

THE PREVALENCE OF SUICIDAL INTOXICATIONS AMONG CASES PRESENTED TO NATIONAL ENVIRONMENTAL AND CLINICAL TOXICOLOGY RESEARCH CENTER BEFORE AND DURING COVID-19 PANDEMIC: A COMPARATIVE STUDY

Sherien Salah Ghaleb*, Rahma Noureldin Mohamed***, Mohamed Kamel Kenawy Mohamed**,
Noha Maher Elrewieny **

*Professor of Forensic Medicine and Clinical Toxicology, Faculty of Medicine, Cairo University

** Lecturer of Forensic Medicine and Clinical Toxicology, Faculty of Medicine, Cairo University

*** Assistant Lecturer of Forensic Medicine and Clinical Toxicology, Faculty of Medicine, Cairo University

Corresponding author: Noha Maher Elrewieny E-mail: noha1986@gmail.com

Submit date: 07-03-2024

Revise date: 01-06-2024

Accept date: 07-06-2024

ABSTRACT

BACKGROUND& OBJECTIVES: Suicide is a tragic and a potentially preventable public health problem. The mental health effects of the coronavirus disease 2019 (COVID-19) pandemic might be profound and there are suggestions that suicide rates will rise. **AIM OF THIS STUDY:** to assess and identify the prevalence of suicidal cases presented to NECTR before and during COVID-19 pandemic **SUBJECTS& METHODS:** The study included 388 cases presented to NECTR during the period of the study which is 6 months before the pandemic and 6 months during the pandemic. **RESULTS:** The total number of cases during the pandemic was decreased compared to before the pandemic. The most common age group was the adult age group (18-25 years) with a higher percentage of females during the two study periods. The most common poison of suicide during the two periods was pesticides. There was a decrease in the mortality rate during the pandemic. The worst outcome was associated with pesticide poisoning and the highest poisoning severity scores. **CONCLUSION:** The current study confirming an overall effect of the COVID-19 pandemic on the prevalence of suicidal intoxications presented to NECTR.

Keywords: Comparative study, COVID 19 Pandemic, Suicide, intoxications.

INTRODUCTION

With the increase in suicide mortality in some nations, suicide continues to be major concern for public policy and health services (Turecki et al., 2019). The risk of suicide gradually rises and deaths due to suicide increase (Caballero-Domínguez et al., 2022).

The COVID-19 pandemic affects healthcare facilities all over the world. When compared to prior years, the pandemic witnessed a change in the number of cases presenting to hospitals (Fayed and Sharif, 2021).

Anxious people have consciously distanced themselves physically and restricted their economic activity as the virus has spread throughout the globe to prevent infection (Tanaka et al., 2021).

As the virus spreads, suicide is expected to become a more urgent concern (Gunell et al., 2020). It was reported that drug overdose, rodenticides, and pesticides were the most common means of suicide in Egypt. (Cantrell et al., 2014; Ranjan et al., 2014).

PARTICIPANTS AND METHODS

The current study included 388 cases admitted to Cairo University's National Environmental and Clinical Toxicology Research Center (NECTR) using comparative cross-sectional analytical methods between the six-month period (April 2019 to September 2019) before the COVID-19 pandemic and the six-month period (April 2020 to September 2020) following the pandemic to ascertain the prevalence of suicidal intoxications. Data of all suicidal intoxicated cases were retrieved from the archives and analyzed after the formal consent from the head of NECTR's, scientific and ethical committee with ethical approval number: **MS-85-2022**. Cases were analyzed with respect to: demographic information (age, sex, place of residence, marital status, degree of education, and occupation), type of the poison, route of exposure, delay time till the patient reach to (NECTR), The severity of the poison will be assessed by using the Poison Severity Scoring system (PSS) (**Persson et al., 1998**), place of admission and period of stay, and the outcome.

The statistical software for the social sciences (SPSS) version 28 (**IBM Corp., Armonk, NY, USA**) was used to code and enter the data. Data was summarized using count and percentage for categorical data. For comparing categorical data, Chi square (χ^2) test was performed. When expected frequency is less than 5, an exact test was utilized instead (**Chan et al., 2003**). Statistics were considered significant for P-values under 0.05.

RESULTS

388 suicidal intoxicated cases presented to NECTR in the studied period. It was found that 256 (66.0%) of the cases were presented to NECTR before the pandemic (April 2019 to September 2019), on the other hand 132 (34.0%) of the cases were presented to NECTR during the pandemic (April 2020 to September 2020). The most frequent age group was (18–25 years), which represented 54.7% of the cases before the pandemic period and 55.3% of the cases during the pandemic period. The young adult (18–25 years) and middle-aged adults (25–40 years) age

groups have increased during the pandemic period, while the old adults (more than 40 years) age group has decreased during the pandemic. In both study periods, females were the majority made up 78.1% of cases prior to the pandemic and 75.8% of cases during it. Cases that originated from urban areas were greater in the two periods made up (69.1%) of cases before the pandemic and (72.7%) of cases during it. The married group was the most prevalent in the two period, accounting for (57.8%) of cases prior to the pandemic and (60.6%) of cases during it. The educated group represented 78.5% of the cases before the pandemic and 73.5% of cases during the epidemic, while cases of unemployment accounted for 78.5% of cases before the pandemic and 81.5% of cases during the pandemic.

