SUICIDAL SELF POISONING AND ITS RELATION WITH PERSONALITY TRAITS AMONG ADMITTED CASES TO MENOUFIA POISONING CONTROL CENTER.

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ABSTRACT

Introduction: Suicide has been ranked among the top ten major causes of death worldwide. Self-poisoning throughout all ages is listed as one of the principal causes of unnatural deaths. **Aim:** Analysis of the pattern of suicidal self-poisoning cases with emphasis on its relationship with personality traits among admitted cases to Menoufia Poisoning Control Center (MPCC). **Method:** This was a cross-sectional, prospective study conducted on 1069 cases of suicidal self-poisoned cases attended to MPCC in one year. Data were collected including sociodemographic criteria, type of poison used, the severity of cases according to poisoning severity score, reasons for committing suicide, and the outcome. A personality questionnaire was fulfilled, which consisted of five personality traits: Extroversion, Agreeableness, Neuroticism, Openness, and Conscientiousness. **Results**: Total number of 1069 suicidal self-poisoning cases were admitted to MPCC over one year. The highest number of them was between 10-20 years (38.4%). Females were more susceptible to suicidal poisoning than males. 78.7% were from rural areas; being single is a high-risk factor. The highest percentage of cases were students, and family troubles were the most common motive in attempting suicide, followed by economic and financial issues. Pesticides were the most used poison. 25.4% of cases were severe according to PSS, and the fatality rate reached 15.9%, where aluminum phosphide was the first claiming agent in this high death rate. Personality trait was a significant factor among people who attempted suicide with a significant difference regarding the gender and type of the used poison. **Conclusion:** Suicide self-poisoning is a considerable public health risk that should be given high attention; the most common age was between (10-20) years. Females were more susceptible than males. Most cases were from rural areas. Most of them were students, and family troubles were the most common motive for attempting suicide. Pesticides were the most used poison, and the fatality rate reached 15.9%. Personality traits are a significant risk factor among people who attempt suicide.

Keywords: Suicidal, Self-Poisoning, Personality traits, Pattern, Menoufia.

INTRODUCTION

Suicide has been ranked among the top ten major causes of death worldwide. Self-poisoning throughout all ages was listed as one of the major causes of unnatural deaths **(Kordrostami et al., 2017).** In recent years, suicide has risen significantly and has been accompanied by substantial increases in youth suicide, especially among young girls **(Khodeary and Elkholy, 2017; Vargas-Medrano et al., 2020).** There has been a 60-percentage surge in suicide rates globally over the last 40 years. Approximately 800,000 suicidal deaths occur in the world annually **(Spiller et al., 2020).** In Egypt**, Aboul-Hagag et al. (2013)** estimated the incidence of suicide deaths that ranged from 0.16 to 0.35/ 100,000 people.

Suicide is a concern of public health that needs attention; there are many ways to commit suicide, as firearm injury, hanging, or self-poisoning **(Najafi et al., 2014; Haroun et al., 2016).** It is a complex behavior that can be termed as a maladaptive response to life stress when individuals cannot overcome it **(Kanchan and Menezes, 2008).** Research shows that the most prevalent suicidal method in Asia is self-poisoning suicide **(Gharbaoui et al., 2019).**

In different cultures and societies, the attitude and pattern of suicide vary. The type of approach used to commit suicide depends on the availability of methods, knowledge of its lethal effectiveness, motive, and intent of the victim. In developing countries, pesticides and drug overdoses are the most alleged agents in poisoning among cases (**Azab et al., 2016; Kandeel and El-Farouny, 2017).** Pesticide self-intoxication accounted for around twenty percent of all suicide deaths per year **(Gunnell et al., 2017).**

Intentional self-poisoning is also one of the significant causes of hospital referral to emergency care unit, accounting for 85-95 percent of all suicidal associated hospital admissions **(Prajapati et al., 2012; Finkelstein et al., 2015).**

Personality traits are a significant predictor for a candidate's suicidal behavior because personality is dominant over an individual's attitude towards the environment **(Judd et al. 2006).** Personality disorders were noted in about 30-40 percent of people who committed suicide, such as borderline or antisocial behavior **(Pilsen, 2018).** It has been speculated that these personality characteristics contribute to psychotic disorders and suicide attempts **(Ekinci et al., 2012).**

According to the "Big Five Personality Traits," there is a diverse personality style that includes neuroticism, conscientiousness, openness to experience, agreeableness, and extroversion **(Costa and McCrae, 1995**). Neuroticism is mainly related to the experience of negative feelings and thoughts, like anger, anxiety, or depression; it is a kind of emotional instability **(Jeronimus et al., 2014)**. Openness is the general acceptance of new ideas, imagination, and various experiences. Conscientiousness is a propensity to act responsibly and to strive against steps or outside standards to have achievement. An agreeable individual is friendly, kind, generous, optimistic, and supportive. While sociability, talkativeness, and emotional intelligence are characteristic of extroversion **(Komarraju et al., 2011).**

Several researchers had reported that; there is a relationship between personality traits and suicidal behavior **(Grucza et al., 2005; Brezo et al., 2006).** For example, **Duberstein et al. (1994), Yen and Siegler (2003), Tsoh et al. (2005)** have concluded that the high suicide rate tends to be associated with higher neuroticism, and less openness, less conscientious. Nevertheless, **Judd et al. (2006)** considered that a higher suicidal rate was associated with lower neuroticism, higher conscientiousness, and lower openness.

