Acciones e investigaciones Sociales. Nº 44 (2023). Páginas 231-248
https://doi.org/10.26754/ojs_ais/accionesinvestigsoc.2023448986

Perfil de las personas con conducta suicida y con enfermedades de salud mental preexistentes antes de la pandemia por COVID-19 y durante los 6 primeros meses de la pandemia: Estudio comparativo por períodos temporales y por género

Profile of people with suicidal behavior and pre-existing mental health illnesses before the COVID-19 pandemic and during the first 6 months of pandemic: Comparative study by time periods and by gender

Liliana Mahulea [1], Marta Domínguez García[1,2,3*], María Millán Taratil[1,2,3], María Ruiz Herrero[1,2,3], Mª Jesús Serrano Ripoll[4,5,6].

[1] Servicio Aragonés de Salud. España.

[2] Instituto de Investigación Sanitaria de Aragón.

[3] Grupo Aragonés de Investigación en Atención Primaria

[4] Instituto de Investigación Sanitaria de las Islas Baleares. España.

[5] Unidad de Investigación en Atención Primaria de Mallorca, Servicio de Salud de las Islas Baleares, Palma de Mallorca, España.

[6] Red de Investigación en cronicidad, Atención Primaria y Servicios Sanitarios (RICAPPS). Instituto de Salud Carlos III, Madrid, España.

*Autor de correspondencia: mardoga5@gmail.com

Recibido: 29-08-2023. Aceptado: 25-10-2023

Resumen

El objetivo de este estudio es analizar y comparar el perfil de las personas con conducta suicida 6 meses antes de la pandemia y durante los 6 meses posteriores al inicio de la pandemia en una cohorte de pacientes con enfermedades de salud mental previas de alta prevalencia, utilizando para ello los registros de Atención Primaria de la Salud (APS).

Metodología: Estudio retrospectivo, longitudinal y comparativo. Se recogieron datos sociodemográficos, enfermedades de salud mental prexistente o nuevos diagnósticos, infección por COVID-19, utilización de los recursos sanitarios durante el período del estudio donde se produjo el intento autolítico o el suicidio. Se realizó un análisis bivariante comparando por género y por periodo

de tiempo donde se produjo la conducta suicida, y un análisis multivariante de regresión logística.
Resultados: En Aragón (España), 173 personas tuvieron conducta suicida durante los 6 meses previos a la pandemia, y 153 personas durante los 6 meses posteriores al inicio de la pandemia, sin que haya habido cambios en el perfil sociodemográfico. Este perfil es el de una mujer, y está relacionado con la preexistencia de un episodio de depresión y/o ansiedad mayoritariamente. La ausencia de contacto con el sistema sanitario, especialmente con el trabajador/a social del centro de salud y los servicios de atención continuada ha incrementado el riesgo de suicidio durante la pandemia.
Conclusiones: Es importante el contacto con el sistema sanitario en futuras pandemias para la prevención de las conductas suicidas.
***Palabras clave**:* Suicidio; pandemia; COVID-19; enfermedad mental preexistente; servicios sanitarios y sociales

Abstract

The aim of this study is to analyze and compare the profile of people with suicidal behavior 6 months before the pandemic and during the first 6 months after its onset, in a cohort of patients with previous high prevalence mental health illnesses, using Primary Health Care (PHC) records.
Methodology: A retrospective, longitudinal and comparative study. We collected data on sociodemographic, pre-existing mental health illnesses or new diagnoses, COVID-19 infection, use of health resources during the study period where the suicide attempt or suicide occurred. A bivariate analysis was performed comparing by gender and by the time period during which the suicidal behavior occurred, as well as a multivariate logistic regression analysis.
Results: In Aragón (Spain), 173 persons were reported with suicidal behavior during the 6 months prior to the onset of the pandemic, and 153 persons during the 6 months after, with no changes in the sociodemographic profile.The participant profile was that of a woman, with a preexisting episode of depression and/or anxiety. Lack of contact with the health system, especially with the health center social worker and the continuing care services increased the risk of suicide during the pandemic.
Conclusions: Contact with the health care system in future pandemics is important for the prevention of suicidal behavior.
Keywords: Suicide; pandemic; COVID-19; pre-existing mental illness; health and social services.

INTRODUCTION

According to the World Health Organization (WHO), suicide can be defined as the set of behaviors that include thinking about suicide or suicidal ideation, planning, attempted suicide, and suicide itself (WHO, 2014). In addition, suicidal behavior has been associated with emotional states of depression and hopelessness (Beck et al., 1990; Ribeiro et al., 2018). Suicide is the second leading cause of death among people aged 15-29 years, thus has become a health and social priority worldwide, being the leading cause of unnatural death since 2012 in Spain (Instituto Nacional de Estadística, 2020). There are 800,000 deaths by suicide every year, and for every death, it is estimated that there are 20 suicide attempts (World Health Organization, 2016). In 2020, there was an increase in the number of suicides, coinciding with a global pandemic produced by COVID-19, which was a very stressful situation for the population due to measures to control the spread of the virus, including home confinements and limited mobility measures, with the consequent economic, social, physical and mental health consequences (Valdés-Florido et al., 2020). Numerous studies have analyzed the psychological consequences of the pandemic and confinement in the Spanish population (Ayuso-Mateos et al., 2021; Villanueva-Silvestre, Vázquez-Martínez, Isorna-Folgar, & Villanueva-Blasco, 2022), concluding that the COVID-19 pandemic increased mental health problems in the population, especially anxiety, depression and sleep disorders, as observed in other countries (Luo et al., 2020; Nochaiwong et al., 2020; Salari et al., 2020; Wu et al., 2021). Regarding suicidal behaviors, data published in Spain showed that in 2020 there was an increase of 7.4% over the previous year (Fundación Española para la Prevención del Suicidio, 2021). Furthermore, one aspect that the COVID-19 pandemic has evidenced is the close relationship between mental health and social determinants (Lear-Claveras, Aguilar-Latorre, Oliván-Blázquez, Couso-Viana, & Clavería-Fontán, 2022), and more specifically with socioeconomic conditions (Lorant et al., 2007; Weich, Nazareth, Morgan, & King, 2007).

