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Online Learning Motivation and Zoom Fatigue in Terms of Some Variables in Nursing Students

Hemşirelik Öğrencilerinde Bazı Değişkenler Açısından Çevrimiçi Öğrenme Motivasyonu ve Zoom Yorgunluğu

Belgin VAROL¹ 

Gamze SARIKOÇ² 

Emine ÖKSÜZ² 

¹ Dr. Öğr. Üyesi, Sağlık Bilimleri Üniversitesi, Gülhane Hemşirelik Fakültesi, Psikiyatri Hemşireliği Anabilim Dalı, Ankara, TÜRKİYE

² Doç. Dr., Sağlık Bilimleri Üniversitesi, Gülhane Hemşirelik Fakültesi, Psikiyatri Hemşireliği Anabilim Dalı, Ankara, TÜRKİYE

Corresponding Author: Belgin VAROL; e-mail: belgin.varol@sbu.edu.tr

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Abstract:

Aim: In this study, it was aimed to determine the zoom fatigue level of nursing students and the variables affecting zoom fatigue, and also to examine the relationship between zoom fatigue and online learning motivation.

Methods: The population of the study consisted of students studying at a nursing faculty. A total of 428 students were reached. In this study, students' introductory information form, Online Learning Motivation Scale and Zoom Fatigue Scale were used as data collection tools. Number, percentage, Mann-Whitney U test, Kruskal-Wallis test, Spearman correlation analysis were used to evaluate the data.

Results: It was seen that students' motivation levels for online learning were close to the average (117.55 ± 39.10), while their zoom fatigue levels were slightly above the average (48.81 ± 15.02). A low negative correlation was found between Zoom fatigue and online learning motivation. The online motivation levels of the students studying in the third and fourth grades and who participate in videoconferences approximately once a week, whose video conference duration is more than 30 minutes, are higher. The zoom fatigue levels of the first and third grade students who attended videoconferences approximately once a week were found to be lower

Conclusion: In order to reduce the fatigue levels of the students and increase their motivation in the distance education process, it is recommended that the number and duration of the lessons are kept short, and that qualified learning methods that will use time effectively are preferred.

Key Words: Zoom fatigue; online learning motivation; nursing student

Özet:

Amaç: Bu çalışmada hemşirelik öğrencilerinin Zoom yorgunluğu düzeyi ve Zoom yorgunluğunu etkileyen değişkenlerin belirlenmesi ile Zoom yorgunluğu ve çevrimiçi öğrenme motivasyonu arasındaki ilişkinin incelenmesi amaçlanmıştır.

Yöntem: Araştırmanın evrenini bir hemşirelik fakültesinde eğitim gören öğrenciler oluşturmuştur. Toplam 428 öğrenciye ulaşılmıştır. Veri toplama aracı olarak öğrencilerin tanıtıcı bilgi formu, Çevrimiçi Öğrenme Motivasyon Ölçeği ve Zoom Yorgunluğu Ölçeği kullanılmıştır. Verilerin değerlendirilmesinde sayı, yüzde, Mann-Whitney U testi, Kruskal-Wallis testi, Spearman korelasyon analizi kullanılmıştır.

Bulgular: Öğrencilerin online öğrenmeye yönelik motivasyon düzeylerinin ortalamaya yakın olduğu (117.55 ± 39.10), zoom yorgunluk düzeylerinin ise ortalamadan biraz üzerinde olduğu (48.81 ± 15.02) görüldü. Zoom yorgunluğu ile çevrimiçi öğrenme motivasyonu arasında düşük düzeyde negatif korelasyon bulundu. Üçüncü ve dördüncü sınıflarda okuyan ve yaklaşık olarak haftada bir kez video konferansa katılan, video konferans süresi 30 dakikadan fazla olan öğrencilerin online motivasyon düzeyleri daha yüksektir. Yaklaşık olarak haftada bir kez video konferansa katılan birinci ve üçüncü sınıf öğrencilerinin zoom yorgunluk düzeyleri daha düşük bulunmuştur.

Sonuç: Uzaktan eğitim sürecinde öğrencilerin yorgunluk düzeylerini azaltmak ve motivasyonlarını artırmak amacıyla; ders sayısı ve süresinin kısa tutulması, zamanı etkin kullanacak nitelikli öğrenme yöntemlerinin tercih edilmesi önerilmektedir.

