



ERASMUS MUNDUS JOINT MASTER'S DEGREE IN EMERGENCY AND CRITICAL CARE NURSING  
(EMJMD NURSING)

**Psychological impact of COVID-19 among Nursing students of the  
University of Oviedo**

**Itziar Méndez Pinto**

**February 2022**

**Master's Thesis**





**Erasmus Mundus Joint Master Degree in Emergency and Critical Care Nursing  
(EMJMD NURSING)**

**Psychological impact of COVID-19 among Nursing Students of the  
University of Oviedo**

**Master's Thesis**

**Itziar Méndez Pinto**

**Author**

**M<sup>a</sup> Pilar Mosteiro Díaz**

**Supervisor**



**ERASMUS MUNDUS JOINT MASTER'S DEGREE IN EMERGENCY AND CRITICAL CARE NURSING**

M<sup>a</sup> PILAR MOSTEIRO DÍAZ, Doctor in Psychology from the University of Oviedo, Senior Lecturer, Area of Nursing, Department of Medicine, University of Oviedo and the Erasmus Mundus Joint Master's Degree in Emergency and Critical Care Nursing Lecturer and Coordinator.

CERTIFY:

That the Master's Thesis submitted by Ms Itziar Méndez Pinto, entitled "Psychological Impact of COVID-19 Among Nursing Students of the University of Oviedo", carried out under my supervision in the Erasmus Mundus Joint Master Degree in Emergency and Critical Care Nursing, meets the necessary requirements to be approved as a Master's Thesis.

And for the record, and for the relevant purposes, the present certification was issued in Oviedo, on 31st January 2022.

M<sup>a</sup> PILAR MOSTEIRO DÍAZ

Supervisor

## Table of Contents

1. INTRODUCTION .....	5
1.1 Coronavirus .....	5
1.2 Nursing Students and COVID-19.....	6
1.3 Mental Health impact of COVID-19.....	7
1.3.1 Posttraumatic Stress Disorder.....	10
1.3.2 Anxiety and Depression.....	11
1.4. Questionnaires .....	12
2. JUSTIFICATION .....	15
3. RESEARCH QUESTION, HYPOTHESIS AND OBJECTIVES.....	16
3.1 Research Question .....	16
3.2 Hypothesis.....	16
3.3 Objectives.....	16
4. MATERIAL AND METHODS .....	18
4.1 Study design .....	18
4.2 Setting .....	18
4.3 Population, sample and inclusion criteria .....	18
4.4 Study period.....	19
4.5 Variables description .....	19
4.6 Instruments .....	20
4.6.1 <i>Impact of Event Scale-Revised (IES-R)</i> .....	20
4.6.2 <i>Hospital Anxiety and Depression Scale (HDAS)</i> .....	21
4.7 Procedure .....	21
4.8 Data analysis.....	22
4.9 Ethical aspects .....	23
5. RESULTS .....	24
5.1 Descriptive analysis .....	24
5.1.1. <i>Demographic characteristics of participants</i> .....	24
5.1.2. Psychological Impact (IES-R).....	26
5.1.3. Anxiety and Depression (HADS).....	27
5.2 Correlation Analysis.....	28
5.2.1 <i>Sociodemographic variables related to IES-R levels</i> .....	28

5.2.2 Sociodemographic variables related to HADS- Anxiety levels .....	29
5.2.3 Sociodemographic variables related to HADS-Depression levels .....	29
5.2.4 IES-R association to HADS scores .....	30
6. DISCUSSION .....	32
6.1. Limitations .....	38
6.2. Implications for research .....	39
7. CONCLUSIONS .....	40
8. REFERENCES .....	41
9. APPENDIX A.....	48

## Table index

Table 1. Demographic Characteristics of participants .....	24
Table 2. IES-R levels .....	26
Table 3. IES-R subscales scores.....	27
Table 4. Descriptive statistics of HADS scores.....	27
Table 5. HADS levels .....	28
Table 6. Correlations between IES-R levels and Sociodemographic variables.....	28
Table 7. Correlation between HADS-Anxiety levels and Sociodemographic variables..	29
Table 8. Correlations between HADS-Depression levels and Sociodemographic variables .....	30
Table 9. Spearman's Rho, Correlations between Age, IES-R and HADS.....	31

## 1. INTRODUCTION

### 1.1 Coronavirus

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a positive-stranded RNA virus belonging to the *Coronaviridae* family that could determine the infectious disease known as Coronavirus disease 2019 (COVID-19) or previously named as 2019 novel coronavirus or 2019-nCoV (Lai et al., 2020). COVID-19 disease clinical manifestation could be from asymptomatic to a mild illness being the most common symptoms: fever, dry cough, fatigue, sputum production, shortness of breath, muscle or joint pain, sore throat, headache, loss of smell and or loss of taste; or severe manifestation, bilateral interstitial pneumonia associated with severe respiratory failure. Other features of the virus are the long-term sequelae as hypercoagulability and the excessive multi-organ immune system response (World Health Organization, 2021).

SARS-CoV-2 transmission is demonstrated to be human-to-human by droplets and aerosols, yet this virus transmissibility was much greater infectivity than other viruses from the same *Coronaviridae* family. SARS-CoV-2 will be spreading quickly in the context of location, proximity, intensity and duration. Besides, since May 2021, the World Health Organization (WHO) has identified mutations occurring to the virus, most of them will not significantly impact. However, some mutations develop advantages as increased transmissibility. The variants Alpha, Beta, Gamma, Delta and Omicron, have been identified as variants of concern (World Health Organization, 2021; Mavragani, 2020; WHO, n.d.).

The emergence of SARS-CoV-2 was first observed during early December of 2019 when unexplained pneumonia cases appeared in the Chinese city of Wuhan, Hubei province. Since then, it has rapidly spread around China and countries worldwide due to easy transmissibility and globalisation. Until the 30th of January 2020, when COVID-19 was declared by the World Health Organization as the sixth public health emergency of international concern. Being the H1N1 (2009), polio (2014), Ebola in West Africa (2014), Zika (2016) and Ebola in the Democratic Republic of Congo (2019), the following five other outbreaks named by the WHO (Lai et al., 2020). Late on the 12th of March of the same year, the proportions of the health problem resulted in declaring a pandemic by the WHO;

and reaching the toll of one million COVID-19 cases worldwide by the 4th of April 2020 (World Health Organization, 2021).

While China started as the pandemic's epicentre, Europe, unfortunately, surpassed China's cases in a short period. Since the first notify COVID-19 death in Europe, in Italy on the 21st of February 2020, the virus has rapidly spread around all European countries (Mavragani, 2020); being Spain one of the European countries that experience the highest number of cases and deaths with a total of 4,961,128 COVID-19 cases and 86,463 deaths due to COVID-19 by the 2nd of October 2021 (Worldometers, 2021).

The high transmission rate, morbidity and mortality of the virus unleashed to some countries develop strict isolation measurements and lockdowns to minimise the spread of the virus and prevent national health systems from collapsing due to the lack of resources and preparation to face it. In the European Union context, it was not a unified policy to cease COVID-19 spread; therefore, different countries adopted different means to address the crisis (Shevlin et al., 2020). In Spain, on the 14th of March 2020, the government supported by the Royal decree 463/2020 decreed a "State of alarm" for the management of the COVID-19 crisis; For this reason, on the same date on the State official newsletter of Spain, the government made publish a series of measurements that aimed to protect the health and safety of the citizens, contain the progression of the disease and reinforce the Spanish public health system; Resulting on the confinement of the population of all the national territory of Spain until the 9<sup>th</sup> of November of 2020 (Spanish Ministry of Health, 2020).

## **1.2 Nursing Students and COVID-19**

COVID-19 has compromised global health, economy and politics, but also education. Pandemic significantly impacts university students from different countries; according to UNESCO, 60% of students worldwide have been affected by national lockdowns (Patelarou et al., 2021). Forcing the cancellation of presential education activities and modifying the teaching approach to a virtual format. Consequently, the academic health science community had a significant impact, where clinical practices were interrupted primarily due to fear of contagion and uncertain knowledge about the disease (Reverté-Villarroya et

al., 2021). This situation had a direct repercussion on students' stress, anxiety, and depression levels. Social interaction indicates the clinical prediction of social anxiety, isolation, depression, and stress (Marcén-Román et al., 2021).

The impact of COVID-19 on nursing students is evident. Nevertheless, the different policies followed by each government lead to differences in the student's education impact. Some nursing students had their clinical practice cancelled or suspended, fearing repercussions on their future career, late graduation, or to face changes of the global recession caused by COVID-19. While others have been in contact with the virus or even suffered from the disease. In Spain, due to the absence of healthcare workers and the overflow of the Spanish health system, the Spanish authorities regulated the contracting of final-year health sciences students (Patelarou et al., 2021; Reverté-Villarroya et al., 2021). Some fourth-year nursing students volunteered to provide health care for vocational and moral reasons, entering the world of work without fully finishing their clinical practicum and compromising their health (Roca et al., 2021). Furthermore, Nursing students about to graduate and become professional nurses were affected by employment pressure and uncertainty related to the pandemic, which caused students to experience psychological distress (Zhu et al., 2021).

Nursing Bachelor is known to be both technical and theoretical degrees. Clinical practices form a vital part of the technical professional development; for this reason, in some Spanish universities, Nursing students have their first contact to the hospital setting in their first year. For instance, at the University of Oviedo, Nursing students have 81 credits representing mandatory Clinical practice, where six credits are to be performed during the second semester of the first year (*Universidad de Oviedo - Grado En Enfermería 2013 - Grados*, n.d.).

