

## Suicidal ideation among basic education teachers in Minas Gerais, Brazil

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**Abstract** *The present study aimed to estimate the prevalence of suicidal ideation and associated factors among elementary school teachers in the public school system of the state of Minas Gerais, Brazil, at the time of the resumption of in-person teaching activities after the COVID-19 pandemic. This is a cross-sectional study that analyzed baseline data from a web survey entitled the ProfSMinas Project. The dependent variable – suicidal ideation – was assessed by responding to one of the questions on the Self-Reporting Questionnaire-20. The independent variables included sociodemographic characteristics, work and employment characteristics, health status, and habits/behaviors. Crude and adjusted associations between the variables were estimated using logistic regression. A total of 1,907 teachers participated, and the prevalence of suicidal ideation was 5.6%. The final adjusted model showed greater chances of suicidal ideation among men, those without a partner, those with a previous diagnosis of depression, those with sleep disorders, and teachers who used smartphones excessively. The results indicate the importance of expanding strategies aimed at the school community to prevent suicidal behavior, considering the risks to which teachers are exposed.*

**Key words** School Teachers, Occupational Health, Suicide, Mental Health, Health Surveys

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## Introduction

Suicide is defined as a social phenomenon based on the degree of cohesion between individuals and society, as well as the way in which individuals are affected by the communities in which they live<sup>1-4</sup>. Therefore, though defined as an act performed by the victim him/herself, suicide would not be the result of a merely individual motivation, but rather an act stemming from social causes<sup>1,3,4</sup> in interaction with biological, psychological, environmental, and cultural factors<sup>5</sup>. 'Suicidal behavior' is the term used to describe the set of voluntary actions related to self-extinction<sup>5-7</sup>. It is classified as fatal -- suicide itself -- and non-fatal, in the form of suicidal attempts and ideations<sup>2</sup>. Suicidal ideation is the feeling of being tired of life or that life is not worth living, which leads the individual to contemplate self-extinction. Such thoughts present themselves in different degrees of intensity and can become more serious if a plan is drawn up to achieve the goal of ending one's own life<sup>2,7</sup>.

Epidemiological studies have helped to estimate the prevalence of suicidal ideation and identify risk factors that indicate vulnerabilities in specific groups. In the general population, a prevalence of 5.3% of suicidal ideation was observed in the 12 months prior to the survey and 17.1% throughout life in a city in the countryside of the state of São Paulo, Brazil<sup>8</sup>. A study carried out with approximately 85,000 individuals from seventeen different countries indicated a prevalence of 9.2%<sup>9</sup>, while the rate among residents of rural settlements in the state of Piauí was 13.4%<sup>10</sup>. A study carried out in Ireland identified differences in the prevalence of suicidal ideation between women and men: 10.6 and 7.0%, respectively<sup>11</sup>. During the period of social isolation due to the COVID-19 pandemic, a prevalence of 5.2% was observed among 5,116 adults in Greece<sup>12</sup>.

Among adolescents from 82 countries, the overall prevalence was 14.0%, ranging from 8.0% in Asian countries to 21.0% in African countries<sup>13</sup>, while among Chilean adolescents, the prevalence was even higher, reaching 65.6%<sup>14</sup>. A study conducted with high school and college students from Montes Claros, Minas Gerais, identified a prevalence of suicidal ideation of 11.6% and 9.8%, respectively<sup>15</sup>. It is possible to observe that the prevalence records vary according to the studied population; however, the different groups share characteristics that are associated with the outcome.

The factors most frequently associated with suicidal ideation include: being female<sup>8-11,13-16</sup>, being a young adult<sup>8,9</sup>, being single or living alone<sup>9,12,15</sup>, having sleep disorders<sup>15,16</sup>, having a history of mental disorders<sup>9,10-12,15,16</sup>, and using substances<sup>11,15</sup>. Among adolescents, there is also an association with excessive internet use<sup>15</sup>, interpersonal conflicts and aggression<sup>13,14</sup>, episodes of bullying<sup>14</sup>, lack of close friendships or feelings of isolation and loneliness<sup>13</sup>.

Studies investigating suicidal ideation among teachers indicated prevalence rates of 4.7% among municipal schoolteachers in the countryside of the state of Rio Grande do Sul<sup>17</sup>; 5.5% among elementary schoolteachers in the countryside of the state of Alagoas<sup>18</sup>, and 14.0% among French university professors<sup>19</sup>. The associated factors observed were diagnosis of chronic illness, having suffered harassment, inability to discuss work problems with colleagues, poor quality of sleep, and feeling undervalued by colleagues and family<sup>19</sup>.

In view of this scenario, it is important to investigate suicidal ideation among teachers for different reasons. The teaching category, especially in basic education, is primarily comprised of women. According to the School Census, in 2021, female teachers represented 96.3% of all professionals in early childhood education, 88.1% in elementary education, and 57.7% in high school education. The age group with the highest concentration, considering both women and men, was 30 to 49 years of age<sup>20</sup>. Mental disorders are the third most common cause of absence from work among teachers in Brazil<sup>21</sup>, a situation that has been aggravated by the COVID-19 pandemic<sup>22</sup>. One study, conducted with 15,641 elementary school teachers from Minas Gerais, found that 25.9% had received a medical diagnosis of depression and/or anxiety during the pandemic, of whom 30.4% were using sleeping pills, antidepressants or tranquilizers; 33.4% began to have sleep problems during the period; and 7.1% were consuming alcoholic beverages in larger quantities and more frequently than usual<sup>23</sup>.

