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# SUICIDAL IDEATION AND SUICIDAL THOUGHTS IN UNIVERSITY STUDENTS DURING THE COVID-19 PANDEMIC: A SYSTEMATIC REVIEW

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**Abstract:** Suicidal ideation and suicidal thinking are relevant phenomena to study given their high incidence among university students in higher education, even more so if during the academic period students are affected by a pandemic such as COVID-19. Consequently, this systematic review's objective was to determine the prevalence of suicidal ideation and suicidal thinking in university students during the COVID-19 pandemic and, as a secondary objective, to establish possible risk factors. The search was performed following the PRISMA model in the Web of Science, Scopus, PubMed, and Medline search engines between January 2020 and January 2021, and the Newcastle-Ottawa Scale (NOS) was used to evaluate the methodological quality of the studies. Regarding the results, at the end of the search, nine relevant studies were identified for analysis: four on suicidal thoughts, four on suicidal ideation, and one on suicide as a continuous variable. In conclusion, it was possible to stipulate that the average prevalence of suicidal ideation and suicidal thoughts were 17.8% for the university population. Likewise, the risk factors associated with the appearance of suicidal thoughts and ideation in university students during the COVID-19 pandemic were ethnographic, psychological, contextual and health factors.

**Keywords:** suicidal ideation, suicidal thinking, mental health, university students, COVID-19 pandemic.

## INTRODUCTION

Suicidal ideation is often an indicator of mental health problems and a significant risk factor for suicide (Pereira & Cardoso, 2015). There is long-standing concern about mental health and suicide risk among college students (McLaughlin & Gunnell, 2020). Since getting into higher education is a time of transition that coincides with the typical onset of severe mental illness (Farrell, Kapur, While, Appleby, & Windfuhr, 2017), it may lead college students to be at an increased risk for suicidal tendencies (Yi et al., 2020). Suicide is a leading cause of death in this population (Hedman-Robertson, 2018); among college students aged 18 to 22 years, 6.6% reported severe suicidal thoughts, 2.2% reported suicide plans, and 1.1% reported attempting suicide in the past year (SAMHSA,

2019). Suicide deaths are almost equally divided between male and female students (Farrell et al., 2017). However, knowledge of students' distinguishing characteristics with mental illness who die by suicide may help us in clinical management (Farrell et al., 2017). Although a systematic review of mental health problems in the general population was recently conducted (Xiong et al., 2020), background information on the prevalence of suicidal ideation and suicidal thoughts in college students has not been accurately determined. Besides, there are scarce studies about the way this population has developed during the COVID-19 pandemic. Consequently, the following systematic review's objective was to determine the prevalence of suicidal ideation and suicidal thoughts during the

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COVID-19 pandemic in college students and, as a secondary objective, to establish associated risk factors.

## LITERATURE REVIEW

Suicidal behavior is a significant public health problem (Freeman et al., 2017). According to various studies, suicide is the thirteenth leading cause of death worldwide (Lozano et al., 2012). Each year, more than 800,000 people die by suicide worldwide, and it is estimated that between 10 and 20 million more people attempt suicide (World Health Organization, 2014). Suicidal behavior is defined as the desire or act that intentionally causes harm or leads to death to oneself, encompasses suicidal ideation, and the suicide attempt until it reaches its goal: consummated suicide (Alvarado & Velez, 2016). Several factors can lead a person to have the capacity to commit suicide, including genetic predispositions, courage in the face of death, greater tolerance to physical pain, and familiarity and access to lethal means, which is a central component of modern theories of suicide (Klonsky & May, 2015; O'Connor & Kirtley, 2018; Van Orden et al., 2010). Suicide-related behaviors can be classified as ideations (i.e., thoughts), communications, and behaviors (Van Orden et al.,

2010). The American Psychiatric Association proposed two new diagnostic entities called suicidal behavior disorder and nonsuicidal self-injury in the chapter "Conditions for Further Study" in the fifth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) (American Psychiatric Association, 2014). A fundamental limitation to progress in the field is incomplete or inaccurate models of suicide and suicide risk (May & Klonsky, 2016). Although suicide is a public health problem, it can be prevented through timely, low-cost, data-driven interventions (Organización Mundial de la Salud, 2020).