As shown in table (1), The type of suicide poisons did not significantly differ between the two study periods; pesticides were the most common suicide poison, accounting for 38.7% and 40.9% prior and during the pandemic respectively. The percentage of pesticides, CNS depressants, CNS stimulants, analgesics & anti-inflammatory drugs, as well as other and combined drugs, increased during the pandemic, while the percentage of psychotropic drugs, anti-epileptic drugs, antidiabetic drugs, cardiovascular drugs, other, and drug combinations, decreased in the same period.

Table (1): Distribution of suicide poisons among studied cases in the two studied periods

Suicide poison	Date of admission				P value
	Before COVID		During COVID		
	Count	%	Count	%	
Anti-diabetic drug	16	6.3%	6	4.5%	
Antiepileptic drug	15	5.9%	7	5.3%	
Cardiovascular drug	26	10.2%	12	9.1%	
CNS depressant	8	3.1%	5	3.8%	0.986
CNS stimulant	18	7.0%	13	9.8%	
Pesticide	99	38.7%	54	40.9%	
Psychotropic drug	46	18.0%	22	16.7%	
Others	3	1.2%	1	0.8%	
Combination	25	9.8%	12	9.1%	

As illustrated in **table (2)**, the oral route represented the majority of cases (99.2%) both before and during the pandemic. The majority of cases were reported to the (NECTR) within 2 to 6 hours of poisoning, accounting for 45.7% of cases prior to the pandemic and 51.5% of cases during the pandemic. During the pandemic time, the percentage of patients that presented to NECTR within 2 to 6 hours has increased whereas the percentage of cases that presented within less than 2 to 6 hours declined.

Table (2): Distribution of routes of intake of toxins of suicide among studied cases in the two study periods.

Route of intake	Before pandemic		During pandemic		P value
	count	%	count	%	
parenteral route of intake	4	1.6%	0	0.0%	0.304
oral route of intake	254	99.2%	132	100.0%	0.550

Regarding the poisoning severity score (PSS), **Figure (1)** shows statistical significant difference between the grades of PSS before and during pandemic periods ($P < 0.001$). Before and during the pandemic, the majority of the cases presented with moderate toxicity accounting for (86.3%) and (93.9%) respectively. It was found that the percentage of cases which presented with mild and moderate toxicity increased during pandemic period, while the percentage of the cases presented with severe toxicity decreased during pandemic period.

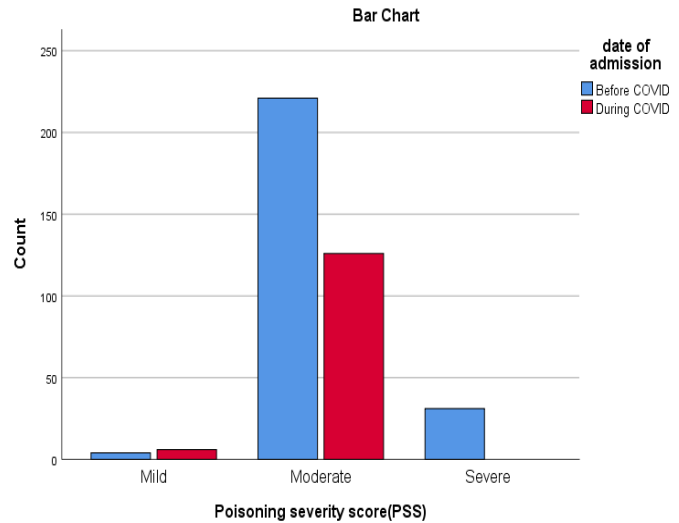


Figure (1): Distribution of poisoning severity score among studied cases in the two studied periods

Regarding the admission of the cases before and during the pandemic period, there was a difference of statistical significance ($P = 0.001$). The percentage of cases that required ICU hospitalization decreased during the pandemic, but the percentage of cases that required observation for a short time and ward admission increased. As shown in **figure (2)**, concerning the period of hospital stay, the majority of cases were discharged within 24-72 hours, representing (91.7%, 76.2%) of the cases before and during the pandemic period respectively. It was discovered that while the percentage of cases who were in the hospital for less than 24 hours increased during the pandemic period, the percentage of cases who stayed in the hospital for more than 72 hours and between 24 and 72 hours decreased.

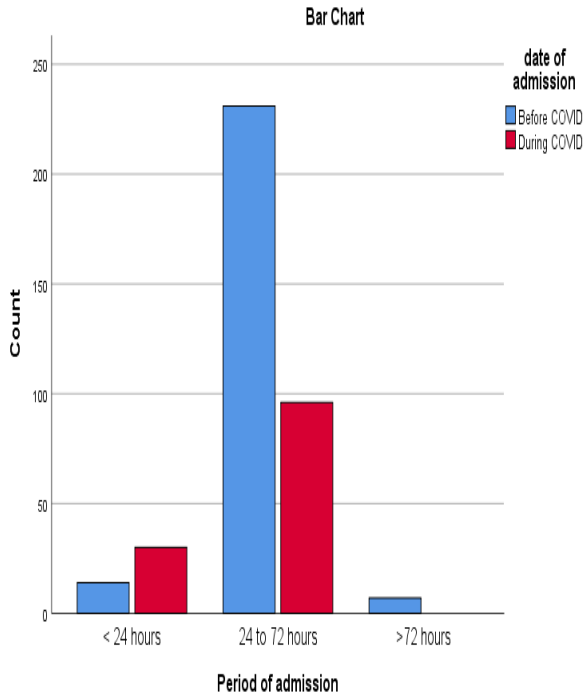


Figure (2): Distribution of period of admission among the studied sample in the two studied periods

Table (3): The percentage and numbers of cases who received management before and during COVID 19 pandemic

Management	Before pandemic		During pandemic		P	
	count	%	count	%		
Supportive treatment	256	100.0%	124	93.9%	< 0.001	
GIT decontamination	Activated charcoal	171	66.8%	105	79.5%	0.030
	Gastric lavage	19	7.4%	5	3.8%	
	No	66	25.8%	22	16.7%	
Symptomatic treatment	254	99.2%	132	100.0%	0.550	
Antidote	85	33.2%	57	43.2%	0.053	

*= *p-value* <0.001

As shown in table (3), The difference between the cases that required supportive care both before and during the epidemic was statistically significant. 100 % of the cases before the pandemic and 93.9% of the cases during the pandemic required supportive care. Between the cases that required GIT

decontamination and symptomatic therapy before and after the outbreak, there was no statistically significant difference. There was non-statistical significant difference between cases received an antidote during their treatment before and during pandemic period.

