

The Relationship between Academic Self-Efficacy and Motivation in the Online Nursing Education Process: The Mediator Role of Anxiety

Çevrim İçi Hemşirelik Eğitimi Sürecinde Akademik Öz Yeterlilik ve Motivasyon Arasındaki İlişki: Kaygının Aracı Rolü

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ABSTRACT

Online-learning has been adopted as an alternative learning method in Turkey during the coronavirus pandemic (COVID-19) quarantine to fill the gap left in academia due to the nationwide pandemic-related quarantine. The aim of the study is to examine the relationship between academic self-efficacy and motivation, as well as the mediator role of anxiety, in nursing students during online education. The sample of this cross-sectional, descriptive study consists of 534 nursing students. The study was conducted between June and August 2021 via online survey. PROCESS model was used to test the hypothesized model. The model was found to be significant, and academic self-efficacy explains 18.68% of the total change in motivation ($R^2=0.187$; $F=122,227$; $p=0.000$). The relationship between academic self-efficacy and anxiety ($\beta=-0.235$), academic self-efficacy and motivation ($\beta=0.432$), anxiety and motivation ($\beta=-0.200$) was significant, respectively ($p<0.05$). It was determined that anxiety decreased the relationship between academic self-efficacy and motivation ($\beta=0.385$, $p<0.05$) and it was a partial mediator (%95 CI [0.024; 0.073]). Consequently, anxiety played a partially mediator role in the relationship between self-efficacy and motivation among nursing students during the COVID-19 pandemic.

Keywords: Anxiety, COVID-19 Pandemic, Motivation, Nursing Student, Self-efficacy

ÖZ

Çevrimiçi öğrenme, koronavirüs pandemisi (COVID-19) karantinası sırasında Türkiye'de alternatif bir öğrenme yöntemi olarak benimsenmiş ve ülke çapında pandemiyle ilgili karantina nedeniyle akademiye oluşan boşluğu doldurmak için kullanılmıştır. Çalışmanın amacı, çevrimiçi eğitim sırasında hemşirelik öğrencilerinde akademik öz yeterlilik ve motivasyon arasındaki ilişkide kaygının aracı rolünü incelemektir. Kesitsel ve tanımlayıcı özellikteki çalışmanın örneklemini 534 hemşirelik öğrencisi oluşturmaktadır. Çalışma Haziran-Ağustos 2021 tarihleri arasında çevrimiçi anket üzerinden yürütüldü. Hipotezlenen modeli test etmek için PROCESS modeli kullanıldı. Model anlamlı bulundu ve akademik öz yeterlilik, motivasyondaki toplam değişimin %18.68'ini açıkladığı ($R^2=0.187$; $F=122.227$; $p=0.000$) belirlendi. Sırasıyla akademik öz-yeterlilik ile kaygı ($\beta=-0.235$), akademik öz-yeterlilik ile motivasyon ($\beta=0.432$) ve kaygı ile motivasyon ($\beta=-0.200$) arasındaki ilişki anlamlı ($p<0.05$) olarak saptandı. Kaygının akademik öz-yeterlilik ile motivasyon arasındaki ilişkiyi azalttığı ($\beta=0.385$, $p<0.05$) ve kısmi aracı olduğu (%95 GA [0.024; 0.073]) belirlendi. Sonuç olarak anksiyete, COVID-19 pandemisi sırasında hemşirelik öğrencileri arasında öz yeterlilik ve motivasyon arasındaki ilişkide kısmen aracı bir rol oynamıştır.

Anahtar Kelimeler: Anksiyete, COVID-19 Pandemisi, Hemşirelik Öğrencisi, Motivasyon, Öz Yeterlilik

Ethics committee permission was obtained from Karadeniz Technical University Faculty of Medicine Scientific Research Ethics Committee with the number 2021/100. This study was presented as an oral presentation at the 1st International 21st National Nursing Students Congress.