There are numerous studies that have addressed the mental health of teachers at different stages of education. However, when considering issues involving suicidal behavior in the school environment, the focus is generally on students, which is justified by the fact that adolescents and young people have shown significant increases in the rates of such behavior<sup>24</sup>. In this regard, several studies and initiatives recognize teachers as privileged agents in the promotion

of healthy environments, capable of identifying at-risk students<sup>25-27</sup>, without, however, considering the risk to which they are exposed in their teaching activities. Therefore, the present study aimed to estimate the prevalence of suicidal ideation, and the factors associated with it among elementary school teachers in the state public school system of Minas Gerais, at the time of the resumption of in-person teaching activities after the COVID-19 pandemic.

## Methods

This work is a cross-sectional epidemiological study that analyzed data from the first phase (baseline) of a web survey entitled 'Health and working conditions of teachers in the state public school system of Minas Gerais: longitudinal study – *ProfSMinas Project*'.

The study population included approximately 90,000 basic education teachers – early childhood education, initial and final years of elementary school, and high school – working in approximately 3,500 state public schools in Minas Gerais (data provided by the State Department of Education through the July 2021 payroll). The inclusion criterion was to have a position as a basic education teacher in a state school in Minas Gerais at the time of data collection.

To estimate the minimum sample required, a formula was used considering an infinite population; a prevalence of 50% in order to achieve a larger sample size and, consequently, a greater inference power for different outcomes; a tolerable error of 3%; and an increase of 20% in order to compensate for possible losses due to non-response rates. According to the calculation based on the aforementioned criteria, a sample of 1,282 teachers was necessary to guarantee a proper representation of the category in Minas Gerais.

Data collection took place between October 26 and December 31, 2021 (the period in which in-person teaching activities were being resumed in state schools), through an online form using the Google Forms platform. The invitation to participate in the survey, along with the link to the form, was sent by the Minas Gerais State Department of Education (SEE/MG) to all 47 Regional Education Superintendencies, requesting that the questionnaire be forwarded to the institutional emails of all teachers affiliated with state public schools.

The dependent variable – suicidal ideation – was assessed by answering (no; yes) to one of

the questions on the Self Reporting Questionnaire (SRQ-20): Have you had thoughts of ending your own life?

The SRQ-20 is an instrument developed by the World Health Organization (WHO) to assess the suspected diagnosis of common mental disorders, characterized by the presence of insomnia, fatigue, forgetfulness, irritability, and difficulty concentrating. There are 20 questions distributed into four groups of symptoms: depressive-anxious mood, somatic symptoms, decreased vital energy, and depressive thoughts<sup>28</sup>.

The independent variables included:

- *Sociodemographic characteristics*: sex (female; male); age (21 to 35 years; 36 to 45 years; 46 to 55 years; 56 years or older); self-declared skin color (white, black, brown, yellow, and indigenous); marital status (with partner, without partner), family income (1 to 3 minimum wages, 4 to 6 minimum wages, 7 minimum wages or more); and main financial provider of the family (no; yes).

- *Characteristics of work and employment*: employment relationship (hired/appointed, public examination/permanent); length of service as a teacher (up to 10 years, 11 to 20 years, 21 years or more); weekly working hours (up to 39 hours, 40 hours or more); other paid employment (no; yes, teaching at another school; yes, in another activity); psychological demands of work (low, high); control over work (low, high); and social support at work (low, high).

Occupational stress was assessed through responses to the Job Stress Scale (JSS). The summarized and validated Portuguese version<sup>29</sup> was used, which contains 17 questions that deal with the dimensions of psychological demand, control, and social support at work. Five questions assess psychological demands, including quantitative aspects, such as time, concentration levels and speed of carrying out work activities, and qualitative aspects, such as task interruptions and contradictions. Six questions deal with the control that workers have over their own work, that is, autonomy in deciding whether or not to carry out the work, along with the possibility of mobilization and development of skills. Another six questions assess the third dimension, social support, which indicates the level of social interaction between workers and their colleagues, in addition to the relationship with their superiors. The response options for each of the dimensions are presented on a Likert scale (1-4), and the average sum of each was used to define the groups of high/low demand, high/low control, as well as high/low social support<sup>29</sup>.

- *Health status and habits/behaviors*: medical diagnosis of depression in the 12 months prior to the survey (no; yes); medical diagnosis of anxiety in the 12 months prior to the survey (no; yes); current smoker (no; yes); alcohol consumption (no; yes); sleep disturbance (no; yes); and excessive smartphone use (no; yes).

The variable 'sleep disturbance' was obtained through the answers to two questions: 1) Have you been losing a lot of sleep lately because you are worried about something? (not at all; no more than usual; a little more than usual; much more than usual); and 2) Over the last month, how would you rate the quality of your sleep in general? (very good; good; poor; very poor). Teachers who answered 'a little more than usual' or 'much more than usual' in the first question and who rated their sleep quality as poor or very poor in the second question were considered 'yes' to sleep disorders.

Excessive smartphone use was assessed through responses to the Smartphone Addiction Inventory (SPAI-BR), an instrument comprised of 26 items with yes and no response options. The total score obtained by adding the items ranges from 0 to 26 points, and the cut-off point of 9 or more positive responses was used to identify excessive use<sup>30</sup>.

Data analysis was conducted using the statistical program STATA, version 13.0. First, a descriptive analysis of the population was performed, estimating the relative frequencies according to the categories of the study variables, and the prevalence of suicidal ideation in the sample was calculated. The next step was to estimate the prevalence of suicidal ideation according to the categories of each of the independent variables and, through logistic regression, a bivariate analysis was performed to verify the existence of gross associations between the investigated outcome and the independent variables. The variables that presented a  $p\text{-value} \leq 0.20$  in the bivariate analyses were selected to compose the adjusted multiple models and were then removed, one by one, until only the variables associated with suicidal ideation at the level of  $p \leq 0.05$  remained in the final model.

