

## **PERCEPTIONS OF NURSING UNDERGRADUATES ABOUT THE CHALLENGES FACED FOR TRAINING IN THE COVID-19 PANDEMIC**

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### **ABSTRACT**

**Objective:** to identify and discuss the challenges faced by nursing undergraduates of a public higher education institution during the COVID-19 pandemic.

**Method:** exploratory, cross-sectional, quantitative study conducted with nursing undergraduates from a public university in Recife, Pernambuco State, Brazil. Data collection took place between July 2021 and February 2022, using exclusively digital questionnaires. Descriptive analyses and statistical tests such as Kolmogorov-Smirnov, Chi-square and Fisher's exact test were performed.

**Results:** the study included 112 nursing undergraduates, mostly female, mean age of 20.9 years, white color/race, single, without children, with a family income of up to three minimum wages. The main challenges were: difficulty in adapting to remote teaching, changes in daily routine, distraction with subjects not discussed in class, fear and/or anxiety regarding the pandemic, difficulty in family support, influence of social isolation on interest in classes, need for institutional programs of financial and psychological support and government encouragement to disseminate measures against the coronavirus. Challenges such as difficulty in handling technological equipment and financial concerns were statistically associated with the variables computer and notebook ownership, quality of internet connection and private study environment.

**Conclusion:** the study raised reflections that emerged from a scenario of health and educational crisis, indicating that the COVID-19 pandemic caused relevant challenges for undergraduate nursing students' learning.

**DESCRIPTORS:** COVID-19. Apprenticeship. Nursing Education. Distance Education. Cross-Sectional Studies.

**HOW CITED:** Lima ACB, Santos DCM, Adamy EK, Gomes BMR. Perceptions of nursing undergraduates about the challenges faced for training in the covid-19 pandemic. *Texto Contexto Enferm* [Internet]. 2023 [cited YEAR MONTH DAY]; 32:e20220314. Available from: <https://doi.org/10.1590/1980-265X-TCE-2022-0314en>

# PERCEPÇÕES DE GRADUANDOS DE ENFERMAGEM ACERCA DOS DESAFIOS ENFRENTADOS PARA FORMAÇÃO NA PANDEMIA DA COVID-19

## RESUMO

**Objetivo:** Identificar e discutir os desafios enfrentados por graduandos de enfermagem de uma instituição de ensino superior pública durante a pandemia da COVID-19.

**Método:** Estudo exploratório, transversal, quantitativo, realizado com graduandos de enfermagem de universidade pública, em Recife, Pernambuco, Brasil. A coleta de dados ocorreu entre julho de 2021 e fevereiro de 2022, mediante questionários exclusivamente digitais. Procederam-se às análises descritivas e aos testes estatísticos, como Kolmogorov-Smirnov, Qui-quadrado e teste exato de Fisher.

**Resultados:** Participaram do estudo 112 graduandos de enfermagem, maioria do sexo feminino, idade média de 20,9 anos, cor/raça branca, solteira, sem filhos, com rendimento familiar de até três salários-mínimos. Os principais desafios foram: dificuldade na adaptação ao ensino remoto, alterações na rotina diária, distração com assuntos não discutidos nas aulas, medo e/ou ansiedade em relação à pandemia, dificuldade de apoio familiar, influência do isolamento social no interesse nas aulas, necessidade de programas institucionais de apoio financeiro e psicológico e incentivo governamental à divulgação de medidas contra o coronavírus. Desafios como dificuldade no manuseio de equipamentos tecnológicos e preocupações financeiras estiveram estatisticamente associados às variáveis posse de computador e notebook, qualidade de conexão à internet e ambiente de estudos privativo.

**Conclusão:** O estudo suscitou reflexões que emergiram de um cenário de crise sanitária e educacional, indicando que a pandemia da COVID-19 provocou relevantes desafios para aprendizagem de estudantes de graduação em enfermagem.

**DESCRITORES:** COVID-19. Aprendizagem. Educação em Enfermagem. Educação à Distância. Estudos Transversais.

# PERCEPCIONES DE LOS LICENCIADOS EN ENFERMERÍA SOBRE LOS DESAFÍOS ENFRENTADOS PARA LA FORMACIÓN EN LA PANDEMIA DEL COVID-19

## RESUMEN

**Objetivo:** identificar y discutir los desafíos que enfrentan los estudiantes de enfermería de una institución pública de educación superior durante la pandemia de COVID-19.

