.9%, 55.6%, 35.4%, & 50.0% respectively).

Table (4) shows that suicidal thoughts were highly statistically significant in relation to marital status at (p=0.001) and family income at (p=0.009). Most of single and those were having sufficient income patients (97.06% & 97.14% respectively) having suicidal thoughts.

Table (5) reveals that there were statistically significant relationship between feeling of hopelessness and residence at (p=0.04), marital status at (p=0.016), job at (p= 0.003), and types of addicted drug at (p= 0.012).It is noticed that the highest percentages of studied patients having severe hopelessness were those living in urban area (19.3%), employers (26.7%), single (23.5%), inpatients (23.3%), and taking all types of drugs (alcohol, cannabis, tramadol and heroin) (20.6%).

Table (6) indicates that there were statistically significant relationships between problem solving ability and educational level at (p= 0.02) and marital status at (p= 0.014), and age at beginning of addiction at (p= 0.006); with increasing percentages of markedly unable to solve problem among illiterate (69.2%), single patients (58.8%), and age lower than 20 years at the beginning of addiction (48.2%).

Table (7) shows that total problem solving score was highly positively statistically significantly correlated with drug abuse screening test, total hopelessness score, and total suicidal thoughts (p<0.001). As well, total suicidal thoughts was highly positively statistically significantly correlated with number of hospitalizations, drug abuse screening test, and total hopelessness score (p<0.001), however it was negatively correlated with age. The same table reveals that drug abused screening test was highly statistically positively correlated with number of hospitalizations and beginning treatment (p<0.001) and positively correlated with duration of hospitalization (p<0.05). As well, beginning treatment was highly positively statistically significantly correlated with number of hospitalizations (p<0.001).

Table (8) shows that significant predictor variables for suicidal probability of drug dependent individuals are DAST score, total hopelessness score, age in years and sufficient monthly income. These variables predict according to Cox and Snell R^2 30.4% for suicidal probability of drug dependent individuals.

Discussion

Drug abuse is considered one of the most important medical, cultural, economic, and social problems. Although drug abuse is socially disapproved, many people from different socioeconomic groups are extremely involved in a way that drug abuse not only endangers their health but also compromises public and family health, causing moral and psychological deterioration **(Abadi et al., 2018).**

The present study results indicated that most of the studied sample were males (98.8%) and their ages ranged from 17 to 51 years with a mean scores of 31±7.5 years. This can be explained by the fact that women prefer to go to private clinics for treatment to conceal their addiction, and its related stigma and repercussions. Moreover, men are financially independent at this age which

makes it easy for them to acquire these addictive substances. This goes online with **Hamdi et al., (2016)** study of substance use and abuse in Egypt who reported that, the ratios between males and females are about 7:1 (13:1 in lower and middle Egypt governorates, 2.7:1 in Cairo, 7:1 in Coastline area governorates, and 5:1 in Upper Egypt governorates. Similarly, **Ali et al., (2018)** in a study of suicide among patients with substance use disorders in sharkia Governorate highlighted that male was the main gender (93%), while females represent only 7% and their age ranged from 18 to 57 years with a mean age of 30.71 ± 8.6 years.

The findings of this study showed that around three fifths of the studied patients had secondary education, insufficient income, and a relatively high percentage of them were living in urban areas. This can be explained as education can be protective factor from drug abuse and urban regions are usually polluted, crowded, and neglected by the caregivers. Moreover, there are still deep family and social ties in rural areas making it difficult to conceal substance abuse and isolate individuals for fear of stigma. This is in the same context with a previous study which indicated that the poorly educated people were more frequent users of substance and most of them came from urban areas **(Hamdi et al., 2016)**. However, the previous results were contradictory with **Al-Sharqi et al., (2012)** study of suicide among patients with drug abuse who indicated that just over half of their studied patients were single, from rural areas, unemployed, about one-third of them had a low income, and most of them were young adults with limited education.

More than half of the studied patients were free workers and job had a significant relation with drug abuse according to the findings of this study. This probably because free work may necessitate the individual to remain awake during the night, which is one of the most important factors in substance abuse as they feel exhausted and experience disruptions in their biological habits, producing depressed mood. This can also be interpreted as the majority of patients with substance abuse were unemployed due to symptoms associated with drug abuse as recurrent absenteeism from work, lack of productivity, insufficient attention and concentration, exhaustion, and worsened relation with their colleges and supervisors.