The suicidal attempt is a substantial indicator of likely suicides in the future, and those who survived after suicidal attempts have been greatly accompanied by a lower chance of further suicide if they had psychiatric support. So, it is valuable to recognize people who had suicide and give them proper psychiatric care **(Spiller et al., 2020).**

Self-poisoning study offers useful knowledge on one of the most popular methods of suicidal attempts; that can help in driving public health efforts to avoid this phenomenon, and the lack of research on the relationship between personality profile and self-poisoning is the primary reason for this study. We now need a clear understanding of the risk factors associated with the suicidal activity.

AIM: The present study aimed to get an overview and analysis of the pattern of suicidal self-poisoning cases and its relationship with personality traits among

admitted cases to Menoufia Poisoning Control Center **(MPCC),** Menoufia University Hospital.

SUBJECTS & METHODS

This was a cross-sectional, prospective study of suicidal self-poisoned cases attended to MPCC over one year from the 1st of January 2019 to the end of December 2019. Inclusion criteria: all suicidal self-poisoned patients in the age group between 7-60 years old; who signed a written consent by themselves or their guardian. Exclusion criteria for the uncooperative patients who refused to share in the study.

An approval from the Ethical Committee of Faculty of Medicine, Menoufia University, was obtained and written informed consent was also signed by the examined cases or their guardian after clarification of the aim of the study.

The personal information gathered was regarded as confidential. Data were collected in a special sheet including sociodemographic criteria, type of poison used, the severity of poisoned cases according to poisoning severity score (PSS); which is a rating scale that classifies poisoned cases into four classes, zero (0): no obvious poisoning symptoms or signs; Minor (1): symptoms that are mild, intermittent and recover spontaneously, Moderate (2): symptoms that are pronounced or continuous, Severe (3): symptoms that are extreme or life-threatening. Fatal (4): Death **(Persson et al., 1998)**, reasons for committing suicide, and the outcome of cases either completely recovered, discharged against medical advice, or died.

Case examination and investigations were carried out on admission, in the form of biochemical laboratory investigations and basic toxicological screening tests; for the identification of the suspected poison, such as cholinesterase level for organophosphorus and carbamate poisoning, silver nitrate testing for aluminum or zinc phosphide poisoning identification, and drug screening tests for suspected drug overdose poisoned cases.

A validated personality questionnaire was fulfilled by cases, after stabilization of their condition. This questionnaire comprises five personality traits: Extroversion, Agreeableness, Neuroticism, Openness, and Conscientiousness **(John and Srivastava, 1999).** The big five personality inventory was developed by **John and Donahue (1994).** We used the Arabic version of the inventory containing 40 items; that was translated by **Haridi and Shawky (2002)**. The final inventory consisted of forty brief statements to be answered on a five-point Likert type scale: 1 (strongly disagree), 2 (disagree), 3 (Neutral), 4 (agree), and 5 (strongly agree). A higher score on the factor shows a higher trait score. The scale has grads from acceptable to high alpha reliabilities **(Haridi and Shawky, 2002).**

The data obtained were tabulated and statistically analyzed using a personal computer with version 20 of the Statistical Package of Social Science (SPSS), and the required statistics were used. Data were conducted as numbers and percentages or mean and standard deviation (SD). The data were analyzed using the chi-square test ($\chi 2$ test), t-test, one-way ANOVA, and Tukey Post Hoc Analysis. A P-value of 0.05 or less was considered significant, while a P-value of more than 0.05 was considered non-significant **(Dawson and Trapp, 2004).**

RESULTS

The total number of suicidal self-poisoned cases admitted to Menoufia Poison Control Center (MPCC), Menoufia University Hospital, over one year was (1096) patients, which represented nearly one-third of the total number of all poisoned cases admitted to (MPCC) at the same period 3322 patients.

It was noticed that the highest number of patients aged between 10-20 years (38.4%), followed by the age group 20-30 years (28.1%) then age groups over 40 years and 30-40 by 17.4%, 16.1% respectively **(Table 1).**

Females were more susceptible to suicidal poisoning than males (66.8%

females versus 33.2% males). 78.7% of patients were from rural areas, while 21.3% were from urban ones. As for the marital status, 59.2% of patients were single, while 35.2% were married, and the least were divorced or widowed, comprising 4.2% and 1.4% of all patients, respectively **(Table 1).**

Fig. (2) shows the significant relation between age group and sex of the studied cases where females constituted the highest participants in all age groups except in 30-40 y male and female were equal with, $\chi 2$ = 31.6 and $p < 0.01$.

The highest percentage of cases (34.9%) were students, followed by not working who represent 34.6% of cases, then manual workers and employees by 16.3% and 9.4%, respectively, while the least percentage (4.8%) were among professional individuals **(Table 1).** As regards motives for suicidal attempts from patient's history, it was noticed that family troubles were the most common cause in 30.6%, followed by economic and financial issue 25.4%, failure in relation in 23.6%, failure in education in 12.3%, and lastly psychiatric problems in 8.2% **(Table 2).**

According to the type of toxic substances used in self-poisoning suicidal attempts, pesticides were the most commonly used poison as they constituted nearly two-third of cases by 66.6%, where 31. 2% of all cases were due to anticholinesterase poisoning, 25.5% were aluminum phosphide, then cases of zinc phosphide poisoning in 9.9%. Drug overdose was the second most common substance used in suicidal self-poisoning by 28.1% of all cases; the most commonly used drug was analgesics in 5.9%, followed by digitalis in 5.3%, then antipsychotics and oral hypoglycemic in 5.1% for each, sedative-hypnotic 3.9% and bronchodilators in 2.7%. After drug overdose came the unknown substances and household products by 2.8%, 2.5%, respectively **(Table 2, and fig. 1).**

