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# Nursing institutions' professors' perception and distant education experience during COVID-19 pandemic lockdown

Anis Sfendla, Abdelilah Merabti, Salwa Lahjou<sup>1</sup>, Nisrin El Mlili<sup>2,3</sup>, Hind Bahri<sup>2</sup>, Banacer Himmi<sup>1</sup>, Abdelhakim El Ouali Lalami

## Abstract:

**BACKGROUND:** The nursing profession represents a demanding and challenging profession with a purpose to keep up with the evolving health-care demands of the population.

**AIMS:** The purpose of this study is to assess nursing institutions' professors' previous experience about information and communication technologies (ICTs) and their perception of distant education during the pandemic lockdown.

**MATERIALS AND METHODS:** This present is a cross-sectional study among participants  $n = 249$  recruited from all academic staff ( $N = 694$ ) of 23 higher institutes of nursing professions and health techniques in Morocco. The Chi-square test for independence ( $\chi^2$ ) and adjusted Z scores were used as a data analysis method to assess the association between the professors' education levels and ICT experience.

**RESULTS:** A significant association [ $\chi^2 (1, n = 249) = 19.510, P < 0.001$ ] was revealed between professors' education level and taken training related to ICT in education; significant few professors (16; 9.3%) reported that taken training session [ $\chi^2 (1, n = 249) = 8.940, P = 0.003$ ] belonged to the bachelor degree group. In matters of perception, a few proportion (10%) reported that using technology effectively belonged to the bachelor and low education background group.

**CONCLUSIONS:** The findings showed that having previous experience in teaching remotely and training related to the ICT was significantly associated with a higher education background. Moreover, professors with higher degrees agreed that distant education could be an alternative to face-to-face course during quarantine.

## Keywords:

Distant learning, Morocco, nursing education, perception, quarantine

## Introduction

The international spread of the novel COVID-19 coronavirus has brought about profound changes in all sectors, especially education. Thereby, the closure of universities and higher education institutions has been imposed globally and led to urgent and common trend of education mode around the world directed toward distant learning protocols, marking

the rapid transition from face-to-face to remote learning.<sup>[1]</sup>

Distant learning is defined as a teaching strategy in which the web is used to provide materials and interactions between students and teachers. It has also been described as a dynamic, innovative, and rich way of providing learning opportunities.<sup>[2]</sup> The advantages of this form of teaching are enormous, particularly in terms of flexibility, accessibility, communications,

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Department of Health Sciences, High Institute of Nursing Professions and Health Techniques Fez, Morocco, <sup>1</sup>Department of Health Sciences, High Institute of Nursing Professions and Health Techniques Rabat, Morocco, <sup>2</sup>Department of Health Sciences, High Institute of Nursing Professions and Health Techniques Tetouan, Morocco, <sup>3</sup>Department of Biology, Faculty of Sciences, Abdelmalek Essaadi University, Tetouan, Morocco

## Address for correspondence:

Prof. Anis Sfendla,  
BP 18046 El Wifak  
Meknes, Morocco.  
E-mail: anis.sfendla@gmail.com

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increased interactions, and variety of teaching and learning modes.<sup>[3]</sup>

Prior to the pandemic, remote learning was found to be in continuum to develop and it was the central core for long strategic goals for many institutions;<sup>[4]</sup> however as any transition, it will bring challenges for instructors and learners when switching from face-to-face learning to online environment learning.<sup>[5,6]</sup> The comparison between face-to-face interaction and distant learning revealed in the one hand that students with a limited educational foundation or lower academic performance in their prior records tend to perceive online education as a chaotic and disorganized learning experience and increased dropout ratio in the learning process.<sup>[7,8]</sup> While for instructors in the other hand, they faced various obstacles including technical challenges and difficulties in conducting online exams and assessments.<sup>[9]</sup> Moreover, digital learning poses a challenge for 84% of teachers, and less than 20% of them have received training on how to effectively deliver education in a remote mode.<sup>[10]</sup>