**Método:** estudio cuantitativo, transversal, exploratorio, realizado con estudiantes de enfermería de una universidad pública de Recife, Pernambuco, Brasil. La recolección de datos se llevó a cabo entre julio de 2021 y febrero de 2022, utilizando cuestionarios exclusivamente digitales. Se realizaron análisis descriptivos y pruebas estadísticas, como Kolmogorov-Smirnov, Chi-cuadrado y prueba exacta de Fisher.

**Resultados:** participaron del estudio 112 estudiantes de enfermería, en su mayoría del sexo femenino, edad media 20,9 años, color/raza blanca, solteros, sin hijos, con renta familiar de hasta tres salarios mínimos. Los principales desafíos fueron: dificultad de adaptación al aprendizaje a distancia, cambios en la rutina diaria, distracción con temas no discutidos en clase, miedo y/o ansiedad con respecto a la pandemia, dificultad en el apoyo familiar, influencia del aislamiento social en el interés por las clases, necesidad de apoyo institucional. programas de apoyo financiero y psicológico e incentivos gubernamentales para la difusión de medidas contra el coronavirus. Desafíos como dificultad en el manejo de equipos tecnológicos y preocupaciones financieras se asociaron estadísticamente con las variables posesión de computadora y notebook, calidad de conexión a internet y ambiente privado de estudio.

**Conclusión:** el estudio suscitó reflexiones que emergieron de un escenario de crisis sanitaria y educativa, indicando que la pandemia de la COVID-19 provocó desafíos relevantes para el aprendizaje de los estudiantes de graduación en enfermería.

**DESCRIPTORES:** COVID-19. Aprendiendo. Educación en Enfermería. Educación a distancia. Estudios transversales.



## INTRODUCTION

On March 11, 2020, when the infection caused by the SARS-CoV-2 coronavirus had spread to several continents, the World Health Organization (WHO) declared the COVID-19 pandemic. One of the strategies adopted against the spread of COVID-19, worldwide, was the closure of educational institutions, which caused adverse consequences to education, such as interruption of learning, loss of interaction between students and teachers, difficulties in the sudden transition from the face-to-face environment to virtual platforms, increased dropout rates and overload due to the demands of teaching based on digital technologies<sup>2</sup>.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), more than 890 million students at various levels of education have been affected by the closure of educational institutions in the pandemic and about 160 countries have had their institutions completely closed, impacting on the training of more than 87% of students worldwide<sup>2</sup>. As a result, educational institutions opted for the use of remote teaching, a proposal developed in exceptional character to offer educational activities based on Digital Information and Communication Technologies (TDIC), at the various levels of education, as a way to ensure the continuity of learning and allow students, teachers and staff to comply with the public health measures necessary to cope with the pandemic<sup>1,3</sup>.

In Brazil, the Ministry of Education (MEC) authorized, on March 17, 2020, by Ordinance No.343, the substitution, on an exceptional basis, of face-to-face classes by classes in digital media, while the pandemic situation lasted. With the course of the pandemic and the need to restructure education mediated by digital technologies, other legal instruments were instituted by the competent entities to regulate and reorganize the activities carried out through remote teaching<sup>4</sup>.

In this scenario, university students who attended face-to-face classes before the pandemic and underwent the sudden change to remote learning, faced challenges for academic training, such as decreased productivity, less dedication to study, impossibility of applying practical activities, dissatisfaction with the virtual pedagogical platform, increased time on the internet due to the accumulation of activities, greater need to filter the information received in the face of possible false news and others. The interruption of face-to-face classes also revealed challenges, such as the difficulty for students to access technological tools and the lack of equipment for teachers<sup>1,3,5</sup>. Research that investigated the educational experiences of students from seven American universities during the COVID-19 pandemic showed negative impacts on academic training, such as decreased productivity, motivation, focus for studies and ability to learn, as well as constant distraction and the absence of adequate space for teaching. Students also demonstrated concerns about the ability to learn in the online environment, perform group activities, manage the required activities and obtain satisfactory grades<sup>6</sup>.

