



# Self-determined motivation and associated factors among health professions students in distance learning: a cross-sectional study in Morocco

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**Purpose:** Learning motivation is an important factor in the teaching learning process in a digital environment. This study aims to examine self-determined motivation levels and associated factors among health professions students in distance learning activities.

**Methods:** A cross-sectional, analytical, quantitative, multicenter study was conducted among health professions students from February 15, 2022, to July 31, 2022. Students' self-determined motivation was assessed using a self-administered instrument. It consisted of 16 items categorized into four dimensions: intrinsic motivation, external regulation, identified regulation, and amotivation. It was based on 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). Student engagement was examined using 15 items classified into the following subscales: behavioral, emotional, and cognitive engagement. A correlation between student motivation and engagement was performed. Univariate and multivariate logistic regression analyses were used to identify factors associated with students' self-determined motivation in distance learning activities.

**Results:** Of 1,121 students invited to the study, 1,061 valid questionnaires were received, giving a response rate of 94.6%; 595 participants (56.1%) were self-determined in distance pedagogical activities. Multiple regression analysis showed that ethnicity (adjusted odds ratio [aOR], 0.25; 95% confidence interval [CI], 0.08–0.73;  $p=0.012$ ), educational level (aOR, 1.65; 95% CI, 1.16–2.34;  $p=0.005$ ), distance learning environment (aOR, 1.65; 95% CI, 1.19–2.29;  $p=0.003$ ), and student engagement: (aOR, 2.9; 95% CI, 2.21–3.80;  $p<0.001$ ) were the significant factors associated with students' self-determined motivation in distance learning.

**Conclusion:** This study predicted some factors influencing students' self-determined motivation. Health professions teachers need to be encouraged to adopt effective pedagogical practices in order to maintain and develop student motivation.

**Key Words:** Distance education, Health occupations, Motivation, Nursing students

## Introduction

The paradigm of higher education has undergone a radical change with the succession of several variants of coronavirus. Indeed, a significant increase in the use of

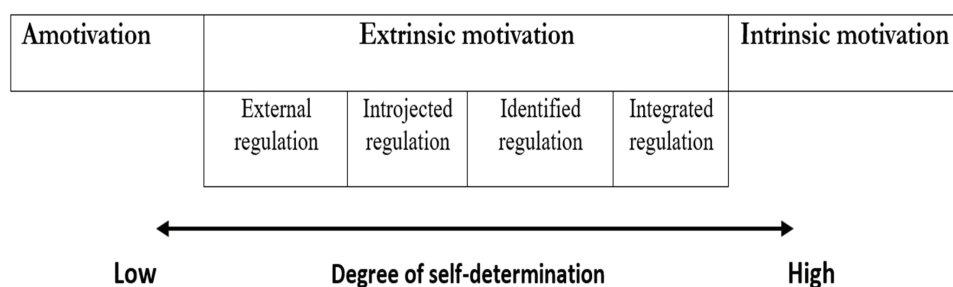
information technology and education use was recorded during the crisis and the post-coronavirus disease 2019 (COVID-19) phase. Several tools were developed to create digital environments for teaching and learning in a distance context. Besides, many factors influence the success of the distance learning process. Students learning

Received: December 9, 2022 • Revised: January 6, 2023 • Accepted: January 6, 2023  
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Korean J Med Educ 2023 Mar; 35(1): 33–43  
<https://doi.org/10.3946/kjme.2023.247>  
eISSN: 2005-7288

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Fig. 1. The Self-determination Continuum Based on Ryan and Deci [3]



From Ryan RM et al. *Contemp Educ Psychol.* 2000;25(1):54-67 [3], with permission from Elsevier.