A meta-analysis study had previously shown that distant learning can increase student control over what, where, and when to learn. It can also help students acquire knowledge and skills faster than traditional methods.<sup>[11]</sup> However, some authors reported that there is no significant difference between e-training and more traditional education among Tunisian students.<sup>[3]</sup> Other authors revealed the ineffectiveness of distance university education in France in terms of cost/ effectiveness compared to traditional education.<sup>[12]</sup>

Remote education also has certain weaknesses, in particular the need to systemically integrate the quality references of the pedagogical aspects, human resources, and infrastructure of this model. For this reason, the educational project of a distance learning course should insist on the adequacy of the course program with the objectives, the methodology, the updated material, the platform used, the forms of tutoring, the communication, and the evaluation.<sup>[13]</sup>

Information and communication technologies (ICTs) as an integrated part of distant learning have an important impact on teaching in higher education.<sup>[14]</sup> ICT issues are common among instructors due to the incomplete integration of ICT in the teaching and learning processes across the majority of educational institutions. ICT has gained paramount importance in the training of educators to effectively utilize technology in education.<sup>[15]</sup> Recent studies have observed and concluded that countries such as Germany, the USA, the United Kingdom, Japan, Turkey, and many others have recognized the necessity and potential of ICT. As a result, they are actively developing strategies and

models to seamlessly integrate ICT into their educational systems and teacher training programs.<sup>[16]</sup> The challenges associated with ICT and e-learning are prevalent in both advanced and low-income countries; these challenges manifest differently in each context but ultimately impact the effective implementation and utilization of ICT in education. Low economic countries often grapple with limited infrastructure, inadequate technology resources, and insufficient training for educators. Low-income countries need to address these challenges in order to fully harness the benefits of ICT and e-learning in their education systems.<sup>[14]</sup>

It was previously stated that ICTs through social networks, especially YouTube and Facebook, are classified as positive technological teaching strategies in nursing learning. For the interviewed professor's perceptions, knowledge was considered the basis of support for the use of ICTs; in addition, lack of practice using digital tools was classified as a limitation for didactic practices.<sup>[17]</sup>

Worldwide, different educational establishments have set up emergency e-learning. Recalling that, a similar strategy was adopted in other forms of natural disasters.<sup>[18,19]</sup> Indeed, the effective progression of distance learning dates back to the beginning of the 20<sup>th</sup> century, as an educational approach allowing all levels of education to be offered as part of continuing education. In addition, the great success of these teaching methods was also reinforced by the emergence of the National University of Distance Education in 1972 in Madrid which constitutes an example to be adopted by other countries.<sup>[13]</sup> For its part, and like other countries, Morocco has been called upon to integrate remote learning into higher education, in particular in the field of nursing care, with a view to improving learning, and to develop digital skills in health sciences with no previous strategies and models were integrate into their educational systems earlier.

In light of the ongoing impact of the COVID-19 pandemic on undergraduate nursing education and the associated constraints and limits, it is imperative to comprehend the current perceptions and adapted approaches among nursing professors. It is in this context that this study aimed to describe the perception and the experience of professors toward distance education during lockdown and to determine the association between the different aspects influencing this mode of teaching.

## Materials and Methods

### Study design and setting

This study is a cross-sectional study conducted among professors of the HINPHT in Morocco. The HINPHT

are higher education establishments not related to universities, created by Decree No. 2.13.658 of September 30, 2013, and which are under the supervision of the government authority in charge of health and social protection. They are organized into 10 headquarter institutes to which 13 annexes are attached. They are geographically distributed over the Moroccan national territory.

### Study participants and sampling

Source population included a total of  $N = 694$  interrogated. Representativeness of the sample was assured through the use of probabilistic sampling technique. A stratified proportional probability sampling was adopted. Our sample size represents 35.9% of the target population, that is,  $n = 249$ . In fact, we recruited 35.9% of the professors of each institute proportionally. To this end, an online survey was conducted via the use of the Google Form application. Subsequently, data collection took place in May 2020. The grid link used was shared among professors by use of e-mails and social networks.