In agreement with this study finding, the National Survey on Drug Use and Health **(2011)** has shown a significant relationship between unemployment and substance abuse as addiction was higher among the unoccupied population **(Massah et al., 2018)**. Similarly, a very recent study in Egypt demonstrated that, free workers represented 60% of abusers, while government employees represented 17.5%. High prevalence of substance abuse amongst free workers (e.g. mechanists and technicians) could be attributed to their lower educational and socio-economical level, together with the relatively elevated income, which is directed to the use of substance rather than other useful activities (**Abddel Moneim**, **et al., 2020)**.

The results of this study indicated that near half of the studied subjects were married and it had a statistically significant relationship with drug abuse. This is might be due to that some people take these drugs because they believe that they enhance their sexual performance and improve their mood. This finding was in the same line with **El-Sawy, Abdel Hay, & Badawy (2010**) study of drug abuse in another area of Egypt, in which about half of the

studied sample was married and marital status was significantly correlated with substance abuse. However, this was contrary with other study results which revealed that marriage is considered a protective factor against substance abuse, as single or divorced person abuse substances more frequently **(Boogar, Tabatabaee, & Tosi, 2014)**.

The current study findings showed that the age at the onset of addiction was less than 20 years in more than two-thirds of the studied patients and it had a statistically significant relationship with drug abuse. This is possibly due to that adolescence is considered to be a critical period in the susceptibility to drug addiction because of this period characteristic problems and the peer pressure and influence. Moreover, they are more curious, bolder, and have insufficient knowledge of illegal drugs. This finding was in agreement with that of a previous study in which the mean age at first-time substance abuse was 22±4 years old **(Elmorsy et al., 2015)**. Similarly, **Refahi et al., (2018)** reported that the age at onset of drug abuse has decreased to 14-16 years. Moreover, **Abddel Moneim**, et al., **(2020)** revealed that, the mean age at the onset of substance abuse was 21.46±6.13 years and there was substantial variation between the mean ages of first substance abuse in correlation to the abused substance.

Concerning types of addicted drugs, the current study result indicated that the majority of studied patients were addicted to multiple drugs especially heroin followed distantly by addiction to tramadol and it had a statistically significant relationship with drug abuse. This might be due to that some individuals start to use these substances to relieve their feelings of depression, stress, and discomfort or to enhance their sexual function, in addition to the accessibility of these substances at a relatively lower cost. This in line with **El-Sawy et al., (2010), Mohamed et al., (2015) and Mahgouba, et al., (2016)** who found that, about half the studied patients were positive for multidrug test and followed by tramadol and heroin usage. This was inconsistent with the findings of a recent Egyptian national survey in which cannabis was the most frequently abused substance (77%), and alcohol is a distant second (28.6%) **(Bassiony et al., 2018)**.

The mean score of the duration of hospitalization in day was 22.5±26 days; while treatment duration was 30.9±41.3 months and the number of hospitalizations ranged between 0 to 9 as revealed in this study results. They were significantly correlated with drug abuse. This might be due to that the majority of studied patients use multiple substances and this collective administration increases the loss of control overutilization in addition to inadequate rehabilitation, which in turn leads to recurrent relapse. Meanwhile, addicted friends, seeing the tools of drug abuse, going to environments where they once used drugs can bring about memories of drug use, which can induce urges that may lead to relapse. This was congruent with **Sau, et al., (2013)** who demonstrated that, a addiction is a chronic disease in which recurrence was a common part of the recovery process, and 71.1% of the studied sample perceived drug abuse as untreatable. Moreover, **Kassani et al., (2015), Refahi, Mohtasham & Raeisoon (2018),** and **Dawood (2018)** found that, most of addicted patients were relapsed within the first six months following treatment episode. A recent study indicated that the risk of relapse increases among individuals with substance abuse discharged after short-term hospitalization (2–4 months) than those

discharged after long-term hospitalization (6–12 months), irrespective of the treatment duration **(Andersson, Wenaas, & Nordfjærn 2019).**

Regarding hopelessness, this study result indicated that near two-fifths of studied patients had mild levels of hopelessness and this result answers the first research question. Hopelessness had significant relationship with residence, job, marital status, and types of addicted drugs. This might be due to that more than half of the studied sample was free workers who were more vulnerable to irregular incomes, financial and social insecurity, therefore they might be unable to marry and have a family which may increase their feelings of stresses and hopelessness. As for the relation of hopelessness with types of addicted drugs, this could be interpreted as most of the studied subjects use multiple drugs and relapse frequently because they are unable to control their impulses and stop taking these drugs, which reinforce their feeling of hopelessness. This was consistent with **Jalilian et al., (2014)** who indicated that, hopelessness was related to marital status, and living place. Moreover, **Fırıncık, and Gürhan (2019)** found that, addition, age, marital status, educational level, and economic status affect the likelihood of suicide, level of depression, and level of hopelessness among individuals who smoke cigarettes, drink alcohol, or use substances.