People with pre-existing mental disorders were particularly vulnerable to these stressors experienced during the pandemic (Sheridan Rains et al., 2021). Having depression, anxiety or —even more— comorbidity between the two, are considered important risk factors for suicidal behavior (Moitra et al., 2021).

Primary health care (PHC) is the gateway to the health system and the place where main mental health problems are managed (Kennedy et al., 2003; Roca et al., 2009). The collapse of health services and especially PHC during the COVID-19 pandemic disrupted health services for these patients (Kozloff et al., 2020). According to the results of the pulse survey conducted by the WHO in 105 countries, most of them (90%) experienced interruptions in essential health services from the beginning of the pandemic, with the consequent impact on health, especially in vulnerable

population sectors (WHO, 2020). Similarly, fear of contagion may have reduced demand on health facilities (WHO, 2020), leading to expected psychopathological imbalances and increased demand downstream (Kozloff et al., 2020).

Research efforts have focused on curbing suicide deaths by trying to predict their occurrence. One strategy of this predictive approach is risk assessment, analyzing risk factors and establishing models and profiles of people at increased risk of suicide (Forte et al., 2021; Large, 2018). Therefore, the aim of this study was to analyze and compare the profile and health resources utilization of persons with previous high prevalence mental health illnesses who attempted or committed suicide 6 months before the pandemic and during the 6 months after its onset, using PHC (specifically family medicine) registries for this purpose. A secondary objective of the study was the comparison by gender of individuals with previous chronic mental illness with suicidal behavior before or after the onset of the pandemic.

METHOD

Design

A retrospective, longitudinal and comparative study in an autonomous community in northern Spain (Aragón) was performed, in which data were collected on all persons over 16 years of age, with a diagnosis of mental illness with a prevalence of more than 5% (depression, anxiety, smoking, alcoholism, previous suicidal behavior) registered in their medical records, and who had attempted or committed suicide in the 6 months before or after the onset of the pandemic. The criterion of including people from the age of 16 is because at this age the health system transfers them from pediatrics to family medicine.

Aragón is an autonomous community, located in the north of Spain, with 1,328,753 inhabitants. Its territory occupies 47,719 km^2 and has a population density of 28.20 inhabitants/km^2. It has an aging population concentrated in rural areas, while the main cities have a younger demographic structure. The regional capital (Zaragoza) accounts for half of the total population, with rural areas (with less than 2,000 inhabitants) representing 16.8%. These characteristics of aging and population dispersion in rural areas are similar to those in other parts of Europe.

Participants

The participants in this study were all men and women with an open medical record in the Aragonese Health Service with electronic access, with a suicide attempt or completed suicide registered in their medical record (code P98 according to CIAP-2 - International Classification of Primary Care. International Classification Committee of ©Wonca) in the 6 month-period preceding

the pandemic (from September 14, 2019, to March 14, 2020, when the state of alarm was initiated in Spain) or during the 6 months after its onset, that is after strict confinement (May 3, 2020 to November 3, 2020). These individuals had to have been diagnosed prior to September 14, 2019, with any chronic mental illness with a prevalence greater than 5% (depression, anxiety, smoking, sleep disorder, alcoholism) (Calderón-Larrañaga et al., 2017), or to have had a previous suicide attempt.

Due to the universal nature of the healthcare system and the lack of other PHC providers, the data obtained in this research was considered representative of the studied population.

The period of strict confinement was excluded because there are few records during this time, either because of saturation of the health system or because they were not recorded, and statistically the comparison cannot be made.

The exclusion criteria were records with inconsistencies in the clinical history.

The population that met the inclusion criteria was 326 persons.

Variables and Instruments

Data were collected on sociodemographic variables, chronic diseases, COVID-19 infection, and use of health care resources during the study period where the suicide or self-harm attempt occurred.

Sociodemographic variables that are associated with the etiopathogenesis of depression and could be collected through the PHC registry were sex, age, pharmaceutical benefit, which was linked to the annual income of individuals (less or more than 18,000 €/year), and residence in a rural or urban area (the latter is defined as having more than 10,000 inhabitants).

- Chronic or new mental health diagnoses in the period of suicidal behavior with prevalence above 5% (Calderón-Larrañaga et al., 2017): smoking, alcoholism, insomnia, depression and/or anxiety.
- Individuals infected with COVID-19 in the sample that attempted or completed suicide6 months after the start of the pandemic, recorded as yes/no.
- Patient's use of healthcare resources was assessed by the number of visits in the time period in which suicide was attempted or completed. Specifically, we recorded the following types of visit: to the family physician or nurse at the health center, either in regular consultation or in continuing care (including telephone or face-to-face visits, but without distinguishing between them); to the health center social worker; to the specialist in first or follow-up visits; and to the hospital emergency room.

These variables were collected from the PHC records (electronic medical records and the interactions that patients have with the health care system, which are recorded). The use of these records allowed us to analyze sociodemographic variables, health diagnoses, and accessed health

resources, which may indicate a change in the patient's mental health status. Professionals from the public health network of Aragón, with appropriate qualifications and training, completed these records.