Moreover, there was no significant difference between the type of toxic substances used in the suicidal attempt regarding the sex **(Table 3).** According to the severity score, 40.2% of cases were mild, 34.3% were moderate, while 25.4% were severe. 37.9% of cases stayed over three days in the hospital, 25.4% stayed from one to two days, 21.4% from two to three days, while only 15.2% stayed less than one day. The highest percentage of cases (76.6%) recovered versus 15.9% died, and the rest 7.5% discharged against medical advice **(Table 2).**

A highly statistically significant relationship was found between the motive for suicide and sex, where the largest percentage of males (27.9%) committed suicide for economic and financial reasons, followed by family troubles at 25.6%, while the most common motivation among females was family problems at 33.1%, followed by 25.5% due to failure in relation with $\chi 2 = 19.182$ and $p < 0.01$ **(Table 4).** Moreover, family troubles were significantly the most common motive among the age group (10-20) years followed by failure in education, while the failure in relation was significantly the most common motive for suicide poisoning between the age groups 20-30 years. Economic and financial causes were significantly common motives for suicide in age groups 30-40 years and above 40 years, $\chi 2 = 526{,}723$ and $p < 0.01$ **(Table 5).**

A highly significant relation was found between the type of poisoning and outcome; where the highest percent of dead cases (88.2%) were among aluminum phosphide users, followed by Zn phosphide in 7.6%, while the largest percentage of treated cases (38.3%) used anticholinesterase substances **(Table 6).** Besides that, a highly significant relationship between the period of hospital stays and outcome of the studied cases as more than half of dead cases (56.5%) stayed in the hospital less than one day, 44.4% of the treated cases stayed over three days in the hospital, while 47.5% of discharged cases against medical advice stayed from one to two days only **(Table 7).**

A significant difference was found between poison severity score and the outcome, as the largest percentage of dead cases were considered severe (72.4%), 25.9% were moderate, while 44.2% of recovered patients were mild in severity, and 18.2% were severe **(fig. 3).**

Personality questionnaire was fulfilled by 847 patients, after receiving their medical treatment and complete stabilization of their medical condition (as the dead cases who were in a severe emergency state and some of those who discharged against medical advice before completing the questionnaire; were not included)

T-test was used to find out the difference in personality based on sex. The results showed a significant difference in neuroticism between males and females, $p < 0.01$. The mean value for males was significantly higher than for females. Females scored significantly higher on agreeableness with a mean value of (25.29) compared to (23.13) of that of males $p < 0.001$. Females also got significantly higher scores on conscientiousness with a mean of (25.6) compared to males (22.4), $p < 0.05$. The results of the t-test showed no significant difference in extroversion and openness between males and females as $p > 0.05$ **(Table 8).**

The difference between the means of score of each personality components in suicidal self-poisoned cases was analyzed by ANOVA test that shows significantly different in (neuroticism, conscientiousness, openness to experience, and extroversion), however, the means of agreeableness were not significant as regards the type of poison used. By using Tukey Post Hoc analysis to view and determine the site of difference; the mean scores of neurotic participants were significantly higher in suicidal cases used pesticides, mean score of extroversion was higher in cases used unknown substances, while the mean score of openness to experience was the highest among those used household products. Also, the mean score of conscientiousness was high among cases used drug overdose, as seen in **table 9**.

Table (1): Sociodemographic distribution of suicidal self-poisoning cases.

Character		**Total number =1069**	**%**
Age	10-20 y	411	38.4%
	20-30 y	300	28.1%
	30-40 y	172	16.1%
	> 40 y	186	17.4%
Sex	Male	355	33.2%
	Female	714	66.8%
Residence	Rural	841	78.7%
	Urban	228	21.3%
Marital status	Married	376	35.2%
	Single	633	59.2%
	Divorced	45	4.2%
	Widow	15	1.4%
Occupation	Employee	101	9.4%
	Student	373	34.9%
	Not Working	370	34.6%
	Manual Worker	174	16.3%
	Professional	51	4.8%

Table (2): Frequency distribution of poisoning data of suicidal self-poisoning cases.

Character			Total number =1069	%
Motive for committing suicide	**Economic and financial**		271	25.4%
	Family troubles		327	30.6%
	Failure in relations		252	23.6%
	Failure in education		131	12.3%
	Psychiatric problems		88	8.2%
Type of the used poison	**Pesticides** (712 cases)	Aluminum phosphides	273	25.5%
		Zinc phosphides	106	9.9%
		Anticholinesterases	333	31.2%
	Drug overdose (300 cases)	Bronchodilators	29	2.7%
		Antipsychotic	55	5.1%
		Digitalis	57	5.3%
		Hypoglycemic	54	5.1%
		Analgesic	63	5.9%
		Sedative-Hypnotics	42	3.9%
	Household products		27	2.5%
	Unknown substance		30	2.8%
Poison severity score (PSS)	**Mild**		430	40.2%
	Moderate		367	34.3%
	Severe		272	25.4%
Period of stay in hospital	**<1 day**		163	15.2%
	1-2 day		272	25.4%
	2-3 day		229	21.4%
	> 3 day		405	37.9%
Outcome	**Recovered**		819	76.6%
	Dead		170	15.9%
	Discharged against medical advice		80	7.5%