## MATERIALS AND METHODS

A systematic review was conducted, identifying articles published in the Web of Science, Scopus, PubMed, and Medline databases between January 2019 and January 2021, written in English and Spanish.

### Search strategy

The literature search was performed according to the preferred reporting protocol for systematic reviews and meta-analyses PRISMA (Moher, Liberati, Tetzlaff, Altman, & Group, 2009; Page et al., 2020; Urrutia & Bonfill, 2013). Title, abstract,

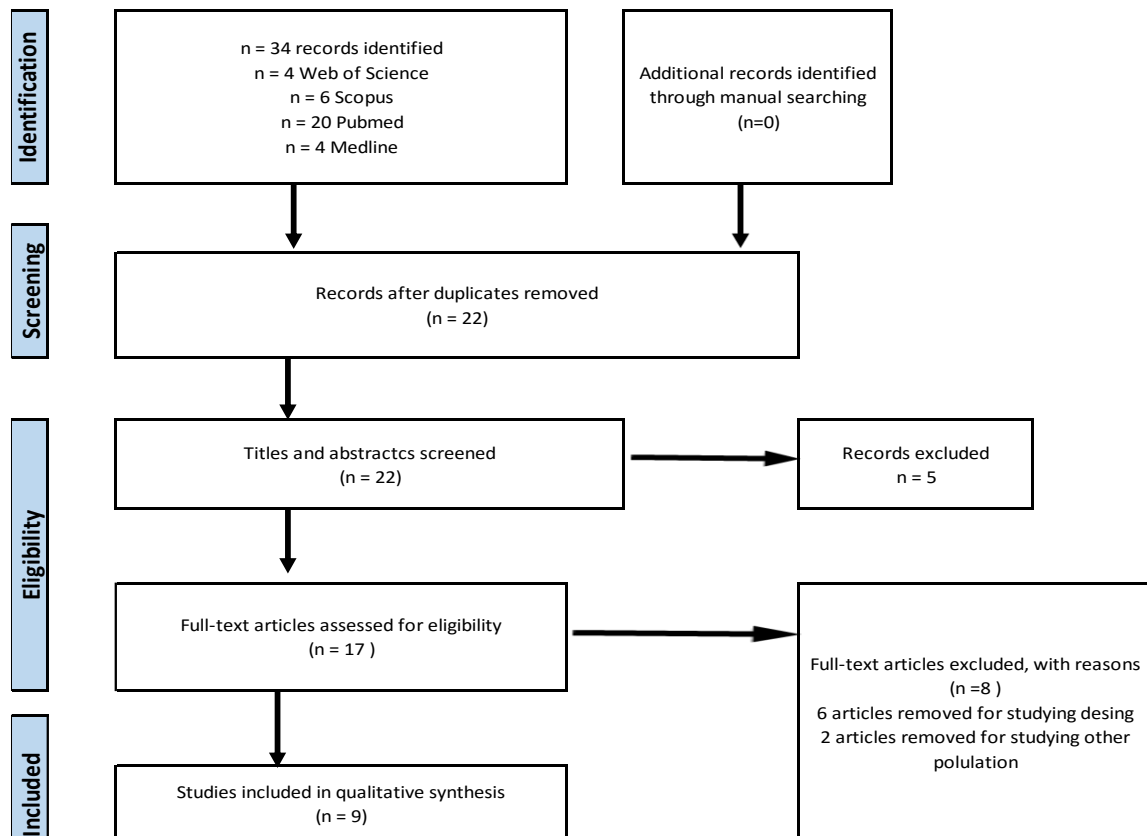


Figure 1. PRISMA flow chart.

and keyword fields were searched in each of the databases. The following keywords combined with Boolean operators (OR/AND) were used: (["COVID-19" OR "SARS-CoV-2" OR "Coronavirus"] AND ["suicide" OR "suicide ideation" OR "suicide thoughts"] AND ["university students" OR "undergraduate Students" OR "college students"]). The search strategy for study selection is shown in Figure 1.