Data analysis

The sample size allowed the use of parametric methods because, although the data do not follow a normal distribution, the statistics tend towards normality in large samples such as this one (Lubin Pigouche P, Maciá Antón MA, 2005). First, a descriptive analysis of the sample was performed for the study variables, using frequencies and percentages for categorical variables, and means and standard deviation (SD) for continuous variables. For the comparison by gender, the chi-square statistic was used to compare categorical variables and Student's t-test for continuous ones. Subsequently, a bivariate analysis was performed, using Chi-square when analyzing categorical variables, and Student's t-test to compare the use of health care resources according to the time of attempted or completed suicide (6 months before or after the start of the pandemic). Finally, a multivariate logistic regression analysis was performed, introducing suicide or attempted suicide in the first 6 months of the pandemic as a dependent variable in the model. The variables that had showed a significant difference in the bivariate analysis were entered as independent variables. These refer to the visit to the health center social worker and the number of visits in ordinary care to the family doctor. The variables of sex and age of the patients were also introduced into the analysis.

Statistical analysis was performed using IBM SPSS version 26 and R 4.0.5. [60] and a result was considered significant when the p-value was equal to or less than 0.05.

RESULTS

In Aragón, 326 persons with previous high prevalence mental illness attempted or completed suicide in the 6 months prior to or after the onset of the pandemic. Of these, 173 had a suicidal behavior in the pre-pandemic period and 153 in the post-pandemic period. As can be seen in Table 1, 63.5% were women, with a mean age of 47.97 years (SD: 18.42, range between 16 and 92 years), 86.8% had an income of less than 18,000 Euros per year, and 83.4% had a previous diagnosis of depression. In the comparison by gender, there were significant differences in the previous diagnoses of smoking and alcoholism, being higher in men, as well as in the previous diagnoses of depression and/or anxiety, which was significantly higher in women. Regarding the use of health services according to gender, women made significantly more use of the health center's continuing care service to receive care from family medicine, as well as follow-up visits by specialized medicine.

Table 1

Description of the sample in the study variables and comparison by gender

VARIABLES	**TOTAL SAMPLE N=326**	**MEN N= 119**	**WOMEN N=207**	**P-VALUE**
Sex				
Female	207 (63.5%)			
Male	119 (36.5%)			
Age*	47.97 (18.42)	49.50 (20.05)	47.10 (17.40)	0.276
Age ranges				
Under 40	123 (34.0%)	39 (32.8%)	71 (34.3%)	
Between 40 and 59	147 (40.6%)	45 (37.8%)	92 (44.4%)	0.233
60 and over	92 (25.4%)	35 (29.4%)	44 (21.3%)	
Income level				
Less than 18,000 per year	283 (86.8%)	104 (87.4%)	179 (86.5%)	0.813
More than 18,000 Euros/year	43 (13.2%)	15 (12.6%)	28 (13.5%)	
Geographic setting				
Urban	149 (45.7%)	54 (45.4%)	95 (45.9%)	0.928
Rural	177 (54.3%)	65 (54.6%)	112 (54.1%)	
Previous mental illness (yes %)				
Smoking	123 (37.7%)	55 (46.2%)	68 (32.85%)	0.017
Alcoholism	35 (10.7%)	18 (15.1%)	17 (8.2%)	0.053
Insomnia	74 (22.7%)	31 (26.1%)	43 (20.8%)	0.273
Depression and/or anxiety	272 (83.4%)	84 (70.6%)	188 (90.82%)	<0.001
Suicide attempt	1 (0.3%)	0 (0%)	1 (0.5%)	0.048
New mental health diagnoses (yes %)				
Smoking	8 (2.4%)	3 (2.5%)	5 (2.4%)	0.953
Alcoholism	4 (1.2%)	2 (1.7%)	2 (1%)	0.573
Insomnia	10 (2.9%)	5 (4.2%)	5 (2.4%)	0.368
Depression and/or anxiety	49 (15%)	20 (16.8%)	29 (14%)	0.496
COVID-19 infection (yes %)	13 (4%)	7 (5.88%)	6 (2.89%)	0.185
Use of health resources*				
No. of visits to ordinary C	10.28 (8.11)	10.13 (8.72)	10.37 (7.76)	0.811
No. of visits to continuing FM	2.84 (3.30)	2.00 (1.42)	3.50 (4.10)	0.002
No. of ordinary nursing visits	2.12 (3.55)	3.52 (3.89)	3.79 (4.12)	0.762
No. of visits to continuing nursing	2.33 (2.04)	1.97 (1.53)	2.59 (2.32)	0.111
No. of visits to social worker	3.00 (2.42)	3.11 (2.29)	2.90 (2.58)	0.795
No. of 1st visits to specialist	1.62 (1.01)	1.28 (0.61)	1.84 (1.15)	0.388
No. of successive visits to specialist	3.46 (3.46)	2.80 (2.48)	3.80 (3.84)	0.014
No. of visits to hospital ER	2.64 (3.25)	2.90 (4.25)	2.50 (2.54)	0.069

Categorical variables, shown in frequency and percentage, and Chi-square statistic is used except in * Continuous variables, shown in means and standard deviations, and Student's t-statistic is used. No.: Number, FM: Family Medicine,

Continuing: Continuing Care, ER: Emergency Room.

In the bivariate analysis, when comparing the individuals who attempted or committed suicide during the two time periods —6 months prior to the onset of the pandemic or 6 months after it, as can be seen in Table 2— we found significant differences in the variables among people who used the social work and family medicine services. Among those who were suicidal during the first 6 months of the pandemic, a lower percentage visited the social services of the health center. On the other hand, among those who visited their family physician, they did so significantly more frequently.

Table 2

Comparison of individuals with suicidal behavior (attempted or completed suicide) 6 months before the pandemic and 6 months after the pandemic.

