

Research Article

Personal and academic factors of stress in nursing students during clinical practices in the context of COVID-19

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Summary

In the year 2020, COVID-19 spread globally. The increase in cases and deaths has created problems such as stress, anxiety, and depression in health workers.

The health care workers (inclusive of students in professional practices are vulnerable to psychiatric pathology due to their exposure to the virus, their increased risk of contagion and even death, overload of functions, pressure for decision-making, the close experience of patients, relatives, and colleagues' pain, and the requirement to function at the top of capacity.

The objective of this research is to analyse the personal and academic factors of stress development in nursing students, during clinical practices in the COVID-19 context.

It is a cases and controls study, with 154 students who attended clinical practices during the period of May-August 2020. High levels of stress were found in 61% of students, 34 of these had difficulties concentrating (OR: 3.08), 64 participants reported fear of contact with COVID-19 patients, (OR: 1.9) and 68 participants were identified with inadequate knowledge of COVID-19 transmission (OR: 1.5).

The study found that the transition to virtual classes as a strategy to reduce contagion increases three times the possibilities of developing stress, another variable that doubles the risk of stress is the fear of caring for a patient with COVID-19 who has not been diagnosed.

Introduction

The World Health Organization (WHO) mentioned that by the beginning of the 21st century, stress-related diseases would have outperformed infectious diseases, and it was estimated that by 2010, in Latin America and the Caribbean, there were more than 88 million people with stress-related disorders [1]. WHO further noted that study programs in medicine and nursing have not invested adequately in mental health subjects and practices. Considering that, the professionals in this field need intensive course training, the

lack of that hinders them from delivering adequate mental healthcare after graduating from the university [3,4].

In Nicaragua, morbidity in mental health has been on the rise and has grown alarmingly in recent years, attributing this to the limited capacity that health professionals have in addressing these conditions [2].

According to the Ministry of Health office in Leon, stress is considered one of the main health problems affecting its workers. Oscar Danilo Rosales Arguello (HEODRA), caring staff at the University Hospital, indicated that most of the

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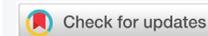
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nursing students exhibited emotional fatigue, anxiety, consumption of psychoactive substances, and disinterest in their clinical practices. These are behaviors attributed to stress [5].

In 2015, the Psychology department of the National Autonomous University of Nicaragua (UNAN León) conducted a study to investigate, 'the stress-generating factors in nursing students at the hospital clinical practices.' This revealed that double shifts and workload were the main stress-generating factors [6].

In December 2019, an outbreak of coronavirus pneumonia occurred in Wuhan, China, and in 2020, the disease (COVID-19) began to spread throughout the world. This rapid increase in cases and deaths has created issues such as stress, anxiety, and depression, in medical staff and the general population [1,7].

The health care workers (inclusive of students in professional practices) taking care of patients with COVID-19, is a population vulnerable to psychiatric pathology due to their exposure to the virus, their increased risk of contagion and even death, overload of functions, pressure for decision-making, the close experience of patients, relatives, and colleagues' pain, and the requirement to function at the top of capacity [3,8].

At the end of March 2020, the Ministry of Health of Nicaragua reported four people with COVID-19. One person died of the virus, and this increased anxiety, distress, stress, and feelings of helplessness amongst the population. The idea of quarantine also had a great effect, directly impacting the mental health of health students, who would face the pandemic regardless of its magnitude [9,10].

It is, therefore, important to investigate the impact of the COVID-19 pandemic on nursing students, to develop strategies to reduce the psychological impact that occurs during the crisis. Temporary suspension of face-to-face activities has been the most immediate impact on students, which has caused a completely new situation for university students and without a clear idea of how long it will last, thus impacting on their daily lives, considering the costs incurred and, of course, the continuity of their studies [11].

The following research question is raised for the above:

What are the personal and academic stress factors in nursing students during clinical practices in the context of COVID-19, at UNAN-León during 2020?

Objectives

To analyze the personal and academic factors of stress in nursing students during clinical practices in the context of COVID-19, of regular modality at UNAN-León, during the 2020 academic year.