### Study selection and eligibility criteria

The titles and abstracts of each article were reviewed, then the full text was reviewed to determine eligibility. Studies were eligible for inclusion if: 1) they followed a cross-sectional study design; 2) the population was in college students; 3) application of clinical and non-clinical instruments; 4) positive and negative outcomes; 5) field studies; 6) English and Spanish language texts; 7) data in the articles were during COVID-19 pandemic. The following exclusion criteria were used, 1) studies not under COVID-19 pandemic; 2) subjects who were not university students; 3) academic notes, letters to the editor or reflections; 4) longitudinal studies.

### Data extraction

A data extraction form was used to include relevant data: (1) Lead author, (2) Country, (3) Study design, (4) Sample size, (5) Measurement instrument, (6) Prevalence, (7) Associated risk factors.

### Quality Assessment

The Newcastle-Ottawa Scale (NOS), adapted for cross-sectional studies, was used to assess the studies' quality (Epstein et al., 2018). The scale consists of three dimensions: selection, comparability, and outcome. Seven categories assess: the sample's representativeness, sample size justification, comparability between respondents and non-respondents, exposure determinations, comparability based on study design or analysis, outcome assessment, statistical analysis appropriateness. A total of nine points may be awarded if the study meets certain criteria, with a maximum of four points assigned for the selection dimension, a maximum of two points assigned for the comparability dimension, and a maximum of three points assigned for the outcome dimension (Epstein et al., 2018).

## RESULTS

### Search Results

In total, 34 publications were identified on the suicide subject, suicidal thoughts, and suicidal ideation in the COVID-19 pandemic in university

students. Of these, 12 were eliminated due to duplicates. Five articles were excluded by reading the title and abstract; finally, eight were eliminated by reading the full text. Thus, nine articles that met the inclusion criteria were selected for the systematic review.

### Study Characteristics

The study characteristics and findings of this review are summarized in Table 1. The nine articles' sample sizes ranged between 1,000 and 69,054 participants, with a total of 106,814 higher education students. All studies had a cross-sectional study design. The 9 studies were conducted in various countries around the world Greece (n = 2), France (n = 1), Bangladesh (n = 1), Libya (n = 1), USA (n = 1), Poland (n = 1), China (n = 1), and Indonesia, Taiwan, and Thailand (n = 1).

### Evaluation of methodological quality

The results of the evaluation of the methodological quality of the studies are presented in Table 2. The overall quality of the included studies was moderate, with a total of 6 to 7 points. There were four studies with seven points (Kaparounaki et al., 2020; M E Patsali et al., 2020; Tasnim, Islam, Hossain, Sikdera, & Potenza, 2020; Xin, Luo, She, Yu, Li, et al., 2020), and five studies with six points (Elhadi et al., 2020; Pramukti et al., 2020; Wang et al., 2020; Wathélet et al., 2020). Results are shown in Table 2.

### Measuring tools

Various scales were used in the studies (n = 11) in the following proportions: The Patient Health Questionnaire (PHQ-9) (n = 3); State-Trait Anxiety Inventory (STAI) (n=3); Center for Epidemiologic Studies-Depression (CES-D) (n = 2); Depression Anxiety and Stress Scales-21 (DASS-21) (n = 2); The Generalized Anxiety Disorder (GAD-7) (n = 2); Beck Depression Inventory (BDI) (n = 1); The Depressive Symptom Index Suicidality Subscale (DSI-SS) (n = 1); The Impact of Event Scale-Revised (IES-R) (n = 1); Perceived Stress Scale (PSS) (n = 1); Risk Assessment Suicidality Scale (RASS) (n = 1); Self-harm or suicidal ideation (SH-SI) (n = 1).

### Risk factors associated with university students

Within the risk factors for the occurrence of suicidal ideation and thoughts we found ethnographic factors, psychological factors, contextual factors, and health factors in the following proportions: depression (n = 5); anxiety (n = 5); female gender (n = 3); stress (n = 3); age (n = 2); COVID-19 compatible symptoms (n = 2); history of suicide attempts (n = 2); non-binary gender (n = 1); problems with income or housing (n = 1);

psychiatric history (n = 1); social isolation (n = 1); poor quality of information received (n = 1); sleep disorders (n = 1); smoking (n = 1); past suicidal thoughts (n = 1); family history of suicide (n = 1); living with a Relative with Covid-19 (n = 1); living alone (n = 1); low support (n = 1); overexposure to

news (n = 1); studies of law, literature, pedagogy, political science and related studies, as well as technical but not health sciences (n = 1); beliefs of conspiracy theories (n = 1); fear of civil war (n = 1).