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INTRODUCTION

As a result of the worldwide outbreak of COVID-19, schools and universities across the globe have shifted from in-person instruction to virtual and distance learning. This change has acted as a substitute approach, ensuring the ongoing education of health professions students during this difficult period.^{1,2} This change was triggered by the necessity to limit the spread of the virus while also ensuring the safety of students and employees. However, the quick increase of COVID-19 instances and deaths has resulted in increased stress among students, which may have an influence on their psychological well-being and academic performance.³ As a result, undergraduate nursing students had to adapt to online learning platforms as the main method of education and had to cope with the problems created by this change. In particular, lack of motivation and lack of teacher-student connection were disadvantages of online learning for students.² However, motivation is an important and effective component of education.⁴ A link is known to exist between high motivation levels and students' academic success and self-efficacy.⁵ Based on social cognitive theory, developed by Bandura, the concept of self-efficacy is the belief in one's own ability to achieve a particular result. Research has demonstrated a notable correlation between self-belief and drive; individuals are more likely to pursue a specific direction if they have faith in their own capabilities and are enthusiastic about a career in research.⁶⁻⁹ In line with social cognitive theory, the notion of academic self-efficacy affects students' academic performances in relation to cognitive, motivational, emotional, and selection processes.¹⁰ Self-efficacy increases students' motivation to learn.¹¹ Similarly, students' motivational orientations also affect their self-efficacy. Bandura's self-efficacy theory points out that individuals' notions of self-efficacy are closely related to their motivation. Individuals with low self-efficacy

are known to tend to avoid doing difficult tasks that they see as a threat to themselves and give up immediately.^{12,13}

Known to have a negative effect on motivation and self-efficacy, anxiety is an important concept that should be addressed in education processes.¹⁴ Personal motivation can be impacted by common signs of anxiety and depression, such as diminished enthusiasm, lack of vitality, and reduced cognitive focus.¹⁵ Internalization of these symptoms also reduces academic achievement.¹⁶ Depressive mood in particular is a state that is characterized by poor motivation and explains low performance.¹⁷ There are also studies showing a negative relationship between self-efficacy and anxiety.^{18,19} Self-efficacy is a reflection of an individual's level of coping with stress and allows an individual to self-evaluate.²⁰ Nursing science, by definition, is a department that requires the acquisition of clinical practice and skill activities, and it is thought that the transition to online education may negatively affect student motivation.²¹ However, no comprehensive studies were found that evaluated the relationship between academic self-efficacy and motivation levels of nursing students in the online education process and the role of anxiety in this relationship. The aim of this study is to examine the relationship between academic self-efficacy and motivation, as well as the mediating role of anxiety, in nursing students in online education.

Research hypotheses:

Based on previous studies, we hypothesized that i: academic self-efficacy affects motivation positively among nursing students, ii: academic self-efficacy affects anxiety negatively, iii: anxiety affects motivation negatively, and iv: anxiety mediates the relationship between academic self-efficacy and motivation.

MATERIAL AND METHOD

Study Design

This is a descriptive relation-seeker type study.

Participants and Setting

The research was conducted from June to August 2021 among undergraduate nursing students at a Turkish university. The total participant pool comprised 706 students, distributed as 187 first-years, 177 second-years, 162 third-years, and 180 fourth-years. The goal was to involve the whole student body, avoiding any sampling. Participation criteria included being 18 years or older, fluency in Turkish, and voluntary agreement to be part of the research. In total, 172 students declined to participate the study and the study was completed with 534 students (%75.6).

Research Instrument

Sociodemographic Information Questionnaire, Academic Self-Efficacy Scale, Motivation Sources and Problems Scale and State-Trait Anxiety Inventory were used to collect the data.

Sociodemographic Information Questionnaire

The sociodemographic information questionnaire consisted of seven questions regarding each student nurse's age, gender, class, academic average, satisfaction with the department, decision to choose the profession, and desire to work in this profession after graduation.

Academic Self-efficacy Scale (ASES)

The "Academic Self-Efficacy Scale" was formulated by Kandemir to measure students' confidence in their academic abilities.²² This tool comprises 19 items, each evaluated using a five-tier Likert scale. The possible scores range between 19 to 95, with higher scores denoting greater academic confidence. In the initial research, the Cronbach's alpha coefficient was 0.92, while it was 0.94 in our study.

