Cukurova Medical Journal
ÇUKUROVA ÜNİVERSİTESİ TIP FAKÜLTESİ

Cukurova Med J 2022;47(3):1095-1104
DOI: 10.17826/cumj.1103467

ARAŞTIRMA / RESEARCH

Comparison of suicidal tendencies before and during the COVID-19 pandemic in a city in the western region of Turkey

Türkiye'nin batı bölgesinde bir şehirde COVID-19 pandemisi öncesi ve sırasında intihar eğilimlerinin karşılaştırılması

Cengiz Cengisiz[1], Lut Tamam[2], Gökhan Dizdar[3], Ezgi Paşaoğlu[1], Ertan Yılmaz[4]

[1]Manisa Mental Health and Disorders Hospital, Department of Psychiatry, Manisa, Türkiye
[2]Faculty of Medicine, Cukurova University, Department of Psychiatry, Adana, Türkiye
[3]Council of Forensic Medicine, Directorate of the Forensic Medicine Department, Manisa, Türkiye
[4]Ceyhan State Hospital, Department of Psychiatry, Adana, Türkiye

Cukurova Medical Journal 2022;47(3):1095-1104

Abstract

Purpose: This study aims to compare the completed suicides in the early period of the COVID-19 pandemic with the completed suicides in the same time interval immediately before the pandemic in the Manisa Province of Turkey and to investigate whether there are pandemic-specific completed suicide trends.

Materials and Methods: The study sample consisted of 162 completed suicides that occurred between January 2019 - February 2020 (pre-pandemic period) and March 2020 - June 2021 (pandemic period) in Manisa Province. Completed suicides were compared in terms of sociodemographic and clinical characteristics.

Results: The number of completed suicides before and during the pandemic was 84 and 78, respectively. There was no statistically significant difference between the pre-pandemic and pandemic periods in the number of completed suicides. In terms of sociodemographic characteristics, marital status, contrary to gender, age, employment status, and educational level, caused a significant difference in the number of suicides before and during the pandemic period. Additionally, the season when the completed suicide occurred and the type of place of residence of the individuals with completed suicide, caused a significant difference in the number of suicides

Conclusion: The study's findings indicated that the pandemic period was not a factor in general in completed suicides. Specifically, however, it is noteworthy that suicide by hanging was more common during the pandemic period, in the spring season, among individuals who were married, employed, resided in urban areas, had a low

Öz

Amaç: Bu çalışmada Covid-19 pandemisi erken döneminde Manisa ili tamamlanmış intiharların, pandemi öncesi aynı zaman aralığıyla karşılaştırılması ve pandemiye özgü tamamlanmış intihar trendleri olup olmadığının araştırılması amaçlanmıştır

Gereç ve Yöntem: Manisa ilinde Ocak 2019- Şubat 2020 (pandemi öncesi dönem) ile Mart 2020- Haziran 2021 (pandemi dönemi) tarihleri arasındaki tamamlanmış intiharların 165 tanesi çalışmaya kabul edilmiştir. Sosyodemografik ve klinik özellikleri bakımından tamamlanmış intiharlar karşılaştırılmıştır.

Bulgular: Pandemi öncesi tamamlanmış intihar sayısının 84, pandemi sonrası tamamlanan intihar sayısının ise 78 olduğu belirlendi. Bulgulara göre pandemi öncesi ve sonrası intihar sayıları arasında istatistiksel olarak anlamlı bir fark yoktu. Sosyodemografik bulgulara göre cinsiyet, yaş, meslek, eğitim açısından pandemi öncesi ve sırasında anlamlı bir farklılaşma saptanmadı. Pandemi öncesi ve sonrası tamamlanmış intiharlar arasında medeni durum açısından istatistiksel olarak anlamlı fark bulundu. Pandemi öncesi ve sonrası tamamlanan intiharlar arasında mevsimsel açısından istatistiksel olarak anlamlı fark olduğu belirlendi. Pandemi öncesi ve sonrası tamamlanan intiharlarda yerleşim yeri açısından istatistiksel olarak anlamlı fark olduğu belirlendi.

Sonuç: Tamamlanmış intiharların üzerinde pandemi döneminin bir etken olmadığı sonucuna varıldı. Ancak pandemi sonrası dönemde sıklıkla bahar döneminde, evli, eğitim seviyesi düşük, şehir merkezinde ikamet eden, işi olan bireylerde, önceden duygudurum bozukluğu gibi

Yazışma Adresi/Address for Correspondence: Dr. Cengiz Cengizis, Manisa Ruh Sağlığı ve Hastalıkları Hastanesi, Psikiyatri Bölümü, Manisa, Turkey E-mail: ccengisiz@gmail.com
Geliş tarihi/Received: 14.04.2022 Kabul tarihi/Accepted: 17.07.2022

educational level, and had a history of psychiatric diseases such as mood disorders.
Keywords:. COVID-19, pandemic, suicide

psikiyatrik tanısı olan bireylerde daha çok ası yoluyla tamamlanmış intiharların görülmesi dikkat çekicidir.
Anahtar kelimeler: Covid-19, pandemi, intihar

INTRODUCTION

According to the World Health Organization (WHO), more than 700000 people die due to suicide every year[1]. WHO addresses the concept of suicide in two categories: completed suicides and attempted suicides. Completed suicides are defined as the suicide attempts that have ended in death, while attempted suicides are defined as all non-fatal attempts to commit suicide or destroy or harm oneself[2]. Suicide attempts are 30-40 times more likely than completed suicides[1].