Higher education institutions in nursing were also impacted by the COVID-19 pandemic, both in relation to face-to-face teaching and practical classes held in health units, since nursing training requires psychomotor skills that depend on learning in practical training and experiences with the patient, which were interrupted in the early stages of the pandemic<sup>7</sup>. A qualitative study developed at a North American university, carried out with third and fourth-year undergraduate nursing students who received virtual classes during the COVID-19 pandemic, pointed out challenges of remote teaching to nursing education, such as few opportunities for practical experiences and impossibility of therapeutic communication with the patient at the bedside<sup>8</sup>.

The International Council of Nurses, an entity made up of more than 130 national associations of nurses, has shown that the COVID-19 pandemic may have long-term implications for the nursing workforce, which requires joint efforts between educational institutions, health service providers and government leaders, so that the training of these professionals is not impaired<sup>9</sup>. Thus, from the perspective of returning to face-to-face activities in the post-pandemic period, recognizing the difficulties encountered by nursing students during remote teaching is crucial, so that they are faced in the medium and long term<sup>7-8</sup>.

With the acceleration of learning mediated by digital technologies during the COVID-19 pandemic, it was observed that there was not enough preparation of teachers to develop classes in the online modality and many students were not prepared to use them. There is even an increase in social inequalities in relation to access to technologies for remote teaching<sup>1,4,6</sup>. Therefore, understanding the way students are studying and the difficulties they face in this critical period is one of the first steps for educational institutions to design pedagogical activities that are more appropriate to the reality of students, which justifies the importance of the proposed investigation in this study.

Therefore, considering that, the pandemic brought a series of physical, social, economic and psychological repercussions for high education health students, this study aimed to identify and discuss the challenges faced by nursing students from a public higher education institution, during the COVID-19 pandemic.

## METHOD

A descriptive, cross-sectional study with a quantitative approach was carried out, whose design was due to the possibility of obtaining a description of the challenges faced by nursing undergraduates during remote teaching in the COVID-19 pandemic and to identify possible correlations between the characteristics of these students. As this is an observational epidemiological study, the construction of this study followed the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) protocol, which provides subsidies for scientific communication of observational studies<sup>10</sup>.

The study was developed at the Nossa Senhora das Graças Nursing Faculty, one of the teaching units of the University of Pernambuco (UPE), a public higher education institution belonging to the Government of the State of Pernambuco, Brazil. The institution's curriculum is modular and integrated, consisting of ten modules<sup>11</sup>. On July 23, 2020, during the COVID-19 pandemic, the UPE approved the completion of the supplementary period 2020<sup>3</sup>, an extra semester for graduation with classes in the remote teaching modality, whose students joined on an optional basis. Still, due to the pandemic, the institution held the semesters of 2020.1, 2020.2, 2021.1 and 2021.2, through remote teaching, with synchronous and asynchronous classes, using virtual learning environments and other digital resources<sup>12</sup>.

The study population was composed of students of the Undergraduate Nursing Course who attended the supplementary period 2020.3 (beginning on September 8, 2020, lasting 10 weeks) and the academic semester 2020.1 (beginning on February 8, 2021, lasting 14 weeks) of the institution, regularly enrolled between Modules I to VIII. The last two modules of the course did not participate in the study, as they were intended for the supervised internship.

Sampling took place in a non-probabilistic way, carried out for convenience, and the sample was delimited from the calculation of the sample size for frequency in a population. When considering the estimated number of 395 nursing students enrolled from Modules I to VIII during the supplementary period 2020.3 and the academic semester 2020.1, the 95% confidence interval and the margin of error were used to calculate the sample of 5%, totaling a minimum sample of 195 participants. Participants were recruited completely remotely, using institutional email addresses and digital applications.

Inclusion criteria were: being a FENSG/UPE student regularly enrolled in the supplementary term 2020.3 and/or academic semester 2020.1; be aged 18 years or over. Exclusion criteria were: students who did not complete the additional period 2020.3 and/or academic semester 2020.1 (enrollment suspension, medical leave, gestational leave or any other reason); enrolled students who did not reach the minimum percentage of attendance in the mandatory workload of theoretical-practical activities developed in the Curriculum Modules.

