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Short communication

Does suicidal ideation increase during the second COVID-19 lockdown?



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ABSTRACT

This longitudinal study aimed to investigate the predictive factors of suicidal ideation during the second lockdown in Greece. The respondents presented a 4.32% suicidal ideation in the second lockdown, which did not differ significantly to the initial 4.81%. Anxiety, depression, suicidal ideation during the first lockdown and living with a person with frail health and vulnerable for COVID-19 severe infection emerged as significant risk factors for suicidal ideation during the second lockdown, after controlling for gender, age, and mental health history. Depression was found as the only significant prognostic factor for suicidal ideation incidence of the second lockdown.

1. Introduction

The societies worldwide have been suffering from subsequent waves of COVID-19 pandemic for more than a year. This pandemic may be linked with severe psychosocial consequences in the community, while its impact on suicidal behavior remains questionable (Jefsen et al., 2020). Studies have shown an increase of suicidal ideation from the initial to the last weeks of the first lockdown period (Killgore et al., 2020; Papadopoulou et al., 2021), so it remains crucial to investigate changes of suicidal ideation during different lockdown periods as the pandemic unfolds, changes that merit attention of the policy makers and researchers.

To the best of our knowledge, there is one follow-up study (Veldhuis et al., 2021) in the general population during five months within COVID-19 pandemic in the USA, showing a significant increase over time in the mean scores of suicidal thoughts and behaviors. However, no conclusions can be made from this study regarding the possible increase in suicidal ideation probable cases.

A web-based survey of our research team exploring the psychosocial

impact of COVID-19 pandemic during the first lockdown period in Greece showed 5.20% prevalence of suicidal ideation (Papadopoulou et al., 2021). Taking into consideration that the second wave of the pandemic was much fiercer worldwide, an up-to-date investigation of suicidal ideation possible cases in the second lockdown is of crucial importance. Consequently, this longitudinal study aimed to investigate the prevalence and the prognostic factors of suicidal ideation during the second lockdown in Greece and the within-person differences in comparison to the first lockdown as well.

2. Materials and methods

2.1. Process and participants

The methods of our study have been described in detail in a previous paper (Papadopoulou et al., 2021). In short, during the first lockdown (April 7 to May 3, 2020) 5116 individuals participated in a web-based survey, completing a questionnaire developed to obtain socio-demographic, psychological and physical health related data, as

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well as COVID-19 pandemic and lockdown related data. The following psychometric questionnaires were administered: Generalized Anxiety Disorder (GAD-2), Patient Health Questionnaire (PHQ-2 along with PHQ item 9 to assess suicidal ideation), Systemic Clinical Outcome and Routine Evaluation (SCORE-15) and Connor-Davidson Resilience Scale (CD-RISC-2). Individuals with a total score of ≥ 3 in GAD-2 or PHQ-2 were considered as possible cases of anxiety or depression, respectively. As aforementioned, suicidal ideation was assessed by PHQ-9 item 9 ("Thoughts that you would be better off dead, or of hurting yourself"). Individuals responding "not at all" were considered as not having suicidal ideation, whereas individuals who responded "several days", "more than half the days", or "nearly every day" were considered as presenting suicidal ideation.

During the second national lockdown (November 22 to December 21, 2020), 1380 individuals who had participated in the first lockdown survey and provided us with their emails in order to take part in a follow-up survey, were invited to complete the same questionnaire. From these 1380, a total of 811 individuals fully completed the questionnaire. Among them, 202 (24.91%) were men, 607 (74.85%) women and 2 (0.10%) reported "other" gender. They had a mean age of 27.19 ± 12.96 years, 458 (56.47%) were married and 609 (75.09%) had completed tertiary education. A 70.04% ($n = 568$) had a paid job, with almost half of them [288 (50.70%)] currently tele-working, while 70 (8.63%) were unemployed. Among the latter, 17 (24.29%) stated that this was due to COVID-19 pandemic. This sub-sample did not differ regarding gender, age, education, occupation, living status and suicidal ideation compared to the remaining initial sample (4305). However, they were found to be married (56.47% vs. 52.42%, $p = 0.03$) to a greater extent.