Anahtar Kelimeler: Zoom yorgunluğu; çevrimiçi öğrenme motivasyonu; hemşirelik öğrencisi

Introduction

Computer-mediated communication platforms have been increasingly used in recent years.⁽¹⁾ With the declaration of the COVID-19 disease as a pandemic by the World Health Organization⁽²⁾, the use of these platforms in the field of education has become a necessity. Although these platforms are required to ensure that education continues without interruption during the pandemic process, their use continues preferably in the post-pandemic period.⁽³⁾ The American Department of Education⁽⁴⁾ also states that technology will transform teaching and become a new educational model.

Although the use of computer-mediated communication platforms has beneficial effects, some negative experiences have also been observed as a result of participating in long-term video conferences and online lectures.⁽⁵⁾ In the literature, these negative symptoms are defined as “Zoom Fatigue”, “Computer Mediated Communication Fatigue” or “Video Call Fatigue”.⁽⁶⁾ In 2021 Bailenson⁽⁶⁾ evaluates these negative symptoms in four main categories: eye gaze at a close distance, increase in cognitive load, an all day mirror (increase in self-evaluation as a result of constantly looking at one's own image), and reduced mobility. On the other hand Fauville et al.⁽⁷⁾ use the concept of Zoom Fatigue and define zoom fatigue as “a feeling of exhaustion from participating in video conference calls”. They state that zoom fatigue has five dimensions: general, emotional, visual, motivational and social.

Although the number of studies in this area is very few in the literature, it has been revealed that zoom fatigue differs according to some variables.^(7,8) It is seen that the frequency of participation in online meetings, long session duration, and short time between online meetings increase zoom fatigue.^(7,9) In a study conducted in England with 210 participants, it is reported that having the camera of the participants increased increases the zoom fatigue.⁽¹⁰⁾ Ratan et al.⁽¹¹⁾ similarly observed that participants using open cameras had more zoom fatigue. Another study conducted with 109 students in the Philippines shows that negative symptoms evaluated by Baileson⁽¹²⁾ in four main categories are associated with zoom fatigue. In a study conducted with nursing students, it was shown that students' video call fatigue levels were high and negative attitudes towards video calling increased the level of fatigue.⁽⁸⁾ Moreover, in another study, it was reported that having a positive attitude towards videoconference reduces Zoom fatigue.⁽¹²⁾

It is thought that students' online learning motivation levels, such as positive attitudes towards videoconferences, may also be effective in zoom fatigue. It is known that the motivation of the students in education is effective in the level of attendance, success in the course and

satisfaction.^(13,14) It is thought that the online learning motivation of the students may affect the zoom fatigue in the online learning process, which is expected to continue in the field of education after the pandemic.

Zoom fatigue is a new concept and it is seen that the number of studies in the literature is quite low. Estimating that online learning will continue in the coming years, it is thought that determining the zoom fatigue that may arise due to online learning and taking measures to reduce it will precede the emergence of mental problems. Therefore, it is necessary to identify possible factors that may cause zoom fatigue.

Aim

In this study, it was aimed to determine the zoom fatigue level of nursing students and the variables affecting zoom fatigue, and also to examine the relationship between zoom fatigue and online learning motivation.

Materials and Methods

Type of Study

It is a descriptive and cross-sectional, relational study.

Study design and participants

This descriptive study was conducted between 15 March and 11 May 2022 at a nursing faculty in Ankara, Turkey. A total of 428 nursing students were included in the study. Sample selection was not made in the study, and all students who volunteered to participate in the study were included in the study.

Data Collection Tools

In this study, students' introductory information form, Online Learning Motivation Scale (OLMS) and Zoom Fatigue Scale (ZFS) were used as data collection tools. The introductory information form for the students consists of questions to determine the sociodemographic characteristics of the students and their videoconference participation status.

Online Learning Motivation Scale (OLMS): The scale was developed by Chen and Jang in 2010, Özbaşı et al.⁽¹³⁾ Turkish validity and reliability study was conducted. The scale is 7-point Likert type and consists of 28 items in total. It includes seven sub-dimensions: intrinsic motivation to know, intrinsic motivation to achieve, intrinsic motivation to experience stimulation, determined regulation, introspective regulation, external regulation, and amotivation. The total scale score is between 28-196. Özbaşı et al.⁽¹³⁾ found the Cronbach alpha

coefficient to be 0.94 for the entire scale in 2022. The Cronbach's alpha coefficient of the sub-dimensions varies between 0.60-0.90. ⁽¹³⁾ In this study, the Cronbach's alpha coefficient of the scale was between 0.97 for the whole and 0.74-0.94 for the sub-dimensions.