### **1.3 Mental Health impact of COVID-19**

The COVID-19 Pandemic had an enormous impact on the health of a large part of the population, not only a physical impact but also on psychological wellbeing. COVID-19 changes every aspect of our personal lives, employment, social activities, education and community connection; causing anxiety, fear, hopelessness, despair, loss of purpose,

insecurity and a specific intolerance of uncertainty among the general population (Reverté-Villarroya et al., 2021; Usher et al., 2020). These feelings have possibly been precipitated by an increase of cases, stress on healthcare staff, confinement at home, lack of psychiatric services and exhaustive media coverage; which caused a rise in public panicking and resulted in mental challenges to the general population as the information was primarily myths and misinformation about the COVID-19 disease (Paulino et al., 2021; Cam et al., 2021).

COVID-19 is a significant health challenge worldwide; the pandemic has directly affected the general population's mental health. A study developed by Paulino et al, during the first outbreak of the virus reported that 49.2% of the Portuguese population had suffered a moderate or severe psychological impact from the COVID-19 pandemic. In comparison, a study developed early that year in China showed an affectation equal to a percentage of 53.8% of participants (Paulino et al., 2021).

Not necessarily only individuals with previous anxiety disorders or panic attacks but also individuals with none of these symptoms before can develop depressive symptoms, different levels of anxiety disorders, and posttraumatic stress disorders (Göl & Erkin, 2021). The most frequent outcomes are stress, fear of transmission and psychological diseases (Marcén-Román et al., 2021).

However, a collective considered at high risk is the frontline healthcare workers. Literature of previous public health emergencies showed an association of the outbreaks with mental health issues among Healthcare workers (D'ettore et al., 2021). A data review of previous epidemics (SARS, MERS, Ebola, 1N1 influenza) and the presently COVID-19 pandemic reveal a high prevalence of anxiety (45%), depression (38%), acute stress disorder (31%), burnout (29%), and posttraumatic stress disorder (PTSD) (19%) (Bassi et al., 2021). It can be explained, as healthcare workers are facing critical situations that can result in suffering from psychological impact, with consequences that can diversify from psychological distress to mental health symptoms; they are experiencing emotions like fear, hyperarousal, intrusive memories, insomnia and emotional exhaustion (Usher et al., 2020). Some of the main reasons for positive psychological impact are the pressure of taking care of risk patients, including co-workers, handling deaths from the virus that can get infected

and spread to other people. Other work stressors include extended shifts, working with limited personal protection equipment, increased workload and severity of the patients, chaotic conditions, and caring for patients without their families (Thornton et al., 2021; Santarone et al., 2020).

A study developed in China concludes that one in six healthcare workers develop stress symptoms during the COVID-19 pandemic, putting them at risk of developed psychological distress and other mental health symptoms (Carmassi et al., 2020). On the other hand, a different study developed in Spain during the COVID-19 outbreak by Alonso et al, resulted in one in every seven healthcare workers meeting the criteria for mental health disorders (Alonso et al., 2021).

Nursing students should always be considered high-risk collective who are exposed to develop psychopathology after the pandemic. It is widely known that the impact of academic life on mental health, the beginning of university studies is a critical period for developing mental illness. Furthermore, this circumstance has been reported to be higher in those students in health-related degrees as nursing (Reverté-Villarroya et al., 2021). Unlike other bachelor degrees, Nursing baccalaureate students are expected to have various coursework assignments and intensive theoretical study and clinical practicum; therefore, their psychological burden may increase (Cheung et al., 2016). Several studies reported higher anxiety levels in healthcare students before clinical practice and their final year. For many students attending classes at university is a way of coping and staying connected to a social environment. Unfortunately, with the presential classes suspended, the students are at risk of loneliness and loss of connection (Reverté-Villarroya et al., 2021). These are not only reasons but also been expected to cope with the traumatic event and distress for a long time while some were actively working or volunteering (Göl & Erkin, 2021). In this respect, numerous nursing students faced the dichotomy of choosing between their safety or pursuing a nursing career (Usher et al., 2020).

A study developed by Reverté-Villarroya et al., comparing mental health problems between Spanish nursing students in 2017 prior to COVID-19 and in 2020 during the pandemic, resulted in two-times greater risk of suffering mental health problems for those studying during the COVID crisis (Reverté-Villarroya et al., 2021). A different study conducted in

Turkey in June 2020 indicated that 71.5% of Turkish nursing students were at risk to develop mental health problems (Göl & Erkin, 2021).

Some factors that are demonstrated to have an affectation on psychosocial health are shown by demographic, psychological, and behavioural factors (optimism, pessimism, psychological flexibility, hope, resilience, fear, vulnerability and preventive behaviour) (Yıldırım et al., 2021)

Another factor that increases the vulnerability to psychological wellbeing is the discrimination and stigma associated with mental health disorders. During the pandemic, nurses were seen as heroes, resilient individuals who could cope with the situation and not get affected or traumatised. The fear of being seen as weak or judged by their colleagues might affect avoiding seeking help (Burdick, 2020). Studies have demonstrated that those diagnosed with COVID-19 or their families are exposed to discrimination, which is an adverse psychological effect (Göl & Erkin, 2021).

### **1.3.1 Posttraumatic Stress Disorder**

Posttraumatic stress disorder (PTSD) is a response to direct or indirect exposure to traumatic events that may occur after a personal trauma or a witnessed trauma. This psychiatric disturbance is characterised by symptoms of re-experiencing as emotional numbing, intrusive thoughts, feelings and imagery; nightmares, behavioural avoidance (of emotions, situations and ideas), and increased arousal showed as anger, irritability, complicated in concentrating and pronounced startle responses (Burdick, 2020; Weiss, 2007). Most individuals can adapt after exposition to traumatic events. Nevertheless, this adaptation can be compromised by several risk factors, an increased sense of vulnerability, a loss of sense of control and predictability, a need to reaffirm familiar relationships, attachments and routines; psychiatric background, female gender, lack of social support, having young children or experiencing feelings of helplessness during the trauma or intensity of emotions (Carmassi et al., 2020; Weiss, 2007). An innate coping mechanism to prevent PTSD is resilience; this can be described as the capacity to react to stress healthily, achieving goals with a physical and psychological minimal cost (Burdick, 2020).

Healthcare workers are more exposed to PTSD than the general population. According to DSM-V, the average PTSD prevalence is 18-15% among nurses, while the general population is 7-8% (Bassi et al., 2021). The increase of PTSD in nursing can be related to their indirect or direct exposure to the traumatic situation while providing care to patients, nurses' relationships with others, coping skills, and environmental workplace conditions (Burdick, 2020; Bassi et al., 2021). During the COVID-19 crisis, the risk of developing PTSD had increased even more, secondary to the exposure of health care workers to biological material as the COVID-19 virus, the risk of infection and development of pathologic illness, the reduced satisfaction at work and the increment in the witnessed of patients passing away during these pandemic years. Furthermore, during the first wave, many healthcare workers believed they needed to isolate themselves to prevent contagion to their families, resulting in a lack of physical and emotional support known to be a coping mechanism (Burdick, 2020).

A study developed in Turkey in May 2020 concluded that 34.5% of University students met the criteria for PTSD, being the female gender and poor family relationships factors for increased risk (Cam et al., 2021).

### **1.3.2 Anxiety and Depression**

Depression is the most common mental condition; whence the individual experiences symptoms such as persistent sadness or a lack of interest and pleasure in previously enjoyable activities, weight changes, insomnia or hypersomnia, lack of energy, difficulty in concentrating and feelings as worthlessness or excessive guilt and recurrent thoughts of death or self-harm (American Psychological Association, n.d.-a). Depression can be triggered by various factors that interact with each other. It can manifest as a long-term or recurrent illness that can properly affect a person's function. According to the WHO, depression affects 264 million people worldwide (World Health Organization, n.d.).

Anxiety can be defined as an innate warning setup the body has for potential danger, most often occurring in new and unknown situations as the COVID-19 pandemic (Yıldırım et al., 2021). A person with an anxiety disorder usually has recurring thoughts or concerns. They might also avoid certain situations out of fear mixed with other physical symptoms such as

hypertension, diaphoresis, vertigo or tachycardia (American Psychological Association, n.d.-b).

Depression, anxiety and stress are the most common psychiatric disorders among University students; depression has the highest prevalence among first-year students (Cheung et al., 2016). In addition, the pandemic of COVID-19 had created an atmosphere of anxiety, insecurity, fear and uncertainty (Yıldırım et al., 2021). A study developed in Spain to measure the stress perceived by University Health students after one year of pandemic indicates a 71.4% percentage of participants had anxiety and 81% had depression, reflecting the work status was an increased risk factor, as 81.8% of the students that were not working suffered from stress (Marcén-Román et al., 2021).

On the other hand, a study developed in Chinese undergraduate nursing students during the COVID-19 pandemic resulted in a 55.0% prevalence of anxiety symptoms, 56.4% of depression and 31.6% of comorbid anxiety and depression for the participants. It is recognised that comorbid anxiety and depression is associated with poor family function, severe social anxiety, negative moods and self-esteem issues (Zhu et al., 2021).

Furthermore, according to a comparative study about depression in nursing students during COVID-19, Spanish students (59.1%) experienced more depression than Greek (21.8%) and Albanian (34.5%) students. Showing that demography is a strong predictor for depression, which can be related to the increased public worried and anxiety due to the increase of deaths in the area (Patelarou et al., 2021).

#### **1.4. Questionaries**

Many questionaries have been published for the aim of studying Mental wellbeing in individuals; some of the most used tools for the study of psychological impact, anxiety and depression are the followed ones:

- **General Health Questionnaire (GHQ-12)** is an adaptation of the 60-item questionnaire developed by Goldberg in the 1970s. The test aims to quantify the risk of developing mental health disorders in populations located in community and primary healthcare settings. The GHQ-12 comprises 12 items with four possible responses from 0 (not at all) to 3 (More than usual). The score results of the

questionary can go from 0 to 12; according to Goldberg, a score of 2 or less indicates no mental disorder, and a score of 3 or greater indicates the presence of disorders (Göl & Erkin, 2021).