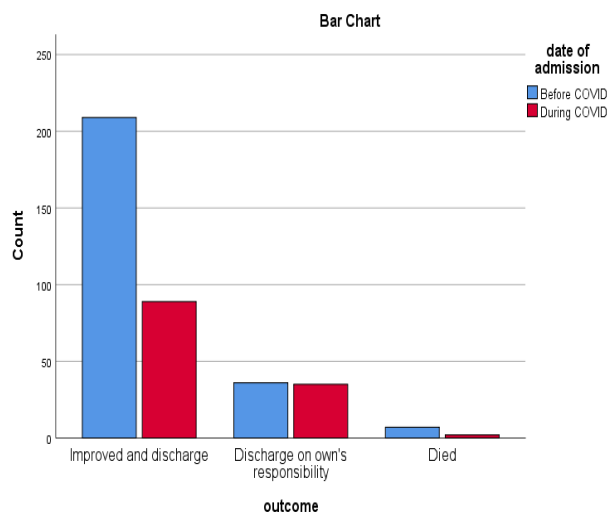


Figure (3): The percentage of cases according to their outcome before and during COVID 19 pandemic.

As shown in **figure (3)**, The outcomes of the cases before and during pandemic times differed non-statistically significant. The majority of the cases improved and were released from NECTR after finishing their treatment, accounting for (82.9%, 70.6%) of the cases before and during the pandemic, respectively. It was found that the cases that improved & discharged and the cases that died decreased during pandemic period. While the cases which discharged on their own responsibility increased during pandemic period.

Before pandemic, pesticides were the most commonly used poison in suicide represented (55.4%) and (34.0%) from the total poisons taken by males and females respectively. Also During the pandemic, pesticides was the most commonly used poison in suicide represented (46.9%) and (39.0%) from the total poisons taken by males and females respectively So the most common poison used in suicide was pesticide in all age groups before and during COVID-19 pandemic

In pesticides, psychotropic drugs, CNS stimulants, antiepileptic drugs, cardiovascular drugs, combined and other drugs toxicity, the most common outcome was the improvement of the cases before and during the pandemic,

regarding analgesics and anti-inflammatory drugs toxicity, the most common outcome was discharge on own responsibility representing (80.0%, 71.4%) of the cases before and during pandemic, respectively. Regarding CNS depressants, before the pandemic, the percentage of improved and discharged cases on their own was equal (50.0%) with no dead cases, while during the pandemic the most common outcome was discharged on own responsibility representing (75.0%). Regarding anti-diabetic drugs, before the pandemic, the most common outcome the improvement and discharge outcome representing (93.8%) of the cases, while during the pandemic, the most outcome was discharged on own responsibility representing (75.0%) of the cases. It was found that the highest mortality was associated with pesticides poisoning and it decreased during pandemic period.

In moderate intoxications according to PSS, the most common outcome was the improvement representing (85.5%, 70.6%) of the cases, before and during the pandemic respectively. In severe intoxications, the most common outcome before the pandemic was improvement represented 64.5% of the cases but during the pandemic was death with significant difference between PSS as regards their outcome before and during pandemic period (p value less than 0.001).

As shown in table (4), Before and during the pandemic, there was a statistically significant association between the period of admission and the outcome (p value less than 0.001), as The most frequent outcome for patients who spent less than 24 hours in the hospital during the two study periods was discharge of their own will, representing 78.6% and 73.3%, respectively. While the most common outcome in the cases who stayed (24 to 72) hours during the two study period was improved and discharged represented (87.9%) and (86.5%) respectively. It was found that, When the average duration of stay was less than 24 hours, the percentage of patients who improved and were discharged during the pandemic period increased, but the percentage of cases who were discharged on their own request and died during the pandemic

period decreased, while when the duration was 24 to 72 hours the percentage of cases who discharged on own responsibility increased during pandemic period and the percentage of the cases who improved and died decreased during pandemic period.

Table (4): The relation between the Period of admission and outcome before and During pandemic period

Outcome	Period of admission before COVID						Period of admission during COVID					
	< 24 hours		24 to 72 hours		>72 hours		< 24 hours		24 to 72 hours		P value	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Improved and discharge	1	7.1%	203	87.9%	5	71.4%	6	20.0%	83	86.5%		
Discharge on own responsibility	11	78.6%	24	10.4%	1	14.3%	< 0.001*	22	73.3%	13	13.5%	< 0.001*
Died	2	14.3%	4	1.7%	1	14.3%		2	6.7%	0	0.0%	

*= *p-value* < 0.001

DISCUSSION

Coronavirus disease 2019 (COVID-19) is severe infectious disease that can lead to death (Dhama et al., 2020). Since COVID-19 emerged from Wuhan at the end of 2019, it has expanded quickly throughout the world (Baloch et al., 2020).