The Hosmer-Lemeshow test was used to assess the quality of the adjustment of the final model. A high  $p\text{-value}$  indicates that there are no significant differences between the probabilities predicted by the model and the values observed in the database under analysis, characterizing a good fit of the model to the data.

The project was approved by the Ethics Committee of the State University of Montes Claros

(Opinion No. 4,964,125, 09/10/2021), and all participants, including both male and female teachers, received the Free and Informed Consent Form when accessing the research form.

## Results

Of the 1,982 forms received, 57 respondents who did not hold a position as a primary school teacher in a state school in Minas Gerais were excluded, and 18 individuals did not agree to participate in the survey. Therefore, the responses from 1,907 valid forms were analyzed, considering the sample of 1,282 individuals needed to ensure representation of the category in the state of Minas Gerais, as detailed in the previous section.

Among the respondents, 77.2% were women; ages ranged from 21 to 72 years (mean 44.4 years,  $SD \pm 9.4$ ); 54.4% self-identified as white; 60.8% lived with a partner; half of them had a family income of 1 to 3 minimum wages; and 59.9% were the main breadwinners for their families (Table 1).

Regarding work and employment characteristics, 57.5% were civil servants or permanent employees at the state school; 59.2% had been teaching for 15 years or less; 65.7% worked up to 39 hours a week; and 67.0% had no other paid job. Approximately half of the teachers were under occupational stress: high psychological demand (51.5%), low control over work (53.0%), and low social support from colleagues and superiors (53.2%) (Table 1).

Regarding the health status of the teachers investigated in this study, 13.1% and 38.6% reported a medical diagnosis of depression and anxiety, respectively, in the 12 months prior to the survey. Regarding habits and behaviors, 6.0% were current smokers and 12.0% reported consuming at least 4 doses of alcoholic beverages on the occasions when they drank; 34.6% had sleep disorders; and 18.5% used their smartphone excessively (Table 1).

The prevalence of suicidal ideation among the teachers was 5.6% (95% CI=4.6-6.6) ( $n=107$ ). Bivariate analyses showed greater chances of suicidal ideation among younger, single, divorced, or widowed individuals, who were the main financial providers for their families, had a stable employment relationship, had worked in teaching between 11 and 20 years, were under occupational stress, had received a previous medical diagnosis of depression and/or anxiety, were current smokers, consumed

**Table 1.** Description of the study population according to sociodemographic characteristics, work and employment characteristics, health status, and habits/behaviors. Basic education teachers in the state public school system of Minas Gerais, 2021.

| Variables                                  | n     | %    | Variables                                 | n     | %    |
|--------------------------------------------|-------|------|-------------------------------------------|-------|------|
| <b>Sociodemographic characteristics</b>    |       |      | <b>Other paid employment</b>              |       |      |
| Sex                                        |       |      | No                                        | 1,277 | 67.0 |
| Female                                     | 1,473 | 77.2 | Yes, teaching at another school           | 361   | 18.9 |
| Male                                       | 434   | 22.8 | Yes, at another activity                  | 269   | 14.1 |
| Age                                        |       |      | <b>Psychological demands of work</b>      |       |      |
| 56 years or older                          | 265   | 13.9 | Low                                       | 925   | 48.5 |
| 46 to 55 years                             | 593   | 31.1 | High                                      | 982   | 51.5 |
| 36 to 45 years                             | 680   | 35.7 | <b>Control over work</b>                  |       |      |
| 21 to 35 years                             | 369   | 19.3 | High                                      | 896   | 47.0 |
| Self-declared skin color                   |       |      | Low                                       | 1,011 | 53.0 |
| White                                      | 1,040 | 54.4 | <b>Social support at work</b>             |       |      |
| Black, brown, yellow, and indigenous       | 867   | 45.6 | High                                      | 893   | 46.8 |
| Marital status                             |       |      | Low                                       | 1,014 | 53.2 |
| With partner                               | 1,160 | 60.8 | <b>Health status and habits/behaviors</b> |       |      |
| Without partner                            | 747   | 39.2 | <b>Previous diagnosis of depression</b>   |       |      |
| Family income                              |       |      | No                                        | 1,658 | 86.9 |
| 7 minimum wages or more                    | 214   | 11.2 | Yes                                       | 249   | 13.1 |
| 4 to 6 minimum wages                       | 718   | 37.7 | <b>Previous diagnosis of anxiety</b>      |       |      |
| 1 to 3 minimum wages                       | 975   | 51.1 | No                                        | 1,171 | 61.4 |
| Main financial provider of the family      |       |      | Yes                                       | 736   | 38.6 |
| No                                         | 765   | 40.1 | <b>Current smoker</b>                     |       |      |
| Yes                                        | 1,142 | 59.9 | No                                        | 1,792 | 94.0 |
| <b>Work and employment characteristics</b> |       |      | Yes                                       | 115   | 6.0  |
| Employment relationship                    |       |      | <b>Alcohol consumption</b>                |       |      |
| Contracted/appointed                       | 811   | 42.5 | No                                        | 1,679 | 88.0 |
| Contested/permanent                        | 1,096 | 57.5 | Yes                                       | 228   | 12.0 |
| Working time as a teacher                  |       |      | <b>Sleep disorders</b>                    |       |      |
| Up to 10 years                             | 740   | 38.8 | No                                        | 1,247 | 65.4 |
| 11 to 20 years                             | 692   | 36.3 | Yes                                       | 660   | 34.6 |
| 21 years or more                           | 475   | 24.9 | <b>Excessive <i>smartphone</i> use</b>    |       |      |
| Weekly working hours                       |       |      | No                                        | 1,554 | 81.5 |
| Up to 39 hours                             | 1,253 | 65.7 | Yes                                       | 353   | 18.5 |
| 40 hours or more                           | 654   | 34.3 | Source: Authors.                          |       |      |

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alcohol, were experiencing sleep disorders, and used smartphones excessively (Table 2).