### Data collection tool and technique

The survey grid included 34 questions either dichotomous, multiple choice, open-ended short, long-form, and scaled questions. These questions focused on professors' perceptions of distance education during the COVID-19 pandemic. Hence, the survey questionnaire included questions about their sociodemographic characteristics (10 questions), a section about perception and constraint (20 questions), and alternatives and advantages (4 questions) of e-learning as a method of teaching. After its development, the survey grid was pretested with a small sample which was not included in the present analysis ( $n = 10$ ); necessary corrections and amelioration of the survey were incorporated by authors. Moreover, reliability and internal accuracy assessment were insured by calculating Cronbach's alpha coefficient revealing an acceptable value of 0.7.

### Data analysis

Since the level of measurement of all variables is normal and ordinal, nonparametric tests were used. The distribution-free Chi-square test for independence ( $\chi^2$ ) was used for background categorical variables (age range, education level) to assess the association between the professor's point of view of defined teaching aspects and background categorical variables, while phi coefficient was calculated to measure the degree of association. When the Chi-square assumption was violated, likelihood ratios were used. Significance was set at  $P < 0.05$ . *Post-hoc* analyses were assured by contingency square analysis to evaluate in depth the relationship within groups. The adjusted Z scores were calculated and transformed to Chi-square by multiplying them with each other. Corrections for type I

errors were made using the Bonferroni correction,<sup>[20,21]</sup> setting the new significance levels at  $\alpha/n$  ( $0.05/6 = 0.008$ ,  $0.05/9 = 0.005$ , respectively), where  $n$  refers to the number of compared groups. The data were recorded in an Excel spreadsheet (Excel 2010) and then presented in graphical forms.

### Ethical consideration

The ethical standards were in agreement with the Helsinki Declaration of 1964. The questionnaire was self-administered online, avoiding direct contact interviewers—participants and even between participants. Responses could not be traced at the individuals' level. ISP addresses were removed to ensure that responses were anonymized. The study was performed after written consent was submitted before participation in the study. Authors have obtained the individual's free prior informed consent.

## Results

### Characteristics of the study participants

The questionnaire was administered to 249 professors. Table 1 displays the description of the main data reported by participants. Sample mean age was  $41.71 \pm 8.98$ ; the female gender was predominant with

**Table 1: Descriptive statistics of participants characteristics (n=249)**

	Mean (%)	SD (n)
Age	41.71	8.98
Gender		
Males	35.3	88
Females	64.7	161
Instruction		
Bachelor's or lower degree	13.6	34
Master's degree	55.0	137
Higher degree	31.4	78
Seniority in the service		
Less than 6 years	46.6	116
From 7 to 11 years of experience	29.7	74
12 years or more	23.7	59
Professors who taught during the lockdown period		
Yes	88.0	219
No	12.0	30
Training related to information and communication technologies (ICT in education)		
Yes	69.1	172
No	30.9	77
Effective use of technology for teaching		
Yes	45.0	112
No	2.0	5
Moderately	53.0	132
Perception on distance learning during quarantine		
Moderately effective	66.7	166
Effective	19.7	49
Missing values	13.7	34

64.7%, while the male gender represented 35.3% of the study sample. More than half reported having a master's degree (55%), about one-third (33.4%) had a doctoral degree or were enrolled in doctoral studies, while 13.7 had a bachelor's degree. Majority of participants (88%) were involved in some kind of teaching during the lockdown period. Previous training related to ICT in education was reported by 69.1%, while the majority of participants reported effective-to-moderate use of technology for teaching. One-fourth (19.7%) perceived an effective distant learning during quarantine, while 66.7% perceived that distant learning was moderately effective.