2.2. Statistical analysis

Descriptive statistics were calculated and presented as absolute and relative (%) frequencies for qualitative variables (valid percentages presented in case of missing values), and means and standard deviation (SD) for quantitative variables. Simple comparisons between groups were performed using independent samples t-tests for quantitative variables and Chi-square tests for qualitative ones to explore whether the sub-sample of the second lockdown was comparable to the initial greater sample of the first lockdown.

Within-person changes between the first *versus* the second lockdown among the 811 individuals who completed the survey during both lockdowns regarding suicidal ideation, depression, and anxiety cases were assessed primarily by McNemar tests, while General Estimating Equations (GEE) logistic regression analyses were also used to adjust for gender and age. Wilcoxon matched-pairs signed-ranks tests were used to determine within-individual changes in symptoms' severity among participants who were identified as cases in both lockdowns.

Penalized logistic regression analyses, with Firth's correction to reduce small-sample size bias, were performed to assess possible socio-demographic and psychological predictors (i) for suicidal ideation cases during the second lockdown, as well as (ii) for the occurrence of

new suicidal ideation cases during the second lockdown (Heinze and Schemper, 2002). The following stepwise procedure was employed: (1) univariable models were fitted for each of the variables: education, marital, job and living status, having children, perceived physical health quality, having frail health and being vulnerable for COVID-19 severe infection, living with a person with frail health and vulnerable for COVID-19 severe infection, having been diagnosed with COVID-19, impaired family functioning (SCORE-15), depression (PHQ-2), anxiety (GAD-2), resilience (CD-RISC-2), alcohol consumption, smoking, sleep quality after COVID-19 outbreak, coping strategies during COVID-19 pandemic (*i.e.* personal skills, relationship with family, relationship with friends, faith in a Supreme Being). (2) Through these univariable analyses, we included in a multivariable model any variable whose univariable test had a $p \leq 0.15$. Gender, age and mental health history were included as control variables and thus were retained despite their statistical significance. Backward selection was used to eliminate non-significant variables at 0.05 level. (3) Finally, each of the non-significant variables from step (1) were considered using forward selection, with significance level 0.05, while interactions were also checked.

3. Results

According to our results, the 811 respondents presented a 4.32% ($n = 35$) suicidal ideation during the second lockdown, which did not differ to the initial 4.81% ($n = 39$; unadjusted $p = 0.64$, adjusted for gender and age $p = 0.54$). This change in the proportion between the two lockdowns was a consequence of 18 participants without suicidal ideation during the first lockdown presenting such thoughts during the second lockdown, 22 participants who initially reported suicidal ideation did not during the second lockdown, while 17 participants presented suicidal ideation during both lockdowns.

Furthermore, 25.40% ($n = 206$) of the second lockdown were potential clinical cases of depression compared to 22.74% ($n = 184$) of the first lockdown (unadjusted $p = 0.12$, adjusted for gender and age $p = 0.15$). This proportion change is due to the fact that 112 participants who did not present depression in the first lockdown did during the second. Furthermore, 90 participants who initially reported depression did not during the second lockdown, while 94 participants presented depression in both lockdowns.

In contrast, 15.68% ($n = 127$) of the second lockdown' respondents were potential cases of anxiety compared to 12.58% ($n = 102$) of those in the first lockdown (unadjusted $p = 0.02$, adjusted for gender and age $p = 0.02$), a significant difference. This proportion change was a consequence of 73 participants without anxiety during the first lockdown presenting anxiety during the second lockdown, whereas 47 participants who initially reported anxiety did not during the second lockdown, while 54 participants presented anxiety in both lockdowns. No statistically significant within-individuals changes were found among individuals who suffered from suicidal ideation, anxiety and depression in both lockdown periods regarding the respective symptoms' severity.

Table 1

Penalized logistic regression analysis predicting suicidal ideation in a Greek community sample during the second lockdown.

