Araştırma Makalesi – Original Article

The Impact of COVID-19 Pandemic on Emergency Department Visits for Substance Addiction and Drug Overdose in North Cyprus*

COVID-19 Pandemisinin Kuzey Kıbrıs'ta Madde Bağımlılığı ve Aşırı Dozda Uyuşturucu Nedeniyle Acil Servis Başvurularına Etkisi

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ABSTRACT

Introduction: Following the COVID-19 outbreak in China in December 2019, viral spread started to be seen in many countries. In March 2020, simultaneous with the pandemic declaration, the first case was observed in Northern Cyprus. During this time, the emergency department visit patterns showed differences worldwide.

Aim: Thus, this study aims to compare and contrast the differences between pre-pandemic and pandemic period emergency department visits resulting from any kind of drug and/or substance intoxication. To do so, a retrospective analysis was held using two private university hospitals' electronic recording systems for the periods of 1st December 2017-9th March 2020 (before the pandemic) and 10th March 2020-30th June 2022 (during the COVID-19 pandemic).

Results: The demographic data were collected, and the study-specific data were grouped into 5 different intoxication categories. Data collected were compared in terms of pre- and post-pandemic timescales. The results showed that there is no significant difference between the demographic data of patients however, intoxication-related emergency department visits were significantly lower during the pandemic compared to the pre-pandemic period.

Conclusion: This study will be a pioneer in contributing to many social problems, especially substance abuse, which was previously lacking in scientific data in Northern Cyprus.

Keywords: COVID-19 pandemic, Emergency department visits, Substance addiction, Drug overdose.

ÖZET

Giriş: Aralık 2019'da Çin'de ortaya çıkan COVID-19 salgınının ardından birçok ülkede viral yayılım görülmeye başlandı. Mart 2020'de pandemi ilanıyla eş zamanlı olarak Kuzey Kıbrıs'ta da ilk vaka görüldü. Bu süre zarfında, acil servis ziyaretleri dünya çapında farklılıklar gösterdi.

Amaç: Bu nedenle, bu çalışma, herhangi bir ilaç ve/veya madde zehirlenmesi nedeniyle pandemi öncesi ve pandemi dönemi acil servis başvuruları arasındaki farklılıkları karşılaştırmayı amaçlamaktadır. Bu bağlamda, 1 Aralık 2017-9 Mart 2020 (pandemi öncesi) ve 10 Mart 2020-30 Haziran 2022 (COVID-19 pandemisi) tarihlerini kapsayan dönemde iki özel üniversite hastanesinin elektronik kayıt sistemleri kullanılarak retrospektif analiz yapılmıştır.

Bulgular: Demografik veriler toplanmış ve çalışmaya özgü veriler 5 farklı zehirlenme kategorisine ayrılmıştır. Toplanan veriler, pandemi öncesi ve sonrası zaman ölçekleri açısından karşılaştırılmıştır. Sonuçlar, hastaların demografik verileri arasında anlamlı bir fark olmadığını, ancak zehirlenme ile ilgili acil servis başvurularının pandemi sırasında pandemi öncesine göre anlamlı derecede düşük olduğunu gösterdi.

Sonuç: Bu çalışma, Kuzey Kıbrıs'ta daha önce bilimsel verilerden yoksun olan başta madde kullanımı olmak üzere birçok toplumsal soruna katkı sağlanmasında öncü olacaktır.

Anahtar Kelimeler: COVID-19 pandemisi, Acil servis başvuruları, Madde bağımlılığı, Aşırı doz.

Mersin Üniversitesi Tıp Fakültesi Lokman Hekim Tıp Tarihi ve Folklorik Tıp Dergisi 2023;13(3):743-749
DOI: 10.31020/mutftd.1273596
e-ISSN: 1309-8004
Geliş Tarihi – Received: 30 Mart 2023; Kabul Tarihi - Accepted: 17 Temmuz 2023
İletişim - Correspondence Author: Şahan Saygı <sahan.saygi@neu.edu.tr>
Ethical Approval: Near East University Health Sciences Ethics Committee (YDU/2022/104-1575)

Introduction

In December 2019, the very first case of COVID-19 was stated in Wuhan, People's Republic of China. Since then, there was an increasing pattern of cases. World Health Organisation (WHO) characterised the COVID-19 outbreak as a pandemic in March 2020.[1] Simultaneously, the first case was observed in Northern Cyprus and as of July 2022, more than 100,000 people tested positive in North Cyprus.[2] Thus, the government started to take actions like national stay-at-home strategies, to minimise the viral spread and control the infection.

