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Increased incidence of high-lethality suicide attempts after the declaration of the state of alarm due to the COVID-19 pandemic in Salamanca: A real-world observational study

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1. Introduction

Most cases of suicide are associated with psychiatric illnesses: depression, substance abuse, and psychosis are the most relevant risk factors, followed by anxiety, personality disorders, eating disorders, and traumatic events (Sher, 2020a). The current coronavirus pandemic, which is the most critical public health problem this generation has faced (Martin et al., 2021), falls into the latter category. Herein, we investigate the influence of the COVID-19 pandemic (Sher 2020b), the declaration of a state of alarm, and other factors, on the incidence of suicidal behaviors in Salamanca (Spain).

2. Materials and methods

We conducted an observational study and analyzed the data of the 241 patients referred for evaluation by on-call psychiatrists for self-harm or suicidal ideation at the University of Salamanca Healthcare Complex (USHC) between January 1, 2020, and July 31, 2020. Generally, patients who express suicidal thoughts to a triage nurse or an emergency doctor are referred to the on-call psychiatrists. Those who visit or get transferred to the emergency room due to self-harm are referred to the on-call psychiatrists as soon as their vital signs are stabilized and their level of consciousness is suitable for a psychiatric interview. This protocol means that on-call psychiatrists evaluate every patient with suicidal ideation or self-harm, except for those cases where medical stabilization fails at the emergency room (resulting in the patient’s death or in a referral to the intensive care unit). Suicidal intention is evaluated by a clinical interview, and this report is added to the electronic medical record of the patient. In this study, we retrospectively reviewed these reports provided by the on-call psychiatrist.

The clinical and demographic characteristics assessed included sex, age, date of consultation/referral, type of environment (rural vs. urban), suicidal methods employed, drugs used (including alcohol, cannabis, nicotine, unprescribed benzodiazepines, unprescribed opiates, illicit use of amphetamines), motives for suicide (existential, economic, social, familiar, the pandemic itself…), employment, social and marital status, diagnosis, and the therapeutic plan made by the psychiatrists. A code system was agreed upon by the investigators (different from those who evaluated the patients and wrote the reports) in order to codify the relevant information gathered. Suicidal behaviors are specifically labelled as impulsive when they are caused by an urge to self-harm without previous plans and generally occur in reaction to some acute...
stress factor; this is followed by an almost instantaneous feeling of regret. Other self-harm episodes are labelled as extrinsically motivated when motivations other than death are detected alongside the desire for self-destruction (for example, self-harm with punitive or manipulative intentions). Forms of self-harm that were non-suicidal were not included in the study. Reasons for referral or consultation were divided into high- and low-lethality suicide methods (Lim, 2014) and suicidal thoughts. We analyzed the influence of the coronavirus crisis, taking the declaration of the first state of alarm on March 14, 2020 as a reference. The state of alarm resulted in a mandatory lockdown, among other measures, and free movement was significantly restricted during this period. These conditions could have an impact on mental health and suicidality. In order to analyze how lockdown (not simply the COVID crisis in general) affected our population, we additionally divided the period we studied into three different intervals: before, during, and after the first state of alarm ended on June the 21st 2020.

3. Results

3.1. Comparison between the pre- and post-declaration of the state of alarm

We observed more cases of suicidality before the declaration of the state of alarm. The proportion of retired patients was three times higher among the patients evaluated for suicidal thoughts and acts after the state of alarm than before. We further observed a qualitative difference between the number of attempts/gestures via injuries before and after the declaration of the state of alarm (no injuries were registered pre-lockdown). Suicidal motivations remained equally prevalent, except for the proportion of patients who gave existential reasons, which was 2.79 times higher before the state of alarm than after. The incidences of suicidal thoughts, drug overdoses, and self-inflicted cuts did not vary significantly. Students were assessed twice as frequently before than after the declaration of the state of alarm. No statistically significant difference was found in the proportions of sex, marital status, or rural/urban residence.

Extrinsic motivations for a suicidal attempt were mostly seen in women (37.1% vs. 24.5%, \( p = 0.04 \)). Most of the patients who made consultations due to suicidal thoughts were men (49% vs. 29.4%, \( p < 0.05 \)). Drug overdose was more common in women (62.9% vs. 36.7%, \( p < 0.05 \)), although drug users were predominantly men (61.2% vs. 42.7%, \( p < 0.05 \)).