The finding of this study revealed that, hopelessness had a statistically significant positive correlation with suicidal thought and problem solving ability. Moreover, hopelessness was a significant predictor for suicidal thoughts among the studied patients, this answers the third research question. This could be attributed to that individuals experiencing hopelessness have pessimistic attitude towards the future, respond poorly to life stressors, can't cope with life problems, and are less motivated to continue their life. Therefore, they may suffer from recurrent suicidal thought and attempts. This finding was consistent with that of a previous study of suicidal thoughts among poly-drug users which showed that, hopelessness was the most important detected correlates to any self-harm behavior and suicidal thought **(Othman et al., 2014)**. On the same line, **Sheikhli and Rezaei (2019)** found that, inability to solve problems and suicide attempts were related to hopelessness. They revealed that people who are unable to solve their problems are more emotionally distressed and hopeless. Consequently, mental pressure and hopelessness caused by a lack of efficient problem solving will lead people to commit suicide.

Regarding problem solving ability, the current study findings revealed that near half of studied patients were markedly unable to solve their problems and this answers the first research question. Problem solving ability was significantly related to the educational level of the studied sample. This was possibly due to that individuals' capability to solve their problems is based on their experience and they improve this experience through education. Moreover, illiterate persons might lack the knowledge and skills necessary for dealing with their life problems. This findings was consistent with that of a very recent study which reported that, the educated persons utilize possible solutions to solve their problems based on their experience and thoughts of problem solving, if they were unsuccessful, they try to find out why they had become unsuccessful and perceived themselves as proficient at solving problem **(Güleç, 2020)**.

Problem solving ability was significantly related to marital status as

revealed in the present study results. This was in agreement with **Fırıncık, & Gürhan, (2019**) who reported that, marital status, gender, and age influence the individual problem solving ability. On the contrary, with a more recent study which showed that, marital status, age, educational background, did not influence an individual's problem solving ability **(Fatma, Polat, & Kashimi, 2020)**.

The current study results indicated that, there was a significant relationship between problem solving ability and age at the onset of addiction, this might be due to that more than two-thirds of the studied sample began addiction early during their adolescent period at which period they have limited experience and skills in solving their problems. This goes on line with **Oğuztürk et al. (2011) and Fırıncık, & Gürhan, (2019)** who indicated that, elder people consider themselves as more proficient in problem solving because they had encountered more problems than younger people in their life. On the other hand, young individuals began alcohol drinking, smoking, or substance abuse to cope with their life problems. However, **Soyer and Bilgin (2010)** showed that age does not affect the individual's problem-solving ability.

The findings of this study revealed that the total problem solving ability was statistically significantly positively correlated with suicidal thoughts. This relation might probably because the individuals' inability to solve daily life problems might enhance their feelings of mental exhaustion, stress, and perceived inability to meet the needs of daily life, and if they remain unsolved they increase psychological distress and this was why some individuals attempt suicide to get rid of anxiety. This was congruent with **Jalilian et al., (2017)** who indicated that, patients with limited ability of problem solving, like those who perceive problems as an obstacle or who feel incompetent in solving their problems, those with an impulsive or careless approach to problem solving, or those who ignore problems until they become unmanageable, might be at greater risk for negative outcomes, including suicidal thoughts or suicide attempts. Similarly, **Barnes et al., (2017)** found that, individual characteristics and qualifications that lead to suicidal commitment include the inability to find a suitable solution to problems, to generate strategies for overcoming anxious and stressful factors and having a restricted number of solutions for problems.