Motivation Sources and Problems Scale (MSPS)

The measurement tool was created by Acat and Köşgeroğlu²³ in 2006 to determine the motivational factors affecting health school students' professional encounters. The Motivation Sources and Problems Scale encompasses 24 questions rated on a five-point Likert scale. Total scores vary from 24 to 120 points, with a higher score indicating a more pronounced motivation level. The Cronbach's alpha for the scale was 0.82 in the original study and 0.89 in our study.

State-Trait Anxiety Inventory (STAI)

Spielberger et al. (1976)²⁴ developed the scale and the validity and reliability of the scale in Turkey were confirmed by Öner and Le Compte (1983).²⁵ The scale consists of two parts that are State Anxiety Inventory and the Trait Anxiety Inventory. In this study, a 20-item STAI section was used in this study to indicate how an individual feels at a certain moment and under specific settings. The responses were evaluated with four-point scale with the total ranging between 20 and 80. The higher score on the scale, the greater the amount of anxiety. The Cronbach's alpha of the scale in the original study and our study were found between 0.94–0.96 in various applications and 0.93, respectively.

Data Collection

The study was conducted from June to July 2021 among nursing students enrolled in online education at Turkish state university. The data were collected using an online platform called Google Forms. The online survey was distributed to students via social media, business e-mail addresses, and social communication technologies (WhatsApp groups, Telegram, Instagram, so on). Those who had access to the online survey link read the explanations and answered the questions after checking the box. The questionnaires remained open for two months after they were distributed to the students, and each student was only permitted to access each form once.

Statistical Procedures

The data obtained in the study were analyzed using SPSS (Statistical Package for Social Sciences) for Windows 22.0 software. Number, percentage, mean, standard deviation were used as descriptive statistical methods in the evaluation of the data. Pearson correlation analysis, linear regression and hierarchical regression analyses regarding the mediation effect between the continuous variables of the study were performed using PROCESS Model 4 developed by Hayes (2013) for SPSS. In the PROCESS model, the effect of the mediating variable on the

relationship between the independent and dependent variable was analyzed by reaching the total effect, indirect and direct effect scores. The obtained analysis result was generated using a 95% confidence interval and 5000 bootstrap samples.

Ethical Aspect of Research

Ethical permission for the study was obtained from the university ethics committee (approval number: 2021/100, date: April 15, 2021). Furthermore, the required institutional approval was obtained to gather data and all students provided their written informed consent.

FINDINGS AND DISCUSSION

In total, 534 students who met the inclusion criteria participated in the study, and an effective response rate of 79.2% was achieved. The data of the study were analyzed in four parts: i) descriptive statistics of sociodemographic information; ii) descriptive statistics of academic self-efficacy, motivation, and anxiety; iii) correlations among academic self-efficacy, motivation, and anxiety; and iv) test of the hypothesized model.

Descriptive Statistics of Sociodemographic Information

The mean age of the nursing students was 20.60 ± 1.67 , 83.1% were female, 29.6% were studying in the first grade, and the academic average of 73.6% was between 3.01-4.00. The nursing program had an overall satisfaction rate of 85.8% with 77.5% had chosen their profession by their own decisions, and 73.6% wanted to pursue their profession after graduation (Table 1).

Table 1. Descriptive Characteristics of Students

Characteristics	n (%)
Sex	
Female	444 (83.1)
Male	90 (16.9)
Grade	
First	158 (29.6)
Second	126 (23.6)
Third	117 (21.9)
Fourth	133 (24.9)
Academic average	
2.01-3.00	141 (26.4)
3.01-4.00	393 (73.6)

Table 1. (More)

Are you satisfied with being in the nursing program	
Yes	458 (85.8)
No	76 (14.2)
Who decided you to choose the nursing profession?	
Own decision	414 (77.5)
Family decision	99 (18.5)
Joint decision	21 (3.9)
Do you want to pursue your profession after graduation?	
Yes	393 (73.6)
No	24 (4.5)
Undecided	117 (21.9)
Age	
Mean (SD)/ Median (Min-Max)	20.60 (1.67) / 20 (18-28)

SD: Standart deviation, Min: Minimum, Max: Maximum

Descriptive Statistics of Academic Self-efficacy, Motivation, and Anxiety

Nursing students' ASES total mean was 66.68 ± 11.37 , MSPS total mean was 89.81 ± 12.09 , and STAI total mean was 43.41 ± 9.71 (Table 2).