**Table 1. Summary of the study sample's characteristics, study design, evaluation tools used, prevalence rates, and associated risk factors.**

Main Author	Country	Study Design	Sample Students	Instrument	Type of Measurement	Prevalence	Risk factors
Wathelet et al., 2020	France	Transversal	69.054	IES-R / PSS / STAI / BDI.	Suicidal thoughts	11,4%	Female or non-binary gender, problems with income or housing, psychiatric history, symptoms compatible with COVID-19, social isolation, low quality of the information received. Sleep disorders, smoking, past suicidal thoughts,
Tasnim, et al., 2020	Bangladesh	Transversal	3.331	DASS-21	Suicidal ideation	12,8%	history of suicide attempts, family history of suicide, depression, anxiety, and stress. Year of study, age, psychological stress due to civil war, living with family or friends with COVID-19, internal displacement due to conflict, and living with family or alone.
Elhadi et al., 2020	Libia	Transversal	3.500	GAD-7 / PHQ-9	Suicidal ideation	22,7%	Woman, presence of Anxiety and Depression, Increased stress
Wang et al., 2020	EEUU	Transversal	2.031	PHQ-9 / GAD-7	Suicidal thoughts	18%	young adult students (18-24 years old)
Debowska et al., 2020	Poland	Transversal	7.228	DASS / DSI-SS	Suicidal	Not specified	Presence of high levels of anxiety and depression
Kaparounaki et al., 2020	Greece	Transversal	1.000	STAI / CES-D / RASS	Suicidal thoughts	20,2%	Presence of depressive symptoms and emotional distress, perceived risk of infection, and mental health variables were significant.
Xin et al., 2020	China	Transversal	24.378	PHQ-9 / SH-SI	Suicidal ideation	12,9%	Low Perceived Support, Sadness and depressed mood, High Anxiety due to overexposure to information
Pramukti et al., 2020	Indonesian, Taiwanese, and Thai	Transversal	1.985	STAI	Suicidal thoughts	26,7%	

Patsali et al., 2020	Greece	Transversal	1.535	CES-D	Suicidal ideation	It increases by 2.59%	Female gender History of self-harm. History of suicide attempts. Following studies of law, literature, pedagogy, political science and related studies, and technical sciences, but not health. Beliefs in conspiracy theories.
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Own elaboration

Table 2. Results of Study quality appraisal of the included studies

Study	Total Score	Selection			Comparability			Outcome	
		Representativeness of the sample	Sample Size	Non-Response	Ascertainment of exposure	Based on Design and analysis	Assessment of Outcome	Statistical Test	Quality
Wathelet et al., 2020	6	*	*		**		*	*	satisfactory
Tasnim, et al., 2020	7	*	*		**	*	*	*	good
Elhadi et al., 2020	6	*	*		**		*	*	satisfactory
Wang et al., 2020	6	*	*		**		*	*	satisfactory
Debowska et al., 2020	6	*	*		**		*	*	satisfactory
Kaparouna ki et al., 2020	7	*	*		**	*	*	*	good
Xin et al., 2020	7	*	*		**	*	*	*	good
Pramukti et al., 2020	6	*	*		**		*	*	satisfactory
Patsali et al., 2020	7	*	*		**	*	*	*	good

Own elaboration

The Patient Health Questionnaire (PHQ); State-Trait Anxiety Inventory (STAI); Center for Epidemiologic Studies-Depression (CES-D); Depression Anxiety and Stress Scales-21 (DASS-21); The Generalized Anxiety Disorder (GAD-7); Beck Depression Inventory (BDI); The Depressive Symptom Index Suicidality Subscale (DSI-SS); The Impact of Event Scale-Revised (IES-R); Perceived Stress Scale (PSS) Risk Assessment Suicidality Scale (RASS)Self-harm or suicidal ideation (SH-SI)