The ongoing pandemic has affected many areas of life worldwide. Since governments took actions such as stay-at-home strategies, social distancing and travel restrictions, these actions led to different patterns of emergence department visits. For instance, in the United States, studies show that non-COVID emergency department visits fell dramatically during the first wave of the pandemic.[3]

There is no doubt that COVID-19 not only affect physical well-being but also affects the psychological well-being of people. Consequently, substance abuse and drug overdose patterns might have changed during this time. The abovementioned mental health issues might increase or decrease depending on the situation. The first expectation is an increased level of mental disorders such as depression due to social isolation, postponed ongoing opioid therapies and difficulties getting prescriptions or the prescribed opioid therapy drugs which in turn leads to an increase in drug or substance abuse.[4,5] On the other hand, many people lost their jobs which led to financial difficulties moreover, due to stay-at-home policies supply chain of many goods was broken. Thus, there is a possibility that substance abuse might be reduced during this period.

The objective of this study is to analyse and compare the emergency department visits due to any kind of substance abuse or drug overdose in private university hospitals located in North Cyprus between the periods of 1st December 2017-9th March 2020 (before the pandemic) and 10th March 2020-30th June 2022 (during the COVID-19 pandemic).

Materials and Methods

During this study, Near East University Hospital and Dr Suat Günsel University of Kyrenia Hospital's emergency department (ED) visits were investigated retrospectively. Two hospitals' electronic recording systems were used to retrieve the substance abuse and/or drug overdose data during the periods of 1st December 2017-9th March 2020 (before the pandemic) and 10th March 2020-30th June 2022 (during the Covid-19 pandemic). In addition to applications to ED due to alcohol, marijuana, synthetic cannabinoids, benzodiazepine, heroin, morphine, cocaine, crack cocaine, amphetamine, methamphetamine, captagon, barbiturates, ketamine, volatile substances, LSD, cathinone, applications to ED resulting from consumer products such as hand sanitisers, home cleaning products etc. were also considered in this study. Throughout the study, all entries that are in the scope of the study were investigated without any exclusion criteria. Demographic data (age, gender, nationality) and study-specific data (the substance used, the reason for ED visit, days spent in hospital, daily and monthly ED visits) were recorded. The reasons for the ER visits were categorised into five categories that are; a) accidental overdose of therapeutic medications, b) suicidal attempts, c) substance overdose including alcohol, d) administration of addictive drugs with other drugs/substances, and e) accidental intoxication.

Prior to the study, Near East University Health Sciences Ethics Committee (YDU/2022/104-1575), Near East University Hospital and Dr Suat Günsel University of Kyrenia Hospital Administrations approved the research. Informed consent forms were not required since this study used data from electronic recording systems.

IBM SPSS Statistics (IBM SPSS Statistics 21. SPSS Inc., an IBM Ca. Somers, NY) was used to conduct statistical analysis to find any significant differences between ED visits during two time periods in terms of demographic

data, variety, and frequency of the visits. Student's t-test, ANOVA test, The Fisher Least Significant Difference (LSD) Method and Pearson analysis were used during the statistical analyses where appropriate. The statistical significance level was accepted as $p<0.05$.

Results

The hospitals' electronic recording systems were carefully investigated and a total of 228 (prior to pandemic n=128, during pandemic n=100) entries were linked to any kind of poisoning/intoxication. ***Table 1*** shows the demographic data of the patients who visited the ED prior to or during the COVID-19 Pandemic. 54% of the ED visits were holding Turkish citizenship followed by 32% Turkish Cypriots, and 3% British. Other 11% were from Nigeria, Sudan, Jordan, Egypt, Iran, Kazakhstan, Zimbabwe, Turkmenistan, UAE, Ukraine, Afghanistan, Congo, Philippines. There is no significant difference between the demographic data of ED visiting patients prior to or during the pandemic.

Table 1. The demographic data of the patients who visited the ED prior to or during the COVID-19 Pandemic.

	Age		Gender	
	Mean	**S.D***	**Female**	**Male**
Prior to Pandemic	24.89	12.86	70	58
During Pandemic	27.35	17.05	61	39
p-value**	0.216		0.339	

*Standard Deviation, **Student's t-test

The ED visits were divided into five categories which are a) accidental overdose of therapeutic medications, b) suicidal attempts, c) substance overdose including alcohol, d) administration of addictive drugs with other drugs/substances, and e) accidental intoxication. ***Figure 1*** illustrates the number of cases in each category before and during the pandemic. According to the statistical analysis, no significant difference was observed between the categories before and during the pandemic ($p>0.005$) except for substance overdose including alcohol which is significantly higher before the pandemic ($p<0.0001$).