Data collection was carried out between July 2021 and February 2022, using an online form. The instruments were developed by the authors and applied using the Google Forms® digital tool, using a questionnaire to characterize the study participants, containing sociodemographic and digital variables (possession of digital equipment, possession of an internet connection, type of digital resources that uses, frequency of use of digital resources, familiarity with digital resources and training on digital technologies), in addition to a questionnaire to survey the challenges presented by students, entitled "Student perception of remote teaching during the COVID-19 pandemic". The construction of this questionnaire was based on the report "COVID-19 and higher education: from the immediate effects to the next day; impact analyses, policy responses and recommendations"<sup>13</sup> and considered what the literature evidences about the personal, school, family, social and emotional context of students, from the perspective of the emerging need to adapt to remote teaching<sup>2,14-16</sup>.

The responses to the questionnaires were automatically recorded in a Google Sheets® spreadsheet, whose file was exported for statistical analysis in the Statistical Package for Social Science (SPSS), version 21.0. Descriptive analyzes were performed to obtain measurements of frequency (absolute and percentage), central tendency (mean) and dispersion (standard deviation).

Statistical analyzes were performed using the Kolmogorov-Smirnov (K-S) test to assess data distribution (as the study has more than two independent variables, the K-S normality test was used for each set of variables); and the Chi-square or Fisher's Exact tests, to verify the existence of correlation between the variables. When the p-value calculated in the statistical tests was less than 5% ( $p < 0.05$ ), it was possible to accept the alternative hypothesis that there was an association between the variables ( $p\text{-value} < 0.05$  was considered significant).

The research was conducted in accordance with the norms of Resolution 466/12 of the National Health Council (CNS), whose project was evaluated and approved by the Research Ethics Committee of the institution where the study was conducted. The study also complied with the norms proposed by the National Research Ethics Commission (CONEP) on the procedures that involve data collection in a virtual environment, at any stage of the research, aiming to guarantee the protection, safety and rights of the participants. The research participants signed the Free and Informed Consent Form before having access to the data collection instruments.

## FINDINGS

The study included 112 undergraduate nursing students, most of whom were female and had a mean age of  $20.9 \pm 2.1$  years, with no comorbidities. The other sociodemographic characteristics are described in Table 1. Among the students, 60.7% declared an average family income of up to three minimum wages, 89.3% reported not being working and 93.8% were not receiving institutional aid (financial, transportation, scientific initiation or others) to study at the university. When asked about the financial impact suffered during the COVID-19 pandemic on family dynamics, 55.4% of students reported reduced family income (decreased wages, unemployment, and others).

Regarding the challenges presented by undergraduate nursing students in remote learning during the COVID-19 pandemic, the main personal, social, institutional and governmental challenges were highlighted. Table 2 expresses the personal challenges exposed by the research participants.

**Table 1** – Sociodemographic characterization of nursing students in emergency remote education (n=112). Recife, Pernambuco, Brazil (2022).

Variables		n	%
Sex	Female	100	89.3
	Male	12	10.7
Color/race	White	59	52.7
	Mixed	43	38.4
	Black	9	8.0
	Yellow (Asian)	1	0.9
Origin	Metropolitan Region of Recife	85	75.9
	Zona da Mata	19	17.0
	Agreste	6	5.4
Marital status	Other regions of the country	2	1.8
	Single	107	95.5
Has children	Married/Stable Union	5	4.5
	No	109	97.3
Median household income (minimum wage)	Yes	3	2.7
	$\geq 3$	68	60.7
	04 - 06	35	31.3
	07 - 10	7	6.3
Residential location zone	> 10	2	1.8
	Urban area	110	98.2
Number of people with whom the student shares the place where he/she lives	Rural area	2	1.8
	3 - 5	70	62.5
	1 - 2	36	32.1
	6 - 8	4	3.6
	Lives alone	2	1.8

**Table 2** – Personal challenges presented by undergraduate nursing students during remote teaching. Recife, PE, Brazil, 2022. (n=112)