Problem solving ability was significantly positively correlated with drug abuse according to the current study results. This is possibly due to that addicted people have limited ability to deal effectively with negative emotions, problems, and difficult life circumstances. They use drugs as a method of coping with difficult situations triggered by extra-personal or intrapersonal situations. This was in agreement with **Eslami-Saaraab et al., (2018)** who found that, individuals suffering from addiction had poor problem solving ability. In problematic situations, they experience loneliness, dissatisfaction, psychological strain from others, frustration, negative feelings, fatigue, and they utilize the least of their individual and social resources in solving their problem. Moreover, those individuals at the risk of substance abuse unsuccessfully deal with problems, negative emotions, and difficult life circumstances and use drugs to cope with stressful situations **(Nasrazadani, Maghsoudi & Mahrabi, 2017).**

Concerning suicidal thoughts, the results of the present study indicated that the majority of studied patients had suicidal thoughts and this answers the

second research question. Suicidal thoughts were significantly related to marital status. This was consistent with a study of **Atasoy et al., (2014)** who found that, the possibility and attempts of suicide were most frequently among single individuals. However, another study revealed that there was not significant relationship between marital status and suicide probability **(Polatöz, et al., 2011)**.

The current study finding also revealed that, sufficient monthly income of the studied sample was significantly related to suicidal thoughts and this was confirmed in the Logistic regression analysis. This result was contradictory with **Thompson et al., (2017)** who demonstrated that, people from lower socioeconomic class were at higher risk of first-time of suicide ideation or attempt. Additionally, **Gupta et al., (2019)** recently reported that, poor socioeconomic conditions and personality characteristics (impulsivity) were among the contributing factors or consequences of drug addiction like suicidal ideation and attempts.

Furthermore, the current study results showed that drug abuse was a positively correlated and significant predictor for suicidal thoughts; this answers the third research question. This could be explained by the fact that drug abuse has negative effect on judgment, as it diminishes impulse control, and disrupts neurotransmitter pathways, leading to suicidal tendencies through toxic effects of many of these drugs. This was consistent with a number of previous studies which indicated that suicide attempt had been increased with almost 6 times among patients with drug abuse disorders than non-users **(Mohammadkhani, et al., 2015; Youssef et al., 2016**; **Bohnert, Ilgen & Louzon, 2017 & Ali et al., 2018).** Additionally, substance and alcohol abuse, emotional issues, divorce, unemployment, low income, and a previous history of suicide attempt were among the most important risk factors associated with suicide **(Othman et al., 2014; & Sheikhli, Rezaei & Mousavi, 2019)**.

The age of the studied sample was negatively correlated with suicidal thoughts and this was confirmed in the Logistic regression analysis of this study result. This might be explained as young people especially adolescents suffer from high levels of stress across many areas of life such as those related to academic achievement and disrupted interpersonal relationships. Consequently, they might had suicidal thought to get rid of stressors, problems, and unmet expectations. This result was consistent with a previous study of **Miranda, et al., (2013)** who indicated that, young addicted persons might think about and engage in suicidal behavior because they were unable to find solutions to their problems. Additionally, **Othman et al., (2014)** and **Youssef et al., (2016)** found that older age was protective factor against suicidal ideation**.** In contrast with other studies which found that the patient's age was not statistically significantly related to suicidal intention **(Öksüz and Bilge 2014;** & **El-Genady & Gaber, 2019)**.

Table (1): Socio-demographic Characteristics and Pattern of Substance Abuse among Studied Subjects (n=162).

Variables	Mean & rang	
Age in years		
Mean ±SD	31±7.5	
Range	17-51	
	No.	%
Gender		
Male	160	98.8
Female	2	1.2
Residence		
Urban	114	**70.4**
Rural	48	29.6
Education level		
Illiterate	26	16.0
Read and write	22	13.6
Secondary education	98	**60.5**
University education	16	9.9
Job		
Without job	36	22.2
Free worker	96	**59.3**
Employer	30	18.5
Marital status		
Married	76	**46.9**
Divorced	18	11.1
Single	68	42.0
Income		
Sufficient	70	43.2
Insufficient	92	**56.8**
Age at the beginning of addiction		
Less than 20 years	112	**69.1**
≥20 years	50	30.9
Types of addiction drugs		
Tramadol	12	7.4
Cannabis & tramadol	10	6.2
Alcohol, cannabis & tramadol	4	2.5
Alcohol, cannabis, tramadol & heroin	136	**84.0**
	Mean ±SD	Range
Duration of hospitalization in days	22.5±26	1-70
Number of hospitalizations	1.59±1.4	0-9
Treatment duration in months	30.9±41.3	1-204

Table (2) Frequency Distribution of Drug Abused Screening Test, Hopelessness Level, Suicidal Probability and Problem Solving Ability of Studied Subjects (N=162).