VARIABLES	**PERSONS WITH SUICIDAL BEHAVIOR 6 MONTHS BEFORE THE PANDEMIC N= 173**	**PERSONS WITH SUICIDAL BEHAVIOR 6 MONTHS AFTER THE PANDEMIC N= 153**	**P-VALUE**
Sex			
Female	109 (63%)	98 (64.1%)	0.845
Male	64 (37%)	55 (35.9%)	
Age*	47.23 (18.36)	48.81 (18.51)	0.441
Income level			
Less than 18,000 per year	151 (87.3%)	132 (86.3%)	0.788
More than 18,000 Euros/year	22 (12.7%)	21 (13.7%)	
Geographic setting			
Urban	82 (47.4%)	67 (43.8%)	0.514
Rural	91 (52.6%)	86 (56.2%)	
Previous mental illness (yes %)			
Smoking	65 (37.6%)	58 (37.9%)	0.950
Alcoholism	15 (8.7%)	20 (13.1%)	0.201
Insomnia	40 (23.1%)	34 (22.2%)	0.847
Depression and/or anxiety	149 (86.1%)	123 (80.4%)	0.165
Suicide attempt	1 (0.6%)	0 (0%)	0.347
New mental health diagnoses (yes %)			
Smoking	5 (2.9%)	3 2%)	0.588
Alcoholism	2 (1.2%)	2 (1.3%)	0.902
Insomnia	7 (4%)	3 (2%)	0.276
Depression and/or anxiety	26 (15%)	23 (15%)	0.999
Use of health resources (yes %)			

Persons visiting ordinary FM	168 (97.1%)	149 (97.4%)	0.879
Persons visiting continuing FM	80 (46.2%)	79 (51.6%)	0.331
Persons visiting ordinary nursing	89 (51.4%)	98 (64.1%)	0.202
Persons visiting continuing nursing	59 (34.1%)	42 (27.5%)	0.195
Persons visiting social worker	28 (16.2%)	12 (7.8%)	0.022
Persons1st visiting specialist	31 (17.9%)	33 (21.6%)	0.408
Persons successively visiting specialist	71 (41%)	64 (41.8%)	0.885
Persons visiting hospital ER	156 (90.2%)	133 (86.9%)	0.357
Use of health resources*			
No. of visits to ordinary MF	9.18 (7.49)	11.52 (8.62)	0.011
No. of visits to continuing MF	2.86 (3.08)	2.83 (3.53)	0.959
No. of ordinary nursing visits	3.76 (3.79)	3.63 (4.25)	0.824
No. of visits to continuing nursing	2.37 (2.19)	2.28 (1.83)	0.829
No. of visits to social worker	3.03 (2.44)	2.91 (2.50)	0.891
No. of 1st visits to specialist	1.74 (1.12)	1.51 (0.90)	0.380
No. of successive visits to specialist	3.36 (3.55)	3.57 (3.38)	0.724
No. of visits to hospital ER	2.50 (3.37)	2.81 (3.12)	0.404

Categorical variables, shown in frequency and percentage, and Chi-square statistic is used except in * Continuous variables, shown in means and standard deviations, and Student's t-statistic is used for hypothesis contrasting. No.: Number, FM: Family Medicine, Continuing: Continuing Care, ER: Emergency Room.

Regarding the multivariate logistic regression analysis —on factors related to attempted or committed suicide comparing both the first 6 months after and before the onset of the pandemic— a significant model was obtained (value= 0.008), with a Cox and Snell R squared of 0.043, and a Nagelkerke R squared of 0.057. As can be seen on Table 3, variables related to attempted or committed suicide during the first 6 months of pandemic included not having visited the health center social worker, and having more frequently visited the family physician. This means that people who did not visit the social worker (odds ratio 2.529, value 0.013) and who visited the family medicine professional more often (odds ratio 1.041, value 0.007) had a higher risk of suicide or attempted suicide. The factor of greatest importance is not visiting the health center social worker, with an Odds ratio of 2.378, that is, the risk of suicidal behavior is 2.378 higher.

Table 3.

Multivariate logistic regression of factors associated with suicidal behavior during the first 6 months of the pandemic compared to the 6 months prior it

	B	**Exp (B) Odds ratio**	**95% Confidence Interval for Exp(B)**	***p-value***
Intersection	-1.601			0.002

Not visiting the health center social worker	0.928	2.529	1.216	5.258	**0.013**
Visiting the social worker	0[b]	Ref			.
No. of visits to continuing FM	0.040	1.041	1.011	1.071	**0.007**
Male	-0.019	0.981	0.613	1.569	0.937
Female	0[b]	Ref			.
Age	0.005	1.005	0.993	1.018	0.384

FM: Family Medicine,Continuing: Continuing Care.

DISCUSSION

The aim of this study was to analyze and compare the profile of persons who committed suicide or made a suicide attempt 6 months before the pandemic and during the 6 months after its onset, from a cohort of patients with previous high prevalence mental health illnesses using Primary Health Care records. It can be affirmed that the sociodemographic profile of persons who attempted or completed suicide did not change when comparing the cases from 6 months before and 6 months after the pandemic, since no significant differences were found in the variables of sex, age, economic income, and rural or urban setting. In our research, the profile of people who have self-injure behaviors tends to be female, with an income of less than 18,000 Euros per year, with a previous or new diagnosis of depression and/or anxiety. These results endorse the relationship between suicidal behavior and the presence of depression and anxiety (Beck et al., 1990; Gouin et al., 2023; Hu et al., 2023; Laghaei et al., 2023; Nawaz et al., 2023; Ribeiro et al., 2018; Souza et al., 2023; Wilk et al., 2023; Zhang et al., 2022), as well as with other social determinants of health.