The suicide statistics vary significantly by sociodemographic variables globally. For instance, the international and national suicide statistics by gender indicate that males attempted & completed suicides significantly more than females[3–5]. The countries' income levels and socio-economic situation are among other major factors in suicide rates. Accordingly, most (77%) deaths due to suicide occur in low to middle-income countries[6]. The relevant reports of WHO revealed that the completed suicide rate worldwide in 2019 was 10.5 per 100,000 [1]. In comparison, Turkey's completed suicide rate was 5.3 per thousand in 2019[5].

The COVID-19 pandemic brought about a rapid increase in unemployment, both in developing and developed countries[7], which worsened the completed suicide rates due to unemployment globally[8]. A comparison of the suicide data from the current economic period and the great depression period between 1929 and 1939 shows that the relationship between unemployment and completed suicides also applies to Turkey[9]. As a matter of fact, sociologist Durkheim categorized suicides triggered by economic turmoils under a separate category naming them as anomic suicides[10].

The restrictions imposed by the pandemic have had many adverse effects on the well-being of individuals and communities. These effects can be exemplified as follows; increased feelings of loneliness and isolation, fear of getting infected with the coronavirus, and fear of discrimination or stigmatization due to a positive Polymerase Chain Reaction (PCR) test. In addition, temporary lockdowns, extended stays at home, and physical restrictions mandated by the social distancing rule, among others, have triggered the development of disorders such as anxiety and depression in individuals, even in individuals who never had a psychiatric disorder before[11]. In addition, it has been suggested that the physical restrictions imposed due to the pandemic may even worsen the underlying diagnosis and trigger a new attack in people who already have a psychiatric disorder.

In this context, Manisa Province, which is located in the Aegean Region, one of the regions with the highest completed suicide rate according to the data of the Turkish Statistical Institute, was selected for the purposes of this study. The data show that the increase in the number of completed suicides in Manisa increased over the years in parallel with the increase in the number of completed suicides in Turkey since 2011. Accordingly, the completed suicide rates in Turkey have risen from 3.61 per thousand in 2011 to 4.12 in 2019 and Manisa from 3.68 per thousand in 2011 to 5.64 in 2019[5].

In view of the foregoing, the objective of this study is to compare the completed suicides in the early period of the COVID-19 pandemic with the completed suicides in the same time interval immediately before the pandemic in the Manisa Province of Turkey in the context of pandemic-related effects as well as sociodemographic and clinical characteristics of individuals with completed suicides.

MATERIALS AND METHODS

Sample

This study was designed as a descriptive, retrospective, and cross-sectional study. It was carried out in Manisa Mental Health and Disorders Hospital between 2019 and 2021. The study protocol was approved by the Manisa Celal Bayar University Faculty of Medicine Health Sciences Ethics Committee (Approval No. 20.478.486/1096, Approval Date: 08.12.2021). The study population comprised all 165 completed suicide cases in Manisa Province during the study period.

Procedure

A forensic medicine specialist and a psychiatrist

evaluated the specific reports of cases brought to the Manisa Forensic Medicine Branch for autopsy due to suspicious death, including crime scene investigation reports and sketches, results of dead body examinations, eyewitness identification records, forensic investigation files, autopsy findings, results of the toxicological analyses, relevant genetic/biological materials, and results of histopathological examinations. Additionally, other specific records of complementary nature were requested from the Manisa Governorate's relevant departments, Provincial Police Department, and Provincial Gendarmerie Command. The statements of first- and second-degree relatives in the cases that committed suicide were used as a source of retrospective information. Manisa Mental Health and Disorder Hospital records of individuals who committed suicide were used as the primary source for identifying the individuals who committed suicide.

As a result of the data selection process by the forensic medicine specialist and psychiatrist, 3 cases who lost their lives as a result of firearm injuries were excluded from the study since they were considered suspicious deaths based on the results of the relevant investigations and prosecutions. Consequentially, the study sample consisted of 162 completed suicides.

As the month when the pandemic was declared by WHO and the first confirmed COVID-19 was seen in Turkey (both on March 11th), March was taken as the cutoff month. Accordingly, the period from January 2019 to February 2020 was regarded as the pre-pandemic period, and the period from March 2020 to June 2021 was taken as the pandemic period.