Uncontrolled fear of COVID-19 has resulted in a dramatic change in the conduct of the population, which has increased the number of poisoning and changed its (Abd ElHakim and Hadhoud, 2022). The COVID-19 virus's impacts include insufficient supplies, disruptions to social life, fears of lockdown, and a danger of infection and death, could have detrimental effects on both private and public life (Ahorsu et al., 2020).

The purpose of the current study was to ascertain the frequency of cases of suicide behavior reported to NECTR in Egypt prior to and during the COVID 19 epidemic. The study included a period of 6 months (from April to September) in 2019 before the pandemic and 6 months (from April to September) in 2020 during the pandemic, and it comprised 388 patients that were admitted to NECTR, Cairo University, during that time.

The total number of cases during the pandemic was dropped compared to before the pandemic. This is in agreement with Knipe et al. (2021) and Milella et al. (2022) who found that toxicology calls were reduced during the lockdown. The quarantine procedures that restrict transport in remote locations provide the greatest explanation for the decrease in hospital presentations during the lockdown period. Another explanation is the growing use of telemedicine, which was previously a common practice in healthcare, which allows for continuity of treatment to be maintained for patients and reduces the spread of COVID-19-related diseases (Arimany-Manso and Martin-Fumadó, 2020). In contrast, studies from other countries, China (Lim et al., 2020), India (Sahoo et al., 2020), Pakistan (Mamun and Ullah, 2020) have raised concerns on increased suicide rate related to COVID-19.

In the present study, the young adults (18 to 25) were the most common age group, while females had a larger percentage of suicides during the two study periods. This goes consistent with Fayed and Sharif (2021) who reported that most of the patients presented to Tanta Poison Control Center, either before or after the pandemic, were of the adult age group with higher female contribution. This could be

explained by the fact that individuals in this age range typically started missing their financial security. The emotional response of females to stress may explain the female preponderance in suicidal intoxications, and it may also be a defense as males typically commit suicide more violently (**Fayed and Sharif, 2021**). In countryside, women have low level of education and participation in social life. Therefore, they have difficulty in reducing their stress (**Alzueta et al., 2021**).

The present study revealed that there was not a significant distinction between the two periods and that urban residents made up the majority of the cases. Our findings are in consistent with (**Islambulchilar et al., 2009; Sorodoc et al., 2011**) and **Okubo et al. (2021)** who found significantly higher prevalence of new-onset suicidal thoughts in the higher urbanization level. This, however, contradicts to **Fayed and Sharif (2021)** study who noted that rural areas accounted for the majority of received cases. The NECTR, where the current work was conducted, serves mainly Cairo and Giza that are urban regions, while the agricultural nature of other areas leads to greater opportunities for admission of rural residents.

The married group was the most prevalent among the analyzed cases in the two study periods, although this study did not find a statistically significant difference between the two eras in regards to marital status. This is consistent with a research by **Kim et al. (2019)** that was based in North Korea. who found that the married cases showed the highest number of suicides. In contrast a study conducted in Alexandria Poison Centre, Egypt by **Fouad et al. (2022)** reported that the suicidal attempts were higher among single cases followed by divorced people.

In the two research periods, the educated cases prevailed over the uneducated cases. This was in line with a study done at the Ain Shams University Hospitals Poison Control Center, where the majority of the victims were educated (**Ghanem et al., 2015**). However, the current data were in contrast to those obtained from Dhaka Medical College, where the rate of

suicide was higher among illiterates (59.33%) (**ahmad et al., 2015**).

The majority of the study's cases were unemployed, and there was no significant difference between the two durations. Additionally, it is clear from the research by (**Mamun 2021; Compton et al., 2014; Azagba et al., 2021**) reported that drug abuse and unemployment are closely correlated. This is because financial difficulty has been linked to psychological suffering, such as depression and nervousness, which frequently results in deviant actions like suicide.

Pesticides were the most frequently used poison in suicide during the two time periods of the current study. These results are in line with (**Shrestha et al., 2021; Fayed and sharif 2021**) who found that the most frequently used toxins for suicide were phosphides and organophosphorus substances (OP). In Egypt, pesticides are easily accessible, freely sold, and often packaged without the required guidelines, especially in agricultural areas. In 2008 in Malaysia, acetaminophen exposure was the most commonly reported agent (35.0%), and pesticides only made up (6.6%) of all admissions in contrast to the current study (**Fathelrahman and Zain, 2008**). Because of the nature of the study locations, it may be possible to explain why drugs rather than pesticides caused the majority of suicidal poisoning in Australia, Turkey, and Iran (**Taft et al., 2002**). In Chile and Japan, benzodiazepines and tricyclic antidepressants were the most frequently used drugs (**Aguilera et al., 2016; Ichikura et al., 2016**).

The oral route was the most frequent method of intake in the current research, which revealed no statistically significant difference between the two periods regarding the route of intake. This goes consistent with (**Fayed and Sharif 2021; Guntheti and Singh 2011; Shokrzadeh et al. 2016; Huynh et al. 2018; Forrester 2007; El Masry & Tawfik 2013**) who stated that the most typical method of hazardous exposure was oral intake. This can be because oral ingestion of the drugs is simpler than parental ingestion.

The majority of cases presented to NECTR between 2 to 6 hours were followed by cases presented in more than 6 hours. The postponed presentation during the lockdown may have been caused by a desire to avoid lockdown hours or difficulties with getting to the transport facility during lockdown hours. This is in line with the study conducted by **Fayed and Sharif. (2021)** showed a greater lag in patients being presented to the hospital during the lockdown.