- **Generalised Anxiety Disorder-7 (GAD-7)** is seven items questionnaire to self-measure the frequency of anxiety symptoms. The scale has four answers, from 0 (Not at all) to 3 (nearly every day). The total score can be from 0 to 21, and it is divided into four grades: Asymptomatic (0-4), mild (5-9), moderate (10-14), and severe (15-21) anxiety. This measurement tool has been extensively used, and it is meant to have good reliability among college students (Savitsky et al., 2020).
- **Patient Health Questionnaire-9 (PHQ-9)**, questionnaire to evaluate the frequency of depression symptoms during the past two weeks. Ranged from 0 to 27, 4 options per item from 0 (not at all) to 3 (nearly every day). It assesses the depression in 5 categories: asymptomatic (0-4), mild (5-9), moderate (10-14), moderately severe (15-19) and severe (20-27) (Zhu et al., 2021).
- **Impact of Event Scale-Revised (IES-R)**, A self-assessment measure tool questionnaire designed by Weiss & Marmar (1997). It is a 22 items shorter version of the original IES designed by Horowitz to measure the subjective response to a specific traumatic event; the tool is not used to diagnose posttraumatic stress disorder but to capture the criteria (Weiss, 2007). Items are scored on a five option scale from 0 (not at all) to 4 (extremely) (Weiss, 2007; Cam et al., 2021). This scale has previously been used during the COVID-19 pandemic in numerous studies, as it has been translated to various languages, being Spanish one of them.
- **Depression, Anxiety and Stress Scale-21 (DASS-21)**, Is a self-assessment measurement scale composed of 21 items in three domains scoring from 0 to 3 (0: did not apply at all over the last week, 1: applied to some degree, or some of the time; 2: applied a considerable degree, or a good part of the time; 3: applied very much or most of the time). The questionnaire aims to calculate the probability of the emotional states of depression, anxiety and stress by a 4-point scale (Cam et al., 2021; Cheung et al., 2016).

- **The International Trauma Questionnaire (ITQ) 18** is a self-reported measure of PTSD based on six symptoms that encompass three symptoms of re-experiencing, avoidance and sense of threat. Each item is answered on a five-option scale with a score of 0 (not at all) to 4 (extremely) (Shevlin et al., 2020).
- **Hospital Anxiety and Depression Scale (HADS)**, designed by Snaith and Zigmond in 1994, was initially developed to measure symptoms that suggested anxiety and depression in a hospital setting. Still, it is now used in other areas as higher education students. It comprises 14 items to measure emotional distress; 7 items corresponding to anxiety and 7 to depression. Each question has four different answers from 0 to 3. Students that score nine or equal to the maximum (21) are considered to have anxiety and/or depression symptoms, not to forget this tool does not diagnose. This questionnaire is one of the most used in various settings, cultures and languages, and it is translated and validated to Spanish (Pais-Ribeiro et al., 2007).

## **2. JUSTIFICATION**

The World Health Organization declared the year 2020 as the year of Nurses and Midwiferies. Yet, this year will be remembered as the most significant health issue the world had to face in the last century due to the outbreak of coronavirus disease (COVID-19). During the pandemic, Nurses were named heroes when the truth is that the impact on the healthcare workers' mental health was outrageous. Many studies were focused on the frontline workers' mental wellbeing during this period. Nevertheless, Health students were also strongly affected by the pandemic; the strict isolation reporting in the closure of universities and cancellation of clinical practices also impacted students' psychologically while others volunteered on the frontline during this difficult time. Every European country was affected differently; One of the most affected countries by cases and deaths was Spain. The study aims to measure the psychological impact of the COVID-19 pandemic on the nursing students of the Spanish region of Asturias.

### **3. RESEARCH QUESTION, HYPOTHESIS AND OBJECTIVES**

As it was previously explained, the COVID-19 Pandemic outbreak is related to a poor mental wellbeing of the general population. A collective that needs to be minded are the Nursing students, firstly because they will be the future healthcare providers. Secondly, they have been strongly affected by the pandemic in the education field and their future professional career.

#### **3.1 Research Question**

How did the COVID-19 pandemic impact the mental health of the Nursing students of the University of Oviedo?

#### **3.2 Hypothesis**

- **Null Hypothesis (H0)**

**H0** - No physiological impact on Nursing students related to COVID-19 is detected once the confinement period is over.

- **Alternative Hypothesis (H1, H2)**

**H1** – The psychological impact on nursing students related to the COVID-19 pandemic is high.

**H2** – A higher prevalence of anxiety, depression and psychological impact on Spanish nursing students is associated with some sociodemographic characteristics.

#### **3.3 Objectives**

- To describe the characteristics of the sample.
- To know the prevalence and severity of anxiety, depression, and posttraumatic stress among nursing students.
- Identify factors that contribute to higher psychological distress in nursing students.

- To compare demographic and social characteristics as possible predictors to develop anxiety, depression or posttraumatic stress disorder.

## **4. MATERIAL AND METHODS**

### **4.1 Study design**

The study adopted a descriptive, quantitative, and cross-sectional survey design. This multicentre study has been carried out at the two Nursing Faculties of the University of Oviedo in the Spanish region of the Principality of Asturias.

### **4.2 Setting**

The data used for the development of this study was obtained from Nursing Students enrolled at the University of Oviedo during the academic year 2021-2022. Our research was conducted presential via standard written questionnaires on the lectures of the Nursing Faculties of the University of Oviedo. The named questionnaires consisted of three sections, including student's information, psychological impact questionnaire and anxiety and depression scale. All questionnaires have previously been translated and validated to the Spanish language.

### **4.3 Population, sample and inclusion criteria**

The target population of this study consisted of undergraduate nursing students affected by the outbreak of the COVID-19 pandemic during the development of the bachelor's degree.

The sampling method used to ensure a representative sample was a non-probability consecutive sampling technique. The data was gathered on the lectures of the Nursing Faculties at a day and time chosen by the research team.

The total size of the sample for the study was estimated to be  $n=165$ ; This was done by the estimated proportion were the total population (N) was 500 students,  $Z_{\alpha}^2 = 1.96^2$  (confidence level  $(1-\alpha)=95\%$ ), Statistical significance  $(p) = 0.05$ ,  $(q) = 1-p$  ( $1 - 0.05 = 0.95$ ) and precision  $(d)=3\%$ , give as 170 participants as the minimum sample requirements. The followed equation obtained these numbers:

$$n = \frac{N * Z_{\alpha}^2 * p * q}{d^2 * (N - 1) + Z_{\alpha}^2 * p * q}$$

The total size of participants was n=304, being more extensive than the determined previous to the data gathering.

The inclusion criteria in the study were as follows: (a) being undergraduate nursing students enrolled in one of the University of Oviedo (Spain) faculties, either Oviedo or Gijón; (b) had been affected by the pandemic outbreak while studying; Therefore, first-year students were excluded; (c) willing to participate in the study; and (d) those who fully completed the questionnaire.

#### 4.4 Study period

The study took place during the first semester of the academic year 2021-2022. Data collection started on the 10th of September 2021, coinciding with the beginning of on-site activities and classes at the University of Oviedo, and it was completed by the 12<sup>th</sup> of November. The time setting of the study corresponded with the end of the State of Alarm as it was declared over on the 9<sup>th</sup> of May of 2021 by the Spanish Ministry of Health, four months before starting the data gathering.

#### 4.5 Variables description

- Sociodemographic variables
  - Age: in years.
  - Gender: Male / Female.
  - Marital status: Single, Live in couple / Married, Divorced / Separated / Widow.
  - Faculty: Oviedo/Gijón.
  - Academic year: 2<sup>nd</sup> year, 3<sup>rd</sup> year and 4<sup>th</sup> year.
  - Coexistence: Living with Parents / Grandparents, Alone, with friends, another situation.

- Children: Yes, No. Number.
- Dependents: Yes, No.
- Smoking habit: Smokers, Non-Smokers.
- Place of residence: Rural area, Urban area.
- Laboral variables
  - Employment situation: Employed, unemployed; if employed, is your work healthcare-related: Yes, No. Specify.
- Variables related to the personal situation due to COVID-19
  - Were you COVID-19 positive: Yes, No.
  - Did any of your family members suffer from COVID-19: Yes, No.
  - Did any of your friends suffer from COVID-19: Yes, No.
  - Are you afraid?: Yes, No.
  - Do you feel stressed?: Yes, No.
  - Are you vaccinated: Yes, No.
- Psychological impact.
- Anxiety and depression.

## **4.6 Instruments**

### **4.6.1 *Impact of Event Scale-Revised (IES-R)***

The study uses the Impact of Event Scale-Revised (IES-R) on the Spanish version validated by Báguena et al; in 2001 (Báguena et al., 2001). The Impact of Event Scale is a self-reported scale designed in 1976 by Horowitz; it is a tool used to assess the frequency of intrusive and avoidance phenomena associated with the experience of a particular event. A revised version of this tool designed by Weiss & Marmar was suggested in 1997; This revised questionnaire included several items based on criteria for hyperarousal symptoms, consisting of 22 items to measure the subjective response to a specific traumatic event (Joseph, 2000). The questionnaire is not used to diagnose posttraumatic stress disorder but to capture the criteria. Items are scored on a five-option scale from 0 (not at all) to 4 (extremely). The IES-R includes a total score (ranging from 0-88) and three different

subscales that aim to reflect the symptoms of intrusion (8 items), avoidance (8 items), and hyperarousal (6 items) (Weiss, 2007; Cam et al., 2021).