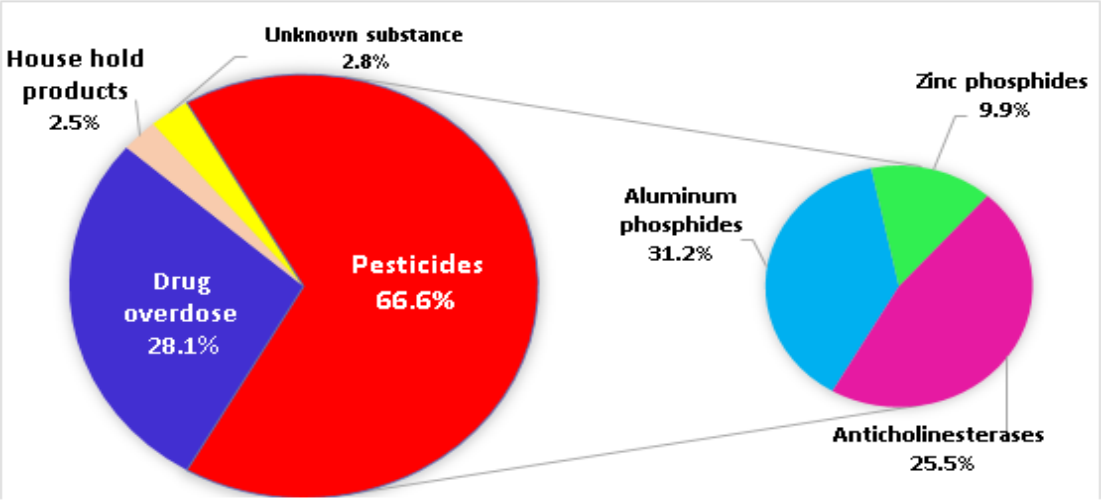

Figure (1): Distribution of the type of poison used by the suicidal self-poisoning cases.

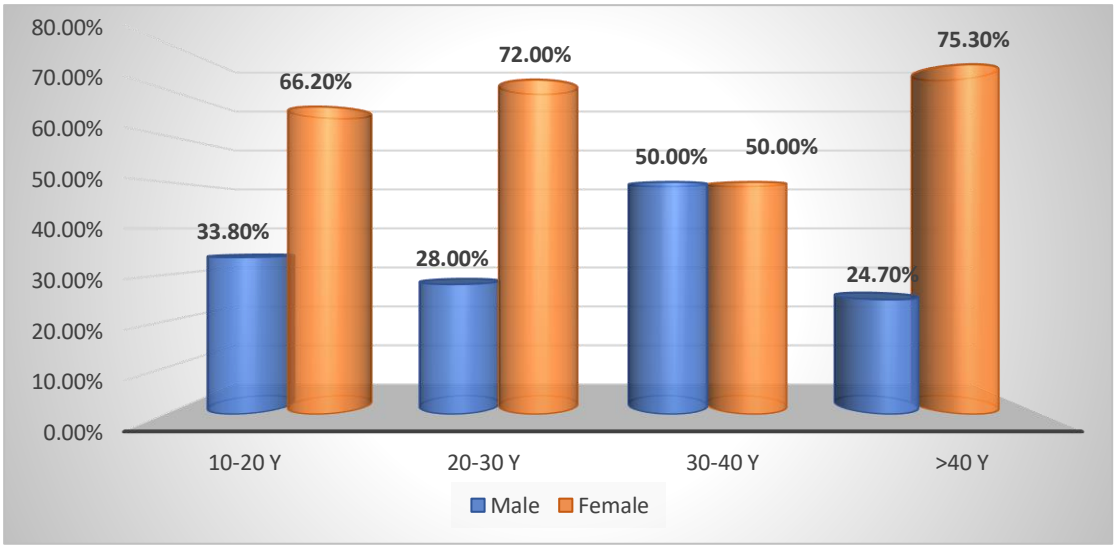

Figure (2): Chi square statistical analysis of the relation between sex and age group, $\chi 2 = 31.6$, $p < 0.01$.

Table (3): Chi square statistical analysis of the relation between sex and the type of the used poisoned substance.

Type of poisoning	Sex				χ2	P-value
	Male		Female			
	No	%	No	%		
Pesticides	250	70.4	462	64.7	4.557	0.207
Drug overdose	85	23.9	215	30.1		
Household products	10	2.8	17	2.4		
Unknown substances	10	2.8	20	2.8		
Total	355	100	714	100		

χ2 test: chi-square test **No = number** **P value >0.05 non-significant.**

Table (4): Chi square statistical analysis of the relation between sex and motive for committing suicide among the studied cases.

Sex	Motive for committing suicide										Total		χ2	P value
	Economic and financial		Family trouble		Failure of relations		Failure in education		Psychiatric problems					
	No	%	No	%	No	%	No	%	No	%	No	%		
Male	99	27.9	91	25.6	70	19.7	57	16.1	38	10.7	355	100	19.182	0.001**
Female	172	24.1	236	33.1	182	25.5	74	10.4	50	7.0	714	100		

χ2 test= chi-square test **No = number** *****= Highly significant (P value <0.01)***

Table (5): Chi square statistical analysis of the relation between age groups and motive for committing suicide among the studied cases.