The scores given on the PSS (Poisoning Severity Scale) varied significantly across the two time periods. The percentage of moderate toxicities has increased during the pandemic while the severe toxicities decreased during the pandemic. But the most common presentation was the moderate one in the two study periods. According to **Olié et al.'s (2021)** study in France, non-severe suicide acts (self-poisoning or self-cutting) were the most common (78.96%), which is consistent with our findings. Contrarily, **Mahmoud et al. (2021); Le Roux et al. (2021) and Milella et al. (2022)** discovered that there was no variation in the severity of the cases overall between the pandemic and the time before the pandemic.

The current study showed statistical significant difference in the pattern of admission before and during pandemic. The percentage of the cases who needed ICU admission decreased during pandemic period, while the percentage of cases needed observation for few hours and admission to ward increased during pandemic period. These findings are consistent with research by **Hilal et al. (2021)** and **Zaki et al. (2019)** which revealed that the majority of the cases were admitted to wards. The results of this research of a reduction in ICU admissions is consistent with a comparative study done in Korea by **Lee et al. (2022)** which found a decline in the rate of intensive care treatment during the COVID-19 pandemic. This is may be explained by non- availability of ICU team for toxicological cases in NECTR where the current study was conducted during the pandemic.

In this research, there was no noticeable distinction in any of the given treatments between the two times. In the two periods, a higher percentage of cases got supportive and

symptomatic care. This is in agreement with a research by **Clark et al. (2011)** who noted that the majority of patients with self-poisoning who were brought to the ICU of a tertiary teaching hospital in Scotland needed ventilator support (69%) and got 6% of inotropic assistance. However only (33.2% & 43.2%) of the case received antidote before and during the pandemic, respectively, this is due to is the absence of specific antidote for some toxins. The current study involved GIT decontamination mainly through activated charcoal (66.8% & 79.5%, before & during the pandemic, respectively), while gastric lavage was performed in only (7.4% & 3.8%) of the cases before and during the pandemic, respectively. In 2008, a study of **Kraut and Kurtz's (2008)** concluded that gastric lavage or emesis must be performed within 30 to 60 minutes of consumption in order to be effective may help to explain this.

There is significant difference regarding period of stay between the two periods. During the pandemic, the number of patients who stayed less than 24 hours increased whereas the percentage of cases who lasted more than 72 hours sharply declined. This is probably due to the non-availability of ICU facilities and doctors for toxicology cases during the pandemic which might have affected the discharge system. This is in line with a study carried out in Scotland in **2011** by **Clark et al.** who found that the average duration of hospital stay was 0.7 days and that only 12% of patients stayed more than 48 hours.

The current study demonstrated that the patient's outcome was comparable between the two periods, with most cases improving and being released from NECTR after finishing their treatment, less than 25% being released on their own, and a few of them dying (2.8% & 1.6% of the cases before and during the pandemic, respectively). **Fayed and Sharif (2021)** discovered that the majority of their cases were discharged following a course of treatment, which is consistent with our findings. In the current study, we discovered that during the pandemic, a higher percentage of cases were discharged on their own. This finding may be

explained by patients' fears of acquiring an infection during their prolonged hospital stays.

The decrease in the mortality rate in our study is also in line with the research performed in Korea by **Lee et al. (2022)** who noted that the rate of death by suicide decreased by 50.3%.

It was found that the highest percentages of the cases which improved & discharged, discharged on their own responsibility or died were observed in pesticides poisoning, this is can be explained by high contribution of pesticide poisoning among the studied case. The highest mortality rate was reported in pesticide poisoning, and this coincides with (**Fathelrahman and Zain 2008; Afshari et al. 2011**) and in china a research is conducted by **Eddleston and Phillips (2004)** who reported that (62.0%) of deaths were due to pesticide ingestion.

The duration of time spent in the hospital and the result varied statistically significantly. In this study, cases that were present in the hospital less than 24 hours and more than 72 hours both had the highest percentage of mortality before the pandemic phase. During the pandemic, cases that stayed less than 24 hours had the highest mortality rate. This may be an indication of cases with poor prognoses that required extended hospital stays. Similar findings were made by **Fayed and Sharif. (2021)** that a longer hospital stay was substantially associated with a poorer result, and **Mehrpour et al. (2018)** that the majority of poisoning center admitted cases who did not survive had a longer hospital stay. Last but not least, the current study found that, as predicted, all of the fatalities happened in people with the highest poisoning severity (PSS) scores, which indicate severe affection. High PSS scores were found to be predictors of patient mortality in **Churi et al. (2012)** and **Abdelhamid (2021)** findings that are consistent with the current study.

CONCLUSION

This study showed that COVID-19 has changed the pattern of suicidal poisoning. The whole number of patients during the pandemic was less than the total number of cases before

the pandemic. The females, adult age group, married, educated, unemployed, from urban areas were more involved than others. The most common poison of suicide was pesticide in the two durations. The average percentage of cases that presented to NECTR within 2 to 6 hours after intoxication increased during pandemic period. The percentage of severe toxicities decreased during pandemic period with statistical difference. There was a statistically significant difference between the cases that required supportive care both before and during the pandemic. The higher percentage of cases was discharged from the hospital within the 24 to 72 hours before and during pandemic period. The most common outcome before the pandemic was improvement but during the pandemic was death with significant. The worst outcome was linked to pesticides poisoning and the highest PSS scores.

ABBREVIATIONS:

COVID-19: Coronavirus disease 2019.

NECTR: National Environmental and Clinical Toxicology Research Center.