The final adjusted model showed higher chances of suicidal ideation among male teachers (OR=1.73; 95%CI: 1.07-2.80); those who lived without a partner (OR=1.86; 95%CI: 1.21-2.86); those with a previous diagnosis of depression (OR=8.14; 95%CI: 5.25-12.63); those who were experiencing sleep disorders (OR=3.57; 95%CI: 2.18-5.84); and those who used smart-

phones excessively (OR=2.12, 95%CI: 1.34-3.34) (Table 3).

## Discussion

This study investigated suicidal ideation among elementary school teachers in public schools in the state of Minas Gerais. The results revealed an association with individual characteristics

**Table 2.** Unadjusted Prevalence and Odds Ratio for suicidal ideation as a dependent variable, Basic education teachers in the public school system of Minas Gerais, 2021.

| Variables                                  | P (%) | Gross OR (95%CI) | p-value |
|--------------------------------------------|-------|------------------|---------|
| <b>Sociodemographic characteristics</b>    |       |                  |         |
| Sex                                        |       |                  |         |
| Female                                     | 5.2   | 1.00             |         |
| Male                                       | 7.1   | 1.41 (0.92-2.18) | 0.116   |
| Age                                        |       |                  |         |
| 56 years or older                          | 4.5   | 1.00             |         |
| 46 to 55 years                             | 4.6   | 1.00 (0.50-2.02) | 0.987   |
| 36 to 45 years                             | 5.3   | 1.18 (0.60-2.30) | 0.630   |
| 21 to 35 years                             | 8.7   | 2.00 (1.01-3.96) | 0.046   |
| Self-declared skin color                   |       |                  |         |
| White                                      | 5.6   | 1.00             |         |
| Black, brown, yellow, and indigenous       | 5.7   | 1.01 (0.69-1.50) | 0.944   |
| Marital status                             |       |                  |         |
| With partner                               | 4.0   | 1.00             |         |
| Without partner                            | 8.2   | 2.15 (1.45-3.19) | 0.000   |
| Family income                              |       |                  |         |
| 7 minimum wages or more                    | 4.2   | 1.00             |         |
| 4 to 6 minimum wages                       | 3.8   | 0.89 (0.41-1.92) | 0.767   |
| 1 to 3 minimum wages                       | 7.3   | 1.79 (0.88-3.64) | 0.108   |
| Main financial provider of the family      |       |                  |         |
| No                                         | 3.8   | 1.00             |         |
| Yes                                        | 6.8   | 1.86 (1.20-2.88) | 0.005   |
| <b>Work and employment characteristics</b> |       |                  |         |
| Employment relationship                    |       |                  |         |
| Contracted/appointed                       | 4.1   | 1.00             |         |
| Contested/permanent                        | 6.8   | 1.71 (1.12-2.60) | 0.013   |
| Working time as a teacher                  |       |                  |         |
| Up to 10 years                             | 4.7   | 1.00             |         |
| 11 to 20 years                             | 7.4   | 1.60 (1.03-2.50) | 0.037   |
| 21 years or more                           | 4.4   | 0.93 (0.54-1.62) | 0.802   |
| Weekly working hours                       |       |                  |         |
| Up to 39 hours                             | 5.3   | 1.00             |         |
| 40 hours or more                           | 6.3   | 1.20 (0.80-1.80) | 0.367   |
| Other paid employment                      |       |                  |         |
| No                                         | 5.9   | 1.00             |         |
| Yes, teaching at another school            | 4.2   | 0.69 (0.39-1.23) | 0.208   |
| Yes, at another activity                   | 6.3   | 1.08 (0.63-1.86) | 0.778   |
| Psychological demands of work              |       |                  |         |
| Low                                        | 4.0   | 1.00             |         |
| High                                       | 7.1   | 1.84 (1.22-2.77) | 0.003   |
| Control over work                          |       |                  |         |
| High                                       | 3.9   | 1.00             |         |
| Low                                        | 7.1   | 1.89 (1.25-2.85) | 0.003   |
| Social support at work                     |       |                  |         |
| High                                       | 2.9   | 1.00             |         |
| Low                                        | 8.0   | 2.90 (1.84-4.55) | 0.000   |

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**Table 2.** Unadjusted Prevalence and Odds Ratio for suicidal ideation as a dependent variable, Basic education teachers in the public school system of Minas Gerais, 2021.

| Variables                                 | P (%) | Gross OR (95%CI)   | p-value |
|-------------------------------------------|-------|--------------------|---------|
| <b>Health status and habits/behaviors</b> |       |                    |         |
| Previous diagnosis of depression          |       |                    |         |
| No                                        | 2.7   | 1.00               |         |
| Yes                                       | 24.9  | 11.88 (7.87-17.95) | 0.000   |
| Previous diagnosis of anxiety             |       |                    |         |
| No                                        | 2.1   | 1.00               |         |
| Yes                                       | 11.3  | 6.07 (3.82-9.66)   | 0.000   |
| Current smoker                            |       |                    |         |
| No                                        | 5.1   | 1.00               |         |
| Yes                                       | 13.0  | 2.77 (1.55-4.96)   | 0.001   |
| Alcohol consumption                       |       |                    |         |
| No                                        | 5.1   | 1.00               |         |
| Yes                                       | 9.2   | 1.88 (1.14-3.09)   | 0.013   |
| Sleep disorders                           |       |                    |         |
| No                                        | 2.1   | 1.00               |         |
| Yes                                       | 12.3  | 6.57 (4.18-10.33)  | 0.000   |
| Excessive <i>smartphone</i> use           |       |                    |         |
| No                                        | 4.2   | 1.00               |         |
| Yes                                       | 11.9  | 3.09 (2.06-4.65)   | 0.000   |

P: Prevalence; OR: Odds Ratio; CI: Confidence Interval.