### Past experiences and point of view with regard distant education according to age groups and education group levels among professors

Chi-square of independence revealed a significant association between age groups and receiving a previous session of training status [ $\chi^2 (1, n = 244) = 23.542, P < 0.001$ ]. *Post-hoc* comparison showed that significantly higher proportion of professors belonging to the age range of 25–35 years [ $\chi^2 (1, n = 244) = 20.250, P < 0.001$ ] and age range of 46 years and higher [ $\chi^2 (1, n = 244) = 12.250, P = 0.002$ ] had received one or more sessions of training on distance education. Similarly, significantly more professors taught remotely before quarantine [ $\chi^2 (1, n = 244) = 7.840, P = 0.020$ ] belonged to the age range of 25–35 years compared to other age groups.

A significant association was revealed between professors' education level and taken training related to ICT in education [ $\chi^2 (1, n = 249) = 19.510, P < 0.001$ ]. In details, significant few professors [(16, 9.3%)] reported that taken training sessions [ $\chi^2 (1, n = 249) = 8.940, P = 0.003$ ] belonged to the bachelor degree group, whereas significantly more professors ( $n = 110, 64%$ ) belonged to the master's degree group [ $\chi^2 (1, n = 249) = 17.98, P = 0.000$ ]. In a similar manner, *post-hoc* analysis showed that significantly fewer professors (7, 5.3%) who had ever received one or more sessions on distance education belonged to the bachelor degree group [ $\chi^2 (1, n = 249) = 17.060, P < 0.001$ ], while significantly more professors (88, 66.2%) were among the master's degree group [ $\chi^2 (1, n = 249) = 14.36, P < 0.001$ ].

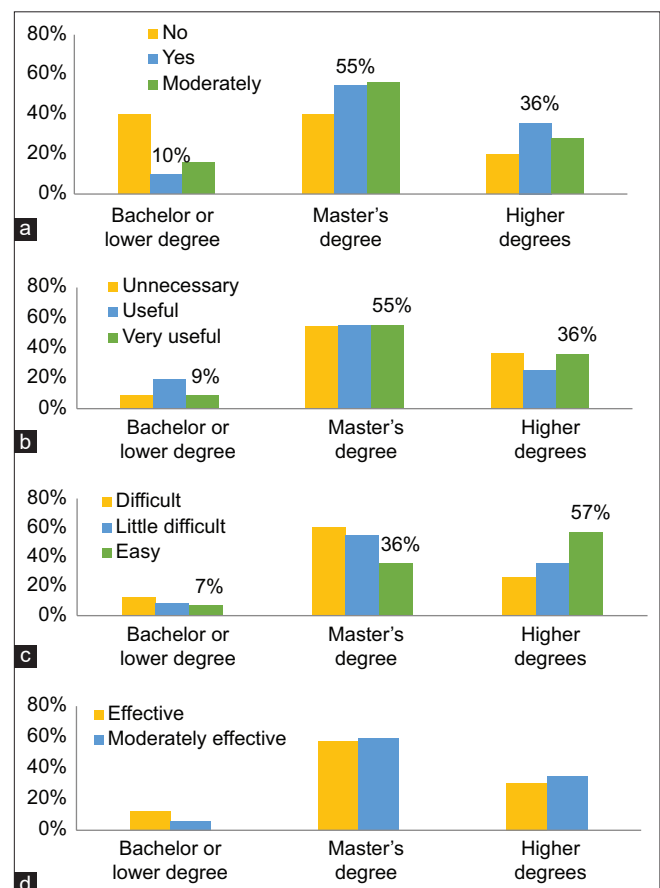
Previous experiences in teaching remotely did not reveal any significant difference in relation to education background groups [ $\chi^2 (1, n = 249) = 6.243, P = 0.044$ ]; in detail, significantly more professors (31, 16.8%) reported that no previous experience in teaching remotely belonged to the bachelor degree group [ $\chi^2 (1, n = 249) = 5.86, P = 0.016$ ] [Table 2].