Higher scores reflect a higher distress level of the person taking the test; the total IES-R scores were divided into normal (0-23), mild psychological impact (24-32), moderate psychological impact (33-36), and severe psychological impact (>37) (Weiss, 2007).

The internal consistency (Cronbach's alpha) of the IES-R is acceptable (Total IES-R ( $\alpha$ ) = 0.95). The data about test-retest reliability are more differing (Báguena et al., 2001).

#### **4.6.2 Hospital Anxiety and Depression Scale (HADS)**

The Hospital Anxiety and Depression Scale (HADS) was designed as a screening instrument for anxiety and depression in a hospital setting by Snaith and Zigmond (1994). Even though it was first intended for a hospital setting, the tool has been acceptable for different contexts as community or higher education (Pais-Ribeiro et al., 2007). This scale contains 14 items with multiple choice questions, conformed in two subscales referred of Anxiety (HADS-A) and Depression (HADS-D), formed of seven items in each domain. Scores for each item have four different answers going from zero to three, the total range scores from 0 to 21. Students who score 0-7 are considered normal, 8-14 borderline, and 15-21 elevated; Therefore, from 8 to equal de maximum (21), students will be deemed to have anxiety and/or depression symptoms, not to forget this tool does not diagnose. To interpret the results, the higher a participant score, the greatest chances the person has to develop an anxiety or depression disorder (Pais-Ribeiro et al., 2007).

This scale is brief and easy to understand, including a few questions. The internal consistency for the Spanish Validation was found to be acceptable with a Cronbach's alpha of 0.90 for the HADS tool, 0.85 for the Anxiety subscale, and 0.84 for the depression subscale (Herrero et al., 2003).

#### **4.7 Procedure**

Succeeding the obtention of the approval of the ethical committee, students were asked to participate in the study. Participants were invited to partake during lectures on the

Nursing Faculties of Oviedo and Gijón; data were collected through written questionnaires; During the mentioned lectures, general information was given to them about the purpose of the study, the process to participate, and the questionnaires. Filling in the three parts of the questionnaire: sociodemographic questions, IES-R and HADS took between 10-15 minutes for participants to complete.

No personal data was recorded, all questionnaires were anonymous, and participation was entirely voluntary; students were aware that participating in the Survey would not affect their academic development.

#### **4.8 Data analysis**

Data were processed and analysed in Statistical Package for the Social Science version 27.0 for McIntosh (IBM-SPSS v 27).

The sample characteristics were analysed and described by descriptive statistics, such as mean, median, minimum, maximum, or measures of dispersion such as the standard deviation to quantitative type and percentages variables.

Sociodemographic characteristics of the sample were identified as the independent variables, while the IES-R score, anxiety score, and depression score were the study's dependent variables.

The normality of distribution of the continuous variables was analysed using the Kolmogorov-Smirnov test and graphics as histograms, and Q-Q plots were used; Identifying that the continuous variables followed a normal distribution. For demonstrating the correlation of the Quantitative variables, the Spearman's Rho test was applied; The significance level of 0.05 was employed; being able to demonstrate the positive correlations between IES-R, HADS-Anxiety and HADS-Depression scores.

The qualitative variables were expressed as absolute and relative frequencies, using the bivariate analysis of chi-square. The independent tests of ANOVA and T-student were used to examine statistically significant differences in the mean of IES-R and HADS concerning the quantitative independent variable of age. The level of significance for acceptance was determined to be  $p < 0.05$ .

Regarding the treatment of missing data, those participants who did not answer more than one item of the IES or HADS were excluded from the study. For replacing missing values, we used a linear trend.

#### **4.9 Ethical aspects**

Before beginning the research, permission to conduct the study was obtained from the Ethics Research Committee of the Principality of Asturias (2020.116) (Appendix A). All data collected was anonymised to ensure the privacy of the participants. They were also aware of the possibility of withdrawing from the study if they wished to.

Participation was entirely voluntary. The investigator introduced herself during lectures, explaining the aim of the study and what will it consist of; Specifying also that participation or not in the Survey will not have any repercussion on their academic development. A form with the questionnaires was given to those students who agreed to participate by sharing their verbal consent. By completing the questionnaire, the participants were given their informed consent.

The study was designed according to the Code of Ethics of the World Medical Association for legal and ethical aspects (*Declaration of Helsinki – WMA – The World Medical Association*, n.d.)

## 5. RESULTS

### 5.1 Descriptive analysis

#### 5.1.1. Demographic characteristics of participants

This cross-sectional study included a total sample of 304 Nursing Students from the University of Oviedo. Among these students, 51.6% (n=157) were from the Nursing Faculty of Oviedo, while 48.4% (n=147) were from the nursing Faculty of Gijón. The mean age was 22.11 (SD±4.905) years. Majority of responders were female (87.5%), singles (89.1%), with no children (95.7%), living with parents/grandparents (84.2%), unemployed full-time students (85.9%), non-smokers (89.8%) and living in an urban area (78%). The distribution of participants concerning the academic year was 32.6%, 33.2%, and 34.2%, respectively, to 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> year students.

Regarding the infectious status, only 18.1% of the participants had been infected with SARS-CoV-2; this percentage increases when referring to infected relatives (45.7%) and friends (81.9%). When the participants were asked if they were afraid, we could see the majority (80.6%) were not; whether for the question related to stress, 60.9% stated they were feeling stressed. From this study, we could observe that 100% of the participants (n=304) have been vaccinated for the COVID-19 virus. The sociodemographic characteristics are presented in Table 1.

Table 1. Demographic Characteristics of participants

Characteristics	N or mean ± SD	%
<b>Age (year)</b>	22.11 ±4.905	
<b>Gender</b>		
Male	38	12.5
Female	266	87.5
<b>Faculty</b>		
Oviedo	157	51.6
Gijón	147	48.4
<b>Academic Year</b>		
2nd year	99	32.6
3rd year	101	33.2

4th year	104	34.2
<b>Marital status</b>		
Single	271	81.9
Live-in couple / Married	33	10.9
Divorced / Separated / Widow	0	0
<b>Coexistence</b>		
Living with Parents / Grandparents	256	84.2
Alone	13	4.3
with friends	11	3.6
another situation	24	7.9
<b>Children</b>		
Yes	13	4.2
One Child	8	2.6
Two Children	5	1.6
No	291	95.7
<b>Dependents</b>		
No	291	95.7
Yes	13	4.3
<b>Smoking habit</b>		
Non-Smokers	273	89.8
Smoker		10.2
Tabaco	27	8.9
Electric cigarettes	3	1.0
Marihuana	1	0.3
<b>Employment situation</b>		
Employed	27	8.9
Unemployed	16	5.3
Full-time student	261	85.9
<b>Place of residence</b>		
Rural area	67	10.9
Urban area	237	89.1
<b>Were you COVID-19 positive?</b>		
No	249	81.9
Yes	55	18.1
<b>Did any of your family members suffer from COVID-19?</b>		
No	165	54.3
Yes	139	45.7
<b>Did any of your friends suffer from COVID-19?</b>		

No	33	10.9
Yes	271	89.1
<b>Are you afraid?</b>		
No	245	80.6
Yes	59	19.4
<b>Do you feel stressed?</b>		
No	119	39.1
Yes	185	60.9
<b>Are you vaccinated?</b>		
No	0	0
Yes	304	100

### 5.1.2. Psychological Impact (IES-R)

The Psychological impact caused by COVID-19 among University of Oviedo Nursing Students was assessed by the Impact of Event Scale-Reviewed (IES-R). Participants obtain a mean score of 21.24 (SD±15.409) (min: 0; Max: 63) for the total score of the IES-R. This result indicates that 18.1% (n=55) of respondents were severely impacted, 8.6% (n=26) had a moderate psychological impact, 13.5% (n=41) were borderline, and 59.9% (n=182) were within the normal parameters of the measurement tool. According to this result, the prevalence of posttraumatic stress disorder symptoms is 26.7%. The IES-R levels are listed in Table 2.

*Table 2. IES-R levels*

	<b>N</b>	<b>%</b>
<b>Normal</b>	182	59.9
<b>Borderline</b>	41	13.5
<b>Moderate</b>	26	8.6
<b>Severe</b>	55	18.1

For the three subscales of this questionnaire, we obtained the following scores (Mean): Avoidance (8.63), Hyperarousal (6.03) and Intrusion (6.58). Table 3 shows the findings of the named subscales for the IES-R.

*Table 3. IES-R subscales scores*

	<i>Minimum</i>	<i>Maximum</i>	<i>Mean ± SD</i>
<b>IES-R Avoidance</b>	0	27	8.63 ±6.529
<b>IES-R Hyperarousal</b>	0	19	6.03 ±4.942
<b>IES-R Intrusion</b>	0	24	6.58 ±5.624

### **5.1.3. Anxiety and Depression (HADS)**

To analyse the parameters of anxiety and depression related to COVID-19 among nursing students, we used the Hospital Anxiety and Depression scale (HADS). The average score of anxiety and depression was 7.02 (SD±3.893) and 4.01 (SD±3.265), correspondingly. A summary of the descriptive statistics can be found in Table 4.

*Table 4. Descriptive statistics of HADS scores*

	<i>Minimum</i>	<i>Maximum</i>	<i>Mean ± SD</i>
<b>HADS- Anxiety</b>	0	20	7.02 ±3.893
<b>HADS- Depression</b>	0	15	4.01 ±3.265

A normal level of anxiety was found in 60.2% of participants, 35.5% had borderline levels, and 4.3% revealed elevated levels. Regarding the depression levels, 84.5% of the sample scored normal, 14.5% borderline, and 1.0% elevated (Table 5).