Dimensions	No	%
Drug abused screening test (DAST)		
- Moderate	16	9.9
- substantial	94	**58.0**
- Severe	52	32.1
Mean ±SD	14.2±2.7	
Range	8-20	
Hopelessness level		
- No	24	14.8
- Mild	64	**39.5**
- Moderate	44	27.2
- Severe	30	18.5
Mean ±SD	9.1±5.6	
Range	0-20	
Suicidal probability		
- No risk	16	9.9
- Mild risk	73	**45.1**
- Moderate risk	67	41.4
- Severe risk	6	3.7
Mean ±SD	85.6±16.2	
Range	52-128	
Problem solving inventory		
- Able to solve problem	20	12.3
- Unable to solve problem	64	39.5
- Markedly unable to solve problem	78	**48.1**
Mean ±SD	104.4±17.4	
Range	58-133	

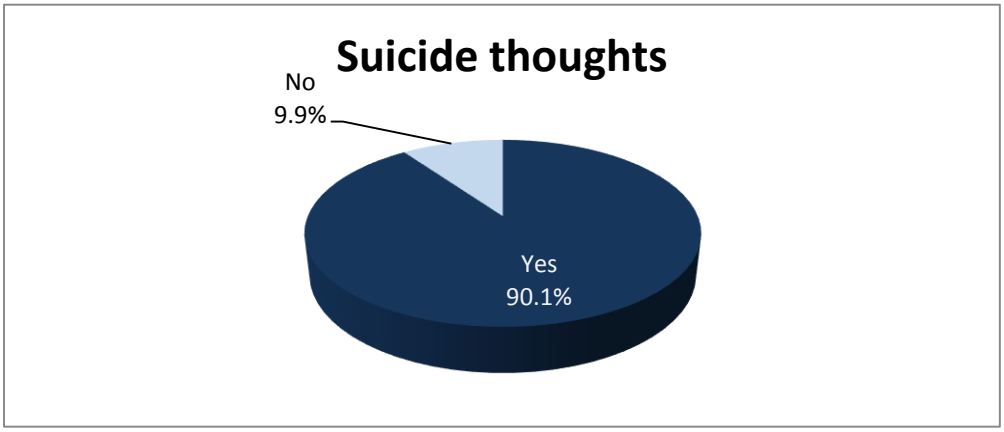

Figure (1): Percent of Suicide Thoughts of Studied Patients

Table (3): Relation of Personal Characteristics and Addiction Pattern of Studied Subjects and Drug Abused Screening Test (n=162).

Variables	DAST						No	χ^2	P
	Moderate		substantial		Severe				
	No.	%	No.	%	No.	%			
Gender									
Male	16	10.0	92	57.5	52	32.5	160	1.5	0.48
Female	0	.0	2	100.0	0	.0	2		
Residence		.		.		.			
Urban	12	10.5	66	57.9	36	31.6	114	0.19	0.9
Rural	4	8.3	28	58.3	16	33.3	48		
Education level		.		.		.			
Illiterate	6	23.1	12	46.2	8	30.8	26		
Read and write	0	.0	14	63.6	8	36.4	22	11.7	0.07
Secondary education	8	8.2	62	63.3	28	28.6	98		
University education	2	12.5	6	37.5	8	50.0	16		
Job		.		.		.			
Without job	2	5.6	22	61.1	12	33.3	36	11.4	0.015
free worker	6	6.3	56	**58.3**	34	**35.4**	96		
Employer	8	26.7	16	53.3	6	20.0	30		
Marital status		.		.		.			
Married	12	15.8	42	55.3	22	28.9	76	21.6	0.0001
Divorced	4	22.2	4	22.2	10	**55.6**	18		
Single	0	.0	48	70.6	20	29.4	68		
Income		.		.		.			
Sufficient	8	11.4	38	54.3	24	34.3	70	0.78	0.68
Insufficient	8	8.7	56	60.9	28	30.4	92		
Age at addiction									
< 20 years	4	3.6	70	62.5	38	**33.9**	112	16.2	0.0001
≥20 years	12	24.0	24	48.0	14	28.0	50		
Types of addiction drugs									
-Tramadol	4	33.3	8	66.7	0	.0	12		
-Cannabis & tramadol	4	40.0	4	40.0	2	20.0	10		
-Alcohol , cannabis and tramadol	0	.0	2	50.0	2	**50.0**	4	24.3	0.0001
-Alcohol, cannabis, tramadol & heroin	8	5.9	80	58.8	48	35.3	136		

Table (4): Relation of Suicidal thoughts and Addiction Pattern and Personal Characteristics of Studied Subjects (n=162).