OP: organophosphorus compounds.

PSS: poisoning severity scale

STATEMENTS AND DECLARATIONS:

Funding: the authors did not receive support from any organization for the submitted work

Ethical approval: The study was performed after the approval of Cairo University's Faculty of Medicine's ethical committee with ethical approval number: **MS-85-2022**

Informed consent for participation and publishing : informed consent was obtained from all individual participants included in the study for participation and for publishing their image if required.

Data Availability Statements: the datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Disclosure of potential conflicts of interest: The authors have no relevant financial or non-financial interests to disclose.

Authors' contributions: All authors search about the point of research and write down a

preliminary protocol, all the authors together with the corresponding author put the final protocol. All authors helped in the practical process. All authors shared in writing the manuscript and the formatting. The corresponding authors is responsible for the publishing process.

REFERENCES

- Abd ElHakim, E., & Hadhoud, R. (2022).** Assessment of toxicities associated with Covid-19 Pandemic period and treatment protocols-cases referred Poison Control Center-Ain Shams University Hospitals-Egypt. *Zagazig Journal of Forensic Medicine*, 20(1), 164-174.
- Abdelhamid, W. (2021).** Evaluation of severity of poisoning exposures among patients presented to Poison Control Center, Ain Shams University Hospitals, Egypt during 2019. *Ain Shams journal of forensic medicine and clinical toxicology*, 36(1), 106- 122.
- Afshari R, Afshar R, Mégarbane B (2011).** Tramadol overdose: review of the literature. *Réanimation* 20:436.
- Aguilera, P., Garrido, M., Lessard, E., Swanson, J., Mallon, W. K., Saldias, F., & Swadron, S. P. (2016).** Medication overdoses at a public emergency department in Santiago, Chile. *Western journal of emergency medicine*, 17(1), 75.
- Ahmad, M.; Rahman, F.N.; Islam, M.M.,and Majumder, M. R.U. (2015).** Death due to Poisoning-a Medicolegal Study at Dhaka Medical College, Dhaka. *Faridpur Medical College Journal*, 9(2), 76-79.
- Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020).** The fear of COVID-19 scale: development and initial validation. *International journal of mental health and addiction*, 1-9.
- Alzueta, E., Perrin, P., Baker, F. C., Caffarra, S., Ramos-Usuga, D., Yuksel, D., & Arango-Lasprilla, J. C. (2021).** How the COVID-19 pandemic has changed our lives: A study of psychological correlates across 59 countries. *Journal of clinical psychology*, 77(3), 556-570
- Arimany-Manso, J., & Martin-Fumadó, C. (2020).** Medico-legal issues regarding from the COVID-19 pandemic. *Medicina Clinica (English Ed.)*, 155(8), 344.
- Azagba, S., Shan, L., Qeadan, F. & Wolfson, M. (2021).** Unemployment rate, opioids misuse and other substance abuse: Quasi-experimental evidence from treatment admissions data. *BMC Psychiatry*, 21(1), 22.
- Baloch, S., Baloch, M. A., Zheng, T., & Pei, X. (2020).** The coronavirus disease 2019 (COVID-19) pandemic. *The Tohoku journal of experimental medicine*, 250(4), 271-278.
- Caballero-Domínguez, C. C., Jiménez-Villamizar, M. P., & Campo-Arias, A. (2022).** Suicide risk during the lockdown due to coronavirus disease (COVID-19) in Colombia. *Death studies*, 46(4), 885-890.
- Cantrell, L.E.E.; Lucas, J.; County, D.; Examiner, M. and Diego, S. (2014):** Suicide by non-pharmaceutical poisons in San Diego County, 171-175.
- Chan F, T; Qi, H.J; Chan, H; Lau, H.C. and Ip, RW. (2003).** A conceptual model of performance measurement for supply chains. *Management Decision*, 41:635-642. [DOI:10.1108/00251740310495568
- Churi, S., Bhakta, K. & Madhan, R. (2012).** Organophosphate poisoning: prediction of severity and outcome by Glasgow Coma Scale, poisoning severity score, Acute Physiology and Chronic Health Evaluation II score, and Simplified Acute Physiology Score II. *Journal of emergency nursing*, 38(5), 493–495.
- Clark, D., Murray, D. B., & Ray, D. (2011).** Epidemiology and outcomes of patients admitted to critical care after self-poisoning. *Journal of the intensive care society*, 12(4), 268-273.