All suicide cases confirmed by the Forensic Medicine Department in Manisa Province within the period from January 2019 to June 2021 were included in the study sample. Cases that were not prosecuted by the prosecutor's office as a result of the death examination (external examination) and/or autopsy, cases that were still investigated and prosecuted as a suspicious death, cases with no concrete information about suicide from the dead examination (external examination) and autopsy reports were excluded from the study.

Based on Knoll's standardized psychological autopsy protocol, a semi-structured form was prepared to systematically record all accessible research data [13–15]. The structured psychological autopsy protocol, developed by the Forensic Psychiatrist Dr. Knoll, evaluates the suicide notes left by the individuals who committed suicide, suicide method, past medical records, autopsy reports written by forensic medicine specialists, and social examination reports written by social workers[14]. The health data recorded using the International Statistical Classification of Diseases and Related Health Problems- 10th Revision (ICD-10)[37]diagnostic system in the health system were re-evaluated and revised by the psychiatrist researcher in accordance with the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)[38].

Statistical analysis

The research data were recorded and analyzed using SPSS 26 (Statistical Package for Social Sciences for Windows, version 26.0, IBM Corp., Armonk, NY, U.S., 2019) software package and Excel (Microsoft Excel, Microsoft Corporation, Redmond, WA, U.S., 2019, retrieved from https://office.microsoft.com/excel) software. Frequency analysis was performed. Descriptive statistics were expressed as mean ± standard deviation values in the case of continuous variables and as percentage values in the case of categorical variables. Pearson's chi-squared test was used to compare the suicides completed before and during the pandemic period in terms of the number of completed suicides, gender, marital status, educational level, employment status, suicide type, the season when the completed suicide occurred, the type of place of residence of the individuals with the completed suicide, presence of psychiatric disorders, and the type of psychiatric disorder. Additionally, the Mann-Whitney U test was used to compare the suicides completed before and during the pandemic period in terms of age. Furthermore, Pearson's chi-squared test was used to compare the age groups by the suicide types, and Pearson's chi-squared test with Bonferroni correction was used to compare the age groups by the season when the completed suicide occurred.

RESULTS

The study sample consisted of 162 completed suicides that occurred between January 2019 and June 2021. The number of completed suicides before and during the pandemic period was 84 and 78, respectively. There was no statistically significant difference between the pre-pandemic and pandemic

periods in the number of completed suicides and age (p=0.63 and p=0.45, respectively) (Table 1).

Of the completed suicide cases before the pandemic period, 17 were female and 67 were male, compared to 17 female and 61 male cases during the pandemic period. Accordingly, the number of completed suicides before and during the pandemic period has not differed significantly by gender (p=0.85). Nevertheless, it was interesting that the total number of female cases was lower than male cases during both periods (Table 1).

Table 1. Comparison of the characteristics of completed suicides before and after the pandemic

	Pre-Pandemic	**Post Pandemic**	**Test Statistics**	
	mean±sd	mean±sd		
The average age	42.91 ± 20.35	44.88 ± 19.57	z=-0.75	p=0.45
	n (%)	n (%)		
Number of completed suicides (n=162)	84(51.9)	78(48.1)	x^2=0.22	p=0.63
Gender Woman Male	 17(20.24) 67(79.76)	 17(21.80) 61(78.20)	x^2=0.96	p=0.85
Marital status				
Married	31(36.9)	44(56.4)		
Single	43(51.2)	29(37.2)	x^2=6.42	p=0.04
Divorced	10(11.9)	5(6.4)		
Residential area Living in rural area Living in the city center	 47(56.0) 37(44.0)	 30(38.5) 48(61.5)	x^2=4.96	p=0.02
Educational status			x^2=4.28	p=0.50
Illiterate	4(5.6)	3(3.9)		
Literate	3(4.2)	2(2.6)		
Primary school	39(54.9)	49(64.5)		
Middle School	7(9.9)	10(13.2)		
High school	14(19.7)	7(9.2)		
Bachelor's degree	4(5.6)	5(6.6)		
Profession				
Chauffeur	-	1(1.5)		
Security guard	-	1(1.5)		
Unemployed	8(11.8)	7(10.0)		
Housewife	14(20.6)	10(15.4)		
Employee	8(11.8)	13(20.0)		
Marketer	-	1(1.5)		
Soldier	1(1.5)	-		
Student	4(5.9)	5(7.7)		
Retired	8(11.8)	8(12.3)	x^2=15.11	p=0.51
Barber	-	1(1.5)		
Lawyer	-	1(1.5)		
Farmer	18(26.5)	13(20.0)		
Shepherd	1(1.5)	1(1.5)		
Police	-	1(1.5)		
Self-employment	1(1.5)	2(3.1)		
Small business	4(5.9)	-		
Doctor	1(1.5)	-		

z: Mann Whitney U Test**, x ^{2}:** Chi-square test

Of the completed suicide cases before the pandemic period, 31 cases were married, 43 cases were single, and 10 cases were divorced, compared to 44 married, 29 single, and 5 divorced complete suicide cases during the pandemic period. Accordingly, the number of completed suicides before and during the

pandemic period has differed significantly by marital status (p=0.04) (Table 1).