Source: Authors.

**Table 3.** Final model adjusted for suicidal ideation as a dependent variable. Basic education teachers in the state public school system of Minas Gerais, 2021.

| Variables                          | Adjusted OR (95%CI) | p-value |
|------------------------------------|---------------------|---------|
| Sex                                |                     |         |
| Female                             | 1.00                |         |
| Male                               | 1.73 (1.07-2.80)    | 0.026   |
| Marital status                     |                     |         |
| With partner                       | 1.00                |         |
| Without partner                    | 1.86 (1.21-2.86)    | 0.004   |
| Previous diagnosis of depression   |                     |         |
| No                                 | 1.00                |         |
| Yes                                | 8.14 (5.25-12.63)   | 0.000   |
| Sleep disorders                    |                     |         |
| No                                 | 1.00                |         |
| Yes                                | 3.57 (2.18-5.84)    | 0.000   |
| Excessive use of <i>smartphone</i> |                     |         |
| No                                 | 1.00                |         |
| Yes                                | 2.12 (1.34-3.34)    | 0.001   |

OR: Odds Ratio; CI: Confidence Interval. Model adjustment: p-value Hosmer-Lemeshow test = 0.2484.

Source: Authors.

and an important association with aspects related to teachers' mental health.

The prevalence of suicidal ideation estimated in this study (5.6%) is similar to that observed in the adult population of a city in the countryside of the state of São Paulo (5.3%)<sup>8</sup> and among elementary school teachers in a city in the countryside of the state of Alagoas (5.5%)<sup>18</sup>. These findings were slightly higher than the prevalence of suicidal ideation found among teachers in the municipal school system in the countryside of the state of Rio Grande do Sul (4.7%)<sup>17</sup> and in a sample of Belgian doctors (4.3%)<sup>31</sup>. However, compared to studies conducted at other times during the COVID-19 pandemic, the prevalence obtained in this study is lower. Among professors and administrative technicians at a university in the countryside of Minas Gerais, a prevalence of 15.6% was observed – data collection carried out between July 20 and August 27, 2020<sup>32</sup>. A study carried out among 1,674 individuals, aged between 18 and 75 years, whose collection took place between June and July 2020, identified a prevalence of 20.3% of suicidal ideation<sup>33</sup>.

The differences observed may be due to the time at which the data were collected in the dif-

ferent studies, since greater or lesser knowledge and uncertainties regarding the development of the COVID-19 pandemic and its consequences have had negative impacts on the physical and mental health of the population. In addition, such differences may be explained by the methodological specificities of each study. Although the SRQ-20 is not a specific instrument for tracking suicidal ideation and, for this study, only one of its items was considered to be a predictor of the outcome, the results do deserve attention. There is evidence of an association between the presence of common mental disorders -- assessed by the SRQ-20 -- suicidal ideation and suicide risk<sup>10,34</sup>. Moreover, it is understood that male and female teachers tend to present higher levels of mental distress when compared to the general population<sup>35</sup>.

Unlike other studies and epidemiological surveys, a greater chance of suicidal ideation was observed among men. In general, women have higher rates of suicidal ideation and attempts or self-harm, while men have higher rates of mortality due to suicide<sup>5,8-10,36</sup>. This phenomenon, called the 'gender paradox in suicidal behavior', seems to be determined by the social roles attributed to men and women. On the one hand, men are expected to be more aggressive, use more lethal means in suicide attempts, and have difficulty asking for help when they need it. On the other hand, women, despite having a higher prevalence of mental illness, form support and social networks, find it easier to talk about their problems and ask for help, and use means of attempting to take their own lives that offer greater chances of saving themselves from suicide attempts<sup>37-39</sup>. However, this phenomenon should not be naturalized, as it may represent underreporting of ideation and attempts among men and deaths among women<sup>37</sup>. In the present study, the anonymity of the responses and the fact that the information was self-reported may have encouraged participants to express such thoughts. Furthermore, the prevalence of depression -- generally higher in females -- was similar between men and women (12.4% and 13.2%, respectively; Pearson's  $\chi^2$  test=0.1871;  $p=0.665$ ); and men more frequently reported low social support from colleagues and superiors (62.4% compared to 50.4% of women; Pearson's  $\chi^2$  test=19.390;  $p=0.000$ ). It should be noted that these data stratified by sex were not presented in the previous section, which addressed the results of this research.

The variable of marital status remained associated with suicidal ideation, and teachers

who lived alone (single, widowed, or separated) had a higher chance of the outcome. This result is in line with other studies<sup>9,12,15</sup>. Living together and positive personal interactions contribute to the individual's motivation to move on with life and act as barriers to risky behaviors, including suicidal ideation. Likewise, conflicting and asymmetrical relationships, especially those marked by episodes of violence, enhance negative coping strategies for the problems experienced<sup>37,40,41</sup>.

Teachers who reported a medical diagnosis of depression in the 12 months prior to the survey had a significantly higher chance of suicidal ideation. A medical diagnosis of mental disorders is the greatest risk factor for suicidal behavior<sup>42</sup>. Studies indicate that the majority of individuals who attempt or commit suicide have some type of previously diagnosed mental disorder<sup>42,43</sup>; depression being the most prevalent<sup>36</sup>, since this condition causes a reduction in serotonin levels, leading to impulsive suicidal ideation and the continuation of the action<sup>43</sup>. Furthermore, abuse, trauma, mistreatment, divorce, death of a relative or friend promote increased emotional stress, trigger depression<sup>44</sup>, and, possibly, aggravate the vulnerability to suicidal ideation.