Preferences of teaching modes presented a significant association with education level groups; significantly,

few professors belonging to the bachelor degree group reported a preference for face-to-face teaching [ $\chi^2 (1, n = 249) = 8.94, P = 0.003$ ]. Conversely, significantly more professors reported a preference for face-to-face teaching type and mixed education (face-to-face and distance learning) belonged to the master's degree group [ $\chi^2 (1, n = 249) = 8.01, P = 0.005$ ;  $\chi^2 (1, n = 249) = 5.2, P = 0.023$ , respectively]. Significantly more professors (53, 41.1%) in the higher degree's group [ $\chi^2 (1, n = 249) = 11.83, P = 0.001$ ] agreed that distance teaching could be an alternative to the face-to-face course during quarantine. Finally, significantly more professors had declared that they did not teach remotely during quarantine [ $\chi^2 (1, n = 249) = 15.29, P < 0.001$ ] [Table 2].

### Professor's perceptions on some aspects related to distant education.

To build a clearer idea about professor's perception on distant education based on their background education, Figure 1 shows percentages of different professors' perceptions with regard distant education. While no significant differences were reported between perceptions and professor's background educations,



**Figure 1:** Perception on different elements of distant education based on professor educational backgrounds; Using technologies effectively in teaching (a); Perception on usefulness of distant courses during quarantine (b); Perception on students engagement during distant learning (c); Perception on distance teaching during quarantine (d)

**Table 2: Post-hoc analyses for professor's past experiences and points of view of teaching aspects during the pandemic according to education group levels**

	Education background groups			Total	Chi square ( <i>P</i> )	Phi
	Bachelor or lower degree	Master's degree	Higher degrees			
Have you taken one (or more) training(s) related to the information technology and communication in education?						
No	18	27	32	77	19.510 (0.000) <sup>a</sup>	0.280
Adjusted <i>Z</i> scores	2.99	-4.24	2.33			
$\chi^2$	8.94	17.98	5.43			
<i>P</i>	0.003	0.000	0.020			
Yes	16	110	46	172		
Adjusted <i>Z</i> scores	-2.99	4.24	-2.33			
$\chi^2$	8.94	17.98	5.43			
<i>P</i>	0.003	0.000	0.020			
Total	34	137	78	249		
Have you ever received one or more sessions of training on distance education?						
No	27	49	40	116	21.859 <sup>c</sup> (0.000) <sup>a</sup>	0.296
Adjusted <i>Z</i> scores	4.13	-3.79	1			
$\chi^2$	17.06	14.36	1			
<i>P</i>	0.000	0.000	0.317			
Yes	7	88	38	133		
Adjusted <i>Z</i> scores	-4.13	3.79	-1			
$\chi^2$	17.06	14.36	1			
<i>P</i>	0.000	0.000	0.317			
Total	34	137	78	249		
Have you ever taught remotely before quarantine?						
No	31	100	54	185	6.243 (0.044) <sup>a</sup>	0.158
Adjusted <i>Z</i> scores	2.42	-0.52	-1.24			
$\chi^2$	5.86	0.27	1.54			
<i>P</i>	0.016	0.603	0.215			
Yes	3	37	24	64		
Adjusted <i>Z</i> scores	-2.42	0.52	1.24			
$\chi^2$	5.86	0.27	1.54			
<i>P</i>	0.016	0.603	0.215			
Total	34	137	78	249		
What kind of teaching do you prefer?						
Face-to-face teaching	21	42	33	96	12.431 <sup>c</sup> (0.014) <sup>b</sup>	0.159
Adjusted <i>Z</i> scores	2.99	-2.83	0.82			
$\chi^2$	8.94	8.01	0.67			
<i>P</i>	0.003	0.005	0.412			
Distance learning	1	8	2	11		
Adjusted <i>Z</i> scores	-4.45	1.21	-0.96			
$\chi^2$	0.20	1.46	0.92			
<i>P</i>	0.653	0.226	0.337			
Mixed education (face-to-face and distance learning)	12	87	43	142		
Adjusted <i>Z</i> scores	-2.76	2.28	-0.41			
$\chi^2$	7.62	5.20	0.17			
<i>P</i>	0.006	0.023	0.682			
Total	34	137	78	249		
Can the distance course (or teaching) be an alternative to the face-to-face course during quarantine?						