Age	Motive for committing suicide										χ2	P-value
	Economic and financial		Family troubles		Failure in relations		Failure in education		Psychiatric problems			
	No	%	No	%	No	%	No	%	No	%		
10-20 y	11	2.7	140	34.1	106	25.8	126	30.7	28	6.8	526.723	0.00**
20-30 y	54	18.0	82	27.3	124	41.3	5	1.7	35	11.7		
30-40 y	109	63.4	39	22.7	10	5.8	0	0	14	8.1		
>40 y	97	52.2	66	35.5	12	6.5	0	0	11	5.9		
Total	271	25.4	327	30.6	252	23.6	131	12.3	88	8.2		

χ2 test= chi-square test **No = number** *****= Highly significant (P value <0.01)***

Table (6): Chi square statistical analysis of the relation between the type of the used poisoning and outcome of the studied cases.

Type of poisoning	Outcome						χ2	P-value
	Recovered		Discharged against medical advice		Dead			
	No	%	No	%	No	%		
Aluminum Phosphide	106	12.9	17	21.3	150	88.3	469.59	0.000**
Zinc Phosphide	93	11.4	0	0	13	7.6		
Anticholinesterase	314	38.3	13	16.3	6	3.5		
Drug overdose	260	31.7	39	48.8	1	0.6		
Household products	20	2.4	7	8.8	0	0		
Unknown	26	3.2	4	5	0	0		
Total	819	100	80	100	170	100		

χ2 test= chi-square test **No = number** ****= Highly significant (P value <0.01)**

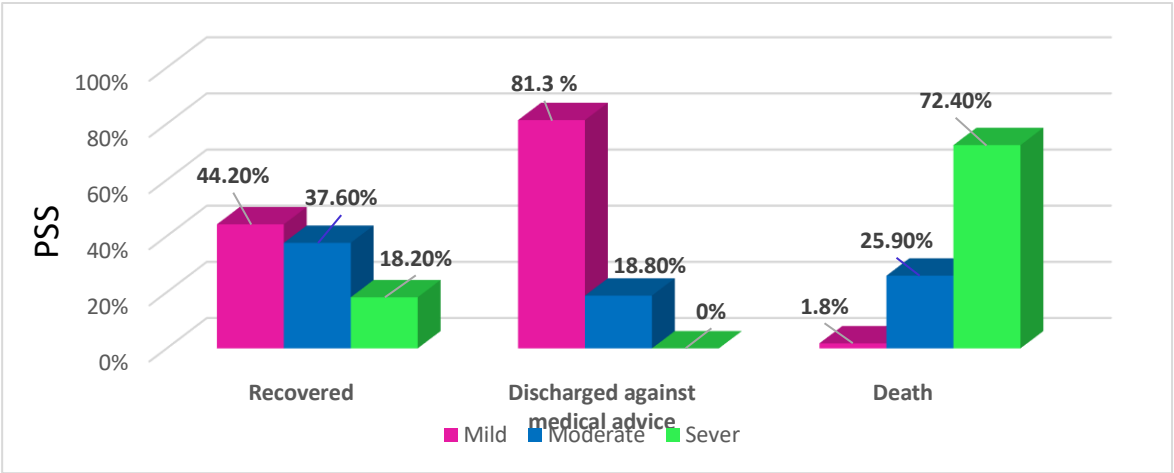

Figure (3): Chi square statistical analysis of the relation between PSS and outcome of the studied cases, $\chi 2 = 295$, P ** < 0.01.

Table (7): Chi square statistical analysis of the relation between period of stay in hospital and outcome of the studied cases.

Period of stay in hospital	Outcome						χ2	P value
	Recovered		Discharged against medical advice		Dead			
	No	%	No	%	No	%		
<1 d	46	5.6	21	26.3	96	56.5	341,492	0.000**
1-2 d	211	25.8	38	47.5	23	13.5		
2-3 d	198	24.2	21	26.3	10	5.9		
> 3d	364	44.4	0	0	41	24.1		
Total	819	100.0	80	100.0	170	100.0		

χ2 test= chi-square test No = number **= Highly significant (P value <0.01)

Table (8): T-test statistical analysis for the five-personality traits (extroversion, neuroticism, agreeableness, openness, and conscientiousness) as regards sex.

Personality trait	Sex	No.	Mean	SD	df	t
Extroversion	Male	278	24.7878	5.9147	845	-1.748
	Female	569	25.5325	5.77904		
Neuroticism	Male	278	27.4604	5.25009	845	4.761**
	Female	569	25.6819	5.03359		
Agreeableness	Male	278	23.1331	3.44952	845	-10.516**
	Female	569	25.2988	2.44561		
Openness	Male	278	28.4748	7.12886	845	-0.444
	Female	569	28.7012	6.88323		
Conscientiousness	Male	278	22.4029	4.35719	845	-11.434**
	Female	569	25.696	3.82275		

No = number SD= stander deviation t= student t-test
df= degree of freedom **= Highly significant (P value <0.01)

Table (9): One-way ANOVA and Tukey Post Hoc analysis of the differences in means of personality trait regarding to the type of the used poisons.

Personality	Type of Used Poision				F	P- value	Tukey Post Hoc
	Pesticide	Drug	Household products	Unknown			
Neuroticism (Mean ± SD)	26.65 ± 5.12 *	25.57 ± 5.31	25.1 ± 4.17	26.19± 4.72	2.990	0.030 *	P1 = 0.026* P2 = 0.545 P3 = 0.969 P4 = 0.979 P5 = 0.937 P6 = 0.892
Extroversion (Mean ± SD)	24.53 ± 5.90	26.35 ± 5.58	27.45 ± 4.93	28.03 ± 4.64*	9.051	0.000 **	P1 = 0.071 P2 = 0.118 P3 = 0.013 * P4 = 0.846 P5 = 0.986 P6 = 0.486