In the sample of this study, 63.5% of individuals were women, which also indicates us the relationship between being female and suffering depressive episodes (Girgus & Yang, 2015; Grigoriadis & Robinson, 2007; Hyde et al., 2008; Hyde & Mezulis, 2020; Kuehner, 2003; Lin et al., 2021a, 2021b; Parker & Brotchie, 2010; Salk et al., 2017; Smith et al., 2007), and therefore a higher risk of suicidal behavior. On the other hand, there is abundant literature linking financial stress or low socioeconomic status and suffering from depression (King et al., 2008; Lorant et al., 2007; Weich et al., 2007; Weich & Lewis, 1998) and/or suicidal behavior (Choi et al., 2021; Mathieu et al., 2022).

The comparative bivariate analysis by gender of people who attempted or completed suicide shows that women who commit suicide or have a suicide attempt have mostly (90.82%) a diagnosis of depression and/or anxiety. It should be noted that the gender difference regarding depression not only has a multifactorial etiology (Hyde et al., 2008; Hyde & Mezulis, 2020), but also has to do with a developmental context (Salk et al., 2017), since there are vital moments in which there may be a greater vulnerability or stressors that appear to produce this gender difference. The gender

difference in treatment is also noteworthy, i.e., men are referred less frequently or receive a lower follow-up by psychiatric services.

On the other hand, both the multivariate and the comparative bivariate analyses between persons who had attempted or committed suicide in the 6 months prior to the pandemic and those who had attempted or committed suicide in the 6 months after its start, reflect the importance of the health care system for suicide prevention. Not only those who did not visit the social worker at the health center, but also those who consulted their family physician and yet—either because it was a telephone consultation or because of saturation—did not receive adequate care had a higher risk of self-inflicted suicide attempts. Contact with the health care system and appropriate response may be crucial in suicide prevention (Myhre et al., 2023).

With respect to visits to the health center social worker, several studies have found that during the first year of the pandemic there was a negative impact on the life quality of users at the physical, psychological, social and economic levels (Algamdi, 2021; Hossain et al., 2020), as well as an increase in distress in households (Shah et al., 2021). The impact of the pandemic at the economic and social levels has been devastating and has generated highly stressful situations for individuals. Social work professionals have tools both to minimize the effects of the social determinants of health and to promote prevention and complement psychosocial treatment of addictions or other mental health pathologies (Burke & Clapp, 1997; Wells et al., 2013).

This study focuses on the consequences of the COVID-19 pandemic on suicidal behavior (attempted or completed suicide) in people with a previous diagnosis of mental illness of high prevalence (prevalence greater than 5%) such as depression and anxiety, smoking, alcoholism and sleep disorders. This population sector is vulnerable to the situations experienced during the COVID-19 pandemic (Lear-Claveras et al., 2022).

This investigation has strengths and limitations. Among the strengths, we can highlight the use of primary care records in Spain which, given the universal nature of primary care, make these data representative of practically the entire population. Moreover, PHC is the gateway for most citizens to the health system, since it represents the level closest to them. Strength is that this study aims to delve into the consequences of the pandemic in a vulnerable population group such as people with previous mental illness. The consequences of COVID-19 on the well-being of general population have been extensively studied, but there is not much research of the kind presented here. On another note, the first limitation would be the length of the study, which could be extended to further explores the long-term consequences of the pandemic in relation to suicidal behavior in people with pre-existing mental illness. The second limitation is that the source of information consulted was data from clinical records and the health system, but although they allow us to develop studies from

an ecological perspective, we cannot deepen factors that are not systematically recorded, such as personality factors, social support, etc. In addition, by using data from clinical records, people in social exclusion have been left out of the analysis, although suicide attempts generally end up in the health system. The third limitation is that remote assistance was used in primary care during the pandemic, and it is not possible to differentiate whether the visit was made in person, online or by telephone. The fourth and final limitation is the scope of the study. It corresponds to a single autonomous community in Spain which, although its population and geographical characteristics make it representative of other areas of Spain and Europe (Llorente et al, 2018), it would be interesting to replicate this study in other communities or countries to widen the external validity of the results.

The implications of this study would indicate that, in future situations similar to those experienced during the COVID-19pandemic, it is greatly important that people at higher risk of suicide due to previous psychiatric illnesses are not alienated from the health system, or that the health system is more proactive in approaching these people.

CONCLUSIONS

In the first 6 months after strict confinement, the sociodemographic profile of people with suicidal behaviors did not change. This profile is usually female, and it is related to the preexistence of an episode of depression and/or anxiety. On the other hand, a higher risk of suicidal behavior during the pandemic has been found in people who did not have contact with the health system, especially with the social worker at the health center and the continuing care services.

AVAILABILITY OF DATA AND MATERIALS

Data supporting the findings of this study are available, upon reasoned request, from the corresponding author.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

FUNDING

This study has been funded by the Department for Science, Universities and the Knowledge Society of the Government of Aragon (Spain), through the DGACovid-01 project. The B21_20R Research Group of the Department of Research, Innovation and Universities of the Aragon Regional Authority (Spain); and the European Regional Development Fund (ERDF) “A way to make Europe” also funds it.

AUTHOR CONTRIBUTIONS

LM, MDG and MªJSR were responsible for the following contributions: conceptualization, data duration, formal analysis, drafting-original manuscript, and editing. MMT and MRH were responsible for the following contributions: writing, editing, and revising the manuscript.

ACKNOWLEDGMENTS

The authors would like to thank Selene Fernández and the Association of Depressive Disorders of Aragon (AFDA), their workers and associates for their collaboration in the development of this study.