Predictors	Odds Ratio	95% CI	<i>p</i> -value
Depression [Potential case (PHQ 2 \geq 3) vs. Non-case]	5.85	2.17 – 15.74	<0.001
Anxiety [Potential case (GAD 2 \geq 3) vs. Non-case]	3.12	1.28 – 7.63	0.01
Suicidal ideation during first lockdown (Yes vs. No)	17.07	7.02 – 41.52	<0.001
Living with a person with frail health and vulnerable for COVID-19 severe infection (Yes vs. No)	2.38	1.06 – 5.28	0.03
Gender [‡] (Women vs. Men)	1.57	0.56 – 4.40	0.40
Age (per year)	1.01	0.98 – 1.05	0.42
Mental health history (Yes vs. No)	1.32	0.47 – 3.63	0.68

Notes: 95% Confidence Interval, 95% CI.

Stepwise penalized logistic regression analysis, with Firth's correction to reduce small-sample size bias.

[‡] Regarding gender, due to the fact that only 2 individuals reported "other", they were not included in the penalized logistic regression analysis.

A penalized logistic regression analysis in the total sample showed that depression, anxiety, suicidal ideation during the first lockdown, and living with a person with frail health and vulnerable for COVID-19 severe infection, were independently associated with higher suicidal ideation odds during the second lockdown, after controlling for gender, age, and mental health history among the 811 participants (Table 1). However, when investigating the factors related with the occurrence of new suicidal ideation cases during the second lockdown, among 771 participants who did not experience suicidal thoughts during the first lockdown, only depression emerged as a significant predictor (OR:17.62, 95%CI: 5.39 to 57.60, $p < 0.001$), after adjusting for gender, age, and mental health history.

4. Discussion

This longitudinal web-based survey assessed the within-person changes on suicidal ideation during two successive nationwide lockdowns in Greece. Among 811 participants included in the study, 4.81% presented suicidal ideation during the first lockdown, whereas 4.32% during the second lockdown, a non-significant decrease. Suicidal ideation during the first lockdown, anxiety, depression, and living with a person with frail health and vulnerable for COVID-19 severe infection, emerged as independent significant risk factors for suicidal ideation during the second lockdown, after adjusting for gender, age and mental health history. Among 771 participants who did not experience suicidal thoughts during the first lockdown a 2.33% presented suicidal ideation during the second lockdown and depression emerged as the only significant risk factor for suicidal ideation incidence during the second lockdown, after adjusting for gender, age and mental health history.

To conclude, this study showed that suicidal ideation prevalence remained stable from the first to the second lockdown due to the COVID-19 pandemic in Greece. It should be noted that Greece experienced a much more severe second wave of COVID-19 pandemic (13.82 confirmed deaths per million people until May 3, 2020 to 408.42 until December 21, 2020; Roser et al., 2020). This second wave's increased severity might be associated with the increase in anxiety prevalence. Although the two lockdowns share similar general characteristics, in practice the five-month free period from lockdown measures during summer, state financial support to professionals affected by the pandemic, increased mobility and greater accessibility to health services during the second lockdown compared to the first might have contributed to the stability of suicidal ideation despite the increased anxiety and worsening of death rate due to COVID-19. Another, speculation for

this suicidal ideation stability prevalence might be its association with the stability in depression prevalence. The latter emerged as the only predictor for suicidal ideation in new cases with suicidal ideation, a finding that underlines the need of its assessment alongside with suicidal ideation in primary health care.

CRedit authorship contribution statement

Vasiliki Efstathiou: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing, Visualization. **Ioannis Michopoulos:** Writing - review & editing. **Vasiliki Yotsidi:** Conceptualization, Methodology, Writing - review & editing. **Nikolaos Smyrnis:** Writing - review & editing. **Christina Zompola:** Writing - review & editing. **Athanasia Papadopoulou:** Conceptualization, Methodology, Writing - review & editing. **Valeria Pomini:** Conceptualization, Writing - review & editing. **Marianna Papadopoulou:** Writing - review & editing. **Evdoxia Tsigkaropoulou:** Writing - review & editing. **Georgios Tsigvoulis:** Writing - review & editing. **Athanasios Douzenis:** Writing - review & editing. **Rossetos Gournellis:** Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing, Supervision.

Declaration of Competing Interest

Authors have no conflicts of interest to declare.

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