Variables	Suicide thoughts		No suicide thoughts		No	χ^2	P
	No	%	No	%			
Gender				.			
Male	144	90.00	16	10.00	160	f	0.99
Female	2	100.00	0	.00	2		
Residence		.		.			
Urban	100	87.72	14	12.28	114	f	0.15
Rural	46	95.83	2	4.17	48		
Education level		.		.			
Illiterate	24	92.31	2	7.69	26		
Read and write	22	100.00	0	.00	22	3.3	0.35
Secondary education	86	87.76	12	12.24	98		
University education	14	87.50	2	12.50	16		
Job		.		.			
Without job	34	94.44	2	5.56	36	1.18	0.55
Free worker	86	89.58	10	10.42	96		
Employer	26	86.67	4	13.33	30		
Marital status		.		.			
Married	68	89.47	8	10.53	76	14.8	0.001
Divorced	12	66.67	6	33.33	18		
Single	66	**97.06**	2	2.94	68		
Income							
Sufficient	68	**97.14**	2	2.86	70	6.8	0.009
Insufficient	78	84.78	14	15.22	92		
Age at addiction							
< 20 years	100	89.29	12	10.71	112	F	0.78
≥20 years	46	92.00	4	8.00	50		
Types of addiction drugs	10		2	16.67	12		
-Tramadol	8	83.33	2	20.00	10	2.38	0.49
-Cannabis & tramadol	4	80.00	0	.00	4		
-Alcohol, cannabis & tramadol	124	100.00	12	8.82	136		
-Alcohol, cannabis, tramadol & heroin		91.18					

F=Fisher Exact test of significant

Table (5): Relation of Hopelessness and Personal Characteristics and Addiction Pattern among Studied subjects (n=162).

Variables	Hopelessness								No	$\chi 2$	P
	No		mild		moderate		Severe				
	No	%	No	%	No	%	No	%			
Gender											
Male	24	15.0	64	40.0	42	26.3	30	18.8	160	5.4	0.14
Female	0	.0	0	.0	2	100.0	0	.0	2		
Residence											
Urban	14	12.3	52	45.6	26	22.8	22	19.3	114	8.1	0.04
Rural	10	20.8	12	25.0	18	37.5	8	16.7	48		
Education level											
Illiterate	2	7.7	10	38.5	12	46.2	2	7.7	26		
Read and write	0	.0	12	54.5	6	27.3	4	18.2	22	14.7	0.09
Secondary education	18	18.4	36	36.7	24	24.5	20	20.4	98		
University education	4	25.0	6	37.5	2	12.5	4	25.0	16		
Job											
Without job	4	11.1	8	22.2	18	50.0	6	16.7	36	19.7	0.003
Free worker	16	16.7	48	50.0	16	16.7	16	16.7	96		
Employer	4	13.3	8	26.7	10	33.3	8	**26.7**	30		
Marital status											
Married	12	15.8	26	34.2	26	34.2	12	15.8	76		
Divorced	6	33.3	10	55.6	0	.0	2	11.1	18	15.7	0.016
Single	6	8.8	28	41.2	18	26.5	16	**23.5**	68		
Income				.							
Sufficient	14	20.0	26	37.1	20	28.6	10	14.3	70	3.7	0.29
Insufficient	10	10.9	38	41.3	24	26.1	20	21.7	92		
Age at addiction											
< 20 years	16	14.3	50	44.6	28	25.0	18	16.1	112	4.3	0.23
≥20 years	8	16.0	14	28.0	16	32.0	12	24.0	50		
Types of addiction drugs											
-Tramadol	4	33.3	4	33.3	2	16.7	2	16.7	12		
-Cannabis &Tramadol	0	.0	2	20.0	8	80.0	0	.0	10		
-Alcohol , cannabis & tramadol	0	.0	2	50.0	2	50.0	0	.0	4	21.3	0.012
-Alcohol, cannabis, Tramadol & heroin	20	14.7	56	41.2	32	23.5	28	**20.6**	136		

Table (6): Relation of Problem Solving and Personal Characteristics, and Addiction Pattern of Studied Subjects (n=162).