Personal challenges presented by nursing students in remote learning	Answers					
	Yes		No		I don't know how to answer	
	n	%	n	%	n	%
Difficulty in adapting to the emergency substitution of face-to-face teaching activities for the format of remote classes	95	84.8	16	14.3	1	0.9
Need for changes in daily routine to attend remote classes	99	88.4	12	10.7	1	0.9
Difficulty in handling technological equipment (computer, tablet, headphones, camera, etc.)	20	17.9	91	81.3	1	0.9
Difficulty in accessing the internet network and digital platforms for learning in remote learning	29	25.9	82	73.2	1	0.9
Distraction with subjects that were not being discussed in remote classes	111	99.1	1	0.9	0	0.0
Feelings such as fear and/or anxiety about the pandemic making learning difficult	98	87.5	11	9.8	3	2.7
Feeling safe to return to face-to-face teaching activities	58	58.1	40	35.7	14	12.5
Thought of giving up on pursuing the course in the remote format	73	65.2	37	33.0	2	1.8

Regarding the characterization of digital variables, 92.0% of the participants stated that they had a desktop or notebook computer to attend remote classes, 81.3% of them considered having a good internet connection, 65.2% indicated having good familiarity with the resources of virtual classrooms, 52.7% reported studying in an environment with silence and/or privacy and 93.8% highlighted that they felt the need to receive training on digital technologies.

The difficulty in handling technological equipment was a challenge statistically associated with digital variables, whose difficulty was greater among students who did not have a computer or notebook, who did not consider having good quality of internet connection, were not familiar with the resources of virtual classrooms, did not study in a study environment with silence and/or privacy to attend remote classes and had the need to receive training on the digital technologies, in which  $p$ -value < 0.001 was found in these associations.

The social and institutional challenges presented by the undergraduates during remote classes were also investigated, as detailed in Tables 3 and 4, respectively. In this study, it was observed that financial concerns were statistically associated with digital variables, especially with computer and notebook ownership ( $p$ -value=0.025), quality of internet connection ( $p$ -value <0.001) and private study environment ( $p$ -value <0.001).

Finally, the governmental challenges presented by the study participants during remote classes were identified, as shown in Table 5. No statistically significant associations were found between digital variables and institutional or governmental challenges.

**Table 3 – Social challenges presented by undergraduate nursing students during remote teaching. Recife, PE, Brazil, 2022. (n=112)**

Social challenges presented by nursing students in remote learning	Answers					
	Yes		No		I don't know how to answer	
	n	%	n	%	n	%
Difficulty interacting with classmates during remote classes	40	35.7	68	60.7	4	3.6
Difficulty in interacting with teachers during remote classes	61	54.5	49	43.8	2	1.8
Difficulty in family support to attend remote classes	84	75.0	20	17.9	8	7.1
Financial concerns that have hampered learning in remote learning	63	56.3	45	40.2	4	3.6
Concerns about the pandemic's restrictive measures hampering learning	71	63.4	40	35.7	1	0.9
Influence of social isolation on interest in attending remote classes	90	80.4	17	15.2	5	4.5

**Table 4 – Institutional challenges presented by undergraduate nursing students during remote teaching. Recife, PE, Brazil, 2022. (n=112)**

Institutional challenges presented by nursing students in remote teaching	Answers					
	Yes		No		I don't know how to answer	
	n	%	n	%	n	%
Offer training for the use of Virtual Learning Environment (VLE) before remote classes	25	22.3	66	58.9	21	18.8
Adjustments in the academic calendar of the educational institution	28	25.0	71	63.4	13	11.6
Technological infrastructure of your educational institution (computers, Internet, etc.) sufficient to meet the needs of remote learning	33	29.5	48	42.9	31	27.7
Offer technical support staff to troubleshoot potential VLE issues during remote classes	51	45.5	34	30.4	27	24.1
Teachers sufficiently trained to teach in the VLE	32	28.6	61	54.5	19	17.0
Offering support programs for students who do not have the necessary resources to attend remote classes	85	75.9	04	3.6	23	20.5
Providing psychological support for students to continue remote learning in the face of the challenges of the pandemic	70	62.5	20	17.9	22	19.6
Evaluation of activities in remote teaching adequately portraying learning	29	25.9	67	59.8	16	14.3
Offer of conditions for the safe return of face-to-face classes	50	44.6	38	33.9	24	21.4
Offer of conditions for the safe return of curricular internships	63	56.3	24	21.4	25	22.3