## DISCUSSION

The review conducted explored suicidal ideation and thoughts in university students during the COVID-19 pandemic. At the end of this review, it

can be concluded that there is a diverse prevalence in the studies consulted, from 11.4% to 26.7%, obtaining an average of 17.8% prevalence of suicidal ideation and thoughts. These results are associated with other studies where the prevalence is similar without the effect of the COVID-19 pandemic, the indicators of suicidal ideation range from 8% to 25% (Villalobos-Galvis, 2009), 14.9% (Rudd, 1989); 9.9% (Blasco et al., 2019); 21% (Sivertsen et al., 2019) in similar populations. From the results described above, it cannot be asserted that the percentage of suicidal ideation or thoughts was elevated in college students during the COVID-19 pandemic. This may be since suicidal ideation is transient and dynamic, increasing and decreasing considerably over days (Siddaway, Holm-Denoma, Witte, & Ruscio, 2021). Nevertheless, the results

present many factors associated with the risk of suicidal ideation, which is reviewed below in four categories: ethnographic factors, psychological factors, contextual factors, and health factors.

### 1. Ethnographic Factors

Among the risk factors presented in studies of suicidal ideation and suicidal thoughts during the COVID-19 pandemic is gender. Concerning the female and non-binary genders, they are at higher risk. This study's results are consistent with previous studies, which indicate that females are more likely to have suicidal thoughts (Boiett et al., 2020; Villalobos-Galvis, 2009). Similarly, concerning the non-binary gender, some studies report that this group of people may experience discrimination. This has been associated with a higher probability of suicide attempts and depressive symptoms; the latter would be due to a more significant perceived burden and frustrated belonging beyond the effects of childhood trauma and sociodemographic variables (Wyman Battalen et al., 2020). Likewise, bisexual sexual orientations are significantly associated with suicidal ideation (Lytle, Blosnich, De Luca, & Brownson, 2018). However, the above contrasts with other research where there is evidence that there are no gender differences in suicidal ideation and suicidal thoughts (Dachew, Bifftu, Tiruneh, & Anlay, 2018; McAuliffe, Corcoran, Keeley, & Perry, 2003; Naderi & Esmaili, 2009; Schweitzer, McLean, & Klayich, 1995), so the gender factor should be deepened in new studies, considering that society has a permanent evolution. There is evidence of a difference because male university students may have a higher risk of death by suicide (Farrell et al., 2017; Granato, Smith, & Selwyn, 2015; McLaughlin & Gunnell, 2020), which is associated with the fact that, apparently, the male gender uses suicide as a form of escape from pain (Lester, Wood, Williams, & Haines, 2004). In summary, the female and non-binary genders present a greater tendency to suicidal ideation, while the male gender tends to commit suicide. This tendency could be related to how the genders proceed, where women tend to be more reflective (Bahamón Muñetón, Vianchá Pinzón, Alarcón Alarcón, & Bohórquez Olaya, 2012); on the contrary, men tend to be more impulsive and concrete (Peñas-Lledó, Fernández, & Waller, 2004).

From a hetero ethnographic perspective, young adult students (18-24 years old) have been prone to suicidal thoughts and ideation, even before the COVID-19 pandemic (Farrell et al., 2017). In this specific group of young people, there is an increased burden of individual pressures or responsibilities. This, together with inexperience

and immaturity, generate stumbling blocks that can translate into moments of distress, loneliness, and frustration, all risk factors for committing a suicidal act or engaging in suicidal behaviors (Cortés, 2013). However, it is essential to point out that age is not a determining factor, considering that in some countries, the highest suicide rate is found in adults of the third and fourth ages (Ordóñez Monak, Franco Agudelo, & González Ortiz, 2013).

### 2. Psychological factors

From the psychological point of view, it has been established that students with a previous psychiatric history may be subject to a high presentation of suicidal ideation and thoughts; this is evidenced both in research focused on the period of the covid-19 pandemic, as well as in previous research (Coentre, Faravelli, & Figueira, 2016).

In addition to personal psychiatric history, family history of psychiatric disorders (Boiett et al., 2020), and family history of suicide and suicidal behavior in a family member (Villalobos-Galvis, 2009) are essential factors in the suicidal ideation of a subject. This could be due to both genetic and contextual factors, which should be scrutinized.