- Compton, W.M., Gfroerer, J., Conway, K.P. & Finger, M.S. (2014).** Unemployment and substance outcomes in the United States 2002–2010. *Drug and Alcohol Dependence*, 142, 350–353.
- Dhama, K., Khan, S., Tiwari, R., Sircar, S., Bhat, S., Malik, Y. S., ... & Rodriguez-Morales, A. J. (2020).** Coronavirus disease 2019–COVID-19. *Clinical microbiology reviews*, 33(4), e00028-20.
- Eddleston, M., & Phillips, M. R. (2004).** Self-poisoning with pesticides. *Bmj*, 328(7430), 42-44.
- El Masry, M., & Tawfik, H. (2013).** 2011 Annual report of the poison control centre of Ain Shams University Hospital, Cairo, Egypt. *Ain Shams Journal of Forensic Medicine and Clinical Toxicology*, 20(1), 10-17.
- Fathelrahman, A. I., & Zain, Z. M. (2008).** Self-poisoning by drugs and chemicals: variations in demographics, associated factors and final outcomes. *General hospital psychiatry*, 30(5), 467-470.
- Fayed, M. M., & Sharif, A. F. (2021).** Impact of lockdown due to COVID-19 on the modalities of intoxicated patients presenting to the emergency room. *Prehospital and disaster medicine*, 36(2), 145-162.
- Forrester, M. B. (2007).** Pattern of clopidogrel exposures reported to Texas poison centers during 1998–2004. *Clinical toxicology*, 45(8), 950-955.
- Fouad, H., Badreldine, F., Abd El Kerim, A., Hieba, R., & Kholeif, W. (2022).** The applicability of Linehan Risk Assessment Scale: A cross-sectional study from Alexandria Poison Centre, Egypt during the COVID-19 pandemic.
- Ghanem, M.; Gamaluddin, H. and Mansour, M. (2015):** Archives of suicide Research Role of Impulsivity and Other Personality Dimensions in Attempted Suicide with Self-Poisoning among Children and adolescents, (February), 37–41.
- Gunnell, D., Appleby, L., Arensman, E., Hawton, K., John, A., Kapur, N & Yip, P. S. (2020).** Suicide risk and prevention during the COVID-19 pandemic. *The Lancet Psychiatry*, 7(6), 468-471
- Guntheti, B. K., & Singh, U. P. (2011).** The pattern of poisoning in Khammam. *Journal of Indian Academy of Forensic Medicine*, 33(4), 296-300.
- Hilal, M.A., Moussa, M.E., Abd Elgwad, A.M. & Elsayed, R.M. (2021).** A Prospective Study of the Association between Arterial Blood Gases Disturbances, Serum Lactate Level and the Prognosis of Acutely Poisoned Patient in Ain-Shams Poison Control Center. *The Egyptian Journal of Hospital Medicine*, 85(1), 2704–2712.
- Huynh, A., Cairns, R., Brown, J. A., Lynch, A. M., Robinson, J., Wylie, C. & Dawson, A. H. (2018).** Patterns of poisoning exposure at different ages: the 2015 annual report of the Australian Poisons Information Centers. *Medical journal of Australia*, 209(2), 74-79.
- Ichikura, K., Okumura, Y., & Takeuchi, T. (2016).** Associations of adverse clinical course and ingested substances among patients with deliberate drug poisoning: a cohort study from an intensive care unit
- Islambulchilar, M., Islambulchilar, Z. & Kargar-Maher, M. H. (2009).** Acute adult poisoning cases admitted to a university hospital in Tabriz, Iran. *Human & Experimental Toxicology*, 28(4), 185–190.
- Kim, J. W., Jung, H. Y., Won, D. Y., Noh, J. H., Shin, Y. S., & Kang, T. I. (2019).** Suicide trends according to age, gender, and marital status in South Korea. *OMEGA-Journal of Death and Dying*, 79(1), 90-105.
- Knipe, D., Silva, T., Aroos, A., Senarathna, L., Hettiarachchi, N. M., Galappaththi, S. R., ... & Rajapakse, T. (2021).** Hospital presentations for self-poisoning during

- COVID-19 in Sri Lanka: an interrupted time-series analysis. *The Lancet Psychiatry*, 8(10), 892- 900.
- Kraut, J.A. & Kurtz, I. (2008).** Toxic alcohol ingestions: clinical features, diagnosis, and management. *Clinical journal of the American Society of Nephrology: CJASN*, 3(1), 208–225.
- Le Roux, G., Sinno-Tellier, S., Puskarczyk, E., et al. (2021):** Poisoning during the COVID-19 outbreak and lockdown: retrospective analysis of exposures reported to French poison control centers. *Clinical Toxicology*, 59(9):832–9.
- Lee, I., Choi, J., Kim, K. S., Suh, J., Kim, J. H., & Kim, S. (2022).** Suicide attempts presenting to the emergency department before and during the COVID-19 pandemic: a comparative study. *Clinical and experimental emergency medicine*, 9(2), 120.
- Lim, L. J., Fong, L. M., Hariram, J., Lee, Y. W., & Tor, P. C. (2020).** COVID-19, a pandemic that affects more than just physical health: Two case reports. *Asian journal of psychiatry*, 53, 102200.
- Mahmoud, N.F., Al-Mazroua, M.K. and Afify, M.M. (2021):** Toxicology Practice During COVID-19 Pandemic: Experience of the Dammam Poison Control Center Eastern Province, Saudi Arabia. *Int J Toxicol*, 40(4):388-394.
- Mamun, M. A. (2021).** Suicide and suicidal behaviors in the context of COVID-19 pandemic in Bangladesh: a systematic review. *Psychology Research and Behavior Management*, 14, 695.
- Mamun, M. A., & Ullah, I. (2020).** COVID-19 suicides in Pakistan, dying off not COVID-19 fear but poverty? The forthcoming economic challenges for a developing country. *Brain, behavior, and immunity*, 87, 163-166.
- Mehrpour, O., Akbari, A., Jahani, F., Amirabadizadeh, A., Allahyari, E., Mansouri, B. & Ng, P.C. (2018).** Epidemio-logical and clinical profiles of acute poisoning in patients admitted to the intensive care unit in eastern Iran (2010 to 2017). *BMC Emergency Medicine*, 18(1), 30.
- Milella, M. S., Grassi, M. C., Gasbarri, A., Mezzanotte, V., Pugliese, F., & Vivino, G. (2022).** Transfer of chemicals to a secondary container, from the introduction of new labelling regulation to COVID-19 lockdown: A retrospective analysis of exposure calls to the Poison Control Centre of Rome, Italy, 2017– 2020. *Basic & Clinical Pharmacology & Toxicology*, 130(1), 200- 207.
- Okubo, R., Yoshioka, T., Nakaya, T., Hanibuchi, T., Okano, H., Ikezawa, S. and Tabuchi, T. (2021).** Urbanization level and neighborhood deprivation, not COVID-19 case numbers by residence area, are associated with severe psychological distress and new-onset suicidal ideation during the COVID-19 pandemic. *Journal of affective disorders*, 287, 89-95.
- Olié, E., Nogue, E., Picot, M., & Courtet, P. (2021).** Hospitalizations for suicide attempt during the first COVID-19 lockdown in France. *Acta Psychiatrica Scandinavica*, 143(6), 535.
- Perrson, H.E., (1998).** Swedish poisoning information. *J Toxicol Clin Toxicol*, 36, 205-213.
- Ranjan, R.; Kumar, S.; Pattanayak, R.D.; Dhawan, A. and Sagar, R. (2014).** (De-) criminalization of attempted suicide in India: A review. *Industrial psychiatry journal*, 23(1), 4.
- Sahoo, S., Rani, S., Parveen, S., Singh, A. P., Mehra, A., Chakrabarti, S. and Tandup, C. (2020).** Self-harm and COVID-19 Pandemic: An emerging concern—A report of 2 cases from India. *Asian journal of psychiatry*, 51, 102104.
- Shokrzadeh, M., Hoseinpoor, R., Hajimohammadi, A., Delaram, A., & Shayeste, Y. (2016).** Epidemiological