REFERENCES

Algamdi, M. M. (2021). Assessment of Post-COVID-19 Quality of Life Using the Quality of Life Index. *Patient Preference and Adherence*, *15*, 2587–2596. https://doi.org/10.2147/PPA.S340868

Ayuso-Mateos, J. L., Morillo, D., Haro, J. M., Olaya, B., Lara, E., & Miret, M. (2021). Changes in depression and suicidal ideation under severe lockdown restrictions during the first wave of the COVID-19 pandemic in Spain: a longitudinal study in the general population. Epidemiology and Psychiatric Sciences, 30, 1-9. https://doi.org/10.1017/S2045796021000408

Beck, A. T., Brown, G., Berchick, R. J., Stewart, B. L., & Steer, R. A. (1990). Relationship between hopelessness and ultimate suicide: a replication with psychiatric outpatients. *The American Journal of Psychiatry*, *147*(2), 190–195. https://doi.org/10.1176/AJP.147.2.190

Burke, A. C., & Clapp, J. D. (1997). Ideology and social work practice in substance abuse settings. *Social Work*, *42*(6), 552–562. https://doi.org/10.1093/SW/42.6.552

Calderón-Larrañaga, A., Vetrano, D. L., Onder, G., Gimeno-Feliu, L. A., Coscollar-Santaliestra, C., Carfí, A., Pisciotta, M. S., Angleman, S., Melis, R. J. F., Santoni, G., Mangialasche, F., Rizzuto, D., Welmer, A. K., Bernabei, R., Prados-Torres, A., Marengoni, A., & Fratiglioni, L. (2017). Assessing and Measuring Chronic Multimorbidity in the Older Population: A Proposal for Its Operationalization. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, *72*(10), 1417–1423. https://doi.org/10.1093/GERONA/GLW233

Choi, M., Lim, J., Chang, S. Sen, Hwang, M., Kim, C. S., & Ki, M. (2021). Financial hardship and suicide ideation: Age and gender difference in a Korean panel study. *Journal of Affective Disorders*, *294*, 889–896. https://doi.org/10.1016/J.JAD.2021.07.102

Forte, A., Sarli, G., Polidori, L., Lester, D., & Pompili, M. (2021). The Role of New Technologies to Prevent Suicide in Adolescence: A Systematic Review of the Literature. *Medicina*, *57*(2), 1–

13. https://doi.org/10.3390/MEDICINA57020109

Fundación Española para la Prevención del Suicidio [Spanish Foundation for Suicide Prevention]. (2021). *Suicide Observatory in Spain*. /www.fsme.es/observatorio-del-suicidio-2020/

Girgus, JS., Yang, K. (2015). Gender and depression. Current Opinion in Psychology, 4, 53-60. https://doi.org/10.1016/j.copsyc.2015.01.019

Gouin, J. P., MacNeil, S., de la Torre-Luque, A., Chartrand, E., Chadi, N., Rouquette, A., Boivin, M., Côté, S., & Geoffroy, M. C. (2023). Depression, anxiety, and suicidal ideation in a population-based cohort of young adults before and during the first 12 months of the COVID-19 pandemic in Canada. *Canadian Journal of Public Health*, *114*(3). https://doi.org/10.17269/S41997-023-00772-7

Grigoriadis, S., & Robinson, G. E. (2007). Gender issues in depression. *Annals of Clinical Psychiatry : Official Journal of the American Academy of Clinical Psychiatrists*, *19*(4), 247–255. https://doi.org/10.1080/10401230701653294

Hossain, M. M., Tasnim, S., Sultana, A., Faizah, F., Mazumder, H., Zou, L., McKyer, E. L. J., Ahmed, H. U., & Ma, P. (2020). Epidemiology of mental health problems in COVID-19: A review. *F1000Research*, *9*. https://doi.org/10.12688/F1000RESEARCH.24457.1/DOI

Hu, F. H., Zhao, D. Y., Fu, X. L., Zhang, W. Q., Tang, W., Hu, S. Q., Shen, W. Q., & Chen, H. L. (2023). Effects of social support on suicide-related behaviors in patients with severe mental illness: A systematic review and meta-analysis. *Journal of Affective Disorders*, *328*, 324–333. https://doi.org/10.1016/J.JAD.2023.02.070

Hyde, J. S., & Mezulis, A. H. (2020). Gender Differences in Depression: Biological, Affective, Cognitive, and Sociocultural Factors. *Harvard Review of Psychiatry*, *28*(1), 4–13. https://doi.org/10.1097/HRP.0000000000000230

Hyde, J. S., Mezulis, A. H., & Abramson, L. Y. (2008). The ABCs of depression: integrating affective, biological, and cognitive models to explain the emergence of the gender difference in depression. *Psychological Review*, *115*(2), 291–313. https://doi.org/10.1037/0033-295X.115.2.291

Instituto Nacional de Estadística [Spanish National Statistics Institute]. (2020). *Defunciones según la Causa de Muerte Año 2020*. http://www.ine.es/prensa/edcm_2020.pdf

Kennedy, N., Abbott, R., & Paykel, E. S. (2003). Remission and recurrence of depression in the maintenance era: long-term outcome in a Cambridge cohort. *Psychol Med*, *33*(5), 827–838.

