

RESEARCH ARTICLE (ORIGINAL) 

# The impact of isolation due to COVID-19 on nursing students

*O impacto do isolamento devido à COVID-19 em estudantes de enfermagem*  
*El impacto del aislamiento por COVID-19 en estudiantes de enfermería*

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**Abstract**

**Background:** The COVID-19 pandemic demanded isolation measures in cases of high disease risk. **Objective:** To assess the impact of isolation on the anxiety, satisfaction with perceived support, learning and academic achievement of nursing students in the northern region of Portugal.

**Methodology:** This exploratory and quantitative study was conducted with 56 students in isolation due to COVID-19. A self-completion questionnaire was applied to assess the evolution of the anxiety, the satisfaction with the perceived support at the pedagogical and emotional levels and from the *Serviço Nacional de Saúde* (SNS – National Health Service), and the impact of isolation on learning and academic achievement.

**Results:** This study observed clinically significant levels of anxiety. The participants expressed greater satisfaction with the support received from the educational institution and less satisfaction with the SNS. The absence from school activities negatively impacted their learning and academic achievement.

**Conclusion:** Student isolation impacted anxiety and learning. Higher education institutions must promote students' mental health.

**Keywords:** COVID-19; students, nursing; social isolation; anxiety; learning

**Resumo**

**Enquadramento:** A pandemia de COVID-19 exigiu a implementação de medidas de isolamento nos casos de alto risco de doença.

**Objetivo:** Avaliar o impacto do isolamento sobre a ansiedade, a satisfação com o apoio percebido, a aprendizagem e o aproveitamento escolar, de estudantes de enfermagem da região norte de Portugal.

**Metodologia:** Estudo exploratório e quantitativo, realizado com 56 estudantes em isolamento devido à COVID-19. Foi aplicado um questionário de autopreenchimento para avaliação da evolução da ansiedade, da satisfação com o apoio percebido, ao nível pedagógico, emocional e do Serviço Nacional de Saúde e do impacto do isolamento na aprendizagem e aproveitamento escolar.

**Resultados:** Foram reportados níveis de ansiedade com significado clínico. Foi referido maior satisfação com o apoio da instituição de ensino e menor com o Serviço Nacional de Saúde. A ausência às atividades letivas teve impacto negativo na aprendizagem e no aproveitamento escolar.

**Conclusão:** O isolamento dos estudantes teve impacto na ansiedade e na aprendizagem. A saúde mental dos estudantes deve ser promovida pelas instituições de ensino superior.

**Palavras-chave:** COVID-19; estudantes de enfermagem; isolamento social; ansiedade; aprendizagem

**Resumen**

**Marco contextual:** La pandemia de COVID-19 requirió la aplicación de medidas de aislamiento en casos de alto riesgo de enfermedad.

**Objetivo:** Evaluar el impacto del aislamiento en la ansiedad, la satisfacción con el apoyo recibido, el aprendizaje y el rendimiento académico entre los estudiantes de enfermería de la región norte de Portugal.

**Metodología:** Estudio exploratorio y cuantitativo, realizado con 56 estudiantes en aislamiento por COVID-19. Se utilizó un cuestionario de autocumplimentación para evaluar la evolución de la ansiedad, la satisfacción con el apoyo recibido a nivel educativo, emocional y del Sistema Nacional de Salud, y el impacto del aislamiento en el aprendizaje y el rendimiento académico.

**Resultados:** Se notificaron niveles de ansiedad con significancia clínica. Se registró una mayor satisfacción con el apoyo de la institución educativa y una menor satisfacción con el Servicio Nacional de Salud. El absentismo escolar tuvo un impacto negativo en el aprendizaje y el rendimiento académico.

**Conclusión:** El aislamiento de los estudiantes repercutió en la ansiedad y el aprendizaje. Los centros de enseñanza superior deben promover la salud mental de los estudiantes.

**Palabras clave:** COVID-19; estudiantes de enfermería; aislamiento social; ansiedad; aprendizaje



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## Introduction

The COVID-19 pandemic caused a severe economic and social crisis worldwide, becoming one of the major international public health problems of the last decades. According to Faro et al. (2020), concerns about the population's mental health increase during a social crisis due to the risk factors associated with the development of symptoms that compromise good psychological functioning and that strongly and negatively impact the population's health and well-being. This impact is reflected in the greater pressure placed on health services, particularly in low-resource countries.