motivation was identified as a significant component [1]. Before the pandemic, research on motivation in distance learning focused on participants voluntarily enrolled in distance learning courses. Whereas during the pandemic, students were forced to take distance learning courses. Furthermore, in the post-COVID-19 era, students were already familiar with and experienced learning in a digital environment. However, a lack of evidence regarding the motivation of health professions students in distance learning was noted, particularly in the Middle East/North Africa region [2]. Motivation means the person is energized or activated to accomplish a task or activity, whereas an unmotivated one feels no impulse to act [3]. The theoretical framework for this study was based on the self-determination theory (SDT) developed by Deci and Ryan [4,5]. The SDT describes a continuum of three forms of motivation: amotivation, extrinsic motivation, and intrinsic motivation (Fig. 1). These are differentiated according to the degree of self-determination. Amotivation during distance learning indicates an absence of intention and willingness to act in learning activities, representing the lowest degree of self-determination. Intrinsic motivation refers to the involvement of the student out of pleasure and personal vocation in the distance learning process. The student is self-motivated and self-determined. However, extrinsic motivation refers to the learner's involvement in the distance learning process for external reasons to the activities performed.

Extrinsic motivation exhibits four modes of regulation. The first is external regulation, which means that student's participation in activities is conditioned to external incentives such as rewards and avoidance of punishment. The second is introjected regulation, which involves individuals participating in educational activities in order to avoid any consequences of failure and guilt and to protect their self-esteem. The third is identified regulation, which means that students participate in activities that they consider interesting and valuable and that align with their personal goals. The last style is integrated regulation, which occurs when students consider learning activities consistent with their core values and beliefs. The current study examines self-determined motivation levels and associated factors among health professions students in distance learning activities.

## Methods

### 1. Study design

A cross-sectional, analytical, quantitative, multicenter study was conducted using a self-administered questionnaire.

### 2. Participants and setting

This study was carried out across four Higher Institutes

Table 1. Fields and Specialties of ISPITS Students Participating in the Study

Study fields	Specialty
Nursing care	Generalist nurse
	Nurse in anesthesia-resuscitation
	Nurse in emergency and intensive care
	Community health nurse
Midwife	Midwife
Health techniques	Laboratory technician
	Radiology technician
Reeducation and rehabilitation	Ortho-prosthesis
	Kinesitherapy
Medical-social assistance	Social worker
Health sciences education	Master's degree in nursing and health techniques pedagogy

ISPITS: Higher Institute of Nursing Professions and Health Techniques.

of Nursing Professions and Health Techniques (ISPITS) in different regions of the Kingdom of Morocco: Marrakech-Safi, Souss Massa, Guelmim-Oued Noun, and Laâyoune-Sakia El Hamra. ISPITS form health professionals in five fields and several options. Further detail in Table 1. The participants in this study were the students who attended the distance learning during the data collection from February 15, 2022, until July 31, 2022. There were no exclusion criteria.

### 3. Data sources/measurement

The questionnaire used in this study was self-administered. It was first tested among 20 undergraduate students. The instrument is divided into three parts: the first part captures socio-demographic data and students' experiences of distance learning (13 items), including age, gender, ethnicity, marital status, higher education institute, discipline, educational level, platform/application used, device/gadget used, internet quality, location of distance learning courses, distance learning environment, and number of distance learning courses attended during the study. The second part concerns the students' motivation in distance learning, and the last part relates to students' engagement in distance activities. The parts of the questionnaire concerning student motivation and engagement are described as follows:

#### 1) Student motivation in distance learning

Student learning motivation in distance learning was examined using the Situational Motivation Scale (SIMS). The SIMS is 16 items validated instrument developed by Guay et al. [6], and classified into the following subscales: intrinsic motivation, external regulation, identified regulation, and amotivation. Each dimension includes four items evaluated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The internal consistency values (Cronbach's  $\alpha$ ) of the subscales were as follows: intrinsic motivation ( $\alpha=0.95$ ), identified regulation ( $\alpha=0.80$ ), external regulation ( $\alpha=0.86$ ), and amotivation ( $\alpha=0.77$ ) [6]. For each participant, the subscale scores were used to calculate a single motivational score called the self-determination index (SDI) according to the formula:  $SDI=(2 \times \text{intrinsic motivation}) + \text{identified regulation} - \text{external regulation} - (2 \times \text{amotivation})$ . SDI scores ranged from -72 to +72. Students with  $SDI (\geq 0)$  were considered to have a self-determined motivation.