3.2. Comparison between the three periods, including pre-lockdown (pre-state of alarm), lockdown, and post-lockdown

There were more active workers among the patients evaluated during the lockdown period. No differences were found in other variables (including gender, marital status, working status, family history, motives, or drug abuse) beside employment status.

Table 1

Prevalence of the different sociodemographic and clinical variables, different consultation motives, gender differences, and variations in frequency along with the two-period and three-period scenarios. \(^1\) Results for which the chi-squared test is unapplicable due to expected counts <5.

|                      | Pre-lockdown (N = 96) | Post-lockdown (N = 145) | P     |
|----------------------|-----------------------|-------------------------|-------|
|                      | n                     | Percentage              | n     | Percentage |
| Type                 |                       |                         |       |            |
| Suicidal thoughts    | 126                   | 54                      | 72    | 49.7%      | 0.292 |
| Overdose             | 16                    | 4                       | 13    | 9.0%       | 0.316 |
| Cuts                 | 6                     | 0                       | 6     | 4.1%       | 0.075 \( ^1 \) |
| Fall                 | 4                     | 0                       | 4     | 3.8%       | 0.044 \( ^1 \) |
| Hanging              | 4                     | 0                       | 4     | 3.8%       | 0.101 \( ^1 \) |
| Hospitalization      | 109                   | 46                      | 63    | 43.4%      | 0.495 |
| Rural origin         | 109                   | 46                      | 63    | 43.4%      | 0.495 |
| Marital status       |                       |                         |       |            |
| Single               | 92                    | 38                      | 54    | 37.2%      | 0.714 |
| Married              | 62                    | 22                      | 40    | 27.9%      | 0.417 |
| Separated/divorced   | 41                    | 18                      | 23    | 15.9%      | 0.559 |
| Widower              | 12                    | 4                       | 8     | 5.5%       | 0.637 \( ^1 \) |
| Partner              | 34                    | 14                      | 20    | 13.8%      | 0.863 |
| Laboral Status       |                       |                         |       |            |
| Student              | 43                    | 24                      | 19    | 13.1%      | 0.025 |
| Active               | 69                    | 26                      | 43    | 29.7%      | 0.665 |
| Inactive             | 41                    | 20                      | 21    | 14.5%      | 0.199 |
| Unemployed           | 30                    | 10                      | 20    | 13.8%      | 0.437 |
| Temporarily incapable| 5                     | 0                       | 5     | 3.4%       | 0.066 \( ^1 \) |
| Permanently incapable| 22                    | 9                       | 13    | 9.0%       | 0.914 |
| Retired              | 31                    | 7                       | 24    | 16.6%      | 0.036 |
| Family history       | 56                    | 23                      | 33    | 22.8%      | 0.829 |
| Drug Users           | 121                   | 49                      | 72    | 49.7%      | 0.833 |

| 3 periods lethality  | Total (N = 241) | Suicidal Thoughts | Low Lethality | High Lethality |
|----------------------|-----------------|-------------------|---------------|---------------|
|                      | n               | %                 | n             | %             |
| Gender (X^2=0.001)   |                 |                   |               |               |
| Women                | 143             | 42                | 89            | 62.2%         | 12            | 8.4%           |
| Men                  | 98              | 48                | 36            | 36.7%         | 14            | 14.3%          |
| Two Periods (X^2=0.026) |            |                   |               |               |
| Pre-declaration      | 96              | 39                | 53            | 55.2%         | 4             | 4.2%           |
| Post-declaration     | 143             | 51                | 72            | 49.7%         | 22            | 15.2%          |
| Three Periods (X^2=0.154) |            |                   |               |               |
| Pre-State of Alarm   | 96              | 44                | 45            | 46.9%         | 7             | 7.3%           |
| During State of Alarm| 85              | 26                | 46            | 54.1%         | 13            | 15.3%          |
| Post-State of Alarm  | 60              | 20                | 34            | 56.7%         | 6             | 10.0%          |
3.3. High/low lethality and the two- and three-period scenarios

There was a greater proportion of active suicidal behaviors after the declaration of the state of alarm, and fewer patients made consultations due to suicidal thoughts. More high-lethality methods were evaluated after the declaration. Women used low-lethality methods approximately three times more than men. However, the use of high-lethality methods was not significantly associated with gender. Retired and older patients were four and five times more likely to fall into the high-lethality attempt category than patients with other employment statuses and younger patients, respectively. Lethality (low or high) was not associated with any other risk factors.