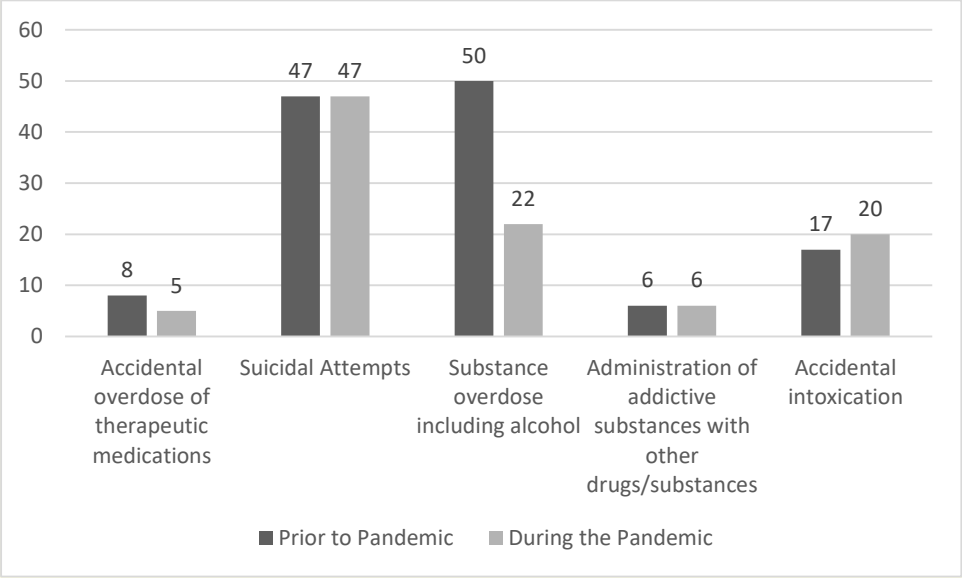

Figure 1. Number of cases in different categories

Among the substances abused, alcohol was found to be the pioneer causing ED visits (prior to the pandemic n=58, during pandemic n=35). 46 women and 47 men were hospitalised due to alcohol-related reasons. Thus, there is no gender difference in alcohol consumption. On the other hand, alcohol consumption-related ED visits were significantly higher before the pandemic. Hand sanitiser-related intoxications are found to be abundant during the pandemic but not before. ***Table 2*** shows every substance used that caused the ED visits

during the specific time period in alphabetical order. Death was seen only once before the pandemic among all the related ED visits. The abovementioned death was related to an alcohol overdose.

Table 2. Substances and/or drugs that cause ED visits during specific time periods.[x]

Substance	Time Period		Substance	Time Period		Substance	Time Period	
	A*	B**		A*	B**		A*	B**
Acemetacin	1	0	Dishwasher tablet	0	1	NaOH	0	1
Acetyl Salicylic acid	1	2	Doxycycline	0	1	Naproxen	1	2
Alcohol	58	35	Doxylamine	0	1	Nitrazepam	1	0
Alprazolam	4	8	Eau de Goulard	0	1	Nitrofurantoin	3	0
Ambroxol HCl	1	0	Escitalopram	0	5	Olanzapine	1	0
Amiodarone	0	1	Etodolac	1	0	Ornidazole	1	0
Amitriptyline	1	1	Famotidine	2	0	Oxazepam	1	1
Amoxicillin	2	3	Ferrum gluconate	0	1	Pantoprazole	1	0
Apixaban	0	1	Fluoxetine	0	6	Paracetamol	20	13
Arveles	2	0	Flurbiprofen	2	1	Paraffin	1	0
Augmentin	1	0	Hand Sanitiser	0	5	Paroxetine	1	0
Avmigren	1	0	HCl	0	1	Permethrin	1	0
Baclofen	0	1	Home Fragrance	1	0	Pregabalin	7	3
Bactrim Forte	2	0	Ibuprofen	6	2	Propranolol	0	1
Benzin	1	0	Insecticide	2	1	Propyphenazone	1	0
Benzodiazepine	1	0	Iron Sulfate	1	0	Pseudoephedrine	1	1
Bleach	1	1	Lamotrigine	1	0	Quetiapine	3	0
Butane	2	0	Levofloxacin	1	0	Risperidone	2	2
Caffeine	1	0	Levothyroxine	2	2	Sertraline	4	2
Cefixime	0	1	Liquid hand soap	0	1	Simvastatin	0	1
Chlorpheniramine maleate	0	1	Lithium	2	0	Sodium valproate	1	1
Ciprofloxacin	1	0	Lorazepam	1	0	Stanozolol	0	1
Clarithromycin	2	0	Losartan	1	0	Tegretol	1	1
Clenbuterol	0	1	Meloxicam	1	0	Tetrahydrocannabinol	2	0
Clonazepam	1	1	Mesalamine	1	0	Theraflu forte	2	0
Cocaine	1	0	Metamizole Na	1	1	Thinner	0	1
Colchicine	0	1	Metformin	0	2	Thiocolchicoside	0	2
Cologne	0	1	Methotrexate	0	1	Tramadol	1	0
Cyclopentolate HCl	0	1	Methylphenidate	1	0	Tranko buskas	1	0
Denatonium Benzoate	2	0	Methylphenidate	1	0	Trazodone	0	2
Dexketoprofen	0	2	Metoprolol	0	3	Unknown	2	1
Diazepam	2	2	Metronidazole	0	1	Venlafaxine	0	3
Diclofenac	3	3	Montelukast	1	0	Vitamine B6	0	1
Difenacoum	2	0	Mupirocin	1	0	Warfarin	1	0
Digoxin	1	1	N-acetyl cysteine	1	0	Water with borax	1	0