The number of individuals with completed suicide who lived in rural and urban areas was 47 and 37, respectively, during the pre-pandemic period, compared to 30 and 48, respectively, during the pandemic period. Accordingly, the number of completed suicides before and during the pandemic period has differed significantly by the type of place of residence (p=0.02) (Table 1).

Table 2. Comparison of suicide form, suicide season and psychiatric diagnoses of completed suicides before and after the pandemic

	Pre-Pandemic	Post Pandemic	Test Statistics	
	n (%)	n (%)		
Suicide pattern				
Hanging	47(56.6)	43(55.1)		
Firearm	24(28.9)	17(21.8)		
Cutting instrument	-	1(1.3)	x^2=7.33	p=0.50
Toxic substance	2(2.4)	2(2.6)		
Medical drug	2(2.4)	7(9.0)		
Jumping from a heigh	5(6.0)	7(9.0)		
Burning	1(1.2)	1(1.3)		
Self-immolation	1(1.2)	-		
Pesticide	1(1.2)	-		
Suicide season				
Spring	23(27.4)	36(46.2)		
Summer	18(21.4)	23(29.5)	x^2=12.5	p=0.006
Autumn	21(25.0)	9(11.5)		
Winter	22(26.2)	10(12.8)		
Presence of psychiatric diagnosis				
Yes	31(36.9)	16(20.5)	x^2=4.51	p=0.03
No	53(63.1)	62(79.5)		
Psychiatric diagnosis				
Bipolar disorder	3(14.3)	2(11.8)		
Depression	9(42.9)	8(47.1)		
Schizophrenia	2(9.5)	-		
Psychosis	1(4.8)	1(5.9)		
Ocd	-	2(11.8)		
Alcohol addiction	1(4.8)	1(5.9)	x^2=9.27	p =0.50
Substance abuse	2(9.5)	1(5.9)		
Adjustment disorder	2(9.5)	-		
Anxiety disorder	1(4.8)	-		
Acute transient psychotic disorder	-	1(5.9)		
Mental retardation	-	1(5.9)		

x^2: Chi-square test, **Ocd**: Obsessive-compulsive disorder

Additionally, there was no significant difference between the number of completed suicides before and during the pandemic period in terms of educational level and employment status of the individuals with completed suicide and the suicide patterns (p=0.50, p=0.51, and p=0.50, respectively) (Table 1 and Table 2). Of the 84 completed suicide cases that occurred during the pre-pandemic period, 23, 18, 21, and 22 cases occurred in the spring, summer, autumn, and winter seasons, respectively. On the other hand, of the 78 completed suicide cases that occurred during the pandemic period, 36, 23, 9, and 10 cases occurred in the spring, summer, autumn, and winter seasons, respectively. Accordingly, there was a significant difference between the number of completed suicides before and during the pandemic period in terms of the season when the completed suicide occurred (p=0.006) (Table 2).

Fifty-three and 62 completed suicide cases that

occurred before and during the pandemic period were never diagnosed with a psychiatric disorder, compared to 31 and 16 completed suicide cases who were diagnosed with a psychiatric disorder before and during the pandemic periods, respectively. Accordingly, there was a statistically significant difference between the number of completed suicides before and during the pandemic period in terms of the presence of a psychiatric disorder (p=0.03) (Table 2). Additionally, a statistically significant correlation was found between age groups and suicide patterns in terms of the number of completed suicides before and during the pandemic period(p=0.03) (Table 3).

The number of completed suicides before the pandemic period has not differed significantly by the season when the completed suicide occurred (p=0.88). In contrast, the number of completed suicides during the pandemic period has differed significantly by the season when the completed suicide occurred (p<0.001) (Table 4). Further analysis of the number of completed suicides that occurred in the pre-pandemic and pandemic periods by season revealed that there was a significant difference between the pre-pandemic and pandemic periods in terms of the number of completed suicides that occurred in each of the spring, autumn, and winter seasons, however, that there was no significant difference between the pre-pandemic and pandemic periods in terms of the number of completed suicides occurred in the summer season p=0.013, p=0.028, p=0.014, and p=0.23, respectively) (Table 4).