King, M., Nazareth, I., Levy, G., Walker, C., Morris, R., Weich, S., Bellón-Saameño, J. Á., Moreno, B., Švab, I., Rotar, D., Rifel, J., Maaroos, H.-I., Aluoja, A., Kalda, R., Neeleman, J., Geerlings, M. I., Xavier, M., de Almeida, M. C., Correa, B., & Torres-Gonzalez, F. (2008). Prevalence of

common mental disorders in general practice attendees across Europe. *British Journal of Psychiatry*, *192*(05), 362–367. https://doi.org/10.1192/bjp.bp.107.039966

Kozloff, N., Mulsant, B. H., Stergiopoulos, V., & Voineskos, A. N. (2020). The COVID-19 Global Pandemic: Implications for People With Schizophrenia and Related Disorders. *Schizophrenia Bulletin*, *46*(4), 752–757. https://doi.org/10.1093/SCHBUL/SBAA051

Kuehner, C. (2003). Gender differences in unipolar depression: an update of epidemiological findings and possible explanations. *Acta Psychiatr Scand*, *108*, 163–174.

Laghaei, M., Mehrabizadeh Honarmand, M., Jobson, L., Abdollahpour Ranjbar, H., & Habibi Asgarabad, M. (2023). Pathways from childhood trauma to suicidal ideation: mediating through difficulties in emotion regulation and depressive symptoms. *BMC Psychiatry*, *23*(1), 295. https://doi.org/10.1186/S12888-023-04699-8

Large, M. M. (2018). The role of prediction in suicide prevention. *Dialogues in Clinical Neuroscience*, *20*(3), 197–205. https://doi.org/10.31887/DCNS.2018.20.3/MLARGE

Lear-Claveras, A., Aguilar-Latorre, A., Oliván-Blázquez, B., Couso-Viana, S., & Clavería-Fontán, A. (2022). Evolution of Anxiety and Depression in Men during the First Six Months of the COVID-19 Pandemic and Factors Associated with Worsening of Mental Health: Retrospective Longitudinal Study. *Journal of Men's Health*, *18*(9). https://doi.org/10.31083/j.jomh1809182

Lin, J., Zou, L., Lin, W., Becker, B., Yeung, A., Cuijpers, P., & Li, H. (2021a). Does gender role explain a high risk of depression? A meta-analytic review of 40 years of evidence. *Journal of Affective Disorders*, *294*, 261–278. https://doi.org/10.1016/J.JAD.2021.07.018

Lin, J., Zou, L., Lin, W., Becker, B., Yeung, A., Cuijpers, P., & Li, H. (2021b). Does gender role explain a high risk of depression? A meta-analytic review of 40 years of evidence. *Journal of Affective Disorders*, *294*, 261–278. https://doi.org/10.1016/j.jad.2021.07.018

Llorente, J.M., Oliván-Blázquez, B., Zuñiga-Antón, M., Masluk, B., Andres, E., Garcia-Campayo, J., Magallon-Botaya, R. (2018). Variability of the Prevalence of Depression in Function of Sociodemographic and Environmental Factors: Ecological Model. Front. Psychol, 9,2182. doi: 10.3389/fpsyg.2018.02182

Lorant, V., Croux, C., Weich, S., Deliège, D., Mackenbach, J., & Ansseau, M. (2007). Depression and socio-economic risk factors: 7-year longitudinal population study. *British Journal of Psychiatry*, *190*(04), 293–298. https://doi.org/10.1192/bjp.bp.105.020040

Lubin Pigouche P, Maciá Antón MA, R. de L. P. (2005). *Mathematical psychology*. Universidad Nacional de Educación a Distancia.

Luo, M., Guo, L., Yu, M., & Wang, H. (2020). The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public - A systematic review and meta-

analysis. *Psychiatry Research*, *291*. https://doi.org/10.1016/J.PSYCHRES.2020.113190

Mathieu, S., Treloar, A., Hawgood, J., Ross, V., & Kõlves, K. (2022). The Role of Unemployment, Financial Hardship, and Economic Recession on Suicidal Behaviors and Interventions to Mitigate Their Impact: A Review. *Frontiers in Public Health*, *10*. https://doi.org/10.3389/FPUBH.2022.907052

Moitra, M., Santomauro, D., Degenhardt, L., Collins, P. Y., Whiteford, H., Vos, T., & Ferrari, A. (2021). Estimating the risk of suicide associated with mental disorders: A systematic review and meta-regression analysis. *Journal of Psychiatric Research*, *137*, 242–249. https://doi.org/10.1016/J.JPSYCHIRES.2021.02.053

Myhre, M., Kildahl, A. T., Astrup, H., Bergsager, D., & Walby, F. A. (2023). Suicide in services for mental health and substance use: A national hybrid registry surveillance system. *Health Informatics Journal*, *29*(1). https://doi.org/10.1177/14604582231167439

Nawaz, H., Shah, I., & Ali, S. (2023). The amygdala connectivity with depression and suicide ideation with suicide behavior: A meta-analysis of structural MRI, resting-state fMRI and task fMRI. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, *124*. https://doi.org/10.1016/J.PNPBP.2023.110736

Nochaiwong, S., Ruengorn, C., Awiphan, R., Ruanta, Y., Boonchieng, W., Nanta, S., Kowatcharakul, W., Pumpaisalchai, W., Kanjanarat, P., Mongkhon, P., Thavorn, K., Hutton, B., Wongpakaran, N., & Wongpakaran, T. (2020). Mental health circumstances among health care workers and general public under the pandemic situation of COVID-19 (HOME-COVID-19). *Medicine*, *99*(26), e20751. https://doi.org/10.1097/MD.0000000000020751

Parker, G., & Brotchie, H. (2010). Gender differences in depression. *International Review of Psychiatry (Abingdon, England)*, *22*(5), 429–436. https://doi.org/10.3109/09540261.2010.492391

Ribeiro, J. D., Huang, X., Fox, K. R., & Franklin, J. C. (2018). Depression and hopelessness as risk factors for suicide ideation, attempts and death: meta-analysis of longitudinal studies. *The British Journal of Psychiatry : The Journal of Mental Science*, *212*(5), 279–286. https://doi.org/10.1192/BJP.2018.27