Zoom Fatigue Scale (ZFS): ZFS is developed by Fauville et al. ⁽⁵⁾ and its Turkish validity and reliability study was conducted by Akduman in 2021. ⁽¹⁵⁾ The scale measures five different dimensions of Zoom fatigue: general fatigue, visual fatigue, social fatigue, motivational fatigue, and emotional fatigue. ZFS is a 5-point Likert-type scale consisting of a total of 15 items. The minimum score that can be obtained from the scale is 15 and the maximum score is 75. High scores indicate high Zoom fatigue, low scores indicate low Zoom fatigue. The minimum score for each sub-dimension is 3 and the maximum score is 15. Akduman ⁽¹⁵⁾ found the Cronbach Alpha coefficient to be 0.94 for the entire scale. The Cronbach Alpha coefficient of the sub-dimensions varies between 0.85-0.94. ⁽¹⁵⁾ Cronbach alpha coefficient of ZFS for this study was 0.95.

Application of Research

Data collection forms were applied to the students by the researchers at the end of the lesson in their classrooms. The purpose of the study was explained to the students and they were told that participation was based on the principle of voluntariness. It took about 10-15 minutes to fill out the forms sent to the mobile phones of the students via Google forms.

Ethical Consideration

Ethics committee permission (December 16, 2021; 2021/411) and written permission from the nursing faculty were obtained in order to conduct the research. The students who will participate in the study were informed about the purpose and subject of the research, and it was explained that participation was based on the principle of voluntariness. The principles of the Declaration of Helsinki were followed throughout the research.

Analysis of Data

Data were analyzed with the Statistical Package for the Social Sciences (SSPS) 21.0 (SPSS Inc., Chicago, IL, USA, 2012). Number, percentage, mean and standard deviation values were used to define the data. Normal distribution fit analysis was performed and it was determined that the variables were non-parametric. Mann Whitney U test and Kruskal Wallis test were used to compare variables. The relationship between the variables was evaluated with the Spearman correlation test. $p < 0.05$ was accepted for statistical significance.

Limitations of the study

The fact that male students are less in number than female students and that the data collection tools consist of self-evaluation scales are the limitations of the research.

Results

The mean age of the nursing students participating in the research is 20.33 ± 1.18 years, 87.9% of them are female, 51.4% of them are studying in the third and fourth grades. 64.5% of the students attend a videoconference approximately once a week, and a videoconference attended by 41.6% takes an average of 30-25 minutes. The interval between two videoconferences, attended by 56.8% of the students, lasts less than 15 minutes, and 56.3% of them state that they think video calls are unnecessary (Table 1).

Table 1. Sociodemographic Characteristics Of Nursing Students (N=428)

Year (Mean \pm SD)	20.33 \pm 1.18	
	n	%
Gender		
Woman	376	87.9
Man	52	12.1
Grade		
1. grade	104	24.3
2. grade	104	24.3
3. grade	110	25.7
4. grade	110	25.7
Frequency of participation in the videoconference		
None	55	12.9
About once a month	47	11.0
About once a week	276	64.5
about once a day	27	6.3
More than once a day	23	5.4
The duration of the videoconference		
Less than 15 minutes	10	2.3
15-30 minutes	26	6.1
31-45 minutes	178	41.6
46-60 minutes	127	29.7
More than 1 hour	87	20.3
Time between two videoconferences		
Less than 15 minutes	243	56.8
15-30 minutes	102	23.8
31-45 minutes	17	4.0
46-60 minutes	16	3.7
More than 1 hour	50	11.7
Your opinion on video videoconferencing		
I love participating in videoconferencing.	187	43.7
I think videoconferences are unnecessary.	241	56.3

SD: Standard derivation

The total mean scores of the students in ZFS were found to be 48.81±15.02, and the total mean scores of the students in OLMS were found to be 117.55±39.10 (Table 2).

Table 2. Mean Scores of Participants in ZFS and OMLS

	Mean ± SD	Lower score	Upper score	Scores ranges
ZFS				
General fatigue	10.51±3.23	3	15	3-15
Visual fatigue	10.62±3.30	3	15	3-15
Social fatigue	9.36±3.42	3	15	3-15
Motivational fatigue	9.24±3.56	3	15	3-15
Emotional fatigue	9.06±3.87	3	15	3-15
Total	48.81±15.02	15	75	15-75
OMLS				
Intrinsic motivation to know	17.87±7.03	4	28	4-28
Intrinsic motivation to achieve	16.29±6.56	4	28	4-28
Intrinsic motivation to experience stimulation	17.05±6.85	4	28	4-28
Determined regulation	16.82±6.86	4	28	4-28
Introspective regulation	15.94±6.54	4	28	4-28
External regulation	16.47±6.56	4	28	4-28
Amotivation	17.08±3.78	9	26	4-28
Total	117.55±39.10	34	189	28-196

ZFS: Zoom Fatigue Scale; OMLS: Online Learning Motivation Scale, SD: Standard derivation