Specific objectives:

1. Characterize the population under study demographically.
2. Identify the prevalence of stress in nursing students during clinical practices in the context of COVID-19.
3. Describe personal and academic stress-related factors in the context of COVID-19.

Methodological design

Type of study: Case and control study, because it represented a sample strategy in which the population under study was characteristically selected based on the presence (cases/with effect) or absence (controls/no effect) of stress during clinical practices, in addition, this study analysed the relationship between personal and academic factors as causal variables of stress.

Study area: The Nursing Department of the National Autonomous University of Nicaragua at Leon, located in the health education building in the city of León. It has a staff of 23 Nursing Educators, offers a full-time bachelor program, with 10 academic semesters equivalent to 5 years of university studies, with the option to graduate with one of the two bachelor's degrees, corresponding to nursing sciences, and maternal and children nursing care.

As an integral part of the academic program, nursing students must complete a total of 80 hours of clinical practices divided into 40 hours in primary health care and 40 hours in secondary health care in each academic semester, starting in the second year of study. The clinical practices in secondary health care take place at the University Hospital Oscar Danilo Rosales Arguello HEODRA. During this period, students provide direct care to patients admitted to the health unit, taking an active role in integrating the multidisciplinary team, while being supervised by a tutor appointed by the nursing department, monitored, and assisted by local health personnel.

In 2020, clinical practices were affected by the outbreak of the COVID-19 pandemic, reducing its development from 8 hours per day to only 4 hours per day, the practice groups were reduced to 6 students to avoid crowding in the hospital facilities that could increase the risk of COVID-19 contagion, in addition, this meant greater monitoring by the clinical tutor. To protect the health and integrity of the practice groups, students were not assigned to high-risk areas, such as the respiratory patient room.

During the clinical practices, the students providing direct care to the patients took all biosafety measures to prevent the spread of pathogens.

Study population: Students enrolled in the 2020 academic period, from the academic levels (II-V) of the UNAN



León Nursing degree, who developed their clinical practices in the context of the COVID-19 pandemic. The total was 154 students who met the criteria of the unit of analysis.

Inclusion criteria: Nursing Department students from academic levels (II-V).

Had fulfilled their clinical practice in the context of the COVID-19 pandemic.

Had voluntarily consented to participate in the clinical practice in the context of the COVID-19 pandemic study.

Exclusion criteria: To have not performed clinical practices during the study period.

Information collection method: the data collection exercise was carried out through the survey method, after obtaining a legal permit from the Director of Nursing Department, it was coordinated with different professors responsible for addressing students according to the active days and hours of face-to-face classes, to explain the procedure of filling the survey; which was applied online through a questionnaire sent in Google forms, explained the ethical criteria of the study and making it known to participants the importance of their participation in the study intended to know the effects of the pandemic on the mental health of nursing students.

The questionnaire consisted of 23 questions based on sociodemographic data, personal factors, academic factors, in addition to the questions of the Perceived Stress Scale (PSS14) test containing 14 items. The Perceived Stress Scale is an instrument adapted to the Spanish version by Dr. Eduardo Remor (Spain, 2006), which was used to assess the behavior of the person on aspects of feelings, thoughts, and activities during the last month, including the day of the application of the test.

This scale is an instrument of self-reporting that evaluates the level of stress perceived during the last month, consisting of 14 items with a response format of a scale of five points (0 x 5 never, 1'4 almost never, 2 x 3 from time to time, 3'2 often, 4'1 very often). The total score of the PSS14 is obtained by reversing the scores of items 4, 5, 6, 7, 9, 10, and 13 (in the following direction: 0-4, 1-3, 2-2, 3-1, and 4-0) and then adding the 14 items. It gives scores between 0 and 56, and where it was taken as higher recency, 28 in the score corresponded to a student with stress [12].

Definition of comparison groups

Cases: Students who according to the PSS14 test were found at a score of more than 28 points on the perceived stress scale.

Controls: Students who scored less than or equal to 28 points on the PSS14 test.