Past suicidal thoughts and suicidal ideation, such as the subject's history of suicide attempts, are central elements in the appearance of new and repeated thoughts (McAuliffe et al., 2003; Sarmiento & Aguilar, 2011), especially when people feel overwhelmed by stressors (Denneson et al., 2015). The research reviewed shows that mood disorders, among others, depression, are the most recurrent risk in college students and are highly associated with suicidal ideation and thoughts (Eisenberg, Gollust, Golberstein, & Hefner, 2007; Hayes et al., 2020; Mikaella E Patsali et al., 2020; Ross, Dehay, & Deiling, 2020). Mood disorders are a cross-cutting factor regardless of gender (Miranda-Mendizabal et al., 2019). This is since, at a cognitive level, the person experiences profound hopelessness about the future, accompanied by death's perception as the only way out (Echeburúa, Psicología, Vasco, & Ehu, 2015).

Anxiety and distress, identified among the risks that occur in college students, are negative feelings that increase the likelihood of suicidal thoughts and ideation considerably (Dachew et al., 2018; Eisenberg et al., 2007; Johnson & Hayes, 2003; Kaparounakia Chrysi K. et al., 2020; Ross et al., 2020). On the one hand, people suffering from anxiety present fears of loss of control and emotional intensity; these symptoms are also associated with panic attacks connected to cognitive concerns, such as feeling a loss of sanity or control and, in more extreme cases, the fear of

dying (Capron et al., 2012). This, in turn, can lead to anxiety disorders, which can severely affect people's lives, impairing health, work, family, and personal relationships. Among these disorders are generalized anxiety disorders, panic disorder, phobias, social anxiety disorder, obsessive-compulsive disorder, and post-traumatic stress disorder (American Psychological Association, 2016).

Although the medical impacts of COVID-19 are notable, the pandemic's interpersonal, financial, and social consequences are likely to have a more significant and more sustained effect on psychological health (Madigan et al., 2020), both in the short and long term (C. L. Park et al., 2021). Research on the psychological effects of COVID-19 has found elevated levels of anxiety, depression, and sleep disturbance in the general population (Huang & Zhao, 2020). There is now considerable empirical evidence on the effects of COVID-19 on the psychological health of the population (Gruber et al., 2020a). These include increased family and occupational stress, increased health anxiety due to fear of illness or contagion (Asmundson et al., 2020), as well as job loss and financial insecurity, fear of lack of essential supplies, fear of infection, loss of resources, supports and interpersonal connection, and possible separation and/or death of loved ones (Gruber et al., 2020b).

### 3. Contextual Factors

The pandemic has brought a decline in the quality of life and mental health of people worldwide, and students in higher education institutions would not be exempt from such consequences (Kaparounaki et al., 2020). Many factors can lead college students to be particularly vulnerable and predisposed to suicidal ideation, creating a public health crisis (Tasnim et al., 2020): life instability and existing mental and physical health problems (Gurung & Stone, 2020), uncertainty about the future and loss of autonomy (Gruber et al., 2020b), the sudden transition to online learning (Besser, Flett, & Zeigler-Hill, 2020), high levels of stress and burnout (Humphrey, 2013), feelings of tension, fear of infection, insomnia and low mood (Yang, Tu, & Dai, 2020), increased psychological distress (Hamza, Ewing, Heath, & Goldstein, 2020), increased moderate depression to severe depression, self-harm, and suicidal ideation and emotional distress due to COVID-19 (Xin, Luo, She, Yu, Wang, et al., 2020), among others.

When we speak of contextual factors, we refer to characteristics of the environment that affect behavior; these factors can be personal, social,

cultural, or economic and have different impacts on different groups (The Australian Curriculum, 2021). From this perspective, COVID-19 is a disease that has wreaked havoc in all areas of life, not only because of its high mortality rate but also because of its political, social, educational, and economic consequences (Martínez-Líbano, 2020).

From the political perspective, public policies have seen the need to restrict personal freedoms (Tisdell, 2020), implementing curfews, quarantines, and military support in the streets, among other measures (Yen-Hao Chu, Alam, Larson, & Lin, 2020). Many criticize the political action, indicating that the measures have been insufficient, late, or motivated by intentions unrelated to the pandemic, which has caused great political tension in different countries and among them (Wenham, 2021). On the other hand, there is a series of negative feelings towards the political class since before the coronavirus, which has devalued the democratic structures regarding the pandemic crisis's response (Flinders, 2020). Moreover, the way countries relate to each other has been disrupted by the pandemic's rapid spread and will probably never be the same again (Brown & Wang, 2020).