3.4. Loglinear analysis

Variables associated with a greater prevalence of both high and low lethality attempts (gender, age older than 65 years, and being retired) were included in two log-linear analyses to assess for interactions: one with high-lethality methods, and the other with low-lethality methods. Four-way log-linear analysis led to a final model that retained two effect interactions related to the use of low-lethality suicide methods. Sex had a significant second-order interaction with low lethality.

Two interaction effects were significant when applying four-way log-linear analysis with high lethality, gender, age older than 65 years, and retirement. However, high lethality did not interact with other variables.

4. Discussion

Our results confirmed the previous evidence on risk factors: men tend to use more lethal methods, while women consult more often due to suicidal thoughts (Turecki and Brent, 2016) and tend to use less lethal methods. The association between higher lethality and older age is also consistent with published evidence (Yang et al., 2020). There appeared to be a tendency toward homogenization of the gender differences observed within the first period; however, it was not statistically significant. Based on the literature, this high prevalence of high-lethality attempts among active workers was not expected (Bachmann, 2018).

The number of consultations related to suicidality in the emergency room remained constant; however, the lethality of the means employed increased. The state of alarm could have dissuaded the population from accessing the hospital, given the fear of contagion and the legal limitations to movements. Hence, more people than usual could have contained their less structured thoughts while avoiding the hospital (Mamun and Ullah, 2020). As we observed an increase in the lethality of the attempts evaluated after the declaration of the state of alarm (Mohan et al., 2020), our sample consisted of a selected number of patients classified as the highest risk. Alternatively, the state of alarm possibly delayed consultations. Indeed, there may have been a wave of patients who planned to seek medical attention after the state of alarm who remained undetected during that period.

Fewer students presented for treatment after the state of alarm was declared, probably because many students were native to other Spanish cities and could have returned home after all daily activities were interrupted, as in other universities (Chang et al., 2020). Regarding active workers, the conditions faced by many industries and employers owing to their halted activities may have caused drastic changes in their situation, explaining the higher rate of suicidality in this group (Kavohl and Nordt, 2020). However, long-term studies are needed to clarify these points.

Our data were extracted from only psychiatric evaluations, and we excluded suicidal acts only assessed by emergency doctors. However, this is a real-world study with a heterogeneous population, making the results generalizable to many other comparable environments.

5. Conclusion

The COVID-19 crisis and the subsequent lockdown and state of alarm were linked to an increase in lethality specifically associated with male gender, age over 65 years, and retired employment status in Spain. An existential motivation for suicide was more prevalent before the state of alarm than after. Investigating the long-term effects of COVID-19 on suicide is essential to identify the groups at highest risk of suicide.

CRediT authorship contribution statement

Llunya Garcia-Ullán: Conceptualization, Investigation, Methodology.
Javier I. de la Iglesia-Larrad: Conceptualization, Data curation, Methodology, Writing – review & editing.
Diego Remón-Gallo: Conceptualization, Investigation, Methodology, Software.
Nerea M. Casado-Espada: Data curation.
Sinta Gamonal-Limacoco: Writing – review & editing.
Maria Teresa Lozano: Data curation.
Lourdes Aguilar: Validation, Visualization.
Carlos Roncero: Conceptualization, Methodology, Resources, Supervision, Validation, Visualization.

Declaration of Competing Interest

Dr. Carlos Roncero has carried out the PROTEUS project, which was funded by a grant from Reckitt-Benckiser/Indivior and the COSTEDOPA project, which was funded by INDIVIOR. He received two medical education grants by Gilead and medical writing support from Abivie, has received fees to give lectures for JanssenCilag, Indivior, Servier, GSK, Astra, Gilead, MSD, Sanofi, Exceltis, Abbvie, Takeda, Rubio and Casein. He has received financial compensation for his participation as consultant or a board member for Lundbeck, Gilead, MSD, Mundipharma, INDIVIOR, Exceltis, Martindale, Camurias, Gebro and Abbvie, and has received support by Castile and Leon’s (Spain) Regional Management of Health (GRS COVID 59/A/20) Scholarship for the project Impacto y abordaje de la salud mental de los pacientes afectados por COVID, sus familiares y del personal sanitario que los atiende. (Impact and approach on the mental health of patients affected by COVID, their families and the health professionals who care for them).

Dr. Javier I. de la Iglesia-Larrad has received honoraria for a presentation for Sanofi and has been given formation and a contract for La Roche as a rater in a clinical essay.

The rest of the author declare to have no other conflicts of interest.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2022.114578.

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