Social and economic changes, mainly resulting from the measures adopted to control the virus spread, have repercussions on mental health and well-being (Laranjeira et al., 2022). On the one hand, measures such as physical distancing, social confinement, school and university closures, and isolation for positive and suspected cases of COVID-19 are considered essential. On the other hand, the profound changes they cause in individual daily routines and family dynamics generate tremendous psychological pressure.

Anxiety and fear of infection limit mobility and social activities, leading to drastic lifestyle changes. Higher education students are susceptible to these conditions (Zukhra et al., 2021). Nursing students, in particular, experience significant challenges due to the suspension of clinical teachings, which must constitute at least 50% of their curriculum (Xavier et al., 2020). Due to this new reality, the experiences lived can become associated with negative emotions responsible for psychological distress and expose the most vulnerable individuals to persistent stress, anxiety, and fear (Zhai & Du, 2020). Therefore, the overall objective of this study is to assess the impact of isolation due to COVID-19 on anxiety, satisfaction with perceived support at the pedagogical and emotional levels and from the *Serviço Nacional de Saúde* (SNS – Portuguese National Health Service), and the learning and academic achievement of undergraduate nursing students of a higher education institution in the northern region of Portugal.

## Background

COVID-19 is an acute respiratory syndrome caused by a new coronavirus, SARS-CoV-2. Identified in 2019 in China, SARS-CoV-2 spread rapidly and widely across the globe and was declared a pandemic by the World Health Organization (WHO). This pandemic has forced the implementation of exceptional measures, such as social confinement and physical distancing. Despite effectively controlling the spread of the disease, these measures negatively impact health. Several studies have related confinement measures to depressive symptoms, anxiety, stress, distress, fear, and sadness (Li et al., 2020). Regarding higher education students, several studies mention the importance of their monitoring during social confinement and online teaching to prevent and identify

early possible changes and difficulties in their health and well-being, as well as in their academic achievement (Kochuvilayil et al., 2021; Savitsky et al., 2021). Considering health and well-being, Tran et al. (2022) report that even people who developed mild COVID-19 experienced symptoms such as fatigue, dyspnea, and changes in memory and concentration, with the frequency of symptoms being similar between the groups of suspected and confirmed disease cases. These changes in health status can interfere with students' academic performance, namely their learning and academic achievement. According to Idris et al. (2021), online teaching and isolation have psychosocial consequences in the academic community. Anxiety as a state can be defined as a temporary emotional condition that varies in intensity over time and is caused by a potentially harmful situation (Takagaki et al., 2018). More anxious students can become less motivated to study, which may be related to more significant concerns about economic, social, and academic well-being (Zukhra et al., 2021). Different studies have already linked isolation measures with students' fear and anxiety (Laranjeira et al., 2022; Li et al., 2020). However, anxiety among nursing students has been reported as prevalent even under normal circumstances (Savitsky et al., 2021).

Historically, nursing education has been consistently associated with anxiety.

Nursing students experience varying anxiety levels, caused chiefly by their experiences in the clinical setting and the assessment periods (Chen et al., 2015). Also, nursing students are exposed to additional stressors, as demonstrated in the study conducted in Hong Kong in 2003 during the Severe Acute Respiratory Syndrome outbreak (Wong et al., 2004). The study reveals that nursing students had higher stress levels than other healthcare students, possibly because of a higher understanding of the infection risk due to their closer and more prolonged contact with patients (Wong et al., 2004).

## Research questions

How did the anxiety level of nursing students evolve during the isolation period due to COVID-19?

How satisfied are nursing students with the perceived support at the educational and emotional levels and from the SNS during the isolation period due to COVID-19?

How did isolation due to COVID-19 impact nursing students' learning and academic achievement due to the absence from school activities?

## Methodology

This quantitative exploratory study was designed to assess the impact caused by isolation due to COVID-19 on nursing students. The convenience sample consisted of 56 undergraduate nursing students from a nursing school located in the northern area of mainland Portugal. These nursing students were isolated for one of the following reasons: i) a positive test for SARS-CoV-2 (isolation for

treatment), or ii) high-risk contact with a person who tested positive (prophylactic isolation).