A* Prior to the COVID-19 Pandemic, B**During the COVID-19 Pandemic

[x]The table shows the cumulative number of substances, not the cases. Some substances were used together in a single case.

The number of daily and monthly ED visits were studied, and average values were calculated. According to the results obtained, both monthly and daily ED visits were significantly lower during the pandemic ($p<0.001$ for both parameters). ***Table 3*** shows the mean daily and monthly ED visits.

Table 3. Daily and Monthly ED visit numbers prior to and during the pandemic.

	Daily ED Visits		Monthly ED Visits	
	Mean	S.D*	Mean	S.D*
Prior to Pandemic	69.07	17.23	1789.46	357.10
During Pandemic	53.72	16.84	1530.62	377.31
p-value*	p<0.001**		p<0.001**	

*Standard Deviation, **Student's t-test

Discussion

The SARS-Cov-2 outbreak is one of the largest pandemics in history.[6] During the first wave of the novel coronavirus, the healthcare system was face-to-face with a virus that had no specific vaccines and/or treatment strategies leading to worldwide panic at that time since the infection might lead to fatality in

patients with concurrent diseases like chronic lung diseases, hypertension, diabetes, and the viral spread was fast. Thus, the novel SARS-Cov-2 outbreak was declared a COVID-19 Pandemic by the WHO in March 2020.[1] After the WHO declaration in March 2020, many countries start to take regulatory actions to control the infection. These actions include social distancing, stay-at-home strategies, travel restrictions and many more.

In order to develop safe and efficient vaccines and rational treatment options studies were started soon after the pandemic declaration. Simultaneously, retrospective studies were begun to understand the characteristics of the novel COVID-19 disease. These retrospective studies were highly dispersed and detailed aiming to identify many effects of the disease in terms of healthcare systems such as emergency visit patterns, outpatient and staying in clinic patterns of both COVID and non-COVID patients and to find out the most susceptible population group. Patients who suffer from chronic respiratory system diseases were the most vulnerable group of patients whose infection might be fatal. Like many other chronic diseases such as diabetes, hypertension, and cardiovascular diseases, chronic respiratory diseases are closely correlated with cigarette smoking. According to a study conducted by Cok et al., e-cigarette users have a five times higher risk of getting infected with COVID-19 compared to non-smokers.[7]

All the restrictions affected the hospitals' ED admissions rate. During the early periods of the pandemic, non-COVID ED visits declined in countries such as Austria, Hong Kong, Italy, and the US.[8] Thus, pre- and during the pandemic ED visit patterns related to any kind of intoxication were the main focus of this study. The study concentrates on a total of 228 (n=118 prior to the pandemic and n=100 during the pandemic) linked to any kind of intoxication/poisoning cases in two private hospitals located in Northern Cyprus. According to the data retrieved from the hospitals' electronic recording systems, no significant difference was observed in terms of patients' demographic data. Hospital ED visit admissions were divided into five groups in order to categorise the ED visits. The first group was an accidental overdose of therapeutic medications where patients accidentally use more than the prescribed dose of their medications. The second group was suicidal attempts. These patients intentionally administered drugs and/or substances in order to attempt suicide. The third group was substance overdose including alcohol. This group of patients abused substances and/or drugs. The fourth group was the patients who administered addictive substances with other drugs/substances. The fifth and the last group was accidental intoxication where patients were hospitalised due to accidental intoxications or poisonings.