survey of suicide attempt by drug poisoning in Gorgan, Iran, 2008 to 2015. *Journal of Mazandaran University of Medical Sciences*, 26(143), 201-210.

Shrestha, R., Siwakoti, S., Singh, S., & Shrestha, A. P. (2021). Impact of the COVID-19 pandemic on suicide and self-harm among patients presenting to the emergency department of a teaching hospital in Nepal. *PLoS one*, 16(4), e0250706.

Sorodoc, V., Jaba, I.M., Lionte, C., Mungiu, O.C. & Sorodoc, L. (2011). Epidemiology of acute drug poisoning in a tertiary \cong 128 References center from Iasi County, Romania. *Human & Experimental Toxicology*, 30(12), 1896–1903.

Taft, C., Paul, H., Consunji, R., & Miller, T. (2002). Childhood unintentional injury worldwide: meeting the challenge. Washington: SAFE KIDS Worldwide.

Tanaka, K. A., Shettar, S., Vandyck, K., Shea, S. M., & Abuelkasem, E. (2021). Roles of four-factor prothrombin complex concentrate in the management of critical bleeding. *Transfusion Medicine Reviews*, 35(4), 96-103.

Turecki, G., Brent, D. A., Gunnell, D., O'Connor, R. C., Oquendo, M. A., Pirkis, J., & Stanley, B. H. (2019). Suicide and suicide risk. *Nature reviews Disease primers*, 5(1), 1-22.

Zaki, A. R., Ghaleb, S. S., Abdelmenem, A., & Yousef, M. A. (2019). Retrospective study of addictive drug-induced acute toxicity of cases admitted to the Poison Control Centre of Ain Shams University Hospital (2015–2016). *Egyptian journal of forensic sciences*, 9(1), 1-11.

الملخص العربي

دراسه مقارنه لمعدل حالات الانتحار بمركز سموم القصر العينى قبل و اثناء جائحه كوفيد 19

شيرين صلاح الدين غالب * رحمه نورالدين محمد رمزى *** محمد كامل محمد قناوي ** نهى ماهر الرويني **
*استاذ الطب الشرعي والسموم الاكلينيكية بكلية الطب - جامعة القاهرة
**مدرس بقسم الطب الشرعي والسموم الاكلينيكية بكلية الطب - جامعة القاهرة
***مدرس مساعد بقسم الطب الشرعي والسموم الاكلينيكية- بكلية الطب- جامعة القاهرة

الانتحار مشكلة صحية عامة مأساوية ويمكن الوقاية منها. قد تكون تأثيرات جائحة فيروس كورونا 2019 (كوفيد-19) على الصحة العقلية خطيرة وهناك اراء بأن معدلات الانتحار سترتفع مع وجود هذه الجائحة. **الهدف من العمل:** تقييم وتحديد مدى انتشار حالات الانتحار المقدمة إلى المركز القومي للسموم بكلية الطب- جامعة القاهرة قبل وأثناء جائحة كوفيد-19. **طريقة الدراسة:** تضمنت الدراسة 388 حالة تم تقديمها إلى المركز القومي للسموم خلال فترة الدراسة وهي 6 أشهر قبل الوباء و 6 أشهر أثناء الوباء. **النتائج:** انخفض العدد الإجمالي للحالات خلال الوباء مقارنة بما كان عليه قبل الوباء. وكانت الفئة العمرية الأكثر شيوعاً هي الفئة العمرية للبالغين (18-25 سنة) مع ارتفاع نسبة الإناث خلال فترتي الدراسة. وكان السم الأكثر شيوعاً للانتحار خلال الفترتين هو المبيدات الحشرية. وكان هناك انخفاض في معدل الوفيات خلال الوباء. وارتبطت أسوأ النتائج بالتسمم بالمبيدات الحشرية وأعلى درجات شدة التسمم. **الخلاصة:** تؤكد الدراسة الحالية التأثير الشامل لجائحة كوفيد-19 على انتشار التسممات الانتحارية المقدمة إلى المركز القومي للسموم.

الكلمات الأفتتاحية: دراسة مقارنة، جائحة كوفيد 19، الانتحار، التسمم.