Openness (Mean ± SD)	28.08 ± 7.13	29.58 ± 6.41	29.7 ± 7.19*	29 ± 7.66	2.946	0.032 *	P1 =0.738 P2 = 0.022* P3 = 0.914 P4 = 0.891 P5 = 0.977 P6 = 0.987
Agreeableness (Mean ± SD)	24.64 ± 2.83	24.53 ± 3.38	24.1 ± 2.35	24.23 ± 2.28	.4040	0.75	
Conscientious-ness (Mean ± SD)	24.59 ± 4.08	24.94 ± 4.54*	23.4 ± 5.45	22.57 ± 4.24	3.024	0.029 *	P1 = 0.708 P2 = 0.608 P3 = 0.087 P4 = 0.406 P5 = 0.037* P6 = 0.917

P1 for (Pesticide, Drug) **P2 for (Pesticide, House hold products)**
P3 for (Pesticide, Unknown) **P4 for (Drug , House hold products)**
P5 for (Unknown, Drug) **P6 for (Unknown, House hold products)**
SD= stander deviation, ***= significant (P value <0.05)**
****= Highly significant (P value <0.01)**

DISCUSSION

Suicidal self-poisoning accounts for most of the total deaths from all poisoning cases. Regarding the data of this study, self-poisoning cases admitted to MPCC over one year were 1069 cases, which represents nearly one-third of the total number of all poisoned cases admitted to MPCC in one year. That reflects the size of the problem in our country, as suicidal poisoning was noticed to be the most reported form of suicidal attempts before the completion of suicide **(Gharbaoui et al., 2019).** That may be due to human life which filled with tension, frustration, self-doubt, social pressure, economic instability, and physical illnesses; all these variables are leading factors to stress during different age groups, which may lead to suicidal behavior, besides that there is a common conviction among people that poisoning will cause death with minimal pain **(Kanchan and Menezes, 2008).**

The most dominant age group was between (10 - 20) years, followed by the age group (20-30) years, while those in the age group from 30 to 40 and more than 40y forms about 33.5% of all cases. The high affection of the younger age may be due to lack of experience, emotional instability, and rapidly influenced by the surrounding stressful situation, Our finding was consistent with that of **Rostami et al. (2016)** in Iran**, Issa et al. (2016)** in Saudi Arabia, and also with **Spiller et al. (2020)** who stated that the most common age for committing suicide was from (15 to 19) years old, with a frequency almost twice more than that of the (35 to 50) years, where poisoning was the most common mechanism (66.5%) of all suicide attempt in his study. **Vijayakumar (2004)** in his study on suicide prevention in developing countries, found that suicide rates were more common among people under 30 years of age. Further research in Iran, **Najafi et al. (2014)** found that more than half of self-poisoning cases were among the age of 20-29 years.

It was obvious in the current study the sex differences among suicidal self-poisoning cases; as two-third of the studied cases were females (66.8%), also singles individuals constituted the highest percent 59.2% versus married persons were 35.2%. That could be because the toxic substances are widely known as a non-violent way for death where females prefer their use, compared to males who would use more direct and aggressive methods as firearm or

hanging. Moreover, the restricted customs in most developing countries, low education, low job status for women, and the increased burden of spinsterish on women play a role in their suicidal behavior. On the other hand, suicides between married individuals, either males or females, are likely to be not classified or unreported because of family ties and feelings of responsibility and obligation toward them. This result was concomitant with **Aboul-Hagag et al. (2013**) in Upper Egypt and **Gharbaoui et al. (2019**) in Tunis, but in contrast to **Handley et al. (2014) and Kordrostami et al. (2017),** where males were more prevalent in his study in Iran than females; this might refer to sample difference as they analyzed only deaths due to suicidal poisoning, not suicidal attempt.

As for the residence, the current analysis revealed that there was a significant residence difference among suicidal self-poisoning cases as rural dwellings are higher than urban ones. This could be because of the rural nature of the Menoufia governorate, the growing tension, poverty, and low socioeconomic level among people living in rural areas. These findings agreed with **Spillar et al. (2020)** in the United States, who declared that the social loneliness and nonavailability of behavioral, or psychological health providers in rural areas can impede the opportunity of individuals to get the proper support and eventually lead to more negative thoughts. Also, **Yip et al. (2005)** in China and **Mashreky et al. (2013)** in Bangladesh reported that rates of suicide were around three times higher in rural areas than in urban areas.

As regards occupational status, the highest percentage of cases (34.9%) were students; as most of the participants in this study were in the age group from (10-20y) and this is the age of adolescence in school or college they are hasty in their actions using suicidal poisoning for threatening their families; this was in line with **El Mahdy et al. (2010**) where students constituted 40% of cases. After students came the not working individuals who constituted 34.6% of cases, so it is believed that the economic downturn and social distress are among the major factors contributing to suicidal behavior as documented by **Kordrostami et al. (2017).**

Regarding the motives for suicidal attempts, it was noticed that family troubles were the most common cause (30.6%), followed by economic and financial issue, that agreed with **El Mahdy et al. (2010)** as the cause of suicide in 23.9% was due to quarrel within the family, and with **Taha et al. (2011),** where family troubles were the commonest followed by economic problems. A significant relation was present between the motive and sex, as the largest percentage of male (27.9%) committing suicide because of an economic and financial issue; as males more affected by economic troubles due to their financial responsibilities, which can push them to commit suicide to escape from the pressure. On the other side, the common cause among females was family troubles in 33.1%, followed by failure of relation in 25.5%.