Table 5. HADS levels

	<i>Anxiety</i>		<i>Depression</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
<b>Normal</b>	183	60.2	257	84.5
<b>Borderline</b>	108	35.5	44	14.5
<b>Elevated</b>	13	4.3	3	1.0

## 5.2 Correlation Analysis

### 5.2.1 Sociodemographic variables related to IES-R levels

Chi-square was used to analyse the correlation of the sociodemographic variables and the IES-R levels. Four of these independent variables were significantly correlated with the IES-R: Gender, Smoking Habits, Fear and Stress.

From a total sample of 304 nursing students, we can observe a severe psychological impact of 19.5% in females versus 7.8% in males. The severe psychological impact is higher in smokers (22.5%) than in non-smokers (17.5%). Regarding the questions about fear and stress, those participants who stated "yes" for the questions had an IES-R severe prevalence of 37.2% for fear and 23.7% for stress; compared to 13.4% and 9.2% correlated for those whose answer was "no" (Table 6).

Table 6. Correlations between IES-R levels and Sociodemographic variables

		Levels of IES-R				<i>Total</i>	<i>P*</i>
		<i>Normal</i>	<i>Borderline</i>	<i>Moderate</i>	<i>Severe</i>		
<b>Gender</b>	<i>Female</i>	159	36	19	52	266	.059
	<i>Male</i>	23	5	7	3	38	
	<i>Total</i>	182	41	26	55	304	
<b>Smoking Habits</b>	<i>Non-Smoker</i>	171	33	21	48	273	.044
	<i>Smoker</i>	11	8	5	7	31	
	<i>Total</i>	182	41	26	55	304	
<b>Fear</b>	<i>Yes</i>	20	9	8	22	59	<.001
	<i>No</i>	162	32	18	33	245	

	<b>Total</b>	182	41	26	55	304	
<b>Stress</b>	<b>Yes</b>	92	27	22	44	185	<.001
	<b>No</b>	90	27	4	11	119	
	<b>Total</b>	182	41	26	55	304	

\*Chi-square test

### 5.2.2 Sociodemographic variables related to HADS- Anxiety levels

In a total sample of 304 Nursing Students, 35.5% revealed borderline anxiety levels, and 4.2% had severe anxiety levels. The anxiety was found to be significantly associated with fear, stress and relative tested positive (Table 7).

Having a relative infected with the COVID-19 virus was associated to lower anxiety levels ( $p=.009$ ). Also, reporting fear or stress was associated with having higher anxiety levels with  $p = <.001$  for both (Table 7).

Table 7. Correlation between HADS-Anxiety levels and Sociodemographic variables

		Levels of HADS-Anxiety				P*
		Normal	Borderline	Elevated	Total	
<b>Relative tested positive</b>	<b>Yes</b>	92	46	1	139	.009
	<b>No</b>	91	62	12	165	
	<b>Total</b>	183	108	13	304	
<b>Fear</b>	<b>Yes</b>	23	31	5	59	<.001
	<b>No</b>	160	77	8	245	
	<b>Total</b>	183	108	13	304	
<b>Stress</b>	<b>Yes</b>	83	89	13	185	<.001
	<b>No</b>	100	19	0	119	
	<b>Total</b>	183	108	13	304	

\*Chi-square test.

### 5.2.3 Sociodemographic variables related to HADS-Depression levels

The prevalence of depression was higher among females, living with friends and reporting stress. Three sociodemographic variables (gender, coexistence, and feeling stress) were identified as having a statistically significant association with depression levels (Table 8).

In a total sample of 266 females and 38 males, depression was only observed in females, with a prevalence of 16.5% for borderline and 1.1% for elevated.

Coexistence has also been associated with depression levels. Those students living with their parents or grandparents had a prevalence of 1.1% for elevated levels, while those living with friends, alone or in another situation was 0%. For the borderline level, the higher prevalence was those living with friends (36.3%), followed by those living in another situation (33.3%), living with their parents (12.1%) and living alone (7.6%).

Perception of stress has been correlated to depression levels as well. Those students who perceived stress (21% vs 6.7%;  $p = <0.001$ ) were more likely to develop depression symptoms.

*Table 8. Correlations between HADS-Depression levels and Sociodemographic variables*

		Levels of HADS-Depression			Total	p*
		Normal	Borderline	Elevated		
<b>Gender</b>	<b>Female</b>	219	44	3	266	.019
	<b>Male</b>	38	0	0	38	
	<b>Total</b>	257	44	3	304	
<b>Coexistence</b>	<b>Parents/Grandparents</b>	222	31	3	256	.040
	<b>Alone</b>	12	1	0	13	
	<b>Friends</b>	7	4	0	11	
	<b>Other</b>	16	8	0	24	
	<b>Total</b>	257	44	3	304	
<b>Stress</b>	<b>Yes</b>	146	36	3	185	.003
	<b>No</b>	111	8	0	119	
	<b>Total</b>	257	44	3	304	

\*Chi-square test.

#### **5.2.4 IES-R association to HADS scores**

The correlation between discrete quantitative variables was studied by Spearman Rho (Table 9).

We couldn't establish any correlation of the age variable with the total score of the measurement tools. We could find a significative moderate positive correlation ( $p = <0.001$ )

between IES-R total Score with HADS-Anxiety (Coeff.= .545) and HADS-Depression (Coeff.= 0.438) scores.

A strong positive correlation was found between HADS-Anxiety and HADS-Depression (Coeff.= 0.669).

Table 9. Spearman's Rho, Correlations between Age, IES-R and HADS.

		Age	Total IES-R	HADS-A	HADS-D
<b>Age</b>	<b>Coeff.</b>	1.000	-.003	.079	.014
	<b>P</b>	.	.965	.171	.807
	<b>N</b>	304	304	304	304
<b>Total IES-R</b>	<b>Coeff.</b>	-.003	1.000	0.545**	.438**
	<b>P</b>	.965	.	<0.001	<.001
	<b>N</b>	304	304	304	304
<b>HADS-A</b>	<b>Coeff.</b>	.079	.545**	1.000	.669**
	<b>P</b>	.171	<.001	.	<.001
	<b>N</b>	304	304	304	304
<b>HADS-D</b>	<b>Coeff.</b>	.014	.438**	.669**	1.000
	<b>P</b>	.807	<.001	<.001	.
	<b>N</b>	304	304	304	304

\*\*The correlation is significant at  $p$  (bilateral) <0.05

## 6. DISCUSSION

Psychopathology as posttraumatic stress syndrome, anxiety and depression are commonly observed during pandemics; there is enough evidence to associate them with the COVID-19 pandemic (Keskin & Özkan, 2021; Gao et al., 2021).

Some factors that are already known to be related to mental wellbeing are emotional exhaustion and lack of control, which are strongly related to the situation we are living in at the moment (Reverté-Villarroya et al., 2021). This study seeks to analyse the psychological impact that the COVID-19 pandemic caused on Nursing Students of the University of Oviedo.

The research results indicate a notable prevalence of posttraumatic stress disease, anxiety and depression symptoms among nursing students, 26.7%, 39.8% and 15.5%, respectively. In our study, many nursing students reported PTSD symptoms; a total of 26.2% scored an IES-R of 33 or higher; 13.5% were borderline, 8.6% were moderate, and 18.1% were severe, according to IES-R measurement. This prevalence is lower than other studies, as the one developed by Gao et al., that demonstrated a prevalence of 44.5% among Chinese college nurses (Gao et al., 2021); or 34.5% for Turkish university students (Cam et al., 2021); or to the Japanese study which showed a prevalence of 58.5% for PTSD symptoms (Tanji & Kodama, 2021); and to the study developed in Bangladesh during the lockdown among university students that resulted in 40.9% of prevalence for PTSD symptoms (Sultana et al., 2021). Hence, the prevalence we obtained is higher than a study developed in China one month after the pandemic started, with a prevalence of 2.7% (Tang et al., 2020). However, the prevalence of severe cases of our study (18.1%) is higher if we compared it with the prevalence of other studies as 12.5% of University students from Valladolid in Spain (Odriozola-González et al., 2020); and 12.5% Nursing students from Japan (Tanji & Kodama, 2021). Consequently, the symptoms of the pandemic's psychological impact on nursing students are still notable four months after the state of alarm ended.

According to the literature, nursing students already have significant stress levels due to their educated choice. Adding risk factors from the pandemic will increase the prevalence of anxiety these students experience (Kuru Alici & Ozturk Copur, 2021). A study developed

in Japan showed that COVID-19-related anxiety had a more significant impact on nursing students than on nurses (Hasuike et al., 2021); This could be explained because of the economic instability, fear of infection, social isolation and uncertain about the academic future that nursing students experienced during the pandemic (Sultana et al., 2021). In our study, 39.8% of participants showed anxiety symptoms. Among them, 35.5% were borderline, and 4.3% were elevated. This is lower than other studies developed during the lockdown period, as 42.8% among Israeli nursing students (Savitsky et al., 2020); 55.0% among Chinese nursing students (Zhu et al., 2021); 51.5% of severe symptoms on Turkish nursing students (Kuru Alici & Ozturk Copur, 2021); or 48.6% of Turkish university students (Cam et al., 2021).