Data analysis: The information collected through the

Google Forms platform was exported to an Excel document which was processed in the SPSS version 22 statistical program. The analysis of the information was carried out through analytical statistics, 2×2 contingency tables were used to demonstrate the association of the variables, through the statistical test Chi-square (X^2). Where X^2 is less than 0.05 implied a statistical association between the variables.

Odds Ratio (OR) test was used to calculate the risk a variable takes, an OR less than 1 indicates a protective factor, while an OR greater than 1 indicates a risk factor, the analysis was performed with a 95% confidence interval, hence, work was done with natural limits to determine statistical significance [13].

Ethical aspects: Informed Consent, Anonymity, Confidentiality, and Autonomy.

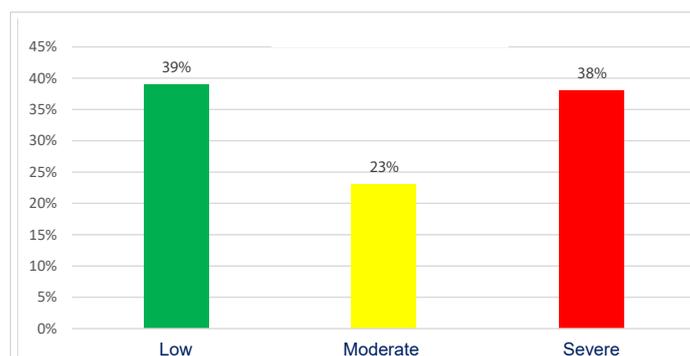
Results

The research on personal and academic factors related to stress in nursing students during clinical practices developed in the period from May to August 2020 in the pandemic context at UNAN-León had a population of 154 students, the age range was from 18 to 27 years, resulting in a statistical model of 20 years.

The female gender predominated with 137/154 (89%), most of the students were from the first two years of study (Second and third year) with 53/154 (34%) in the second year and 32/154 (21%) in the third year, the fourth-year students represented 29/154 (19%), and the fifth-year students were 40/154 (26%). 142/154 (92%) of the participants were single, the urban origin represented 102/154 (66%), and 10/154 (6.5%) have children.

On the level of stress in the nursing students during the period of their clinical practices that started in May until August of 2020 in the context of COVID-19, a prevalence of 61% equivalent to 93/154 of the participants was identified, of this 23% of the population studied presented moderate stress and 38% of nursing students had severe stress (Graph 1).

By dividing the study period into two groups to establish



Graph 1: Level of stress in nursing students during clinical practice 2020.



the comparison, the second-, and third-year groups were defined as initial years, and the fourth and fifth years were defined as final years. It was found that 54 students with stress belonged to the initial year of study with an OR of 1.3 (P: 0.377) (95% CI: 0.7 - 2.6) when checking whether students used public transportation to travel from another city to the city of León for more than 1 hour, 35 of those who had stress did so, presenting an OR of 1.7 (P: 0.884) (95% CI: 0.5 - 2.1).

The difficulties in concentrating during clinical practices were present in 35 stress participants obtaining an OR of 3.08 (P: 0.005) (CI 95%: 1.4 - 6.8), in the question of conflict presented with the staff of the room where participants rotated in their clinical practices or with the teacher assigned as a tutor, it was reported in 40 students who presented stress reaching an OR of 2.2 (P: 0.05) (CI 95%: 1.6 - 3.9) (Table 1).

When asking if the student considered their knowledge as being adequate to develop clinical practice, 77 of those who had stress responded affirmatively to the question with an OR of 1.3 (P: 0.524) (CI 95%: 0.6 - 2.9), 63 of the participants with stress were very concerned about the results they would obtain in their performance evaluations in the practical area, reaching an OR of 2.3 (P: 0.012) (95% CI: 1.2 - 4.1), the assignment overload was expressed in 68 students with stress with an OR of 2.1 (P: 0.012) (95% CI: 1.5 - 4.1), students with difficulties when using the patient's clinical file had an OR of 2.6 (P: 0.005) (95% CI: 1.3 - 5.0), and those who considered themselves not correctly being able to master nursing procedures and actions for patient care reached an OR of 2.2 (P: 0.048) (95% CI: 1.3 - 4.8) (Table 2).