#### 2) Student engagement in distance learning

The adapted version of "the engagement scale" was the tool used to assess students' engagement in distance learning activities. It consisted of 15 items categorized into the following subscales: behavioral engagement, emotional engagement, and cognitive engagement. Each item was scored on a 5-point Likert scale ranging from 1 (strongly

disagree) to 5 (strongly agree). Internal consistency coefficients were: emotional engagement ( $\alpha=0.88$ ), cognitive engagement ( $\alpha=0.75$ ), and behavioral engagement ( $\alpha=0.63$ ) [7]. The total engagement score for each participant was calculated in order to classify them into two groups, “low engagement” and “high engagement”, using the dynamic clustering method.

#### 4. Statistical methods

Data management and statistical analysis were performed using SPSS ver. 13.0 (SPSS Inc., Chicago, USA). Categorical variables were presented as frequency, percentages, and mean  $\pm$  standard deviation. Furthermore, we performed the chi-square test to identify differences in the proportions of categorical variables between the two groups (low and high self-determined motivation). Pearson correlation coefficients were calculated to describe the linear association between motivation and student engagement. Correlation coefficients whose magnitude are between 0.7 and 0.9 indicate variables which can be considered highly correlated [8]. Univariate and multivariate logistic regression analyses were performed to

identify factors associated with students’ self-motivation in distance learning. The multivariate logistic regression analysis considered all independent variables with a p-value  $<0.25$  in the univariate analysis. All p-values  $<0.05$  were considered to indicate statistical significance.

#### 5. Ethics statement

This study was approved by the Ethics Committee for Biomedical Research of Faculty of Medicine and Pharmacy, Mohammed V University, Rabat, Morocco (registration number: 20/22). Consent was obtained from each participant, and confidentiality was assured.

## Results

### 1. Students’ characteristics, experiences, and engagement based on their self-determined motivation during distance learning

Of 1,121 participants invited to the study, 1,061 students

Table 2. Participants’ Characteristics, Experiences, and Engagements Based on Their Self-determined Motivation in Distance Learning (N=1,061)

Characteristic	No. (%)	Low self-determined	High self-determined	p-value
Age (yr)	20.2 $\pm$ 1.3			0.470
<21	902 (85)	392 (43.5)	510 (56.5)	
>21	159 (15)	74 (46.5)	85 (53.5)	
Gender				0.210
Female	725 (68.3)	309 (42.6)	416 (57.4)	
Male	336 (31.7)	157 (46.7)	179 (53.3)	
Ethnicity				0.010
Moroccan	1,035 (97.5)	461 (44.5)	574 (55.5)	
Other	26 (2.5)	5 (19.2)	21 (80.8)	
Marital status				0.153
Single	1,025 (96.6)	446 (43.5)	579 (56.5)	
Married	32 (3)	19 (59.4)	13 (40.6)	
Divorced	4 (0.4)	1 (25)	3 (75)	
Higher education institute				0.039
Ispits Marrakech	375 (35.3)	181 (48.3)	194 (51.7)	
Ispits Guelmim	254 (23.9)	95 (37.4)	159 (62.6)	
Ispits Laayoune	406 (38.3)	176 (43.3)	230 (56.7)	
Ispits Agadir	26 (2.5)	14 (53.8)	12 (46.2)	

(Continued on next page)

Table 2. (Continued)