From a social perspective, the confinement, social isolation and interruption of daily life during the COVID-19 period have impacted the population to a great extent (Tasnim et al., 2020), becoming an epidemic that affects all aspects of human life (Nguyen, Nguyen, & Le, 2021). In this sense, COVID-19, has been characterized by presenting three traumatic components: (i) fears of present and future infections, (ii) widespread economic impact, and (iii) disruption and isolation from routine (Kira et al., 2020). Thus, the confinement generated by this pandemic meant, for many people, a radical change in lifestyle, avoiding contact with friends and family and, in addition, stopping activities not related to work (Corvo & Caro, 2020).

From the same social perspective, another risk factor was isolation. Several authors report that social isolation has historically been implicated as a factor that directly and fundamentally influences suicidal ideation and behavior (Masuda, Kurahashi, & Onari, 2013; Trout, 1980). The low quality of the information received and the low tolerance to uncertainty increase the possibility of suicidal ideation and thoughts (Zerach & Levi-Belz, 2019). The subjective feeling of loneliness has a significant impact on people (Calati et al., 2019). However, other research has reported that social isolation has affected young people to a lesser extent due to their more significant social network interaction (Orben, Tomova, & Blakemore, 2020). These have been positively associated with psychological well-

being (Doo-Hun & Ghee-Young, 2020). On the other hand, when referring to the psychological and psychosocial implications of covid on students, we found a need to present emotional containment plans to the entire school community; they will serve to deal with the social crisis context; it was also found that the psychological and pedagogical impact of social restriction and online education should be analyzed. Strategies should be sought to mitigate the psychological impact of confinement at home—this includes providing access to accessible, friendly platforms that minimize technical issues (Yeomans Cabrera & Silva Fuentes, 2020). However, depending on the student, the decrease in face-to-face contact for youth may be less detrimental due to widespread access to digital forms of social interaction through social networking technologies (Orben et al., 2020).

On the other hand, stress and stressful life events (such as living in a pandemic like COVID-19) are situations that elevate suicidal ideation and are phenomena that occur together regularly (Brailovskaia, Teismann, & Margraf, 2020; Rodríguez-hidalgo et al., 2020). The person, feeling overwhelmed by various stressors and life changes, perceives suicide as a solution to his or her problems (Denneson et al., 2015).

It adds the low social support perceived in university students, which is an essential element in the appearance of suicidal ideation and thoughts; this same idea has been manifested in contexts outside covid (Dachew et al., 2018; Soares et al., 2020). Besides, a connection has been found between suicidal thoughts and the negative view of social support, such as exaggerating their perception of conflict in interpersonal relationships (Arria et al., 2009).

In this review, financial distress is identified as another contextual risk factor. This is in line with other research where it is referred that financial difficulty promotes suicidal ideation and thoughts (Dachew et al., 2018). This same factor has a statistically significant influence on the risk of depression (Areas et al., 2012) and increases the risk of having mental health problems in general (Eisenberg et al., 2007). Stressful events often precede suicidal behaviors, and debt can be seen as a continuous source of stress (Bebbington, Jenkins, Mcmanus, & Dennis, 2011), leading to suicidal behavior (Chen et al., 2006).

Similarly, other contextual factors affect the individual's mind, such as tobacco and substance use (Dachew et al., 2018; Fekih-Romdhane, ElKhouni, Sassi, & Cheour, 2021), and alcohol dependence (Decou & Skewes, 2016), which can increase suicidal thoughts and ideation in college

students. This is since in homes with drug use, the absence of family warmth, lack of communication with parents, and permanent family discord have been observed (Larraguibel, González, Martínez, & Valenzuela, 2000).