Among these categories, only "substance overdose including alcohol" showed significant differences between the two time periods. A sharp decrease in ED admissions due to substance overdose might be a result of various occasions. First of all, during the first wave of the pandemic, many restrictions including a curfew were imposed.[9] Thus, people could not easily access alcoholic beverages at this particular time. Furthermore, economic issues arose and thus, some people could not afford substances or alcohol. The supply chain of many products was also affected which might result in a sharp decrease. According to the results, alcohol is pioneered in terms of hospital admission. High student profile in a popular holiday destination, easy-to-access beverages, high number of discos, casinos, bars, and pubs made it expected. However, during the time of the pandemic, alcohol consumption was significantly lower similar to the results of the studies conducted by the European Monitoring Centre for Drugs and Drug Addiction and Tan et al.[10,11] During the time of the pandemic, social places like discos and pubs were closed to minimise social gatherings and control the infection spread. Thus, people could only drink alcohol in their homes. This led to a sharp decrease in alcohol consumption as shown in Table 2.

It is not surprising that hand sanitiser products related to poisonings were seen during the pandemic since both national and international authorities drew attention to hygiene.[12,13] However, sometimes social media effects might be misunderstood, and people might intentionally drink hand sanitiser products to avoid

getting infected.[14,15] Although hand sanitiser-related intoxications might be fatal, no deaths related to hygiene products were observed in this study.[16–18] Our result is not controversial to the results obtained from a retrospective study conducted at Poison Control Centre located in Italy that found a significant increase in calls related to household products.[19] Likewise, household product-related calls increased during the pandemic according to the results of a retrospective study that focused on French Poison Control Centre call characteristics.[20] The entirety of our data contains a variety of analgesics, and they were used often. This might be a result of easy-to-access over-the-counter painkillers. Inappropriate doses and drug-drug interactions might result in side effects and hospitalisation.[21]

In a study conducted by Sahar et al., children's ED visits before and during the pandemic were studied and it was found that the number of intoxication-related ED visits increased during the pandemic period.[22] In this study, our main focus was general ED visit characteristics before and during the pandemic. During the study, daily and monthly visits were investigated and for both, the pre-pandemic period's mean numbers were higher than that of the pandemic period. Due to the risk of getting infected, people preferred not to visit Eds.[8] This pattern was also seen in the US.[3]

We declared that this study was restricted to EDs of the two private university hospitals. Consequently, the limitation of the study was that the results cannot be extrapolated to the entirety of North Cyprus.

Conclusion

Despite the precautions taken, especially vaccination, the COVID-19 pandemic, and its process, which is still going on all over the world in different dimensions, has created the need for societies and health authorities to obtain information on issues that did not attract attention before. As in this study, countries that previously postponed or overlooked the investigation of the causes of ED applications have started studies to identify deficiencies in their health systems and take precautions as a result of the COVID-19 pandemic. While there is no information on the epidemiology of poisonings in emergency service applications in Northern Cyprus, the first information was obtained based on this study carried out due to the evaluation of the COVID-19 pandemic results. Thus, the first contributions were made to the preparation of the scientific ground for the poisoning parameters that are important for public health and the precautions to be taken. For example, pre-pandemic alcohol poisoning is one of the most remarkable issues in terms of the results of this study, and the first information about alcohol poisoning was revealed in this island country and awareness was created. In addition, the results of the use and poisoning of painkillers are also noteworthy. It is interesting that in addition to the health risks created by the Covid-19 Pandemic, it also plays a positive role in contributing to the completion of such scientific deficiencies. This study will be a pioneer in contributing to many social problems, especially substance abuse, which was previously lacking in scientific data in Northern Cyprus.

Acknowledgements

The authors received no financial support for the research, authorship, and/or publication of this article.

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Ethical Approval

Near East University Health Sciences Ethics Committee (YDU/2022/104-1575).

Author Contributions

Koray Kadam: Data collection and processing, literature review, references and fundings
Kumsal Kocadal: Design, data collection and processing, literature review, article writing

İlker Etikan: Analysis or interpretation, literature review
İsmet Çok: Idea/concept, design, control/supervision, literature review, article writing
Şahan Saygı: Idea/concept, design, control/supervision, literature review, article writing, critical review

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