Table 2. Mean, Standart Deviation, Minimum and Maximum of Academic Self-Efficacy, Motivation and Anxiety

Scales	Mean \pm SD	Min-Max
Academic Self-Efficacy Scale		
Academic efforts	14.67 \pm 2.79	5-20
Academic planning	13.70 \pm 2.72	5-20
Coping with academic problems	38.30 \pm 6.97	15-55
Total mean score	66.68 \pm 11.37	31-90
Motivation Sources and Problems Scale		
Intrinsic motivation	42.08 \pm 8.01	13-55
Extrinsic motivation	22.05 \pm 3.18	7-25
Negative motivation	25.66 \pm 6.62	8-40
Total mean score	89.81 \pm 12.09	50-108
State Anxiety Inventory Scale		
Total mean score	43.41 \pm 9.71	20-64

SD: Standart deviation, Min: Minimum, Max: Maximum

Correlations among Academic Self-Efficacy, Motivation, and Anxiety

The correlation relationships between students' academic self-efficacy, motivation, and anxiety levels are shown in Table 3.

Except for the relationship between negative motivation and intrinsic and extrinsic motivation, a significant relationship was found between all variables ($p < 0.05$), although the direction differed

Table 3. Correlatation of Academic Self-Efficacy, Motivation and Anxiety

	1	2	3	4	5	6	7	8	9
1. Academic self-efficacy total	1.000								
2. Academic efforts	0.804*	1.000							
3. Academic planning	0.883*	0.642*	1.000						
4. Coping with academic problems	0.965*	0.660*	0.792*	1.000					
5. Motivation total	0.432*	0.320*	0.365*	0.435*	1.000				
6. Intrinsic motivation	0.383*	0.237*	0.334*	0.400*	0.796*	1.000			
7. Extrinsic motivation	0.337*	0.304*	0.269*	0.324*	0.662*	0.561*	1.000		
8. Negative motivation	0.163*	0.152*	0.132*	0.154*	0.544*	-0.026	0.050	1.000	
9. Anxiety	-0.235*	-0.166*	-0.278*	-0.208*	-0.291*	-0.247*	-0.126*	-0.171*	1.000

* $p < 0.01$; Pearson correlational analysis

The test of the hypothesized model and affect estimates are shown in Figure 1 and Table 4. Academic self-efficacy explains 18.68% of the total change in motivation ($R^2 = 0.187$; $F = 122,227$; $p = 0,000$). In the mediated structural model analysis results applied according to the model established to determine the mediating role of anxiety (Fig. 1, path a), academic self-efficacy was found to predict anxiety ($\beta = -0.235$; $F = 30,987$; $p < 0.001$). Anxiety explained 5.5% of the variance ($R^2 = 0.055$). An increase in academic self-efficacy was shown to reduce anxiety. The effect of anxiety, the mediating variable, on motivation (Fig. 1, path b), the dependent variable, was found to be statistically significant ($\beta = -0.200$; $F = 122,227$; $p < 0.001$). However, with the inclusion of the mediating variable, anxiety, in the model (Fig. 1, path c'),

the path coefficient between academic self-efficacy and motivation was still significant ($\beta = 0.385$; $p < 0.001$), with 95% CI of 0.024 to 0.073. Given that the confidence interval doesn't include 0, we infer that anxiety significantly mediates the relationship between academic self-efficacy and motivation. The predictive effect of academic self-efficacy on motivation was 0.432 ($p < 0.001$) (Fig. 1, path c), so, the mediating effect of anxiety was partial