**Table 5 – Government challenges presented by undergraduate nursing students during remote teaching. Recife, PE, Brazil, 2022. (n=112)**

Government challenges presented by nursing students in remote learning	Answers					
	Yes		No		I don't know how to answer	
	n	%	n	%	n	%
Search for sufficient strategies to ensure remote education by government bodies (municipal, state and/or federal)	08	7.1	94	83.9	10	8.9
Government allocation of sufficient resources to the educational institution to prepare for remote learning	03	2.7	97	86.6	12	10.7
Guarantee of research and extension support programs during the period of remote teaching	04	3.6	85	75.9	23	20.5
Government allocation of sufficient resources to assist students who were unable to attend remote learning	06	5.4	90	80.4	16	14.3
Government encouragement to disseminate coronavirus protection measures in the academic environment	47	42.0	49	43.8	16	14.3
Taking effective measures to ensure the safe return of face-to-face teaching activities	28	25.0	68	60.7	16	14.3

## DISCUSSION

The COVID-19 pandemic was an event of global proportions that caused disruption in the daily lives of university students, impacting on human dimensions, family relationships, socioeconomic status, educational aspects and mental health<sup>2,5,16</sup>. Worldwide, educational institutions, faced with the “emergency phase” of the pandemic, sought quick solutions to continue delivering content to students, and the main alternative was the reorganization of face-to-face teaching for online teaching, which entailed challenges for students to continue with studies mediated by digital technologies<sup>1</sup>.

The sociodemographic characteristics of the students in this study were similar to those of the investigation carried out during the COVID-19 pandemic, with students from public educational institutions in the Brazilian Northeast, which identified the predominance of female, young and brown students<sup>17</sup>. In the descriptive-correlational study that aimed to evaluate the relationship between the sociodemographic profile of students from different areas of two universities in Brazil and Portugal, it was found that the majority of students were female, belonging to the age group of 19-20 years, were single, had no children and belonged to the upper middle class. In this study, the largest sample group attended the nursing course<sup>18</sup>.

In the scenario of the COVID-19 pandemic, the participants of this study revealed the main challenges during the academic activities developed through remote teaching. The most mentioned personal challenges were related to the reorganization of teaching due to the pandemic and the students' cognitive and metacognitive dimensions. Digital technologies were already part of contemporary society before the COVID-19 pandemic, in which experiences of using virtual learning, or e-learning, in higher education in health were being described with the popularization of teaching based on TDIC<sup>19,20</sup>.

However, with the emergency suspension of face-to-face classes, the need emerged to readjust teaching activities that are usually face-to-face to those mediated by digital technologies, with no time to prepare students and teachers to develop the teaching-learning process in the remote environment, especially in relation to the development of appropriate pedagogical proposals, access to technological equipment and the restructuring of family routines, so that learning may take place at home<sup>2,5,21</sup>.

The new reality showed the need for students to acquire technological resources and previously non-compulsory skills and, if on the one hand, students who were familiar with digital technologies gained the opportunity to develop learning from them, students who did not have or had little familiarity with these tools faced an unexpected challenge to incorporate them into learning<sup>14,15</sup>. In addition, the abrupt educational transformations resulting from the pandemic had significant impacts on the physical and mental health of students, favoring the development of somatic and/or psychological disorders, such as anxiety, stress, depression, fear, mood swings and other conditions<sup>2,16, 22</sup>.

Distraction with content unrelated to classes, one of the personal challenges most reported by students in this study, was an attribute addressed in a study on the insertion of digital technologies in higher education, in which it was seen that, just as it happened in traditional lectures, students can be more easily inattentive or disinterested in online classes. This may be a result of the ability to multitask (multitasking), characteristic of postmodern society, in which the individual performs several activities simultaneously, but it is emphasized that the excess of stimuli, information and impulses can fragment attention and, consequently, cause distractions<sup>23</sup>.