Family troubles were also the most common motive among the age group from 10 to 20 years, followed by failure in education, while the failure in relation was significantly the most common motive for suicide poisoning in the age from 20 to 30 years. Economic and financial causes were the commonest motives among age groups 30-40 y and above forty years. That reflects the nature of each phase of life as adolescence in early age are more influenced by family member conflicts, while the age of 20-30 y is mainly the age of entangling in romantic relation, but from 30 y to over 40 y is the age of maturity and more financial responsibilities and life burden.

As the use of specific poison to commit suicide depends upon the accessibility of the toxic agent to the person, it was noticed in this study that pesticides were the commonest poisons used for committing

suicide in 64.9%; as they are easily accessed with no restriction and not expensive, the most dominant form of pesticides was anticholinesterase substances (organophosphorus or carbamate); they are widely used in rural areas, followed by aluminum phosphide; which used to preserve grains; today's it has become one of the most common substances used for self-poisoning in Egypt. The least number of pesticides was zinc phosphide poisoning in 6.8%. That was coincident with **ElHak et al. (2009)** in Port Said and **Hassan et al. (2015)** in their study of Menoufia, Gharbia, and Kafr Elsheikh Governorates from (2008-2012), **Kandeel and El-Farouny, (2017)** in Menoufia and with **Gharbaoui et al. (2019)** in Tunis, as they stated that pesticides were the most common route of suicidal attempts, especially in agricultural areas. Using organophosphorus substances in suicidal poisoning was confirmed in previous research **Falia et al. (2017)** and **Eldin and Azim, (2018).** This shows the ease of availability of these poisonous chemicals, which is responsible for their high poisoning rate **(Gharbaoui et al., 2019).** In 2002, around one-third of the world's overall suicides were recorded by pesticides, with the bulk of cases happening in East Asia, Africa, and the Pacific Ocean **(Gunnell et al., 2007).** In contrast to a study on suicidal attitude in Europe, **Schmidtke et al. (2004)** concluded that self-poisoning was mostly performed with drugs in the developed countries. In Iran, **Zafaghandi et al. (2012)** and **Azizpour et al. (2016)** also reported that medicinal formulations were the suicide agents most widely used, followed by agricultural products. Such variations are thought to be due to the availability of toxic substances and the difference in social and cultural dimensions between cultures.

As noticed in this study, mild cases constituted the largest percentage by 40.2%, and one-fourth of cases were severe (25.4%). The highest percentage of cases (76.6%) recovered versus 15.9% had died. This result agreed with **Eldin and Azim (2018),** as they documented that during years 2015 and 2016, the majority of cases were mild (>70%), while severe cases constituted 6.8% of cases, with a mortality rate of 0.6% in both years of the study. The larger death rate in our study might be due to varying features of the used poisoned substance. **Shokrzadeh et al. (2017)** also reported a higher incidence of fatality in their study.

Death rate reached 15.9%, and a highly statistically significant relationship between the type of poison and the outcome was present, where the highest percentage of dead cases (88.2%) used aluminum phosphide pesticide; aluminum phosphide is a highly toxic substance; converted to phosphine gas after exposure to water or hydrochloric acid in the stomach; phosphine prevents oxidative phosphorylation by inhibiting Cytochrome c oxidase that leads to cell death, it has no antidote (**Oghabian et al. 2020).** Moreover, it is cheap and widely available in pesticide shops. **Gunnell et al. (2007)** declared that the fatality of aluminum phosphide was often above 60 percentage: close to other suicide strategies with extreme lethality, like a firearm and hanging. This observation was in line with **Kordrostami et al. (2017)** in Iran, as there was a high rate of self-intoxication with aluminum phosphide-related deaths (80.8% of total deaths).

The present study highlighted the significant difference between sex in individuals attempting suicide and personality traits, as the male group exhibited more neuroticism, less agreeableness and conscientiousness than females. This difference between the males and females could have been the consequence of inequality, particularly social and cultural pressure on males' role that forced them towards feelings of powerless and frustration in some situations. Otherwise, females showed less neuroticism than males did. Thus, the higher neuroticism in men could lead to depression and anxiety and could be considered as a potential risk factor for

suicide attempts as they show negative feelings when faced with stressful conditions **(Hokm Abadi et al. 2018; Shahin et al. 2018).** That was in coincidence with **Fergusson et al. (2003), and Kendler et al. (2006),** who got similar results**. De Shong et al. (2015)** found that persons with high neuroticism and low extroversion were found to be more vulnerable to suicide. **Mandelli et al. (2015)** stated that neuroticism had been proven to be closely associated with depression and suicidal attempts that seem to be due to bad thoughts.

The results obtained in the current study regarding higher conscientiousness and agreeableness scores obtained by females relative to males refers to the way of thinking and coping styles, females are more inclined to interpersonal relationships, willing to help others, believing that others can help her in return, and this can be valuable in understanding their personality and in finding a way to help **(Gould and Kramer, 2001; Rostami et al., 2014)**. Overall, studies in the area of personality traits that induce suicidal thoughts, or its attempts have shown that variables such as neuroticism, extroversion, and novelty-seeking, may have the potentiality of suicide ideas or suicide behaviors in some people **(Brezo et al., 2006; Calati et al., 2008).**

There was a statistically significant relation regarding the personality traits and type of poisoned substance according to our findings in this study; where neurotic participants were significantly more in using pesticides, individual with high extroversion score was more directed to use unknown substances, and openness to experience was the highest among those using household products. In addition, conscientiousness was high among cases used drug overdose. Unfortunately, there was a lack of research on the relationship between personality profile and self-poisoning; therefore, we suggest future studies should be done in this field.