Characteristic	No. (%)	Low self-determined	High self-determined	p-value
Discipline				0.121
Generalist nurse	577 (54.4)	260 (45.1)	317 (54.9)	
Nurse in anesthesia-resuscitation	106 (10)	39 (36.8)	67 (63.2)	
Emergency and critical care nurse	66 (6.2)	23 (34.8)	43 (65.2)	
Community health nurse	30 (2.8)	10 (33.3)	20 (66.7)	
Midwife	41 (3.9)	20 (48.8)	21 (51.2)	
Laboratory technician	53 (5.0)	20 (37.7)	33 (62.3)	
Radiology technician	100 (9.4)	55 (55.0)	45 (45.0)	
Ortho-prosthesis	30 (2.8)	14 (46.7)	16 (53.3)	
Kinesitherapy	14 (1.3)	6 (42.9)	8 (57.1)	
Social worker	18 (1.7)	5 (27.8)	13 (72.2)	
Nursing and health technique pedagogy	26 (2.5)	14 (53.8)	12 (46.3)	
Educational level				<0.001
Bachelor' degree: 1st year	505 (47.6)	193 (38.2)	312 (61.8)	
Bachelor' degree: 2nd year	238 (22.4)	101 (42.4)	137 (57.6)	
Bachelor' degree: 3rd year	292 (27.5)	158 (54.1)	134 (45.9)	
Master's degree: 2nd year	26 (2.5)	14 (53.8)	12 (46.2)	
Platform or application used				0.622
Google Classroom	254 (23.9)	110 (43.3)	144 (56.7)	
Zoom Cloud Meeting	52 (4.9)	25 (48.1)	27 (51.9)	
Google Meet	66 (6.2)	29 (43.9)	37 (56.1)	
WhatsApp Messenger	591 (55.7)	267 (45.2)	324 (54.8)	
Edmodo and Whatsapp Messenger	63 (5.9)	23 (36.5)	40 (63.5)	
Zoom Cloud Meeting and Whatsapp Messenger	35 (3.3)	12 (34.3)	23 (65.7)	
Choice of gadget/device				0.807
Laptop	300 (28.3)	128 (42.7)	172 (57.3)	
Computer	18 (1.7)	9 (50)	9 (50)	
Mobile	736 (69.4)	325 (44.2)	411 (55.8)	
Tablet	7 (0.7)	4 (57.1)	3 (42.9)	
Internet quality				0.193
Excellent	60 (5.7)	25 (41.7)	35 (58.3)	
Good	603 (56.8)	252 (41.8)	351 (58.2)	
Bad	398 (37.5)	189 (47.5)	209 (52.5)	
Location of distance learning courses				0.708
Home	954 (89.9)	415 (43.5)	539 (56.5)	
University campus	34 (3.2)	16 (47.1)	18 (52.9)	
Friends' houses	62 (5.8)	31 (50.0)	31 (50.0)	
Leisure center	11 (1.0)	4 (36.4)	7 (63.6)	
Distance learning environment				<0.001
Slightly appropriate	300 (28.3)	116 (38.7)	184 (61.3)	
Appropriate	419 (39.5)	161 (38.4)	258 (61.6)	
Inappropriate	342 (32.2)	189 (55.3)	153 (44.7)	
No. of distance learning courses attended during the survey				0.986
1	354 (33.4)	154 (43.5)	200 (56.5)	
2-3	295 (27.8)	129 (43.7)	166 (56.3)	
4-5	121 (11.4)	55 (45.5)	66 (54.4)	
>6	291 (27.4)	128 (44.0)	163 (56.0)	
Student engagement during distance learning				<0.001
High engagement	623 (58.7)	199 (31.9)	424 (68.1)	
Low engagement	438 (41.3)	267 (61)	171 (39)	

Data are presented as mean±standard deviation or number (%).

Ispits: High Institute of Nursing Professions and Health Techniques.

completed the questionnaire, giving an overall response rate of 94.6%. Descriptive statistics show that the participants' mean age was  $20.2 \pm 1.3$  (Table 2). More than half 725 (68.3%) of the participants were female, the majority 1,035 (97.5%) of the participants were Moroccan students, and most were single 1,025 (96.6%). The students were from four Ispits in different cities: Marrakech 375 (35.3%), Guelmim 254 (23.9%), Laâyoune 406 (38.3%), and Agadir 26 (2.5%). More than half 577 (54.4%) of the participants were training to become generalist nursing students, 106 (10%) to become nurse in anesthesia-resuscitation and 100 (9.4%) to become radiology technicians. The majority 1,035 (97.5%) were bachelor's degree level, of which 505 (47.6%) were in 1st year. Many different platforms and applications were used for distance learning. More than half 591 (55.7%) reported using WhatsApp Messenger, and 254 (23.9%) declared using Google Classroom. The mobile phone was the most used device 736 (69.4%). The internet connection was good for 603 (56.8%) of the respondents. The most significant number of participants took the distance learning courses from their homes 954 (89.9%). Furthermore, 419 students (39.5%) reported that conditions in the distance learning environment was appropriate. Over a third of all participants 354 (33.4%) took at least one distance learning course during the study. In terms of engagement, over half 623 (58.7%) reported a high level of engagement with distance learning activities.