The high flow of information about the COVID-19 pandemic situation caused stress in 56 students, presenting an OR of 1.7 (P: 0.12) (95% CI: 0.6 - 2.9). Of the stressed participants, 68 had difficulty following the virtual modality

Table 1: Personal factors in relation to the stress development of UNAN-León Nursing students.

Year of study	Stress on students		Total	X ² : (P)	OR	IC: 95%
	Yes	No				
II-III year	54	31	85	0.377	1.3	(0.7-2.6)
IV-V year	39	30	69			
Travel daily from another city to Leon, for more than 1 hour on public transport				0.884	1.07	(0.5-2.1)
Yes	35	22	57			
No	58	39	97			
Difficulty of concentration				0.005	3.08	(1.4-6.8)
Yes	35	10	45			
No	58	51	109			
Drug and alcohol consumption				0.979	0.98	(0.2-3.6)
Yes	6	4	10			
No	87	57	144			
Conflicts with health staff/teacher in clinical area				0.05	2.2	(1.6-3.9)
Yes	40	17	57			
No	53	44	97			
Meet new tutor				0.13	1.6	(0.9-3.1)
Yes	51	26	77			
No	42	35	77			

Table 2: Academic factors about the stress development of UNAN-León Nursing students.

Knowledge adequate to develop clinical practices	Stress on students		Total	X ² : (P)	OR	IC: 95%
	Yes	No				
Yes	77	48	125	0.524	1.3	(0.6-2.9)
No	16	13	29			
Concern about evaluation results				0.012	2.3	(1.2-4.5)
Yes	63	29	92			
No	30	32	62			
Assignment overload				0.03	2.1	(1.5-4.1)
Yes	68	35	103			
No	24	26	50			
Difficulties with the use of patients' clinical file				0.005	2.6	(1.3-5.0)
Yes	58	24	82			
No	35	37	72			
Lack of mastery in health procedures and nursing care				0.048	2.2	(1.3-4.8)
Yes	78	43	121			
No	15	18	33			

Table 3: Situations generated as a contingency to the contagion of COVID 19 concerning the stress development of UNAN-León Nursing students.

COVID-19 Information Flow	Stress on students		Total	X ² : (P)	OR	IC: 95%
	Yes	No				
Yes	56	29	85	0.12	1.7	(0.6-2.9)
No	37	32	69			
Difficulty following the virtual modality of the theoretical classes together with the clinical practices				0.02	3.0	(1.5-5.9)
Yes	68	29	85			
No	25	32	69			
Knowledge about the transmission of COVID- 19				0.67	1.5	(0.2-11.2)
Inappropriate	68	43	111			
Suitable	25	18	43			
Correct Use of face mask				0.073	0.75	(0.1-4.3)
Yes	89	59	148			
No	4	2	6			
Fear of providing nursing care to a patient with COVID-19 without having been diagnosed				0.05	1.9	(1.3-3.7)
Yes	64	33	97			
No	29	28	57			

of the theoretical classes together with the clinical practices, achieving an OR of 3 (P: 0.02) (95% CI: 1.5 - 5.9). The fear of providing nursing care to a patient with COVID-19 without having been diagnosed had an OR of 1.9 (P: 0.048) (95% CI: 1.3 - 3.7) (Table 3).

Discussion

This study analyzed the relationship between the experience acquired by students in previous years of the university period of study by comparing two groups. The first group comprised of students from academic years (II to III) who had little experience, and another group composed of those from academic years IV and V, with greater experience in the clinical areas. When measuring the relationship of the presence of stress was taken as a variable of exposure to the least experienced in clinical practices, despite this, no association of variables or statistical significance was found in the data, with stress during clinical practices in both comparison groups.