Sleep disorders remained associated with a higher chance of suicidal ideation. Frequent insomnia episodes, nightmares, short sleep duration, and poor sleep quality can cause cognitive, behavioral, and mood changes; increased stress; and excessive fatigue, and are also commonly associated with depression and suicidal ideation<sup>45,46</sup>.

Excessive smartphone use was also associated with a higher chance of suicidal ideation. There is no doubt that this device represents a tool for communication, social relationships, entertainment, and adaptations to daily life; however, excessive use can have negative impacts on physical and mental health. Studies show the association between excessive smartphone use and stress, poor sleep quality, depression, and anxiety<sup>47-49</sup>. Causal mechanisms would include changes in melatonin levels and exposure to magnetic fields that could affect brain activity, in addition to physical discomforts, such as headaches and muscle pain, situations capable of leading to poor sleep quality, which, in turn, could result in mood changes, stress, depression and anxiety<sup>49</sup>. Added to this are the demands of staying connected because of work, which could lead to greater emotional exhaustion and insufficient time to practice activities



related to health and well-being, such as physical exercise and social interactions<sup>49</sup>.

Exposure to occupational stressors did not reach statistical significance in the present study, unlike a study conducted among French workers that indicated an association between suicidal ideation and psychosocial aspects of work<sup>50</sup>. This result does not mean the absence of such exposure, since approximately half of the teachers reported high psychological demand, low control over work, and low social support from colleagues and superiors. It is well-known that mental illness is associated with occupational stressors<sup>51</sup>. Thus, it must be considered that mental illness, because it is more proximal and stronger, may have overshadowed the effect of exposure to such stressors, which may have influenced the outcome in a more distal way.

The results of this study should be analyzed taking into account some limitations of the study. Regarding the outcome, there is a limitation of investigating suicidal ideation in isolation without assessing one's history of suicide planning or attempts. In future studies, additional instruments should be considered. The cross-sectional design requires cautious interpretation, especially because it is a multidimensional outcome, and it should be emphasized that it is impossible to indicate causal relationships. Furthermore, research conducted over the web does not allow control over the investigated sample, and it therefore becomes impossible to guarantee equiprobabilistic sampling among the elements of the study population or to know the real response rate. There is also the possibility of selection bias, as it depends on internet access, and memory bias, as it uses self-reports.

However, strengths can also be highlighted. The sociodemographic characteristics of the teachers investigated in this study were consistent with those observed among Brazilian

teachers working in basic education. A robust sample was obtained and distributed throughout the state of Minas Gerais – including rural areas – at a low cost, with rigorous methodology and use of validated instruments. In addition, key support was received from the SEE/MG to disseminate the study and send out the form. Therefore, it is considered that the research presents important original information about the factors associated with suicidal ideation among teachers.

This article investigated suicidal ideation among teachers and identified the associated factors, with an emphasis on the male gender, as well as the presence of depression, sleep disorders, and an excessive use of smartphones. The results indicate the need to expand policies to prevent harm and promote physical and mental health, aimed more specifically at the teaching profession. Actions that are part of the Health in Schools Program, implemented in Brazil by the Ministries of Health and Education in public schools, for example, focus on children, adolescents, and young people of school age<sup>52</sup>. In Minas Gerais, the SEE/MG provides psychologists to work in state schools with the responsibility of helping to resolve conflicts and to improve interpersonal relationships and the quality of teaching. Although relevant, these responsibilities seem to cover only the determining factors for teacher illness.

Regarding suicidal ideation, the justification for expanding policies to prevent harm and promote the physical and mental health of teachers should be based on evidence that suicidal ideation represents a high risk of attempted suicide in the future and that attempts are the main risk factor for completed suicide. Therefore, supporting at-risk individuals and caring for their mental health become key strategies to prevent self-extermination and protect workers.

## Collaborations

REC Barbosa participated in the conception and design of the study, data analysis and interpretation, article writing, and approval of the version to be published. EO Santos participated in the data analysis and interpretation, article writing, and approval of the version to be published. GC Fonseca participated in the conception and design of the study, data analysis and interpretation, article writing, and approval of the version to be published. NSS Silva participated in the conception and design of the study, critical review of the article, and approval of the version to be published. RRV Silva participated in the conception and design of the study, critical review of the article, and approval of the version to be published. CA Sampaio participated in the conception and design of the study, critical review of the article, and approval of the version to be published. DS Haikal participated in the conception and design of the study, data analysis and interpretation, article writing, and approval of the version to be published.

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## Data availability statement

The data sources adopted in the research are indicated in the article's body.