On the other hand, the study's results showed that 595 participants (56.1%) were self-determined in distance education. Among these students, 416 (69.9%) were female, 574 (96.5%) were from Morocco, and 579 (97.3%) were single. The self-determined students were 1st year undergraduate 312 (52.4%) from Ispits of Laayoune 230 (38.6%), and 194 (32.6%) from Ispits of Marrakech. The generalist nursing students were the most self-determined 317 (53.3%), and 67 (11.3%) were anesthesia-resuscitation

nursing students. WhatsApp Messenger was the most used application for self-determined students 324 (54.4%), while 144 (24.2%) attended Google Classroom. More than 2/3 of the self-determined students 411 (69.1%) reported using mobile phones during distance learning, and 351 (59%) mentioned that the internet connection was good. The majority 539 (90.5%) took distance learning courses from their homes, and 258 (43.3%) reported that the distance learning environment was appropriate. Moreover, 200 (33.6%) of the self-determined students completed at least one distance learning course during the study's questionnaire response. Regarding online student engagement, out of the 623 students who were highly engaged, 424 (68.1%) showed self-determined motivation.

Table 2 showed a statistically significant relationship between students' self-determined motivation and nationality ( $p=0.01$ ), higher education institutions ( $p=0.039$ ), educational level ( $p<0.001$ ), distance learning environment ( $p<0.001$ ), and student engagement ( $p<0.001$ ).

## 2. Students' self-determined motivation and associated factor in distance learning using univariate analysis

Univariate logistic regression analysis showed that students' self-determined motivation is potentially associated with: ethnicity (Moroccan: odds ratio [OR], 0.30; 95% confidence interval [CI], 0.11-0.79;  $p=0.015$ ), distance learning environment (slightly appropriate: OR, 1.959; 95% CI, 1.43-2.69;  $p<0.001$ ; appropriate: OR, 1.980; 95% CI, 1.48-2.65;  $p<0.001$ ), and student engagement (high: OR, 3.327; 95% CI, 2.58-4.29;  $p<0.001$ ). Other variables were not significantly different. Further details are presented in Table 3.

Table 3. Factors Associated with Students' Self-determined Motivation during Distance Learning Using Univariate Analysis (N=1,061)

Variable	OR (95% CI)	p-value
Age (yr)		
<21	1.13 (0.81–1.59)	0.470
>21	Ref	
Gender		
Male	0.85 (0.65–1.10)	0.210
Female	Ref	
Ethnicity		
Moroccan	0.30 (0.11–0.79)	0.015*
Other	Ref	
Marital status		
Single	0.43 (0.04–4.17)	0.469
Married	0.20 (0.02–2.44)	0.222
Divorced	Ref	
Higher education institute		
Ispits Marrakech	1.250 (0.56–2.77)	0.583
Ispits Guelmim	1.953 (0.87–4.40)	0.106
Ispits Laayoune	1.525 (0.69–3.38)	0.299
Ispits Agadir	Ref	
Discipline		
Generalist nurse	1.422 (0.65–3.13)	0.381
Nurse in anesthesia-resuscitation	2.004 (0.84–4.77)	0.116
Emergency and critical care nurse	2.181 (0.87–5.49)	0.098
Community health nurse	2.333 (0.79–6.88)	0.125
Midwife	1.225 (0.46–3.28)	0.686
Laboratory technician	1.925 (0.74–4.98)	0.177
Radiology technician	0.955 (0.40–2.27)	0.916
Ortho-prosthetist	1.333 (0.46–3.82)	0.592
Physiotherapist	1.556 (0.42–5.76)	0.508
Social worker	3.033 (0.84–10.99)	0.091
Nursing and health technique pedagogy	Ref	
Educational level		
Bachelor' degree: 1st year	1.886 (0.85–4.16)	0.116
Bachelor' degree: 2nd year	1.583 (0.70–3.57)	0.268
Bachelor' degree: 3rd year	0.989 (0.44–2.21)	0.979
Master's degree: 2nd year	Ref	
Platform or application used		
Google Classroom	0.683 (0.33–1.43)	0.313
Zoom Cloud Meeting	0.563 (0.23–1.36)	0.204
Google Meet	0.666 (0.28–1.56)	0.348
Whatsapp Messenger	0.633 (0.31–1.30)	0.211
Edmodo and Whatsapp Messenger	0.907 (0.38–2.16)	0.826
Zoom Cloud Meeting and Whatsapp Messenger	Ref	
Choice of gadget/device		
Laptop	1.792 (0.39–8.15)	0.450
Computer	1.333 (0.23–7.74)	0.749
Mobile	1.686 (0.37–7.59)	0.496
Tablet	Ref	
Internet quality		
Excellent	1.266 (0.73–2.19)	0.400
Good	1.260 (0.98–1.62)	0.076
Bad	Ref	