In the present study, difficulty in the handling of technological equipment among nursing undergraduates was observed, especially among students with fewer resources essential to the development of classes in remote teaching. Similarly, another study that sought to identify the potentialities and difficulties of nursing undergraduates during the COVID-19 pandemic highlighted that the lack of access of students to electronic devices, such as notebook, smartphone or computer, the difficulty in accessing the internet, the difficulty in handling digital technologies, the inadequate environment for studies and others were listed among the difficulties presented by students in remote education<sup>24</sup>, demonstrating the need to better explore digital competencies in undergraduate nursing curricula in the face of the expansion of teaching mediated by TDIC.

Regarding the social challenges pointed out in this study, the influence of social isolation on the interest in attending remote classes and the difficulty of family support to attend these classes are often cited. It was evidenced in the literature, that social distance mainly impacted students in the last periods of the nursing graduation, moments in which they attend, partially or totally, curricular internships in health institutions, and the risk of students and professors contracting and transmit the cannot be eliminated<sup>7,12,25</sup>. This measure, although protective, interferes with the learning of skills and abilities that require practical training, and educational institutions must consider alternatives to minimize these losses, which imposes a new reality of adaptation in the educational system.

Some publications showed changes in family relationships resulting from the pandemic. For many families, the closure of educational institutions meant the conversion of homes into classrooms, in which the digital divide was one of the technological barriers to learning<sup>26</sup>. It was seen that a structured family environment becomes a factor that accentuates the retention of learning in remote teaching<sup>24</sup>. It is also emphasized that an adequate study environment stimulates self-reflection and critical behavior in university students and, therefore, is one of the conditions that interfere in the learning process<sup>23</sup>. Thus, studying in an adequate and private environment can minimize worries and distractions that may interfere with effective learning, which can be useful to intensify student concentration and motivation in remote academic activities.

Coping with illness and social distancing caused by the COVID-19 pandemic created difficulties for both students and their families, due to the reorganization of domestic routines to receive classes in a remote format<sup>27</sup>. In this regard, a study that evaluated the effects of the pandemic on the learning process in remote teaching provided evidence that learning loss was more pronounced among students from less favored homes, whose study environments had less infrastructure for students to learn at home<sup>28</sup>.

As for institutional challenges, the need to offer institutional support programs with resources for students to attend remote classes and the need to offer psychological support for them to continue in remote teaching were the challenges most cited by the evaluated sample. In higher education, student assistance is important, because it makes it possible for students to stay at the university, especially those with financial instabilities or who live in locations far from the university campus and, of similar importance, the offer of psychological support is indispensable, so that academics cope with risk factors related to mental health during training<sup>14,22</sup>.

With the changes brought about by the COVID-19 pandemic in educational scenarios, the demands on higher education in health have become even more evident, especially during the period when universities remained closed<sup>4,14,15</sup>. Even without receiving students in a physical space during the pandemic, universities continued with the mission of training individuals for the job market, but with the challenge of adapting to abrupt and unplanned changes from face-to-face activities to remote teaching, unlike than what happened before the pandemic, when the transition from predominantly face-to-face teaching to online learning happened in a voluntary and planned way<sup>29</sup>.

In the present study, the governmental challenges were the least prevalent, among which, the governmental incentive to disseminate protective measures against COVID-19 in the academic environment was the most mentioned challenge, demonstrating, until then, the students' concern with the return to face-to-face classes. During the course of the pandemic, situations such as fear of the imminent risk of death, the growth in the number of infected people, the unavailability of hospital beds, the multitude of information about the disease, socioeconomic concerns, as well as uncertainties regarding the closure of institutions of teaching and the quality of education in remote education, demanded effective responses from governments in the face of the crisis scenario<sup>22</sup>.

In a multicenter study that explored national resilience in Israel, the Philippines and Brazil during the COVID-19 pandemic, in terms of the ability of these countries to withstand the crisis and recover from it as quickly as possible, Brazilian participants had lower ratings when compared to other countries, and when asked about dimensions involving the management of the pandemic by the public authorities, especially in questions such as "I believe that my government will make the right decision in times of crisis", "Confidence in public institutions" and others<sup>30</sup>.

The relevance of the participation of government leaders in the context of public health was widely highlighted during the COVID-19 pandemic, in which it was necessary, more than ever, to recognize and claim responsibility for these leaders in the face of the health, political and administrative challenges imposed by the pandemic. However, public policies that put digital inclusion on the agenda still only emphasize the dimension of access to equipment, such as computers, notebooks and the internet, without considering aspects related to the broad concept of education mediated by digital technologies<sup>30</sup>.