As regard depression, the prevalence of this study was 15.5%, 14.5% were borderline, and 1.0% were elevated. A study performed during the COVID-19 outbreak on the general population of Spain resulted in 18.7% of the sample detecting depression symptoms (González-Sanguino et al., 2020). Even so, other studies designed with university students during the pandemic in Bangladesh (Sultana et al., 2021), Turkey (Cam et al., 2021), Nursing Students in Albania (Mechili et al., 2021), and Nursing students in China (Zhu et al., 2021); showed 52.8%, 64.6%, 25.2% and 56.4%, respectively. In contrast, different researches on nursing students in China had a lower prevalence of 2.9% (Gao et al., 2021) and 9.0% (Tang et al., 2020). While a study developed one year after the pandemic, on January 2021, among health science students from Spain showed 81% of the sample had depression (Marcén-Román et al., 2021). This discrepancy can be explained by the moment of the pandemic when the data collection was performed. Previous studies have demonstrated that stress levels increase significantly when comparing periods of before and after restrictions (Keskin & Özkan, 2021).

### **Co-relations of sociodemographic variables and psychological impact, anxiety, and depression**

There is enough evidence demonstrating the correlation between age and psychological impact; age plays an essential role as a predictor of psychological impact; a study developed

in Spain during the COVID-19 pandemic showed anxiety and depression symptoms were more evident in younger individuals than participants over 60 years. This could be explained as the younger people were more affected by the lockdown due to the cancellation of presential activities and experiencing uncertainty about the future (Picaza Gorrochategi et al., 2020; Patelarou et al., 2021; Carmassi et al., 2020; Kuru Alici & Ozturk Copur, 2021; González-Sanguino et al., 2020). Withal, our study could not find a significant correlation between the parameters of psychological impact, anxiety and depression, and the participants' age.

In previous studies, psychological impact levels among female students were frequently higher than in male students (Medicine, 2021; Tang et al., 2020; Hasuike et al., 2021; Sultana et al., 2021; Savitsky et al., 2020; Kuru Alici & Ozturk Copur, 2022; da Silva et al., 2021; Cam et al., 2021; González-Sanguino et al., 2020; Marcén-Román et al., 2021). The risk of developing PTSD after experiencing a traumatic event is twice as high for females as it is for males (Cam et al., 2021); Previous research has found a link between university students enrolling in health-related courses and female students who are more depressed (da Silva et al., 2021), matching with the founds of this study. Gender has been demonstrated as a solid predictor to develop PTSD and anxiety symptoms during the COVID-19 pandemic. Not to forget that females were most of our nursing student's population (87.5%), which can indeed explain the higher prevalence of PTSD and anxiety. Prevalence of mental health issues during the COVID-19 pandemic is usually higher among females; some explanations we can find in the literature are that females are more emotional and undergo daily challenges resulting from the social status and roles they have in society (Laranjeira et al., 2021), in most cases, females are likely to do the domestic duties while balancing with employment (González-Sanguino et al., 2020), another one is because of male's higher hippocampus activation, which contributes to a better ability to contextualise fear-related inputs (Kuru Alici & Ozturk Copur, 2021).

Diverse studies found working during COVID-19 (da Silva et al., 2021; Marcén-Román et al., 2021), parental status (Zhu et al., 2021; Savitsky et al., 2020), COVID-19 infectious status (Sultana et al., 2021) or the academic year (Kuru Alici & Ozturk Copur, 2021) as predictors

for a negative impact on students mental health. On the contrary, our study did not find any significant relation.

In the case of coexistence, it has been demonstrated that as the number of people living together at home increases, the level of depression reduces (Keskin & Özkan, 2021). This relates to the results of our study where we could find a significant correlation between coexistence and depression; those students living with parents/grandparent (12.1%) and alone (7.6%) experiences a lower prevalence of depression than the ones living with friends (36.3%) or another situation (33.3%). But whereas, the highest prevalence of severe depression was found in students living with their parents/grandparents (1.1%);

Some explanations for this phenomenon are that students living alone have less fear of infecting their loved ones, as living with high-risk groups has been linked with increased levels of depression in previous studies (Laranjeira et al., 2021). On the other hand, feelings like loneliness, a lousy assessment of the family environment, and a lack of social connection were the cause of psychological discomfort during the pandemic (da Silva et al., 2021; De Micheli et al., 2021). We believe those students living with their families feel more supported and are less discriminated against or rejected.

Our findings contributed to the correlation between fear of infection and increased PTSD (Sultana et al., 2021) and anxiety symptoms (Savitsky et al., 2020); our study has also proved this premise. Participants who reported being afraid had higher levels of PTSD (37.2%) and anxiety (60.9%) than those who stated not being afraid.

Regarding perceived stress, considerable studies suggest a relation with anxiety and depression (Marcén-Román et al., 2021). When stress is under control, an adequate level can improve the body's resistance and function as a protective mechanism. Although stress has a harmful effect on the vegetative nervous system and cortex, resulting in physical and psychological symptoms. The COVID-19 situation is stressful and inhibits adequate coping techniques such as hope and life satisfaction (Laranjeira et al., 2021). Our research found a link between perceived stress and anxiety, depression and psychological impact.

The literature shows a significant relationship between anxiety and a COVID-19 positive relative (Kuru Alici & Ozturk Copur, 2021). On the contrary, not having a relative infected was demonstrated to be a predictor for anxiety in our study; Those students from the

University of Oviedo who had a relative already infected had a lower prevalence of anxiety than those who did not (35.9% vs 44.7%). An explanation found in the literature is that anxiety increases as the fear of infecting family members grows (Keskin & Özkan, 2021); It follows that those students with relatives already infected suffered less fear of infection, resulting in lower levels of stress. In fact, those students who have less contact with COVID-19 have more stress (Marcén-Román et al., 2021; Keskin & Özkan, 2021).

Results indicate an 18.1% prevalence of infected participants in our study. Concordant with the study developed in Spain during January 2021, where 10.3% of the students had the virus (Marcén-Román et al., 2021). In contrast, a study comparing Portuguese and Spanish students during April and May 2020 had a prevalence of 0.7% and 2.7%, respectively. Even more outrageous is that the majority of 89.1% of participants have a friend who got infected with COVID-19, and 45.7% a relative tested positive in our study.

Various studies display that the place of residence is a strong predictor of psychological impact. We could subtract that prevalence of psychological distress is higher in locations where COVID-19 is prevalent, during high-risk seasons and due to the difference in legislation. In our case, Spain has been affected badly by the virus; as being Spanish has proved to be a predictor; nevertheless, the moment our data collection took place was not a high-risk period; the population was more relaxed after the end of the lockdown measurements (Gao et al., 2021; Patelarou et al., 2021). Previous studies also found a difference in the psychological impact between students living in a rural or urban area, demonstrating that living in rural areas is a protective factor against anxiety during COVID-19 outbreak; Even so, our study could not find a relation (Kuru Alici & Ozturk Copur, 2021).

People who use mental health services are more likely to smoke (Peckham et al., 2021)

Finally, students with outstanding fear scores were more prone to engage in unhealthy behaviours like smoking (Tavolacci et al., 2021). Furthermore, people who use mental health services are more likely to smoke (Peckham et al., 2021). From all of the participants, 22.5% who had posttraumatic stress disorder were smokers. As a result, smoking was a predictor of developing PTSD in this research; concurring with the results obtained in a study in Bangladesh, smoking habits increase students' mental health disparity (Alam et al., 2021).

A sociodemographic factor that we did not explore is socioeconomic status; other studies developed in less developed countries such as Brazil and Turkey found a link between poor income or socioeconomic disadvantages and increased psychological distress (Cam et al., 2021; da Silva et al., 2021).

A limitation to keep in mind is the difference in the psychological impact that we can observe across the literature; these disparities can be attributable to a variety of factors such as data collection period, cultural differences, use of different tools, the of the pandemic, government measurements and healthcare system responses.

## **6.1. Limitations**

Study limitations were identified, including the cross-sectional design and self-reported measurements. A cross-sectional approach limits the causal-effect connections between variables; we want to highlight the necessity of future longitudinal research. Also, being a self-reported questionnaire has the challenges of subjectivity and reliability.

## **6.2. Implications for research**

Universities play a critical role in creating a sense of control and security. We suggest more visibility for the university psychological support services, develop counselling services, assistances and promote programs to help the psychological wellbeing of the university students. The results of this study could be used to identify the profile of students at significant risk to develop mental health problems; and undertake appropriate intervention, especially for those students who are at a greater risk for developing mental issues as Nursing students. A follow-up assessment is needed to evaluate the symptoms and assess the long-term consequences during and after the pandemic.

As the future of this COVID-19 pandemic remains unpredictable, further studies need to focus on suggesting assessing methods and coping strategies.

## 7. CONCLUSIONS

- The sample was formed by 304 Nursing Students from the University of Oviedo.
- The majority are female, single, with a mean age of 22.11 years old, with no children, and living with family in an urban area.
- Regarding the infectious status, 18.1% of the participants had been infected with COVID-19, and 45.7% and 81.9% had, respectively, relatives or friends infected. All students were vaccinated for the COVID-19 virus.
- The prevalence of posttraumatic stress disorder, anxiety and depression symptoms among nursing students was 26.7%, 39.8%, and 15.5%, respectively.
- A normal level of anxiety was found in 60.2% of participants, 35.5% had borderline levels, and 4.3% revealed elevated levels.
- Regarding the depression levels 84.5% of the sample scored normal, 14.5% borderline, and 1.0% elevated.
- 26.7% of the nursing students scored an IES-R of 33 or higher. 8.6% revealed moderate and 18.1% severe levels of PTSD.
- A statistically significant association was found between gender, coexistence, and feeling stress; with depression levels.
- Anxiety symptoms were found to be statistically significant associated with fear, stress and having a relative who tested positive.
- Gender, smoking habits, feeling fear and feeling stress were statistically significant associated with the IES-R.