Table 3. Findings regarding the distribution of completed suicides before and after the pandemic by age groups and suicide patterns (2019-2021)

Suicide patterns	**Age groups**								
	under 18 years n(%)	18-24 years n(%)	25-34 years n(%)	35-44 years n(%)	45-54 years n(%)	55-64 years n(%)	65-74 years n(%)	75-84 years n(%)	85 years and older n(%)
Hanging	8(72.7)	8(33.3)	16(55.2)	15(55.6)	9(50.0)	18(72.0)	8(61,5)	8(80.8)	-
Firearm	3(27.3)	9(37.5)	8(27.6)	7(25.9)	4(22.2)	6(24.0)	2(15.4)	2(20.2)	-
Jumping	-	2(8.3)	2(6.9)	4(14.8)	4(22.2)	1(4.0)	1(7.7)	-	5(100)
Other*	-	5(20.8)	3(10.3)	1(3.7)	1(5.6)	-	2(15.4)	-	-
Test statistic	$x^2 = 694$ $p < 0.05$								

x^2: Chi-square test**, *** sharp-bladed instrument, toxic substance, medical drug, burning, self-immolation

Table 4. Test and p values of the relationships between the number of suicides according to the seasons in the pre-pandemic and post-pandemic groups

Group	**Seasons**				**x^2 - p**
	Spring	Summer	Autumn	Winter	
Before the pandemic n(%)	23(27.4)	18(21.4)	21(25.0)	22(26.2)	0.66 0.881
Post-pandemic n(%)	36(46.2)	23(29.5)	9(11.5)	10(12.8)	24.87 <0.001
x^2	6.15	1.38	4.85	6.05	
p	0.013	0.238	0.028	0.014	

x^2: Chi-square test

DISCUSSION

Manisa's crude death rate (3.58 per 1000) in 2020 during the pandemic period did not differ significantly from the crude death rate in 2019 during the pre-pandemic period. Similarly, one of the US-based studies where seven countries were compared in terms of completed suicide rates also did not find any significant difference between the crude death rates before and during the pandemic periods[16]. In parallel, in a study conducted in England, there was no significant increase in completed suicide rates during the pandemic period compared to the pre-pandemic period[17]. Additionally, in a study conducted in Germany in 2021, it was determined that the rates of completed suicides before and during the pandemic period have not significantly differed[19].

In contrast, in a study conducted by the US Centers for Disease Control and Prevention (CDC) in 2020, a significant increase was detected in suicidal thoughts during the pandemic period compared to the pre-pandemic period. However, the study stressed that suicidal thoughts do not always result in suicide[18]. In addition, in a meta-analysis by Pirkis et al.[16], in which 21 countries were compared in terms of completed suicides, there was a significant increase in the number of completed suicides that occurred during the pandemic period compared to the pandemic period in Germany, the U.S., South Korea, Sweden, and Norway, contrary to Greece. Furthermore, in a systematic analysis conducted by Mamun et al. in Pakistan in 2021, which focused on the economic consequences of the pandemic, it was demonstrated that the number of completed suicides increased in Pakistan during the pandemic period compared to the pre-pandemic period. This finding was attributed to pandemic-related factors such as poverty, food insecurity, hunger, and xenophobia by the authors of the said study[21]. Interestingly, in a study conducted in Peru[20], it was determined that the number of completed suicides that occurred during the pandemic period actually decreased compared to the pre-pandemic period. This finding was attributed to the social distancing and quarantine measures by the authors of the said study. In light of the above information, it can be concluded that the cross-sectional studies do not provide concrete and generalized outcomes about the definitive effects of the COVID-19 pandemic on the completed suicide rates[16,22–25].

As for the age groups, it has been reported that completed suicides both in Turkey and the world occur primarily among young adults between the ages of 25and 44[5,26]. Similarly, the mean age of the individuals with completed suicides before and during the pandemic periodswas42.91±20.35 and 44.88±19.57 years, respectively.

On the other hand, the results of this study regarding the distribution of the completed suicide rates by gender, which revealed that there was a significantly higher number of males with completed suicide than females both before and during the pandemic periods, contrasted with the studies available in the literature, which reported a significantly higher number of females with completed suicide than males[3–5,17].

In line with the relevant findings reported in the literature[24,27,28], the distribution of the completed suicides before the pandemic period by marital status revealed that the majority of completed suicides were committed by single or divorced individuals. In contrast, the distribution of the completed suicides during the pandemic period by marital status revealed that the majority of completed suicides were committed by married individuals. The discrepancy between the said finding of this study and the relevant results reported in the literature on the marital status of the individuals who committed suicide during the pandemic period[26]was attributed to the cross-sectional design of this study.

Most of the individuals who committed suicide both before and during the pandemic periods were elementary school graduates. In comparison, the results reported in the literature on the educational level of the individuals who committed suicide are contradictory. While there are studies that reported that suicide attempts were mainly observed among individuals with a higher educational level, there are also other studies that reported that the completed suicides were primarily observed among individuals with low educational levels [1,26,2927,30,31].