## References

1. Almeida FM. Suicídio: contribuições de Émile Durkheim e Karl Marx para a compreensão desse fenômeno na contemporaneidade. *Aurora* 2018; 11(1):119-138.
2. Dantas ESO, Meira KC, Bredemeier J, Amorim KPC. Suicídio de mulheres no Brasil: necessária discussão sob a perspectiva de gênero. *Cien Saude Colet* 2023; 28(5):1469-1477.
3. Queiroz JB. O suicídio na sociologia brasileira. *Contemporânea* 2020; 10(3):1453-1480.
4. Rodrigues MMA. Suicídio e sociedade: um estudo comparativo de Durkheim e Marx. *Rev Latinoam Psicopat Fund* 2009; 12(4):698-713.
5. World Health Organization (WHO). *Preventing suicide: a global imperative*. Geneva: WHO; 2014.
6. Davila-Cervantes CA, Luna-Contreras M. Suicide attempts in the adult Mexican population: an analysis of sociodemographic characteristics and associated factors. *Rev Bras Epidemiol* 2024; 27:e240014.
7. Krug EG, Dahlberg LL, Mercy JA, Zwi AB, Lozano R, editors. *World report on violence and health*. Geneva: WHO; 2002.
8. Botega NJ, Marín-León L, Oliveira HB, Barros MBA, Silva VF, Dalgallarrondo P. Prevalências de ideação, plano e tentativa de suicídio: um inquérito de base populacional em Campinas, São Paulo, Brasil. *Cad Saude Publica* 2009; 25(12):2632-2638.
9. Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, Bruffaerts R, Chiu WT, de Girolamo G, Gluzman S, de Graaf R, Gureje O, Haro JM, Huang Y, Karam E, Kessler RC, Lepine JP, Levinson D, Medina-Mora ME, Ono Y, Posada-Villa J, Williams D. Cross-national prevalence and risk factors for suicidal ideation, plans, and attempts. *Br J Psychiatry* 2008; 192:98-105.
10. JP, Silva BM, Bezerra LLS. Ideação suicida em assentamentos rurais no Piauí. *Psicol Pesq* 2018; 12(3):1-10.
11. O'Neill S, Ferry F, Murphy S, Corry C, Bolton D, Devine B, Ennis E, Bunting B. Patterns of suicidal ideation and behavior in Northern Ireland and associations with conflict related trauma. *PLoS One* 2014; 9(3):e91532.
12. Papadopoulou A, Efstathiou V, Yotsidi V, Pomini V, Michopoulos I, Markopoulou E, Papadopoulou M, Tsigkaropoulou E, Kalemi G, Tournikioti K, Douzenis A, Gournellis R. Suicidal ideation during COVID-19 lockdown in Greece: Prevalence in the community, risk and protective factors. *Psychiatry Res* 2021; 297:113713.
13. Biswas T, Scott JG, Munir K, Renzaho AMN, Rawal LB, Baxter J, Mamun AA. Global variation in the prevalence of suicidal ideation, anxiety and their correlates among adolescents: a population based study of 82 countries. *E Clin Med* 2020; 24:100395.
14. Veloso-Besio C, Cuadra-Peralta A, Gallardo-Peralta L, Cuadra-Fernandez P, Quiroz PT, Troncoso NV. The prevalence of suicide attempt and suicidal ideation and its relationship with aggression and bullying in Chilean adolescents. *Front Psychol* 2023; 14:1133916.