## 8. REFERENCES

- Alam, M. K., Ali, F. Bin, Banik, R., Yasmin, S., & Salma, N. (2021). Assessing the mental health condition of home-confined university level students of Bangladesh due to the COVID-19 pandemic. *Journal of Public Health (Berl)*. <https://doi.org/10.1007/s10389-021-01542-w>
- Alonso, J., Vilagut, G., Mortier, P., Ferrer, M., Alayo, I., Aragón-Peña, A., Aragonès, E., Campos, M., Cura-González, I. D., Emparanza, J. I., Espuga, M., Forjaz, M. J., González-Pinto, A., Haro, J. M., López-Fresneña, N., Salazar, A. D. M. de, Molina, J. D., Ortí-Lucas, R. M., Parellada, M., ... Pérez-Solà, V. (2021). Mental health impact of the first wave of COVID-19 pandemic on Spanish healthcare workers: A large cross-sectional survey. *Revista de Psiquiatria y Salud Mental*, 14(2), 90–105. <https://doi.org/10.1016/j.rpsm.2020.12.001>
- American Psychological Association. (n.d.-b). *Depression*. Retrieved September 1, 2021, from <https://www.apa.org/topics/depression>
- American Psychological Association. (n.d.-a). *Anxiety*. Retrieved September 1, 2021, from <https://www.apa.org/topics/anxiety>
- Báguena, M. J., Villarroya, E., Beleña, Á., Amelia, D., Roldán, C., & Reig, R. (2001). Propiedades psicométricas de la versión española de la Escala Revisada de Impacto del Estresor (EIE-R) [Psychometric properties of the Spanish version of the Impact of Event Scale – Revised (IES-R)]. *Análisis y Modificación de Conducta*, 27(114), 581–604.
- Bassi, M., Negri, L., Delle Fave, A., & Accardi, R. (2021). The relationship between posttraumatic stress and positive mental health symptoms among health workers during COVID-19 pandemic in Lombardy, Italy. *Journal of Affective Disorders*, 280(PB), 1–6. <https://doi.org/10.1016/j.jad.2020.11.065>
- Burdick, K. (2020). Pandemics and PTSD: Caring for the Caregivers. *MEDSURG Nursing*, 29(6), 365–390. <http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=147618022&lang=pt-pt&site=ehost-live&scope=site>
- Cam, H. H., Ustuner Top, F., & Kuzlu Ayyildiz, T. (2021). Impact of the COVID-19 pandemic

- on mental health and health-related quality of life among university students in Turkey. *Current Psychology*. <https://doi.org/10.1007/s12144-021-01674-y>
- Carmassi, C., Foghi, C., Dell'Oste, V., Cordone, A., Bertelloni, C. A., Bui, E., & Dell'Osso, L. (2020). PTSD symptoms in healthcare workers facing the three coronavirus outbreaks: What can we expect after the COVID-19 pandemic. *Psychiatry Research*, *292*, 113312. <https://doi.org/10.1016/j.psychres.2020.113312>
- Cheung, T., Wong, S. Y., Wong, K. Y., Law, L. Y., Ng, K., Tong, M. T., Wong, K. Y., Ng, M. Y., & Yip, P. S. F. (2016). Depression, anxiety and symptoms of stress among baccalaureate nursing students in Hong Kong: A cross-sectional study. *International Journal of Environmental Research and Public Health*, *13*(8), 779. <https://doi.org/10.3390/ijerph13080779>
- D'ettore, G., Ceccarelli, G., Santinelli, L., Vassalini, P., Innocenti, G. Pietro, Alessandri, F., Koukopoulos, A. E., Russo, A., D'ettore, G., & Tarsitani, L. (2021). Posttraumatic stress symptoms in healthcare workers dealing with the covid-19 pandemic: A systematic review. *International Journal of Environmental Research and Public Health*, *18*(2), 1–16. <https://doi.org/10.3390/ijerph18020601>
- da Silva, A. N., Guedes, C. R., Santos-Pinto, C. D. B., Miranda, E. S., Ferreira, L. M., & Vettore, M. V. (2021). Demographics, socioeconomic status, social distancing, psychosocial factors and psychological wellbeing among undergraduate students during the covid-19 pandemic. *International Journal of Environmental Research and Public Health*, *18*(14). <https://doi.org/10.3390/ijerph18147215>
- De Micheli, G., Vergani, L., Mazzoni, D., & Marton, G. (2021). After the Pandemic: The Future of Italian Medicine. The Psychological Impact of COVID-19 on Medical and Other Healthcare-Related Degrees Students. *Frontiers in Psychology*, *12*, 1–9. <https://doi.org/10.3389/fpsyg.2021.648419>
- Declaration of Helsinki – WMA – The World Medical Association*. (n.d.). Retrieved December 9, 2021, from <https://www.wma.net/what-we-do/medical-ethics/declaration-of-helsinki/>
- Gao, J., Wang, F., Guo, S., & Hu, F. (2021). Mental Health of Nursing Students amid Coronavirus Disease 2019 Pandemic. *Frontiers in Psychology*, *12*, 1–12.

<https://doi.org/10.3389/fpsyg.2021.699558>

- Göl, İ., & Erkin, Ö. (2021). Mental status of nursing students assessed using the general health questionnaire during the COVID-19 pandemic in Turkey. *Perspectives in Psychiatric Care, January, 57*(4), 1712-1718. <https://doi.org/10.1111/ppc.12740>
- González-Sanguino, C., Ausín, B., Castellanos, M. Á., Saiz, J., López-Gómez, A., Ugidos, C., & Muñoz, M. (2020). Mental health consequences during the initial stage of the 2020 Coronavirus pandemic (COVID-19) in Spain. *Brain, Behavior, and Immunity, 87*(May), 172–176. <https://doi.org/10.1016/j.bbi.2020.05.040>
- Hasuike, M., Hara, Y., Mori, H. M., Ideguchi, N., Shirai, F., Yoshimura, Y., Murakami, I., Kawahata, H., Aoki, M., & Ogihara, T. (2021). Influence of new coronavirus pandemic on behavior and awareness of young nurses and nursing students in Japan. *BMC Nursing, 20*(1), 1–10. <https://doi.org/10.1186/s12912-021-00724-x>
- Herrero, M. J., Blanch, J., Peri, J. M., De Pablo, J., Pintor, L., & Bulbena, A. (2003). A validation study of the hospital anxiety and depression scale (HADS) in a Spanish population. *General Hospital Psychiatry, 25*(4), 277–283. [https://doi.org/10.1016/S0163-8343\(03\)00043-4](https://doi.org/10.1016/S0163-8343(03)00043-4)
- Joseph, S. (2000). Psychometric evaluation of Horowitz's Impact of Event Scale: A review. *Journal of Traumatic Stress, 13*(1), 101–113. <https://doi.org/10.1023/A:1007777032063>
- Keskin, S., & Özkan, B. (2021). Mental statuses of nursing students in the Covid-19 pandemic period: A systematic review. *Annals of Clinical and Analytical Medicine, 12*(Suppl 2), S245-249. <https://doi.org/10.4328/acam.20654>
- Kuru Alici, N., & Ozturk Copur, E. (2021). Anxiety and fear of COVID-19 among nursing students during the COVID-19 pandemic: A descriptive correlation study. *Perspectives in Psychiatric Care, 58*, 141–148. <https://doi.org/10.1111/ppc.12851>
- Lai, C.C., Shihb, T.P., Koc, W.C., Hung-Jen, T., & Po-Ren, H. (2020). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *International Journal of Antimicrobial Agents, 55*(3), 105924. <https://doi:10.1016/j.ijantimicag.2020.105924>.
- Laranjeira, C., Querido, A., Marques, G., Silva, M., Simões, D., Gonçalves, L., & Figueiredo,

- R. (2021). COVID-19 pandemic and its psychological impact among healthy Portuguese and Spanish nursing students. *Health Psychology Research, 9*(1), 1–11. <https://doi.org/10.52965/001c.24508>
- Marcén-Román, Y., Gasch-Gallen, A., de la Mota, I. I. V. M., Calatayud, E., Gómez-Soria, I., & Rodríguez-Roca, B. (2021). Stress perceived by university health sciences students, 1 year after covid-19 pandemic. *International Journal of Environmental Research and Public Health, 18*(10), 1–10. <https://doi.org/10.3390/ijerph18105233>
- Mavragani, A. (2020). Tracking COVID-19 in Europe: Infodemiology approach. *JMIR Public Health and Surveillance, 6*(2), 1–13. <https://doi.org/10.2196/18941>
- Mechili, E. A., Saliaj, A., Kamberi, F., Girvalaki, C., Peto, E., Patelarou, A. E., Bucaj, J., & Patelarou, E. (2021). Is the mental health of young students and their family members affected during the quarantine period? Evidence from the COVID-19 pandemic in Albania. *Journal of Psychiatric and Mental Health Nursing, 28*(3), 317–325. <https://doi.org/10.1111/jpm.12672>
- Odrizola-González, P., Planchuelo-Gómez, Á., Irurtia, M. J., & de Luis-García, R. (2020). Psychological effects of the COVID-19 outbreak and lockdown among students and workers of a Spanish university. *Psychiatry Research, 290*, 113108. <https://doi.org/10.1016/j.psychres.2020.113108>
- Pais-Ribeiro, J., Silva, I., Ferreira, T., Martins, A., Meneses, R., & Baltar, M. (2007). Validation study of a Portuguese version of the Hospital Anxiety and Depression Scale. *Psychology, Health and Medicine, 12*(2), 225–237. <https://doi.org/10.1080/13548500500524088>
- Patelarou, A., Mechili, E. A., Galanis, P., Zografakis-Sfakianakis, M., Konstantinidis, T., Saliaj, A., Bucaj, J., Alushi, E., Carmona-Torres, J. M., Cobo-Cuenca, A. I., Laredo-Aguilera, J. A., & Patelarou, E. (2021). Nursing students, mental health status during COVID-19 quarantine: evidence from three European countries. *Journal of Mental Health, 30*(2), 164–169. <https://doi.org/10.1080/09638237.2021.1875420>
- Paulino, M., Dumas-Diniz, R., Brissos, S., Brites, R., Alho, L., Simões, M. R., & Silva, C. F. (2021). COVID-19 in Portugal: exploring the immediate psychological impact on the general population. *Psychology, Health and Medicine, 26*(1), 44–55.