Roca, M., Gili, M., Garcia-Garcia, M., Salva, J., Vives, M., Garcia Campayo, J., & Comas, A. (2009). Prevalence and comorbidity of common mental disorders in primary care. *Journal of Affective Disorders*, *119*(1–3), 52–58. https://doi.org/10.1016/j.jad.2009.03.014

Salari, N., Hosseinian-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., Rasoulpoor, S., & Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-

analysis. *Globalization and Health*, *16*(1). https://doi.org/10.1186/S12992-020-00589-W

Salk, R. H., Hyde, J. S., & Abramson, L. Y. (2017). Gender differences in depression in representative national samples: Meta-analyses of diagnoses and symptoms. *Psychological Bulletin*, *143*(8), 783–822. https://doi.org/10.1037/BUL0000102

Shah, R., Ali, F. M., Nixon, S. J., Ingram, J. R., Salek, S. M., & Finlay, A. Y. (2021). Measuring the impact of COVID-19 on the quality of life of the survivors, partners and family members: a cross-sectional international online survey. *BMJ Open*, *11*(5). https://doi.org/10.1136/BMJOPEN-2020-047680

Sheridan Rains, L., Johnson, S., Barnett, P., Steare, T., Needle, J. J., Carr, S., Lever Taylor, B., Bentivegna, F., Edbrooke-Childs, J., Scott, H. R., Rees, J., Shah, P., Lomani, J., Chipp, B., Barber, N., Dedat, Z., Oram, S., Morant, N., Simpson, A., … Cavero, V. (2021). Early impacts of the COVID-19 pandemic on mental health care and on people with mental health conditions: framework synthesis of international experiences and responses. *Social Psychiatry and Psychiatric Epidemiology*, *56*(1), 13–24. https://doi.org/10.1007/S00127-020-01924-7

Smith, K. L. W., Matheson, F. I., Moineddin, R., & Glazier, R. H. (2007). Gender, income and immigration differences in depression in Canadian urban centres. *Canadian Journal of Public Health,98*(2), 149–153. http://doi.org/10.1007/BF03404328

Souza, L. C., Galvão, L. P., Paiva, H. S., Périco, C. de A. M., Ventriglio, A., Torales, J., Castaldelli-Maia, J. M., & Martins-da-Silva, A. S. (2023). Major depressive disorder as a risk factor for suicidal ideation for attendees of educational institutions: a meta-analysis and meta-regression. *Revista Paulista de Pediatria : Orgao Oficial Da Sociedade de Pediatria de Sao Paulo*, *41*, e2021344. https://doi.org/10.1590/1984-0462/2023/41/2021344

Valdés-Florido, M. J., López-Díaz, Á., Palermo-Zeballos, F. J., Martínez-Molina, I., Martín-Gil, V. E., Crespo-Facorro, B., & Ruiz-Veguilla, M. (2020). Reactive psychoses in the context of the COVID-19 pandemic: Clinical perspectives from a case series. *Revista de Psiquiatria y Salud Mental*, *13*(2), 90–94. https://doi.org/10.1016/J.RPSM.2020.04.009

Villanueva-Silvestre, V., Vázquez-Martínez, A., Isorna-Folgar, M., & Villanueva-Blasco, V. J. (2022). Problematic Internet Use, Depressive Symptomatology and Suicidal Ideation in University Students During COVID-19 Confinement. Psicothema, 34(4), 518-527. https://doi.org/10.7334/psicothema2022.40

Weich, S., & Lewis, G. (1998). Poverty, unemployment, and common mental disorders: population based cohort study. *BMJ (Clinical Research Ed.)*, *317*(7151), 115–119. http://www.ncbi.nlm.nih.gov/pubmed/9657786

Weich, S., Nazareth, I., Morgan, L., & King, M. (2007). Treatment of depression in primary care.

Socio-economic status, clinical need and receipt of treatment. *The British Journal of Psychiatry : The Journal of Mental Science*, *191*, 164–169. https://doi.org/10.1192/bjp.bp.106.032219

Wells, E. A., Kristman-Valente, A. N., Peavy, K. M., & Jackson, T. R. (2013). Social workers and delivery of evidence-based psychosocial treatments for substance use disorders. *Social Work in Public Health*, *28*(3–4), 279–301. https://doi.org/10.1080/19371918.2013.759033

World Health Organization. (2020). *Pulse survey on continuity of essential health services during the COVID-19 pandemic: interim report, 27 August 2020*. https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuity-survey-2020.1

Wilk, A., Falk, A., Joseph, R., & Smith, S. (2023). Mood and Anxiety Disorders: Suicide. *FP Essentials*, *527*, 19–24. https://pubmed.ncbi.nlm.nih.gov/37036768/

World Health Organization. (2014). *Preventing suicide: A global imperative.* .

World Health Organization. (2016). *Suicide rate estimates, age-standardized - Estimates by WHO region*. World Health Organization. app.who.int/gho/data/view.main.MHSUICEDEASDRREGv?lang=en

Wu, T., Jia, X., Shi, H., Niu, J., Yin, X., Xie, J., & Wang, X. (2021). Prevalence of mental health problems during the COVID-19 pandemic: A systematic review and meta-analysis. *Journal of Affective Disorders*, *281*, 91–98. https://doi.org/10.1016/J.JAD.2020.11.117

Zhang, B., Fu, W., Guo, Y., Chen, Y., Jiang, C., Li, X., & He, K. (2022). Effectiveness of mindfulness-based cognitive therapy against suicidal ideation in patients with depression: A systematic review and meta-analysis. *Journal of Affective Disorders*, *319*, 655–662. https://doi.org/10.1016/J.JAD.2022.09.091