#### 4. Health Factors

In this review, sleep disorders were associated with increased suicidal thoughts and suicidal ideation, coinciding with other studies in which sleep quality (Fekih-Romdhane et al., 2021; Soares et al., 2020) and insomnia have been identified as risk factors for suicidal ideation (Chu et al., 2016). Insomnia directly impacts the mood of the sufferer, manifesting itself with irritability, fatigue, headache, appetite alterations, accident proneness, or difficulty in attending and concentrating on simple tasks, which increases the risk of suicidal ideation, even in pre-pandemic contexts (Escobar, Quijano, & Calvo, 2017). Because it is during sleep that all physical and psychological functions of the human being are restored and regulated (Balk, de Jonge, Oerlemans, & Geurts, 2019), good quality sleep is of utmost importance for the body's proper functioning. It is a fact that not sleeping brings harmful consequences for people (Cirelli & Tononi, 2008), since the brain activity that develops during sleep allows the body to function (Fernandez & Lüthi, 2020). Poor sleep quality affects people's health (Bernert, Turvey, Conwell, & Joiner, 2014; Leng et al., 2015), affecting moods and cognitive functions (Belenky et al., 2003). All people require a minimum number of hours of sleep (Lowe, Safati, & Hall, 2017). However, sleep deprivation caused by different factors in all sectors (Chen et al., 2006; Costa, Accattoli, Garbarino, Magnavita, & Roscelli, 2013; Hoyos et al., 2020), including health and contextual factors (Magnavita & Garbarino, 2017).

#### Study implications

This article is the first systematic review that examines and summarizes the existing literature associated with suicidal ideation and thoughts, the COVID-19 pandemic in the college student population, and the associated risk factors. Thus, a precedent is established to develop studies that will contribute to the prevention of suicide and promote mental health in the university population.

#### Limitations

There are certain limitations in this systemic review; all the studies reviewed were conducted through self-reports, leading to social desirability responses. Also, as they were online studies, there



may be a population that could not access the evaluation. All the studies were cross-sectional, so they were measured at a specific point in time. However, it is difficult to extrapolate these results to the general population, so causal inferences cannot be made. Also, most of the studies had a higher number of women in the samples, so that this situation could interfere with the data analysis.

Concerning the scales used to evaluate suicidal ideation and suicidal thoughts, although they are validated internationally (Hall et al., 2021; Lamela, Soreira, Matos, & Morais, 2020; S. H. Park et al., 2020), progress is required in the application of much more specific scales such as the psychache scale (Holden, Mehta, Cunningham, & Mcleod, 2001) and the suicidal behaviors questionnaire revised scale (SBQR) (Linehan, 1996); These scales have demonstrated superior performance in the accurate identification of suicide and its subcomponents, as evidenced in various investigations (Liang et al., 2020; Troister, D'Agata, & Holden, 2015). The use of non-specific scales could be the reason for not finding other risk factors identified by the literature associated with the occurrence of suicidal ideation and thoughts in college students, such as low self-esteem (Man & Rrez, 2002; Thompson, 2010), hopelessness (Boduszek & Dhingra, 2016; Chioqueta & Stiles, 2007), stressful situations in the student's life (Brailovskaia et al., 2020), alcohol dependence (Decou & Skewes, 2016), academic and financial problems (McLaughlin & Gunnell, 2020), and dissatisfaction with academic performance (Madadin et al., 2020).

All of the above should continue to motivate the study of the effects of the pandemic in different populations around the world and, by the way, continue to delve into the mental health of higher education students, who will be the ones called to lead the future of our society in the coming years.

#### Future studies

Further studies are needed to investigate the relationship between sleep quality and suicidal ideation, gender and suicidal ideation, and the Covid-19 pandemic's impact on suicide rates.

#### CONCLUSIÓN

We can conclude that little research addresses suicidal ideation and thoughts in college students during the COVID-19 pandemic period around the world and none in Latin America. According to this study, between 11.4% to 26.7% of the university population could present suicidal ideation and suicidal thoughts during the COVID-19 pandemic ( $\bar{x}$ =17.8%). This percentage is high and correlates

with studies conducted before the COVID-19 pandemic. Among the risk factors found in the appearance of suicidal thoughts and behaviors in higher education students during the pandemic there are ethnographic, psychological, contextual, and health factors. Ethnographic factors include being female and non-binary. Psychological factors include depression, anxiety, stress, suicidal thoughts in the past, family history of suicide attempts, own suicide attempts. Contextual factors include academic performance problems and financial problems. Finally, health factors include sleep problems and smoking. It is necessary to emphasize this problem since students' mental health and future professionals should also be a responsibility of university institutions.

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