In line with the relevant results reported in the literature[18,27], the places of residence of most individuals with completed suicide before and during the pandemic periods were rural and urban areas, respectively. Pandemic restrictions, rapid social changes, and disrupted social ties, which are felt more intensely in urban areas, deepen the person's sense of loneliness, resulting in a higher suicide rate in urban areas during the pandemic period[18]. On the other hand, the higher number of completed suicides in rural areas in the pre-pandemic period may be attributed to less accessibility to health institutions and lower educational levels[18,27]. Specifically, in the case of Manisa Province, to the fact that there are more individuals living in rural areas than in urban areas, given that the primary source of income in Manisa is agriculture.

The majority of the individuals with completed suicide both before and during the pandemic period consisted of farmers, workers, and housewives. This result is compatible with the relevant results reported in the literature[27,28,32], which indicated that completed suicides are more common among employed individuals. The compelling business life, especially when combined with existential and socio-economic difficulties such as the pandemic, might have played a role in the increase of completed suicides among the employed individuals during the pandemic

period. Additionally, the fact that the pandemic conditions also increased the workload of housewives might be the reason for the increase in the number of completed suicides committed by housewives during the pandemic period.

It was determined that the majority of individuals with completed suicides who were diagnosed with a psychiatric disorder both before and during the pandemic periods were diagnosed with a mood disorder and depressive disorder. Similarly, it was reported in the literature that 90% of individuals with completed suicides had a psychiatric disorder, and most of them had mood disorders and major depression. In addition, it was stated in the same study that the risk of completed suicide increases with psychotic disorders and substance abuse[33].

It was determined that the completed suicides were mostly committed by hanging, followed by the use of firearms, jumping off high structures, and overdosing both before and during the pandemic periods. Similarly, it was reported in the literature that the completed suicides were mostly committed by hanging, followed by the use of firearms, and jumping off high structures, both in Turkey and the world[1,5].

The general factors that are known to increase the risk of depressive disorder change during economic crises. Accordingly, while single, unemployed women have the highest risk of depressive disorder in general, married young men have the highest risk of depressive disorder during the times marked with economic hardships. This change in the factors that increase the risk of depressive disorder during financial crises has been attributed to the fact that the married young men who have undertaken the responsibility to provide for their families face additional difficulties during such times to fulfill theirresponsibility[34]. Similarly, in this study, most of the individuals with completed suicide during the pandemic period were found to be married.

Lastly, a significant difference was found in this study between the pre-pandemic and pandemic periods in terms of the number of completed suicides that occurred in each of the spring, autumn, and winter seasons. However, there was no significant difference between the pre-pandemic and pandemic periods in terms of the number of completed suicides that occurred in the summer season. The highest number of completed suicide cases was observed in the spring season, both before and during the pandemic periods. In parallel, one of the studies on the completed suicides that occurred between 1986 and 2016 in 12 countries in the northern hemisphere revealed that the completed suicide rates increased in April and May [35]. Along these lines, an internet-based meta-analysis on the completed suicides that occurred between 1979 and 2009 both in the northern and southern hemispheres revealed that the completed suicide rates increased in spring and early summer [36].

To sum up, it can be said that there was no change in the completed suicide rates before and during the pandemic in the Manisa Province of Turkey, a province with a higher completed suicide rate compared to other provinces in the Aegean Region. Among the limitations of this study was that only the completed suicide rates were taken into account, whereas that other indicators of suicide such as suicidal thoughts, suicide attempts, and severe states of mental health conditions were not. Further studies that incorporate the said indicators will better reveal whether the suicidal thoughts and attempts have increased and individuals adopted other negative coping strategies such as alcohol and substance abuse, child and forced marriages, domestic violence, withdrawal, etc., during the pandemic period compared to the pre-pandemic period. Additionally, developing and using psychological autopsy protocols specific to Turkish culture might also improve the relevance of the results.

The lack of data about the physical health problems of the individuals who committed suicide may be considered another limitation of this study. As a reason, many individuals with chronic diseases might have felt helpless and chosen suicide as a way of escaping their problems due to the disruption of health services during the pandemic period.

In conclusion, the study's findings indicated that the pandemic period was not a factor in general in completed suicides. Specifically, however, it is noteworthy that suicide by hanging was more common during the pandemic period, in the spring season, among individuals who were married, employed, resided in urban areas, had a low educational level, and had a history of psychiatric diseases such as mood disorders. In conclusion, it can be said that major life events with adverse psychosocial effects, such as pandemics, lead to the development of more negative coping strategies in individuals living in cities than in individuals living in rural areas or remote districts. Therefore, in terms of

suicide prevention and crisis interventions, it would be reasonable to target provincial centers as geographical focal points.

Additionally, it is important to identify the groups of individuals with a pre-existing mood disorder and depressive disorder as the groups with high suicide risk and to include them in preventive health and social service programs based on their sensitivities. It is critical that individuals with psychiatric disorders have access to relevant health services and receive treatment with regular follow-ups. Further multi-center studies that cover more extended periods and address other indicators of suicide, such as domestic violence, migration, physical and sexual abuse, and discrimination, are needed as an extension to this study.