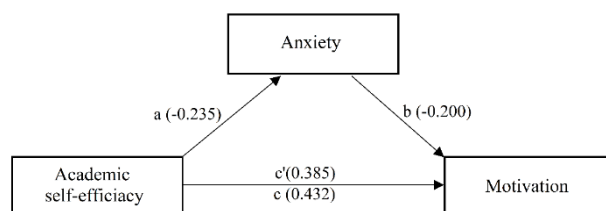


Figure 1. Final Model

Table 3. The Mediator Role of Anxiety in the Relationship Between Academic Self-Efficacy and Motivation

Dependent Variable	Independent Variable	β	SE	t	p	%95 CI Lower	%95 CI Upper
ANX	ASE (a)	-0.235	0.036	-5.567	0.000*	-0.271	-0.130
$R = 0.235$; $R^2 = 0.055$; $F = 30.987$; $p = 0.000*$							
MOT	ASE (c)	0.432	0.042	11.056	0.000*	0.378	0.541
$R = 0.432$; $R^2 = 0.187$; $F = 122.227$; $p = 0.000*$							
MOT	ASE (c')	0.385	0.042	9.800	0.000*	0.328	0.492
	ANX (b)	-0.200	0.049	-5.100	0.000*	-0.346	-0.154
$R = 0.474$; $R^2 = 0.225$; $F = 76.989$; $p = 0.000*$							
Total Effects		0.460	0.042	11.056	0.000*	0.378	0.541
Direct effects		0.410	0.042	9.800	0.000*	0.328	0.492
Indirect effects		0.047	0.012	-	-	0.024	0.073

* $p < 0.001$; ASE: Academic self-efficacy; ANX: Anxiety; MOT: Motivatio

Academic self-efficacy and motivation are critical components of learning process. Academic self-efficacy can assist students in developing confidence in their academic performance and believing in their ability to achieve. Motivation, on the other hand, can assist students to persist in the learning process and achieve their goals. However, emotional factors like anxiety may have an impact on this relationship. Anxiety can make students fearful about failing or failing to fulfill expectations. As a result, their motivation may suffer. In this study, the relationship between students' academic self-efficacy and motivation and the mediating role of anxiety in this relationship were examined. Our results confirmed the hypotheses proposed in the developed model.

The nursing students were shown to be highly motivated throughout online education in our study. In contrast, Baygeldi et al. (2021) reported medium motivation in university students during online education.²⁶ It has been emphasized in the literature that education planning should consider students' motivation and expectations.¹⁴ While the shift to digital learning at the beginning of the pandemic initially caused uncertainty, virtual education also offered many benefits to students during the lockdown period.²⁷ It appears from the findings of our study that students' motivation is high. In comparison to the clinical setting and the physical field, online learning may have enhanced students' motivation because it allows them to learn from anywhere, they choose and participate in tests online.

Furthermore, the majority of students in this study stated that they were satisfied with the nursing undergraduate program, that the choice of profession was their own decision, and that they wanted to work in this profession after graduation. The fact that the majority of students selected the nursing profession willingly and desired to work in it may have influenced their motivations positively. Working in a preferred specialty is known to be associated with motivation to acquire the necessary knowledge and skills using various information sources, including online learning²⁸, which supports our findings.

It is difficult to present certain topics online, especially in nursing and health science specialties involving practical and even clinical components.²⁷ Fawaz and Samaha (2021) stated that the unexpected change that occurred during the pandemic reduced students' motivation to learn and caused anxiety.²⁹ In nursing students, our study found that anxiety was adversely associated to motivation. We, therefore, believe that nursing students' motivation levels can be improved by reducing their anxiety levels. Considering the findings, undergraduate nursing education in the digitalized new global order should take students' anxiety levels into account. The anxiety levels of nursing students were almost medium in our study. Unlike our study, some studies examining the anxiety levels of nursing students enrolled in online education during the COVID-19 pandemic found that their anxiety levels were above medium^{27,30} and had an increasing prevalence.³⁰ The reasons for students' anxiety may be that they had to quickly adapt to an online education system with insufficient infrastructure due to the COVID-19 pandemic, and that they felt pressured.³¹ Furthermore, issues with the internet caused by technical infrastructure, disconnections during lessons, and power cuts during online exams are among the factors that might increase students' anxiety.²⁹ The fact that the nursing is a practical profession, and only theoretical knowledge is provided without practice and involvement during the pandemic may have caused students to feel academically inadequate and increased their anxiety on top of the enormous academic burden.^{32,33} In addition, the lack of teacher-student interaction in online teaching, the fact that students are given a homework-oriented education³⁴, and the students' lack of interest and concentration in the lesson may have partially affected their academic self-efficacy and increased their anxiety.