Data was collected using an online self-completion questionnaire made available to the students at the end of their isolation period. This instrument was designed for this study by the members of the *Comissão de Acompanhamento dos Estudantes do CLE* (Monitoring Committee of Undergraduate Nursing Students) under the COVID-19 Contingency Plan (CaeClePcCov19) of the higher education institution. Data collection took place from 1 October 2020 to 30 April 2021. This period corresponded to the progressive beginning of face-to-face theoretical and clinical teaching activities after the period of social confinement in which theoretical classes were held online and clinical teachings were suspended.

The questionnaire consisted of five parts. The first part covered sociodemographic aspects such as sex, age, nationality, place of residence, and household characteristics. The second part included academic aspects such as the course year and course units attended and the special attendance regime. The third part assessed the clinical aspects and isolation, such as the context where the infection or risk of infection occurred, the results obtained in the SARS-CoV-2 tests, the duration of the isolation period, and the presence of symptoms. The fourth part characterized the isolation experience, satisfaction with the perceived support at the educational and emotional levels and from the SNS, and the impact of isolation on learning and academic achievement. Finally, the fifth part included the Zung Self-Rating Anxiety Scale (Zung, 1971), validated for the Portuguese population by Ponciano et al. (1982). This scale comprises 20 items corresponding to statements containing signs and symptoms that characterize anxiety. Considering their self-assessment, respondents chose one of four response options for each item of the Likert-type scale as follows: *a little of the time*, *some of the time*, *a good part of the time*, or *most of the time*. Each item is assigned a score between 1 and 4, from least to most anxious. Thus, the more anxious the person feels, the higher the score on the scale. The scale score ranges from 20 - 80 and results from adding the scores assigned to each of the twenty items (global anxiety obtained for each participant). The cut-off point with clinical significance lies at the value of 37. Thus, the individuals who score values equal to or higher than this value suffer from anxiety (Ponciano et al., 1982). This scale has good validity and reliability both in the American version (Zung, 1971) and in the adaptation for the Portuguese population and culture (Ponciano et al., 1982). In this study, the scale showed good internal consistency ( $\alpha = 0.709$ ). It was administered at three assessment time points: 1) the moment when students were informed that they had a high-risk contact or when they began displaying symptoms suggestive of COVID-19 (AnsM1); 2) the moment when they were informed of the result of the first Sars-Cov2 test (AnsM2), and 3) the moment when they were authorized to resume face-to-face classes (AnsM3).

This study aims to assess anxiety as an emotional state expressed during isolation, which influences students' health

and well-being and, consequently, their perceived academic achievement. The Statistical Package for the Social Sciences (SPSS, version 27) was used for data analysis and processing, using descriptive statistics (measures of central tendency and dispersion) and inferential statistics (testing the differences in means). Parametric tests were used in this assessment when the assumptions underlying their use were observed. The present study found that global anxiety (quantitative variable) followed an approximately normal distribution in the three assessment time points ( $n = 56$ ). Thus, the Repeated Measures ANOVA procedure ( $F$ ) was used. The non-parametric Mann-Whitney ( $U$ ) test was applied when the assumptions underlying parametric tests (normality and homogeneity of variances) were not met.

This study obtained a positive opinion from the Ethics Committee for Research in Life and Health Sciences of the higher education institution where it was conducted (Reference 010/2021). It also complied with the ethical principles of scientific research, namely the participants' informed consent and the guarantee of confidentiality and anonymity.

## Results

The results account for the sociodemographic characteristics, the evolution of anxiety, the satisfaction with perceived support at the pedagogical and emotional levels and from the SNS, the impact of isolation on learning and academic achievement, and the correlations between the anxiety, satisfaction with perceived support, and learning and academic achievement of the students in the sample.

### *Sociodemographic characteristics*

The 56 students in the sample had a mean age of 20.7 years ( $SD = 1.9$ ), 51 (91.1%) were women, and 45 (80.4%) did not live with other students. Twenty-seven students (48.2%) benefited from student grants, ten (17.9%) had a work activity in addition to attending the undergraduate nursing degree, and seven (12.5%) had a student worker status. Forty-one students (73.2%) were in their last years of the degree (third or fourth year) at the time of isolation, and 46 (82.1%) were enrolled in clinical teachings/internships. Also, 22 (39.3%) students were in isolation due to illness or high-risk contacts in the clinical setting and 20 (30.3%) in the family setting.