Variables	Problem solving ability						No	χ^2	P
	Able		Unable		Markedly Unable				
	No	%	No	%	No	%			
Gender									
Male	20	12.5	64	40.0	76	47.5	160	2.2	0.33
Female	0	.0	0	.0	2	100.0	2		
Residence		.		.		.			
Urban	16	14.0	38	33.3	60	52.6	114	6.2	0.045
Rural	4	8.3	26	54.2	18	37.5	48		
Education level		.		.		.			
Illiterate	0	.0	8	30.8	18	**69.2**	26		
Read and write	0	.0	8	36.4	14	63.6	22	15.1	0.02
Secondary education	16	16.3	42	42.9	40	40.8	98		
University education	4	25.0	6	37.5	6	37.5	16		
Job		.							
Without job	6	16.7	12	33.3	18	50.0	36		
Free worker	12	12.5	38	39.6	46	47.9	96	2.1	0.72
Employer	2	6.7	14	46.7	14	46.7	30		
Marital status		.		.		.			
Married	8	10.5	36	47.4	32	42.1	76		0.014
Divorced	6	33.3	6	33.3	6	33.3	18	12.6	
Single	6	8.8	22	32.4	40	**58.8**	68		
Income		.		.		.			
Sufficient	10	14.3	30	42.9	30	42.9	70	1.4	0.48
Insufficient	10	10.9	34	37	48	52.2	92		
Age at addiction									
< 20 years	8	7.1	50	44.6	54	**48.2**	112	10.4	0.006**
≥20 years	12	24.0	14	28.0	24	48.0	50		
Types of addiction drugs									
-Tramadol	2	16.7	6	50.0	4	33.3	12		
-Cannabis & tramadol	0	.0	4	40.0	6	60.0	10	7.02	0.32
-Alcohol , cannabis & tramadol	0	.0	0	.0	4	100.0	4		
-Alcohol, cannabis, tramadol & heroin	18	13.2	54	39.7	64	47.1	136		

Table (7): Correlation Matrix of Suicidal Thoughts, Drug Abused Screening Test (DAST), Hopelessness, Problem Solving Score and Some Characteristics of Studied Subjects (N=162).

Parameters	1	2	3	4	5	6	7
	R	R	R	R	R	R	R
1-Age	1						
2-Duration of hospitalization in days	0.04						
3-No of hospitalizations	-0.13	-0.15					
4-beginning treatment in months	0.11	0.05	0.45**				
5-Drug abuse screening test score	0.03	0.24*	0.51**	.44**			
6-Total hopelessness score	-.096	-.054	0.061	0.013	0.092		
7-Total suicidal thoughts scale	-.18*	-0.02	0.28**	0.096	.370**	.502**	
8-Total problem solving score	-.096	0.14	-0.075	0.035	.230**	.425**	.532**

Correlation coefficient= r * Significant <0.05 ** Highly significant <0.001

Table (8): Logistic Regression for Predictors Variables for Suicidal Probability of Drug Dependents Individuals (n=162).

					95% C.I for EXP(B)	
Variables	**B**	**Wald**	**Sig.**	**Exp (B)**	Lower	Upper
DAST score	0.478	8.205	0.004	1.612	1.163	2.236
Total hopelessness score	0.636	10.657	0.001	1.889	1.290	2.769
Age in years	- 0.227	12.371	0.0001	0.797	0.702	0.904
Monthly income (sufficient)	2.098	4.917	0.027	8.148	1.276	52.044

CI= confidence interval Cox & Snell R^2 = 30.4%

Conclusions:

Based on the findings of this study, it can be concluded that, the most of studied patients had suicidal thoughts. More than one-third of studied patients had severe levels of drug abuse, mild level of hopelessness and unable to solve their problems. There were statistically significant positive correlations between suicidal thought, problem solving ability, and hopelessness. Hopelessness, drug abuse, patients' age, and monthly income were significant predictors for suicidal probability among drug abuse patients.

Recommendations:

- Providing counselling programs for adolescents and less educated people about drug abuse and its effects. Encourage patients to develop meaning and goals to accomplish in their life as this can aid in diminishing their feelings of hopelessness and suicidal thoughts.
- Further research of possible predictors of suicide among patients with drug abuse is recommended.
- Develop annual screening tests for drug abuse among youth.

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