Anxiety has been found in studies to have a detrimental link not only with motivation but also with academic self-efficacy.^{11,35,36} Supporting this information, this study found that academic self-efficacy was negatively related to anxiety and positively related to

motivation. This finding means that the higher the academic self-efficacy of nursing students, the lower their anxiety and the higher their motivation. Similar to our study, studies conducted with university students have shown that there is a direct positive^{32,37,38} and significant relationship between self-efficacy and motivation.³⁹ However, in this model, academic self-efficacy explains 18.7% of motivation. The unexplained part of the motivation can be explained by students' digital education because of COVID-19 pandemic and related variables.⁴⁰ In terms of academic self-efficacy score, the academic self-efficacy of the students in our study was above-medium, indicating that they felt their academic self-efficacy partially sufficient, and they needed support. Similar to our study, Croy et al. (2020) found medium academic self-efficacy in their study with nursing students. In our study, the academic average of three-quarters of the students was above 3.01.¹¹ The high academic grade point averages of the students may also have contributed to their high academic self-efficacy beliefs.

In a study of nursing students, it is found that intrinsic motivation significantly reduced the negative effect of anxiety on academic achievement.³² In this study, however, we found that anxiety played a partially mediating role between academic self-efficacy and motivation, supporting our

hypothesis. The findings demonstrated that lowering anxiety could improve the influence of academic self-efficacy on motivation. Strong academic self-efficacy beliefs can reduce students' anxiety and increase their motivation. On the contrary, low self-efficacy beliefs might cause students to experience more intense anxiety and decrease their motivation. Therefore, our study showed that students' academic self-efficacy beliefs are antecedent variable in increasing their motivation levels by reducing their anxiety. The mediating effect of anxiety has provided a new perspective on increasing the motivation of nursing students. In the systematic review of Regmi and Jones (2020), in which the authors examined the factors affecting online education in health sciences education, they concluded that high levels of anxiety and low self-efficacy affect the learning process and motivation negatively.¹⁴

Limitations

The study had some limitations. First, the study's design did not examine the implications of relationships between independent variables and motivation. Second, the sample presented data from a single university in a single geographic region in Turkey. Many elements, such as university education curriculum and techniques, might influence the study's findings. It may therefore be difficult to generalize results beyond this population.

CONCLUSION AND RECOMMENDATIONS

This study determined that the academic self-efficacy of the participating nursing students was above medium, their motivation levels were good, and their anxiety was above-medium. There was a positive relationship between academic self-efficacy and motivation, a negative relationship between academic self-efficacy and anxiety, and a negative relationship between anxiety and motivation. In other words, academic self-efficacy increases motivation, and it also reduces anxiety. Academic self-efficacy, on the other hand, has an indirect effect on

motivation through anxiety. Based on the study's findings, we suggest assessing student anxiety and making efforts to reduce anxiety and consequently increase student motivation in online education processes. Reducing students' anxiety by maintaining educator-student interactions, one of the most essential components of the educational system, can contribute to improve process management and increase student motivation. In addition, nursing education by its very nature is an area where face-to-face communication and interactive training methods are needed for the

development of clinical skills. Taking initiatives to increase self-efficacy by using different learning strategies for students who receive online education and are deprived of face-to-face interactions can increase their motivation. Moreover, providing adequate emotional and academic support can help students develop a positive concept of self-efficacy and strategies for coping with stress and thus reduce their anxiety. part of the educational role of nurses and one of their

primary responsibilities. In particular, the awareness of nurses working in surgical clinics should be raised about organizing planned discharge education programs in accordance with the personal characteristics and educational needs of patients, so that the patients can perform self-care activities. In addition, organizing educations on subjects that nurses consider insufficient will contribute positively to this process.

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