<https://doi.org/10.1080/13548506.2020.1808236>

- Peckham, E., Algar, V., Crosland, S., Heron, P., Johnston, G., Newbronner, E., Ratschen, E., Spanakis, P., Wadman, R., Walker, L., & Gilbody, S. (2021). Investigating smoking and nicotine dependence among people with severe mental illness during the COVID-19 pandemic: analysis of linked data from a UK Closing the Gap cohort. *BJPsych Open*, 7(3), 1–3. <https://doi.org/10.1192/bjo.2021.45>
- Picaza Gorrochategi, M., Eiguren Munitis, A., Dosil Santamaria, M., & Ozamiz Etxebarria, N. (2020). Stress, Anxiety, and Depression in People Aged Over 60 in the COVID-19 Outbreak in a Sample Collected in Northern Spain. *American Journal of Geriatric Psychiatry*, 28(9), 993–998. <https://doi.org/10.1016/j.jagp.2020.05.022>
- Reverté-Villarroya, S., Ortega, L., Lavedán, A., Masot, O., Burjalés-Martí, M. D., Ballester-Ferrando, D., Fuentes-Pumarola, C., & Botigué, T. (2021). The influence of COVID-19 on the mental health of final-year nursing students: comparing the situation before and during the pandemic. *International Journal of Mental Health Nursing*, 30(3), 694–702. <https://doi.org/10.1111/inm.12827>
- Roca, J., Canet-Vélez, O., Cemeli, T., Lavedán, A., Masot, O., & Botigué, T. (2021). Experiences, emotional responses, and coping skills of nursing students as auxiliary health workers during the peak COVID-19 pandemic: A qualitative study. *International Journal of Mental Health Nursing*, 30(5), 1080–1092. <https://doi.org/10.1111/inm.12858>
- Santarone, K., McKenney, M., & Elkbuli, A. (2020). Preserving mental health and resilience in frontline healthcare workers during COVID-19. *American Journal of Emergency Medicine*, 38(7), 1530–1531. <https://doi.org/10.1016/j.ajem.2020.04.030>
- Savitsky, B., Findling, Y., Ereli, A., & Hendel, T. (2020). Anxiety and coping strategies among nursing students during the covid-19 pandemic. *Nurse Education in Practice*, 46(May), 102809. <https://doi.org/10.1016/j.nepr.2020.102809>
- Shevlin, M., McBride, O., Murphy, J., Miller, J. G., Hartman, T. K., Levita, L., Mason, L., Martinez, A. P., McKay, R., Stocks, T. V. A., Bennett, K. M., Hyland, P., Karatzias, T., & Bentall, R. P. (2020). Anxiety, depression, traumatic stress and COVID-19-related anxiety in the UK general population during the COVID-19 pandemic. *BJPsych Open*,

- 6(6), 1–9. <https://doi.org/10.1192/bjo.2020.109>
- Snaith, RP, & Zigmond, A.S. (1994) *The Hospital Anxiety and Depression Scale Manual*. Nfer-Nelson, Windsor.
- Spanish Ministry of Health,(2020). Orden SND/232/2020, de 15 de marzo, por la que se adoptan medidas en materia de recursos humanos y medios para la gestión de la situación de crisis sanitaria ocasionada por el COVID-19., *Boletín Oficial del Estado* 61561 (2020). <https://www.boe.es/eli/es/o/2020/03/15/snd232/con>
- Sultana, M. S., Khan, A. H., Hossain, S., Ansar, A., Sikder, M. T., & Hasan, M. T. (2021). Prevalence and predictors of posttraumatic stress symptoms and depressive symptoms among Bangladeshi students during COVID-19 mandatory home confinement: A nationwide cross-sectional survey. *Children and Youth Services Review, 122*, 105880. <https://doi.org/10.1016/j.childyouth.2020.105880>
- Tang, W., Hu, T., Hu, B., Jin, C., Wang, G., Xie, C., Chen, S., & Xu, J. (2020). Prevalence and correlates of PTSD and depressive symptoms one month after the outbreak of the COVID-19 epidemic in a sample of home-quarantined Chinese university students. *Journal of Affective Disorders, 274*, 1–7. <https://doi.org/10.1016/j.jad.2020.05.009>
- Tanji, F., & Kodama, Y. (2021). Prevalence of psychological distress and associated factors in nursing students during the COVID-19 pandemic: A cross-sectional study. *International Journal of Environmental Research and Public Health, 18*(19), 10358. <https://doi.org/10.3390/ijerph181910358>
- Tavolacci, M. P., Wouters, E., Van de Velde, S., Buffel, V., Déchelotte, P., Van Hal, G., & Ladner, J. (2021). The impact of covid-19 lockdown on health behaviors among students of a french university. *International Journal of Environmental Research and Public Health, 18*(8), 4346. <https://doi.org/10.3390/ijerph18084346>
- Thornton, T. M., Decker, S. A., & Roe, E. A. (2021). *Fear of Contagion Among Nursing Students in the Era of COVID-19*. *Journal of Nursing Education, 60*(7). <https://doi.org/10.3928/01484834-20210616-09>
- Universidad de Oviedo - Grado en Enfermería 2013 - Grados. (n.d.). Retrieved August 22, 2021, from [https://www.uniovi.es/estudios/grados/-/asset\\_publisher/X5CYKURHdF1e/content/grado-en-enfermeria-](https://www.uniovi.es/estudios/grados/-/asset_publisher/X5CYKURHdF1e/content/grado-en-enfermeria-)

2013?redirect=%2Festudios%2Fgradados

- Usher, K., Wynaden, D., Bhullar, N., Durkin, J., & Jackson, D. (2020). The mental health impact of COVID-19 on pre-registration nursing students in Australia. *International Journal of Mental Health Nursing*, 29(6), 1015–1017. <https://doi.org/10.1111/inm.12791>
- Weiss, D. S. (2007). The Impact of Event Scale: Revised. *Cross-Cultural Assessment of Psychological Trauma and PTSD*, 19, 219–238. [https://doi.org/10.1007/978-0-387-70990-1\\_10](https://doi.org/10.1007/978-0-387-70990-1_10)
- Weiss, D.S., & Marmar, C.R. (1997). The impact of event scale – revised. In: Wilson, J.P., & Keane, T.M. (editors). *Assessing psychological trauma and PTSD*. New York: Guilford Press; 1997. pp. 399–411.
- World Health Organization. (n.d.). *Tracking SARS-CoV-2 variants*. Retrieved January 14, 2022, from <https://www.who.int/en/activities/tracking-SARS-CoV-2-variants/>
- World Health Organization. (n.d.). *Depression*. Retrieved September 1, 2021, from [https://www.who.int/health-topics/depression#tab=tab\\_1](https://www.who.int/health-topics/depression#tab=tab_1)
- World Health Organization. (2021). WHO-convened Global Study of Origins of SARS-CoV-2 : China Part (14 January-10 February 2021). *Joint WHO-China Study Team Report, February*, 120.
- Worldometers. (n.d.). *COVID Live Update: 235,127,644 Cases and 4,807,158 Deaths from the Coronavirus - Worldometer*. Retrieved October 2, 2021, from <https://www.worldometers.info/coronavirus/>
- Yıldırım, M., Akgül, Ö., & Geçer, E. (2021). The Effect of COVID-19 Anxiety on General Health: the Role of Covid 19 Coping (Original article published in Turkish). *International Journal of Mental Health and Addiction*, 11: 1–12. <https://doi.org/10.1007/s11469-020-00429-3>
- Zhu, Y., Wang, H., & Wang, A. (2021). An evaluation of mental health and emotion regulation experienced by undergraduate nursing students in China during the COVID-19 pandemic: A cross-sectional study. *International Journal of Mental Health Nursing*, 30(5), 1160-1169. <https://doi.org/10.1111/inm.12867>

## 9. APPENDIX A

GOBIERNO DEL PRINCIPADO DE ASTURIAS

CONSEJERÍA DE SALUD

Dirección General de Calidad,  
Transformación y Gestión del  
Conocimiento

Comité de Ética de la Investigación del Principado de Asturias

Hospital Universitario Central de Asturias

N-1, S3.19

Avda. de Roma, s/n

33011 Oviedo

Tfno: 9851079 27 (ext. 37927/38028).


ceim.asturias@asturias.org

Oviedo, 26 de enero de 2022

El Comité de Ética de la Investigación del Principado de Asturias, ha revisado la *Enmienda relevante al cambio de Investigador Principal*, presentada en este Comité, para la Tesis Doctoral, anteriormente TFM, código del CEImPA nº 2020.116, titulado "**Psychological impact of COVID-19 in Spanish Nursing students and pharmacists**". realizado por Dña. Itziar Méndez Pinto y tutorizada por Dña. Pilar Mosteiro Díaz, Universidad de Oviedo.

El Comité ha tomado el acuerdo de considerar que la citada Enmienda reúne las condiciones éticas necesarias para poder realizarse y en consecuencia emite su autorización.

Le recuerdo que deberá guardarse la máxima confidencialidad de los datos utilizados en este proyecto.

  
Fdo: Pablo ISIDRO MARRON  
Secretario del Comité de Ética de la Investigación  
del Principado de Asturias