Contd...



Table 2: Contd...

	Education background groups			Total	Chi square (P)	Phi
	Bachelor or lower degree	Master's degree	Higher degrees			
Disagree	1	8	3	12	13.063 <sup>c</sup> (0.011) <sup>b</sup>	0.160
Adjusted Z scores	-0.55	0.83	-0.48			
$\chi^2$	0.30	0.69	0.23			
P	0.582	0.407	0.631			
Moderately agree	19	67	22	108		
Adjusted Z scores	1.58	1.95	-3.26			
$\chi^2$	2.50	3.80	10.63			
P	0.114	0.051	0.001			
Agreed	14	62	53	129		
Adjusted Z scores	-1.34	-2.29	3.44			
$\chi^2$	1.80	5.24	11.83			
P	0.180	0.022	0.001			
Total	34	137	78	249		
Did you teach remotely during the period of quarantine?						
No	11	12	7	30	11.938 <sup>c</sup> (.003) <sup>a</sup>	0.248
Adjusted Z scores	3.91	-1.76	-1.01			
$\chi^2$	15.29	3.10	1.02			
P	0.000	0.078	0.312			
Yes	23	125	71	219		
Adjusted Z scores	-3.91	1.76	1.01			
$\chi^2$	15.29	3.10	1.02			
P	0.000	0.078	0.312			
Total	34	137	78	249		

<sup>a</sup>Significance level set at  $P < 0.008$  after the Bonferroni adjustment. <sup>b</sup>Significance level set at  $P < 0.005$  after the Bonferroni adjustment. <sup>c</sup>Likelihood ratio

some differences were noticed. Only 10% reported that using technology effectively belonged to the bachelor and low education background group [Figure 1a]. Hence, 9% of the same education background group perceived that distance courses (or teaching) were very useful during the period of quarantine [Figure 1b]. A similar pattern was also reported with regard to the effectiveness of such teaching mode where 12% of the lower education group reported this teaching mode's effectiveness. In the matter of student follow-up and engagement with regard to distant learning, 7% of professors belonging to the low education group perceived that students could stay engaged in the learning process during distant learning against 57% of the higher degree group [Figure 1c].

## Discussion

In this study, carried out with 23 institutes, about 70% of professors reported having training related issue to ICT in education; the transition to technology use is remarked in the present sample despite education platforms used. However, there are different approaches to how institutions apply ICT either for nursing health or other academic fields.<sup>[22]</sup> Higher tendencies (94.5%) were previously reported for being familiar with the use of information, communication, and technology among professors in a Lebanese study, where a similar education background was reported.<sup>[23]</sup> The study of

Nsouli and Vlachopoulos<sup>[23]</sup> classified nursing faculty members into three subgroups: members with a positive attitude, members with neutral perception and resisters who oppose to ICT use. These results are to some extent in line with the results of this study. Several factors limited educators from including ICT in teaching, including lack of experience, lack of knowledge, and limited skills.<sup>[23]</sup> Previous literatures identified factors that affected educators toward the use of ICT including educational background and training background of educators.<sup>[23,24]</sup>