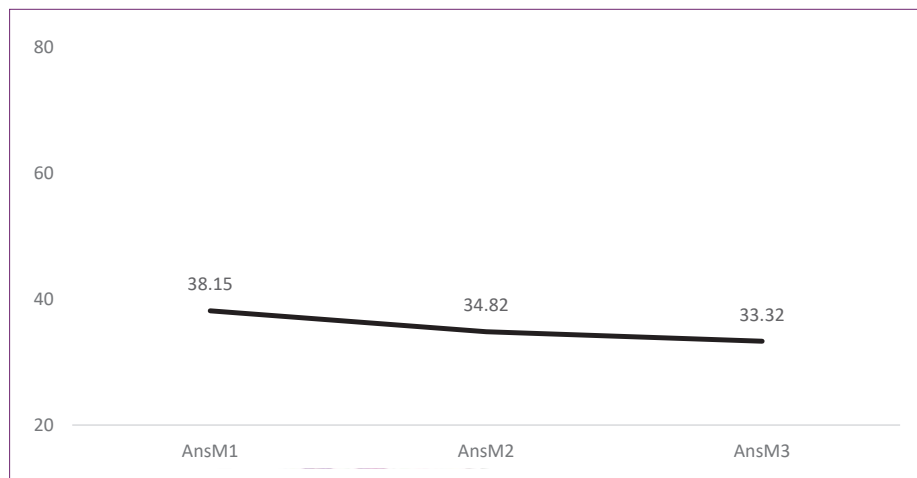
### *Evolution of anxiety*

Figure 1 shows the evolution of students' anxiety between AnsM1, AnsM2, and AnsM3 after administering the Zung Self-Rating Anxiety Scale (Ponciano et al., 1982). Statistically significant changes were observed between the three assessment time points ( $F = 17.859$ ;  $p < 0.001$ ;  $n = 56$ ), as anxiety decreased from the first time point ( $M = 38.15$ ; Minimum [Min.] = 28; Maximum [Max.] = 62;  $SD = 7.128$ ) to the second time point ( $M = 34.82$ ; Min. = 22; Max. = 60;  $SD = 6.668$ ) and from this to the third time point ( $M = 33.32$ ; Min. = 20; Max. = 60;  $SD = 6.180$ ).



**Figure 1**

*Evolution of the mean values of anxiety in the three assessment time points (n = 56)*



When assessing the evolution of anxiety in the group of students who contracted COVID-19 (in isolation for treatment) and those who did not contract COVID-19 (in prophylactic isolation), statistically significant differences were found at the three assessment time points within each group (intra-subject assessment). Anxiety decreased across the three assessment time points in students who contracted COVID-19 (n=22): *Mdn* = 36 (AnsM1 and AnsM2), and *Mdn* = 31 (AnsM3);  $X^2(2) = 8.842$ ;  $p = 0.012$ . A decrease in anxiety across the three assessment time points was also observed in students who did not contract COVID-19 (n=34): *Mdn* = 39 (AnsM1), *Mdn* = 34 (AnsM2), and *Mdn* = 33 (AnsM3);  $X^2(2) = 27.793$ ;  $p < 0.001$ .

Regarding the anxiety assessed at the first time point (AnsM1), between the students who contracted COVID-19 and those who did not contract COVID-19 (inter-subject evaluation), statistically significant differences were detected ( $U = 227.0$ ;  $p = 0.034$ ), that is, students who tested positive showed less anxiety (*Mdn* = 36; Min. = 28; Max. = 45;  $n = 22$ ) compared to those who tested negative (*Mdn* = 39; Min. = 28; Max. = 62;  $n = 34$ ). However, no statistically significant results were obtained when these differences were compared at the remaining assessment time points - AnsM2 and AnsM3.

#### *Satisfaction with perceived support*

Of the total sample, 20 (35.7%) students were “not at all/not very satisfied” with the support provided by the SNS during the isolation period, namely the SNS24 (telephone service of the SNS) and the USP - *Unidade de Saúde Pública* (Public Health Unit) in their area of residence. This study also found that 55 (98.1%) students reported being “satisfied/very satisfied” with the pedagogical team responsible for the course unit they attended during the isolation period. All the students (100%) were “satisfied/very satisfied” with the support provided by the CaeClePcCov19. Finally, 12 (21.4%) students reported having felt the need for professional psychological support.