15. Lima CA, Messias RB, Brito AB, Ferreira TB, Barbosa MS, Pinho L, Brito MFSE, Silveira MF. Ideação suicida e fatores associados entre estudantes de ensino médio e superior: uma análise hierarquizada. *J Bras Psiquiatr* 2021; 70(3):211-223.
16. Turecki G, Brent DA. Suicide and suicidal behaviour. *Lancet* 2016; 387(10024):1227-1239.
17. Rocha LM, Behlau M, Souza LDM. Behavioral dysphonia and depression in elementary school teachers. *J Voice* 2015; 29(6):712-717.
18. Alves VM, Rocha MGD, Silva JA, Silva JK., Santos RTS, Francisco LCFL. Qualidade de vida e risco de depressão e suicídio em professores. *Res Soc Dev* 2022; 11(4):e54711427565.
19. Dres M. Job strain, burnout, and suicidal ideation in tenured university hospital faculty staff in France in 2021. *JAMA Netw Open* 2023; 6(3):e233652.
20. Brasil. Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (Inep). *Resumo Técnico: Censo Escolar da Educação Básica 2021*. Brasília: Inep; 2022.
21. Maia EG, Claro RM Assunção AA. Múltiplas exposições ao risco de faltar ao trabalho nas escolas da Educação Básica no Brasil. *Cad Saude Publica* 2019; 35(Supl. 1): e00166517.
22. Silva DF, Cobucci RN, Lima SC, Andrade FB. Prevalence of anxiety, depression, and stress among teachers during the Covid-19 pandemic: a PRISMA-compliant systematic review. *Medicine* 2021; 100(44):e27684.
23. Silva NSS, Barbosa REC, Leão LL, Pena GDG, Pinho L, Magalhães TA, Silveira MF, Rossi-Barbosa LAR, Silva RRV, Haikal DS. Working conditions, lifestyle and mental health of Brazilian public-school teachers during the Covid-19 pandemic. *Psychiatriki* 2021; 32:282-289.
24. Ribeiro JM, Moreira MR. Uma abordagem sobre o suicídio de adolescentes e jovens no Brasil. *Cien Saude Colet* 2018; 23(9):2821-2834.
25. Brito MDLS, Silva Júnior FJG, Costa APC, Sales JCS, Gonçalves AMS, Monteiro CFS. Suicidal behavior and prevention strategies from teachers' perspective. *Esc Anna Nery* 2020; 24(4):1-7.
26. Haugen JS, Sutter CC, Jones JLT, Campbell LO. Teachers as youth suicide prevention gatekeepers: an examination of suicide prevention training and exposure to students at risk of suicide. *Child Youth Care Forum* 2023; 52:583-601.
27. Madjara N, Walsh SD, Harel-Fischa Y. Suicidal ideation and behaviors within the school context: Perceived teacher, peer and parental support. *Psychiatry Res* 2018; 269:185-190.
28. Santos KOB, Araújo TM, Oliveira NF. Estrutura fatorial e consistência interna do Self-Reporting Questionnaire (SRQ-20) em população urbana. *Cad Saude Publica* 2009; 25(1):214-222.
29. Alves MGM, Chor D, Faerstein E, Lopes CS, Werneck GL. Versão resumida da "job stress scale": adaptação para o português. *Rev Saude Publica* 2004; 38(2):164-171.
30. Khoury JM, Freitas AAC, Roque MAV, Albuquerque MR, Neves MCL, Garcia FD. Assessment of the accuracy of a new tool for the screening of smartphone addiction. *PLoS One* 2017; 12(5):e0176924.
31. Loas G, Lefebvre G, Rotsaert M, Englert Y. Relationships between anhedonia, suicidal ideation and suicide attempts in a large sample of physicians. *PLoS One* 2018; 13(3):e0193619.
32. Paula W, Oliveira WC, Meireles AL, Nascimento RC, Silva GN. Effects and implications of the COVID-19 pandemic on medicine use by employees of a Brazilian public university: a cross-sectional study. *Sao Paulo M J* 2022; 140(2):250-260.
33. Antonelli-Salgado T, Monteiro GMC, Marcon G, Roza TH, Zimerman A, Hoffmann MS, Cao B, Hauck S, Brunoni AR, Passos IC. Loneliness, but not social distancing, is associated with the incidence of suicidal ideation during the COVID-19 outbreak: a longitudinal study. *J Affect Disord* 2021; 290:52-60.
34. Silveira LB, Kroeff CR, Teixeira MAP, Bandeira DR. Uso do Self-Reporting Questionnaire (SRQ-20) para identificação de grupo clínico e predição de risco de suicídio. *Rev Psicol Saude* 2021; 13(4):49-61.
35. Tostes MV, Albuquerque GSC, Silva MJS, Peterle RR. Sofrimento mental de professores do ensino público. *Saude Debate* 2018; 42(116):87-99.
36. Brasil. *Boletim Epidemiológico. Mortalidade por suicídio e notificações de lesões autoprovocadas no Brasil* [Internet]. 2021 [acessado 2024 abr 11]. Disponível em: [https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2021/boletim\\_epidemiologico\\_svs\\_33\\_final.pdf](https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/boletins/epidemiologicos/edicoes/2021/boletim_epidemiologico_svs_33_final.pdf).
37. Baére F, Zanello V. O gênero no comportamento suicida: uma leitura epidemiológica dos dados do Distrito Federal. *Estud Psicol* 2018; 23(2):168-178.
38. Griffin L, Hosking W, Gill PR, Shearson K, Ivey G, Sharples J. The gender paradox: understanding the role of masculinity in suicidal ideation. *Am J Mens Health* 2022; 16(5):1-12.
39. Moore F, Taylor S, Beaumont J, Gibson R, Starkey C. The gender suicide paradox under gender role reversal during industrialisation. *PLoS One* 2018; 13(8):e0202487.
40. Pedrosa NFC, Barreira DA, Rocha DQC, Barreira MA. Análise dos principais fatores epidemiológicos relacionados ao suicídio em uma cidade no interior do Ceará, Brasil. *J Health Biol S* 2018; 6(4):399-404.
41. Silva DA, Marcolan JF. O impacto das relações familiares no comportamento suicida. *Res Soc Dev* 2021; 10(2):e17310212349.
42. Botega NJ. Comportamento suicida: epidemiologia. *Psicol USP* 2014; 25(3):231-236.
43. Gusmão ROM, Santos NHF, Silva DVA, Moreira DFN, Vieira MA, Araújo DD. Depressão em pacientes atendidos em serviço de saúde mental: fatores associados e diagnósticos de enfermagem. *Rev Electronica Saude Mental Alcool Drog* 2021; 17(2):44-53.
44. Motta GC, Aguiar WM, Dunningham WA. Suicídio no Brasil: um retrato de 2004 a 2014. *Rev Bras Neurol Psiquiatr* 2021; 25(1):4-17.
45. Littlewood DL, Kyle SD, Carter L, Peters S, Pratt D, Gooding P. Short sleep duration and poor sleep quality predict next-day suicidal ideation: an ecological momentary assessment study. *Psychol Med* 2018; 49:403-411.

46. Littlewood DL, Kyle SD, Pratt D, Peters S, Gooding P. Examining the role of psychological factors in the relationship between sleep problems and suicide. *Clin Psychol Rev* 2017; 54:1-16.
47. Elhai JD, Dvorak RD, Levine JC, Hall BJ. Problematic smartphone use: a conceptual overview and systematic review of relations with anxiety and depression psychopathology. *J Affect Disord* 2017; 207:251-259.
48. Alhassan AA, Alqadhib EM, Taha NW, Alahmari RA, Salam M, Almutairi A. The relationship between addiction to smartphone usage and depression among adults: a cross sectional study. *BMC Psychiatry* 2018; 18(148):1-8.
49. Yang J, Fu X, Liao X, Li Y. Association of problematic smartphone use with poor sleep quality, depression, and anxiety: a systematic review and meta-analysis. *Psychiatry Res* 2020; 284:112686.
50. Niedhammer I, Bègue M, Chastang J, Bertrais S. Psychosocial work exposures and suicide ideation: a study of multiple exposures using the French national working conditions survey. *BMC Public Health* 2020; 20:895.
51. Gomes NR, Assis-Santos CC, Rezende BA, Medeiros AM. Fatores psicossociais do trabalho e o adoecimento de professores: uma revisão sistemática. *Rev Bras Med Trab* 2023; 21(3):e20221014.
52. Fernandes LA, Shimizu HE, Prado Neto PF, Cavalcante FVSA, Silva JRM, Parente RCM. Trajetória dos 15 anos de implementação do Programa Saúde na Escola no Brasil. *Saude Debate* 2022; 46(3):13-28.

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