When it comes to education in the digital environment, the literature emphasizes that government digital inclusion programs must not only guarantee access to technological equipment and the internet network, but must also consider other dimensions of digital inclusion, such as cognitive aspects (capacity management of digital technologies, in order to use them properly to achieve certain goals) and attitudinal aspects (identification of attitudes in which the use of technologies can be harmful, such as phobias, addictions and others)<sup>4,14</sup>.

As limitations of this study, it was difficult to obtain a more expressive participation of the undergraduates through the online questionnaires, possibly due to the critical moment in which the data collection was carried out, since the students were still adapting to the requirements of the remote teaching and co-managing the academic obligations and uncertainties of the pandemic. With regard to statistical associations, effect-modifying variables such as income, race and housing were not considered. Also, variables that would allow further analyzes of students' digital characteristics were not evaluated, such as type of internet, connection speed, number of people with whom the student shares the internet and others, which could influence academic training in the remote environment. In addition, the very cross-sectional nature of data collection only made it possible to make associations, which requires future research, with new designs to understand, more intensely, the relationships between remote teaching during the pandemic and the challenges faced by students.

However, this study is important for the field of nursing, as it sought to understand, in an innovative way, how the training of nurses is taking place at a time of global crisis, whose results may support the planning and evaluation of future educational activities for students and nursing professionals, one of the categories that acted on the front lines of the pandemic.

In the current path towards the "return to normality", knowing the difficulties that undergraduate nursing students faced in learning during the period of sanitary restrictions makes it possible for public managers, educational manager, teachers and family members to find effective ways to help students to continue with the learning process.

## **CONCLUSION**

The present study raised reflections that emerged from a scenario of health and educational crisis, whose results indicated that the COVID-19 pandemic provoked challenges for the learning of undergraduate nursing students, in the most diverse aspects of life, due to the sudden implementation of teaching activities mediated by digital technologies. It was evident from the students' perspective, that personal, socioeconomic, family, academic and governmental factors influenced learning in the virtual environment, which requires the adoption of actions, based on scientific evidence, to mitigate the consequences of these impacts on the training of nursing professionals in the medium and long term.

Thus, actions are suggested, such as the creation of favorable environments for learning, the sociodemographic and digital characterization of students, the promotion of conditions for teachers and students to use technological resources, the offer of teacher qualification in relation to teaching mediated by digital technologies and the implementation of public policies to democratize students' access to the internet and digital equipment.

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## NOTES

### ORIGIN OF THE ARTICLE

Extracted from the Dissertation – Challenges and strategies for undergraduate nursing students learning during the COVID-19 pandemic, presented to the Graduate Program in Nursing of the Universidade de Pernambuco/Universidade Estadual da Paraíba, in 2022.

### CONTRIBUTION OF AUTHORITY

Study design: Lima ACB, Santos DCM.

Data collection: Lima ACB, Santos DCM.

Data analysis and interpretation: Lima ACB, Santos DCM.

Discussion of results: Lima ACB, Santos DCM, Adamy EK, Gomes BMR.

Critical review of the content: Lima ACB, Santos DCM, Adamy EK, Gomes BMR.

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### ACKNOWLEDGMENT

We would like to thank the Graduate Program in Nursing of the University of Pernambuco/State University of Paraíba for making the research feasible.

### FUNDING INFORMATION

Researcher Assistance Program (APQ) of the Graduate Program of the University of Pernambuco. Source: Government of Pernambuco, 2021.

### APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Ethics Committee in Research of the Universidade de Pernambuco/Hospital Universitário Oswaldo Cruz, opinion nº. 4.451.097/2020. Certificate of Presentation for Ethical Appreciation (CAAE) nº. 40093620.4.0000.5192.

### CONFLICT OF INTEREST

There is no conflict of interest.

### EDITORS

Associated Editors: Glilciane Morceli, Maria Lígia Bellaguarda.

Editor-in-chief: Elisiane Lorenzini.

### HISTORICAL

Received: December 17, 2022.

Approved: April 27, 2023.

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