(Continued on next page)

Table 3. (Continued)

Variable	OR (95% CI)	p-value
Site of distance learning courses		
Home	0.742 (0.22–2.55)	0.636
University campus	0.643 (0.16–2.61)	0.536
Friends' houses	0.571 (0.15–2.15)	0.408
Leisure center	Ref	
Distance learning environment		
Slightly appropriate	1.959 (1.43–2.69)	<0.001**
Appropriate	1.980 (1.48–2.65)	<0.001**
Inappropriate	Ref	
No. of distance learning courses attended during the survey		
1	1.020 (0.76–1.40)	0.902
2–3	1.011 (0.73–1.40)	0.950
4–5	0.942 (0.61–1.44)	0.785
>6	Ref	
Student engagement during distance learning		
High engagement	3.327 (2.58–4.29)	<0.001**
Low engagement	Ref	

OR: Odds ratio, CI: Confidence interval, Ref: Reference, Ispits: High Institute of Nursing Professions and Health Techniques.

\* $p < 0.05$ ; The correlation is significant at the 0.05 level (two-tailed). \*\* $p < 0.01$ ; The correlation is significant at the 0.01 level (two-tailed).

Table 4. Factors Affecting Students' Self-determined Motivation during Distance Learning Using Multivariate Analysis (N=1,061)

Variable	$\beta$	SE	Wald	aOR (95% CI)	p-value
Ethnicity					
Moroccan	-1.387446	0.550777	6.345723	0.25 (0.08–0.73)	0.012
Educational level					
1st year bachelor's degree	0.499502	0.179684	7.727843	1.65 (1.16–2.34)	0.005
Distance learning environment					
Slightly appropriate	0.500497	0.178169	7.891114	1.65 (1.16–2.40)	0.005
Appropriate	0.502233	0.166281	9.122733	1.65 (1.19–2.29)	0.003
Student engagement					
High engagement	1.067519	0.141007	57.315374	2.91 (2.21–3.80)	<0.001

SE: Standard error, aOR: Adjusted odds ratio, CI: Confidence interval.

### 3. Factor affecting students' self-determined motivation during distance learning using multivariate analysis

Variables with a p-value  $< 0.25$  in the univariate analysis were considered in a multivariate logistic regression analysis to obtain a predictive model. Indeed, out of the 10 variables that were included in the multivariate analysis, four were included in the final model as factors associated with students' self-determined motivation: ethnicity (Moroccan: adjusted odds ratio [aOR], 0.25; 95%

CI, 0.08–0.73;  $p = 0.012$ ), educational level (1st year bachelor's degree: aOR, 1.65; 95% CI, 1.16–2.34;  $p = 0.005$ ), distance learning environment (slightly appropriate: aOR, 1.65; 95% CI, 1.16–2.40;  $p = 0.005$ ; appropriate: aOR, 1.65; 95% CI, 1.19–2.29;  $p = 0.003$ ), and student engagement (high: aOR, 2.9; 95% CI, 2.21–3.80;  $p < 0.001$ ) (Table 4).