*Impact of isolation on learning and academic achievement*  
Regarding the (negative) impact on learning due to the absence from school activities during isolation (theoretical/theoretical-practical classes or clinical teachings/internships), 37(66.1%) students reported having felt a “medium to very high impact.” Regarding the (negative) impact on academic achievement in the course unit they were attending, 32 (57.1%) reported having felt a “medium to very high impact.”

#### *Correlations between anxiety, satisfaction with perceived support, learning and academic achievement*

When analyzing the results with statistical significance: 1) in AnsM3, students with work activity in addition to attending the undergraduate nursing degree showed higher anxiety compared to those without work activity ( $U = 120.50$ ,  $p = 0.026$ ); 2) in AnsM2 and AnsM3, students who expressed feeling the need for psychological support during the isolation period showed higher anxiety compared to those who did not express the need for psychological help ( $U = 144.50$ ,  $p = 0.025$ ;  $U = 146.50$ ,  $p = 0.028$ ); 3) in AnsM1 and AnsM2, students who felt a medium/very high (negative) impact on learning due to the absence from school activities during the isolation period showed higher anxiety when compared to those who felt no/low impact ( $U = 128.00$ ,  $p < 0.001$ ;  $U = 188.00$ ;  $p = 0.018$ ); 4) in AnsM1 and AnsM3, students who felt a medium/very high (negative) impact on the academic achievement of the course unit they were attending during the isolation period revealed more significant anxiety compared to those who felt no/low impact ( $U = 222.00$ ,  $p = 0.022$ ;  $U = 229.00$ ,  $p = 0.030$ ).

## Discussion

This study’s results demonstrate the negative impact of isolation due to COVID-19 on nursing students, particularly on their level of anxiety, satisfaction with the perceived support, and learning and academic achievement.

### *Students' Anxiety*

Even before the pandemic, different studies had already pointed out that nursing students show higher anxiety levels than other higher education students (Chen et al., 2015). The present study reveals that the moment of highest anxiety for students in isolation occurred when they were informed that they had a high-risk contact or began displaying symptoms suggestive of COVID-19 (AnsM1). The anxiety mean at this time point was 38.15, a value that, according to Zung (1971), has clinical significance. The study conducted with higher education students during the COVID-19 pandemic by Žilinskas et al. (2021) found that approximately half of the students had anxiety with clinical relevance. Laranjeira et al. (2022) also observed that those attending health courses showed higher anxiety levels during the COVID-19 pandemic in the universe of higher education students.

A surprising result of the present study is that, in AnsM1, students who tested negative for SARS-CoV-2 showed higher anxiety levels than those who tested positive. Several studies have demonstrated that the fear of infection accounts for much of nursing students' anxiety. Yazici and Okten (2022) found a correlation between the fear of contracting the disease and anxiety among nursing students in clinical practice. On the other hand, Silva et al. (2021) found that during the first confinement, students who were in clinical settings and attending the last years of the degree demonstrated more adjusted coping strategies and higher levels of well-being. Another study in Indonesia showed that nursing students' anxiety in clinical settings might be aggravated by limited access to personal protective equipment (Zukhra et al., 2021). When confronted with the test result (AnsM2), students with symptoms, namely fever, and dyspnea, showed higher anxiety than students without symptoms. This corroborates the study by Zukhra et al. (2021) that showed higher anxiety in students with respiratory symptoms.

At the end of the isolation period (AnsM3), students with work activity showed higher anxiety levels, perhaps because this moment represented the return to their learning and work activities and the need to reconcile both. These results are corroborated by Laranjeira et al. (2022), who, during the COVID-19 pandemic, found that Portuguese higher education students without a professional activity had a significantly lower risk of stress, anxiety, and depression.

Students who felt a negative impact on their learning and academic achievement and expressed a need for psychological support showed higher anxiety during the isolation period. Although this study specifically focused on students in isolation, the results of the anxiety assessment are generally consistent with other studies involving nursing students during the COVID-19 pandemic, regardless of their isolation situation.