THE LIMITATIONS OF THE STUDY

The study sample was from one governorate so that our finding could not be generalized, besides the type of the study as a cross-sectional analysis was not feasible for long-term follow-up of the sample population.

CONCLUSION

Suicidal self-poisoning in our community is a considerable public health risk that should be given high attention as the total number of suicidal self-poisoned cases admitted to Menoufia Poison Control Center (MPCC), over one year was 1069 cases. The highest number of them was between 10-20 years (38.4%). Females were more susceptible to suicidal poisoning than males (66.8% females versus 33.2% males). Most cases (78.7%) were from rural areas. 34.9% were students, and family troubles were the most common motive in attempting suicide. Pesticides were the most used poison, as they constituted nearly two-third of the used poisons. 25.4% were severe, and the fatality rate was 15.9%, where aluminum phosphide was the first claiming agent in that death rate. Personality traits are a significant risk factor among people who attempt suicide.

RECOMMENDATION

The Governmental policy should be moved towards restricting the usage of extremely fatal pesticides that are commonly used for suicide, particularly aluminum phosphide. Besides, introducing alternatives fewer toxic compounds for pest control.

Conducting educational seminars to raise awareness among vulnerable peoples.

Further studies are recommended on a larger sample with long-term follow-up of such suicidal attempts to determine national patterns of self-poisoning in EGYPT and to declare the role of some personality traits as a critical predictor of suicide.

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الملخص العربى

التسمم الذاتي الانتحاري وعلاقته بسمات الشخصية بين الحالات التي تم دخولها مركزعلاج السموم جامعة المنوفية.

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مقدمة: يعد الانتحار من الأسباب العشرة الأولى للوفاة بين جميع الفئات العمرية في مختلف أنحاء العالم. كما انه أحد الأسباب الرئيسية للوفيات غير الطبيعية. وهناك العديد من الطرق الانتحاريه بما في ذلك التسمم الذاتي.

الهدف: هدفت هذه الدراسة على تقديم نظرة عامة وتحليل لحالات التسمم الذاتي بغرض الانتحار للحالات التي ادخلت مركز علاج السموم بمستشفى جامعه المنوفية مع التركيزعلى العلاقة بين هذه الحالات وسمات الشخصية.

طرق البحث: تم تصميم هذه الدراسة المستقبلية لدراسة حالات التسمم الذاتي الانتحاري التي ادخلت مركز علاج السموم بمستشفى جامعه المنوفية خلال عام واحد بدايه من 1 يناير 2019 وحتى نهاية ديسمبر 2019 لجميع الحالات في الفئة العمرية ما بين 7-60 سنة، والتي وقعت على موافقة خطية على خطه البحث، حيث شملت 1069 حاله و تم جمع البيانات الاجتماعية والديموغرافية، الدوافع لمحاولة الانتحار، ونوع المواد المستخدمة، وشدة الحالات، ونتائجها. كما تم استيفاء ورقة الفحص السريري وكذلك استبانة الشخصية للحالات بعد استقرار حالتهم لتقييم سمات الشخصية بينهم حيث يتألف هذا الاستبانة من خمس سمات شخصية تضم الانبساط، التوافق، العصبية، الانفتاح، ويقظه الضمير.

النتائج: شملت الدراسه 1069 حالة تسمم ذاتي انتحاري تم ادخالهم مركز علاج السموم بمستشفى جامعه المنوفية على مدار عام واحد. حيث كان أكبر عدد منهم بين 10-20 سنة بنسبه (38.4%). كما كانت الإناث أكثر عرضة للتسمم الانتحاري من الذكور (66.8٪ إناث مقابل 33.2٪ ذكور). وكانت غالبية الحالات 78.7٪ من المناطق الريفية. كما شكلت المشاكل الأسرية الدافع الأكثر شيوعًا لمحاولة الانتحار، تليها المشاكل الاقتصادية والمالية. وكانت مبيدات الآفات هي المادة المستخدمة الأكثر شيوعاً حيث شكلت ما يقرب من ثلثي المواد المستخدمه من جميع الحالات حيث شملت التسمم بمضادات الكولينستريز، فوسفيد الألومنيوم والتسمم بفوسفيد الزنك. 25.4٪ من الحالات كانت شديدة حسب درجه شده السميه وبلغ معدل الوفيات 15.9٪. هذا ويعد فوسفيد الألومنيوم العامل الرئيسي المؤدي لارتفاع معدل الوفيات. هذا وتعتبر سمات الشخصية من العوامل المؤثره بين الأشخاص الذين يحاولون الانتحار مع وجود اختلاف كبير فيما يتعلق بالجنس ونوع السم؛ المستخدم حيث كان متوسط قيمة العصابية للذكور أعلى بكثير من الأناث. كما سجلت الإناث درجات أعلى بكثير في التوافق ويقظه الضمير مقارنة بالذكور.

التوصيات: يجب توجيه سياسة الحكومه نحو تقييد استخدام مبيدات الآفات شديدة الخطورة التي يشيع استخدامها في محاولات الانتحار، ولا سيما فوسفيد الألومنيوم، والبحث عن بدائل أقل سمية من مضادات الآفات، بالإضافة إلى إجراء ندوات تثقيفيه لرفع الوعي بين الفئات الاكثر تعرضا للتفكير الانتحاري. كما يُنصح بإجراء مزيد من الدراسات على عينة أكبر مع متابعة طويلة المدي لتحديد دور سمات الشخصية كمؤشر للتسمم الذاتي الانتحاري.