It was previously stated that most professors have not received a training on the use of tools related to distant education where only 27% declared having a previous experience with distance education.<sup>[25]</sup> Yet this study sample reported that 53.4% of professors had received one or more sessions of training on distance education. In detail, traditional learning mode was the highly preferred mode of education among professors with a bachelor's degree and the same for those with lower degree (e.g., high school degree, two-year degree); this could be explained by the fact that distant learning requires media knowledge use, online course, navigation training, and use of platforms and presence of active teacher-tutor.<sup>[26]</sup> Lack of advanced training programs for distant education could have a consequence of education mode during the pandemic. Similar conclusion was

drawn among nurses' instructors distance education experience where it was found that 24.9% were continuing their postgraduate studies and have used distant education as a student.<sup>[27]</sup> This preference of face-to-face learning could to the other hand be explained by the fact that nursing education requires practices and simulations,<sup>[2,26]</sup> which could be difficult to transfer to students through platforms and online courses. This was more supported by the fact that professors with a master's degree believed that a distant education could be an alternative to face-to-face education and were the more group to have enough training in terms of ICT.

During quarantine, professors with a master's degree believed that a distant education could be an alternative for face-to-face teaching. As it is known, the pandemic did not leave time for any prior measures to implement distance learning.<sup>[28]</sup> However, adaptation methods were not the same for all professors as it was around the world where one common trending education system around the world has been to respond to the pandemic with "emergency e-learning" protocols, marking the rapid transition of face-to-face classes to online learning systems.<sup>[1]</sup>

While to our knowledge, only few studies<sup>[29,30]</sup> focused on how students reacted to distant learning and if they had one during the first phase of quarantine in Morocco. The present sample professor with a bachelor's or lower education reported not being able to teach in such a manner. This limitation of pedagogical continuity could be mainly explained by the rapid transition to a different teaching mode and difficulty to adapt for professors with lower education background or limited experience with ICT. Such challenge was previously linked to segregation in student's attendance by levels, where absence decreased with increasing module level explaining the sense of implication and responsibility among students.<sup>[31]</sup> Professor ICT skills determine the quality of distance education; one of the issues that affects the education process is professors' technical experiences and confidence in their own technological skills.<sup>[32]</sup> Furthermore, it was previously stated that professors, who had an experience between 6–11 years and between 12–17 years, previously showed higher ICT usage. On the other hand, professors with 24 years or higher years and professors with lower than 6 years indicated less ICT competence.<sup>[33]</sup> While our results could support such findings, it can be stipulated that half of professors working at nursing institutions belong to the group of less than 6-year teaching experience.

While again this study could not assess student perception of remote learning, it was previously stated that students felt the least amount of anger, out-of-control feelings, inability to cope, and difficulties about virtual

clinical, and other more common emotions expressed by students were nervousness, anxiety, and worry about academics.<sup>[34]</sup> Such emotions can have a negative feedback on professors with low technology knowledge and therefore be a major reason on why this group of professors could not follow with remote learning. This will also be useful for hybrid teaching modules, which have become increasingly common.

In order to overcome learning difficulties imposed by health crises, distant learning was found to be an adequate solution when associated with specific characteristics among professors. However, the specific characteristic of the nursing field implies the implementation of educational workshops late after. This was supported by a study by Sheikhbardsiri and colleagues,<sup>[35]</sup> where it was supported that 1 month of educational workshop among nurses increased individual perception of one's ability to perform a task, while a 3-month follow-up revealed a higher self-efficacy score.

### limitations and recommendations

This study is not without limitations; the cross-cultural design of this study limits establishing a true cause-and-effect relationship. In addition, the use of self-reported questions is a limitation. Self-reported rely greatly on the respondent's capability to remember and admit answers truthfully mainly on sensitive questions; answers may be distorted by social desirability and recall biases. Furthermore, future research should be based on specific instruments evaluating such concepts using longitudinal study design.

### Conclusion

This study revealed a significant lack of knowledge in terms of ICTs among professors with a lower level of education. A better access to health ICT should be adopted for professors that could allow nursing institutes to develop new ways to help students deploy better intervention techniques through the applicability of software in nursing education not only during pandemics but also in normal situations. Future studies should focus on how to evaluate and promote a skills-based approach of ICT integration in education for nurses programs.

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## Conflicts of interest

There are no conflicts of interest.

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