Yazar Katkıları: Çalışma konsepti/Tasarımı: CC, LT, GD, EP, EY; Veri toplama: CC, LT, GD, EP, EY; Veri analizi ve yorumlama: CC, LT, GD, EP, EY; Yazı taslağı: CC; İçeriğin eleştirel incelenmesi: CC, LT, GD, EP, EY; Son onay ve sorumluluk: CC, LT, GD, EP, EY; Teknik ve malzeme desteği: -; Süpervizyon: CC, LT, GD, EP, EY; Fon sağlama (mevcut ise): yok.
Etik Onay: Bu çalışma için Manisa Celal Bayar Üniversitesi Tıp Fakültesi Sağlık Bilimleri Etik Kurulundan 08.12.2021 tarih ve 1096 sayılı kararı ile etik onay alınmıştır.
Hakem Değerlendirmesi: Dış bağımsız.
Çıkar Çatışması: Yazarlar çıkar çatışması beyan etmemişlerdir.
Finansal Destek: Yazarlar finansal destek beyan etmemişlerdir.

Author Contributions: Concept/Design : CC, LT, GD, EP, EY; Data acquisition: CC, LT, GD, EP, EY; Data analysis and interpretation: CC, LT, GD, EP, EY; Drafting manuscript: CC; Critical revision of manuscript: CC, LT, GD, EP, EY; Final approval and accountability: CC, LT, GD, EP, EY; Technical or material support: -; Supervision: CC, LT, GD, EP, EY; Securing funding (if available): n/a.
Ethical Approval: For this study, ethical approval was obtained from the Ethics Committee of Health Sciences of the Faculty of Medicine of Manisa Celal Bayar University with the decision dated 08.12.2021 and numbered 1096.
Peer-review: Externally peer-reviewed.
Conflict of Interest: Authors declared no conflict of interest.
Financial Disclosure: Authors declared no financial support

REFERENCES

1. World Health Organization(WHO). Suicide Worldwide in 2019, Global Health Estimates. Geneva, WHO, 2019.
2. World Health Organization(WHO). Preventing Suicide: A Resource for Filmmakers and Others Working on Stage and Screen. Geneva, WHO, 2019.
3. Appleby L. What has been the effect of Covid-19 on suicide rates? BMJ. 2021;372:4-5.
4. Sardar T, Biswas R, Biswas A, Chatterjee S. Suicidal deaths amid COVID-19 pandemic: a cross-sectional autopsy-based study. Indian J Forensic Med Toxicol. 2021;15:2696-704.
5. Türkiye İstatistik Kurumu. Ölüm ve ölüm nedeni istatistikleri. TÜİK. https://data.tuik.gov.tr/Bulten/Index?p=Olum-ve-Olum-Nedeni-Istatistikleri-2019-33710 (accessed 1.2.2022)
6. A. Baran, R. Gestner, M. Ueda, A. Gmitrowicz. Implementing real-time data suicide surveillance systems. Crisis. 2021;42:321-27.
7. United Nations Statistics. Global Indicator Framework for the Sustainable Development Goals and Targets of the 2030 Agenda for Sustainable Development.;2020. https://unstats.un.org/sdgs/indicators/Global%20Indicator%20Framework%20after%202020%20review_Eng.pdf (Accessed 1.2.022).
8. IMF. World Economic Outlook: Recovery during a Pandemic - Health Concerns, Supply Disruptions, and Price Pressures. International Monetary Fund; 2021. https://iiep.gwu.edu/2021/10/26/imf-world-economic-outlook-recovery-during-a-pandemic-health-concerns-supply-disruptions-and-price-pressures/ (accessed 1.2. 2022).
9. Organisation for Economic Cooperation and Development (OECD). Evaluating the Initial Impact of COVID-19 Containment Measures on Economic Activity.; 2020. https://read.oecd-ilibrary.org/view/?ref=126_126496-evgsi2gmqj&title=Evaluating_the_initial_impact_of_COVID-19_containment_measures_on_economic_activity (accessed 1.2.2022).
10. Dohrenwend BP. Egoism, altruism, anomie, and fatalism: a conceptual analysis of Durkheim's types. Am Sociol Rev. 1959;24:473.
11. McIntyre RS, Lee Y. Projected increases in suicide in Canada as a consequence of COVID-19. Psychiatry Res. 2020;290:113104.
12. Moutier C. Suicide Prevention in the COVID-19 Era: Transforming threat into opportunity. JAMA Psychiatry. 2021;78:433-8.
13. Knoll JL. The psychological autopsy, part I: Applications and methods. J Psychiatr Pract. 2008;14:393-97.
14. Knoll JL. The psychological autopsy, part II: toward a standardized protocol. J Psychiatr Pract. 2009;15:52-9.
15. Knoll JL, Hatters-Friedman S. The homicide-suicide phenomenon: findings of psychological autopsies. J Forensic Sci. 2015;60:1253-57.
16. Pirkis J, John A, Shin S, DelPozo-Banos M, Arya V, Analuisa-Aguilar P et al. Suicide trends in the early months of the COVID-19 pandemic: an interrupted time-series analysis of preliminary data from 21 countries. Lancet Psychiatry. 2021;8:579-88.
17. Appleby L, Kapur N, Turnbull P, Richards N, National Confidential Inquiry (NCISH). Suicide in England since the covid-19 pandemic: early figures from real time surveillance. Manchester, Manchester University, 2020..
18. Dietze PM, Peacock A, Mariottini C, Ojanperä I, Kriikku P, Wang QQ et al. Mental health, substance