### *Nursing students' satisfaction with perceived support*

Several studies demonstrate the importance of monitoring higher education students during the COVID-19 isolation period to prevent and identify early the changes and difficulties it may trigger in their health and well-being

as well as in their academic achievement (da Mata et al., 2021; Kochuvilayil et al., 2021; Savitsky et al., 2021). In this sense, the higher education institution where the present study took place created the CaeClePcCov19 to provide students in isolation with closer pedagogical and emotional support provided by their case manager teacher. The coordinators of the respective course units of this institution also implemented alternative pedagogical strategies. Apart from the satisfaction with the CaeClePcCov19 and each course unit's pedagogical team, this study assessed students' satisfaction with the support from the SNS, namely the SNS24 and the USP of their area of residence. Regarding the support provided by the CaeClePcCov19 and the pedagogical support, 100% of the students in the sample were satisfied, and 98.1% were very satisfied. All students were contacted on four occasions: i) at the beginning of the isolation period; ii) when they reported the results of the tests taken; iii) halfway through the isolation period; iv) when they returned to face-to-face teaching activities. The students received guidance from the course unit's pedagogical coordinators. These established personalized and alternative pedagogical strategies with each student to minimize the effects of their absence from the learning activities. These contacts also aimed to clarify doubts and provide psychological and emotional support. Besides these pre-established moments, the students could contact their case manager whenever needed. This procedure allows nursing students to use the coping strategies that best promote their psychological well-being during this period. These strategies consist of instrumental (seeking help, information, or advice on what to do) and emotional support (getting sympathy or emotional support from someone; Silva et al., 2021). Still, 21.4% of students reported needing professional psychological support. Alomari et al. (2021) also identified support needs associated with financial difficulties, social isolation, the need to communicate, and nursing students' lack of preparation for online teaching as contributing to understanding this result.

Regarding the support provided by the SNS, 35.7% of students reported being "not at all or not very satisfied," which aligns with the study by Tran et al. (2022), who identified the negative impact on relationships with healthcare providers as one of the effects of the pandemic on the lives of individuals. Nevertheless, Xavier et al. (2020) demonstrated that, at the beginning of the pandemic, Portuguese nursing students considered the information provided by the SNS as clear and adequate. According to the case managers, students mainly reported difficulties in the initial contact with the SNS24 and the delay in contact by the USP of their area of residence for contact tracing, monitoring of symptom evolution, and communication of clinical discharge. Students' dissatisfaction with the support from the SNS can be related to the need to reorganize the health services to respond to the pandemic and the high demand for healthcare.

### *Impact of isolation on learning and academic achievement*

Following the general confinement decreed by most countries, higher education institutions adapted their

pedagogical strategies for online teaching, minimizing the impact of the absence of face-to-face teaching activities. The study by Idris et al. (2021), conducted on the online teaching experience of theoretical classes by higher education students in the health area, pointed out the positive and negative aspects of the online format. The possibility of keeping the study plan according to the planned schedule was considered a positive aspect. However, the evaluation's uncertainty was considered a negative aspect of the experience. The present study observed that most students (82.1%) were attending clinical teaching/internship course units when they faced the situation of isolation. Despite the alternative teaching strategies that were implemented, these did not replace the students' clinical experiences, which can explain the negative impact on their learning (66.1% of the students reported medium to high impact) and academic achievement (57.1% of the students reported medium to high impact).

This study was limited by the sample size, as it focused on nursing students in isolation. Further studies are recommended to compare the students' experiences during the pandemic from different perspectives, considering other variables such as social, family, and economic support.

## Conclusion

The COVID-19 pandemic has significantly influenced people's individual, family, social, academic, and professional lives. This study aimed to assess the impact caused by isolation due to COVID-19 on undergraduate nursing students of an institution in the northern region of Portugal. During isolation, nursing students showed clinically significant anxiety levels at the beginning of the isolation period. Students expressed higher satisfaction with the support provided by the CaeClePcCov19 and the pedagogical team of the course units and lower satisfaction with the support from the SNS. The absence from school activities, specifically from clinical teachings/internships, negatively impacted their learning and academic achievement.

Since the pandemic's beginning, research has strengthened the scientific community's concern with the mental health of higher education students. The results reinforce the need for long-term support and monitoring programs for students in general, and health students in particular, that promote self-care, healthy lifestyles, and coping strategies to deal with the anxiety and stress experienced. Throughout their academic career in clinical settings, nursing students are exposed to specific risks, namely the risk of infection, which causes increased stress and anxiety. Thus, nursing students must have access to updated scientific evidence on this issue to use it to protect themselves and promote their mental health and well-being. Higher education institutions, in close collaboration with health institutions, must take steps to monitor students' mental health, provide the necessary support and conduct large-scale multicenter studies in this area. Students' health and well-being are crucial to their academic success and development as health professionals.

## Author Contributions

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