On the analysis of the relationship between the use of public transport for more than one hour to travel from another city to Leon, to be present in clinical practices and the development of stress, found out that, by their value of X^2 , these phenomena are associated, increasing up to three times the presence of stress in this population. These results are reinforced by the conclusion by Marín Laredo who proposed that most stressed students who traveled from other cities to attend their University, due to the increased use of the means of transport time control, and the late arrival probabilities, in the context of COVID-19, this stressor factor can be underpinned because public transport exposes crowds and make it difficult, for social distancing [14].

The difficulties in concentration during the development of clinical practices was another variable that was associated with the presence of stress increasing up to three times the risk of developing it, this could further be explained that the focus of nursing students should be on performing the procedures correctly, satisfying the evaluators' demands, by properly using biosecurity equipment and by taking precautions throughout the process to avoid being infected or infecting patients with COVID-19.

The conflict between health personnel and students or practitioners are commonly presented by an ineffective form of conflict resolution due to the fusion of personal problems with work or the lack of altruism and empathy with training professionals, who do not depend on educational centers or hospital policies but on the labor pressure, stress and psychosocial burden that this type of work generates [15]. Added to this, is the scarcity of inputs and human resources that can condition violent behavior or, sometimes, an insensitive and not very empathetic reception towards the student [16]. This was reflected in this study after being referred to by 57 of the 154 participants, hence proving to be a risk factor that doubled the presence of stress.

Concern about the results obtained in the evaluation of clinical practice was present in 92 participants, statistically associated with the development of stress increasing to 2.3 times the risk of developing it, this situation explains what is raised by Revuelta and Rodriguez for whom the achieved results are performed at the end of each practice where the level of learning achieved is measured and if it is considered optimal, in which the stress that is generated in the students in the face of an evaluation is always present [16].

Excessive workload assigned to nursing students during clinical practices was confirmed to condition their psychological responses because they were not fully prepared to deal with complex phenomena such as health problems. This situation increased to 2.3 times the risk of stress in this population, similar values that double the risk stress was presented by the lack of mastery of procedures and the problems presented with the use of the clinical record. Reyes and García observed that "nursing students developed stress

at the time of making annotations in the clinical record since they were aware that it was a legal document that should neither go with any kind of corrections nor amendments and that, they may be subjected to different types of medical and legal audits" [17].

Analyzing the relationship between stress and situations generated as contingency measures to COVID-19 contagion that nursing students face during the development of clinical practices found that taking their classes through the virtual modality tripled their risk of developing stress. Situation similar to Nekane Balluerka's study where students complained that they worked more than going to class, and now that one can't get out due to the pandemic, everything got more complicated because of online classes, video conferences, jobs, online exams, it proved hard to concentrate at home [18]. Another situation that doubled the risk of stress in nursing students, was the fear of caring for a patient with the COVID-19 virus during their clinical practices, especially those who had not yet been diagnosed.

Conclusion

This research was conducted with a sample of 154 participants, 93 cases and 61 controls, the statistical mode age was 20 years, with an age- range from 18 years and maximum of 27 years, predominated by the female gender, most participants were in academic level II representing 34% followed by those of level III, most are single, 9% of those investigated had at least 1 child.

The prevalence of stress was 61%, severe stress was present in 38% of nursing students who attended clinical practices during 2020.

Difficulties concentrating on the execution of procedures in the clinical environment is a risk factor that triples the onset of stress, another stress-causing variable in nursing students is the conflict between the student and their clinical tutor or health staff members resulting in double risk to be stressed.

Academic factors found out that, concerns about the results they would obtain in their performance evaluations in the practical area, the assignment overload of nursing students due to reduced time of stay in the clinical environment, lack of mastery in health procedures and nursing care, and difficulties with the use of patients' clinical files are variables that doubled the presence of stress in the studied population.

The context of the COVID-19 pandemic has led to situations affecting the development of clinical practices in nursing, this research found that the difficulties in following the virtual modality of the theoretical classes together with the clinical practices, a strategy to reduce contagion increases three times, the possibilities of developing stress, another variable is fear of providing nursing care to a patient with COVID-19 without being diagnosed, doubles the risk of stress.



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