use, and suicidal ideation during the covid-19. Pandemic. 69.;2020.
19. Radeloff D, Papsdorf R, Uhlig K, Vasilache A, Putnam K, Von Klitzing K. Trends in suicide rates during the covid-19 pandemic restrictions in a major German city. Epidemiol Psychiatr Sci. 2021;30:1-5.
20. Calderon-Anyosa RJC, Kaufman JS. Impact of COVID-19 lockdown policy on homicide, suicide, and motor vehicle deaths in Peru. Prev Med. 2021;143.
21. Mamun MA. Suicide and suicidal behaviors in the context of covid-19 pandemic in bangladesh: a systematic review. Psychol Res Behav Manag. 2021;14:695-704.
22. Botchway S, Fazel S. Remaining vigilant about COVID-19 and suicide. Lancet Psychiatry. 2021;8:552-3.
23. Sher L. The impact of the COVID-19 pandemic on suicide rates. QJM. 2020;113:707-12.
24. Santomauro DF, Mantilla Herrera AM, Shadid J, Zheng P, Ashbaugh C, Pigott DM et al. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. Lancet. 2021;398:1700-12.
25. Ayers JW, Poliak A, Johnson DC, Leas EC, Dredze M, Caputi T et al. Suicide-related internet searches during the early stages of the COVID-19 Pandemic in the US. JAMA Netw Open. 2021;4:21-4.
26. WHO. Live Life: An Implementation Guide for Suicide Prevention in Countries. Geneva, World Health Organization; 2021.
27. Topaktaş B, Dündar C, Çağlayan Z. Sociodemographic pattern of suicide and attempted suicide cases in ardahan province in 2013-2016. Kafkas J Med Sci. 2020;10:74-80.
28. Çiftçi H, Kaya F, Bostanci N. Kars ilinde intihar ve intihar girişimlerinin üç yıllık değerlendirilmesi. Psikiyatride Güncel Yaklaşımlar. 2020;12(Suppl 1):255-67.
29. Reeves A, Stuckler D, McKee M, Gunnell D, Chang S Sen, Basu S. Increase in state suicide rates in the USA during economic recession. Lancet. 2012;380:1813-14.
30. Taktak Ş, Üzün İ, Balcıoğlu İ. İstanbul'da tamamlanmış intihar olgularının psikolojik otopsisi. Anadolu Psikiyatr Derg. 2012;13:117-24.
31. Gönenir Erbay L, Celbiş O, Oruç M, Karlıdağ R. Adli tıp kurumu malatya grup başkanlığı'na gelen tamamlanmış intihar olgularının psikolojik otopsi yöntemi ile incelenmesi. Adli Tıp Derg. 2020;34:1-6.
32. Demir S, Yazar ME, Kurtuluş Dereli A, Acar K. Denizli'deki intihar ölümlerinin analizi 10 yıllık retrospektif otopsi çalışması. Adli Tıp Bülteni. 2018;23:93-9.
33. Karataş KS, Şahin MF, Sevinç S. Tamamlanmış intiharlarda psikolojik otopsi yöntemi ile intihar belirleyici faktörlerin araştırılması. Adli Tıp Derg. 2016;30:128-34.
34. Tamam L, Demirkol ME, Yeşiloğlu C. Ekonomik kriz ile ruh sağlığı ilişkisi. Multidisipliner Yaklaşımla İktisadi Kriz Olgusu (Ed Ç Gülgün) 107-24. Ankara, Gazi Kitabevi, 2020.
35. Yu J, Yang D, Kim Y, Hashizume M, Gasparrini A, Armstrong B et al. Seasonality of suicide: A multi-country multi-community observational study. Epidemiol Psychiatr Sci. 2020;29:1-10.
36. Christodoulou C, Douzenis A, Papadopoulos FC, Papadopoulou A, Bouras G, Gournellis R et al. Suicide and seasonality. Acta Psychiatr Scand. 2012;125:127-46.
37. World Health Organization(WHO). ICD-10: International Statistical Classification of Diseases and Related Health Problems. Geneva, WHO, 2004.
38. American Psychiatric Association. The Diagnostic and Statistical Manual of Mental Disorders 5th ed. DSM–5. Washington DC, American Psychiatric Association, 2013.