### 4. Relationship between student motivation and engagement in distance learning

The correlation coefficient results show that intrinsic motivation has moderate, positive, and statistically sig-



nificant correlations with emotional, behavioral, and cognitive engagement (Table 5). Similarly, identified regulation is positively correlated with the different subscales of engagement. Moreover, there is, on the one hand, a negative and significant correlation between external regulation and emotional engagement, and on the other hand, a weak but significant association between external regulation and behavioral engagement. Finally, amotivation was negatively correlated at the 0.01 level with emotional, behavioral, and cognitive engagement.

## Discussion

The current study aims to explore the self-determined motivation levels of health sciences students in a distance learning context, and identify the predictive factors using multivariate logistic regression analysis. The results revealed that health science students showed acceptable levels of self-determined motivation during distance learning courses. This finding is consistent with previous research [9-11]. This finding can be linked to the different experiences and skills acquired during the sudden and forced transition to distance education during the COVID-19 pandemic. Indeed, students were able to familiarize themselves with different educational technologies. In addition, students can interact and communicate in synchronous or asynchronous mode [12]. Second, our analysis showed that ethnicity, educational level, environmental conditions dedicated to distance learning, and student engagement were the situational factors associated with the self-determined motivation of health professions students. Regarding ethnicity, the study conducted by Barak et al. [13] concluded that motivation was similar among participants during online activities despite belonging to different countries and ethnicities, which is inconsistent with our results. Many factors, such as

individual, family, academic, and social aspects, can positively or negatively influence the motivation of ethnic minority students [14]. Related to the educational level, the results indicate a statistically significant relationship between self-determined motivation and educational degrees. This finding concurs with the results of Firat et al. [11] analyzing the intrinsic motivation levels of distance education students in online learning environments. In terms of distance learning environment quality, students perceived the physical environment for distance learning was generally adequate. A comfortable physical space for distance learning contributes significantly to improving student motivation. In addition, controlling conditions such as temperature, noise, family distractions, and ergonomic furniture can positively affect students' distance learning [15-17]. E-learning environments at home are strongly related to families' socioeconomic levels [18]. Lastly, we concluded that student engagement is a factor associated with motivation. These findings are consistent with previous research results [19-21]. In fact, when students are more motivated, they are more engaged in e-learning activities, which allows them to reach the learning targets [22].

The study has some limitations. First, our results reflect a cross-sectional analysis of student motivation during distance learning. Assessment of motivation through experimentation or longitudinal survey will provide a more in-depth understanding. Second, factors predicting students' self-determined motivation were not included exhaustively. Third, some students' responses coincided with the end of the academic year, i.e., the exam period, which may influence their responses.

In conclusion, as a result of these findings, it seems worthwhile to encourage teachers and professors in the health professions to adopt effective pedagogical practices in the context of distance learning in order to maintain and develop student motivation. In other words, although

Table 5. Pearson Correlation Coefficients between Learning Motivation and Student Engagement (N=1,061)

Variable	Emotional engagement	Behavioral engagement	Cognitive engagement
Intrinsic motivation	0.474**	0.292**	0.307**
Identified regulation	0.412**	0.276**	0.266**
External regulation	-0.069*	0.112**	0.039
Amotivation	-0.102**	-0.114**	-0.129**

\*p&lt;0.05. \*\*p&lt;0.01.

Whatsapp Messenger is effective in distance learning and increases students' motivation [23]. It is essential to note that using learning management systems and various pedagogical approaches, including video-based learning, can help develop students' critical thinking skills. Nevertheless, many other factors may affect students' self-determined motivation in the context of distance education, such as the perceived quality of the course, technology-related issues, the nature of the course implemented online, and issues related to the acquisition of some practical skills online. Therefore, further research is needed to exploit these factors to provide students with an engaging and motivating digital environment.

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**Acknowledgements:** none.

**Funding:** No financial support was received for this study.

**Conflicts of interest:** No potential conflict of interest relevant to this article was reported.

**Author contributions:** Conceptualization: AN, MR, GC; data collection: AN, AK, HS; data analysis and interpretation: AZ, GC; drafting the article: AN, MR, AK, HS; critical revision of the article: MR, GC; and final approval of the version to be published: all authors.

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