In Table 3, the mean scores of the students according to their descriptive characteristics are compared. A statistically significant difference was found between the total and sub-dimension mean scores of the students according to the class they are studying ($p < 0.05$). Paired analyzes were conducted to determine which group caused this difference. Accordingly, first-year students' general fatigue, visual fatigue, social fatigue, motivational fatigue, emotional fatigue sub-dimensions, and total ZFS score averages were lower than those of second-year students ($Z = -2.592, p = 0.010$; $Z = -3.247, p = 0.001$; $Z = -2.505, p = 0.012$; $Z = -2.173, p = 0.030$; $Z = -2.413, p = 0.016$; $Z = -2.842, p = 0.008$). Visual fatigue, social fatigue, and motivational fatigue sub-dimensions mean scores of first-year students are higher than those of third-year students ($Z = -1.979, p = 0.048$; $Z = -2.294, p = 0.022$; $Z = -2.648, p = 0.012$).

First-year students' general fatigue, visual fatigue sub-dimensions, and ZFS total score averages are lower than those of fourth-year students ($Z = -3.254, p = 0.001$; $Z = -4.150, p = 0.001$; $Z = -2.389, p = 0.017$). The general fatigue, visual fatigue, social fatigue, motivational fatigue, emotional fatigue sub-dimensions and ZFS total score averages of the third-year students were higher than those of the fourth-year students ($Z = -3.247, p = 0.001$; $Z = -2.278, p = 0.023$; $Z = -2.279, p = 0.023$; $Z = -3.245, p = 0.001$; $Z = -3.672, p = 0.001$; $Z = -3.560, p = 0.001$) and second-year students ($Z = -2.837, p = 0.005$; $Z = -4.087, p = 0.001$; $Z = -4.744, p = 0.001$; $Z = -4.312, p = 0.001$; $Z = -4.077, p = 0.001$).

A statistically significant difference was determined between the general fatigue, social fatigue, motivational fatigue, emotional fatigue sub-dimensions and the total ZFS score averages according to the frequency of students' participation in videoconferences ($p < 0.05$). In the pairwise analyzes carried out to determine which group caused this difference, the social fatigue, motivational fatigue, emotional fatigue sub-dimensions and ZFS total score averages of the students who participated once a week ($Z = -2.209, p = 0.027$; $Z = -2.340, p = 0.019$; $Z = -2.666, p = 0.008$; $Z = -2.528, p = 0.011$), once a day ($Z = -2.675, p = 0.007$; $Z = -2.038, p = 0.023$; $Z = -2.284, p = 0.004$; $Z = -2.610, p = 0.009$) and more than once a day ($Z = -2.169, p = 0.030$; $Z = -2.852, p = 0.004$; $Z = -2.487, p = 0.013$; $Z = -2.805, p = 0.005$) were low (Table 3).

A statistically significant difference was found between the average scores of the general fatigue sub-dimension according to the duration of the videoconference attended by the students ($p < 0.05$). In the pairwise analyzes conducted to determine which group caused this difference, the general fatigue subscale mean scores of those whose videoconference duration lasted between 30- 45 minutes and 45-60 minutes were found to be lower than those lasting more than 1 hour ($Z = -3.376, p = 0.001$; $Z = -2.531, p = 0.001$). A statistically significant difference was found between the visual fatigue sub-dimension mean scores of the students who like to participate in video calls ($p < 0.05$) (Table 3).

A statistically significant difference was found between the visual fatigue sub-dimension mean scores according to the views of the students within the scope of the study on videoconferences ($Z = -2.401, p = 0.016$). Accordingly, the visual fatigue sub-dimension mean scores of those who like to attend videoconferences are higher than those who think videoconferences are unnecessary (Table 3).

There was no statistically significant difference between the total and sub-dimension mean scores of ZFS according to the gender of the students and the time between the two videoconferences they attended ($p \geq 0.05$) (Table 3).

Table 3. Comparison of Participants' ZFS Score Averages According to Descriptive Characteristics

	ZFS					
	General fatigue	Visual fatigue	Social fatigue	Motivational fatigue	Emotional fatigue	ZFS Total
Gender						
Woman	10.46±3.25	10.72±3.24	9.43±3.42	9.26±3.42	9.06±3.87	48.95±14.95
Man	10.86±3.10	9.92±3.65	8.86±3.41	9.13±3.83	9.05±3.85	47.84±15.66
	Z= -0.681 p=0.496	Z= -1.435 p=0.151	Z= -1.027 p=0.304	Z= -0.067 p=0.947	Z= -0.035 p=0.972	Z= -0.491 p=0.624
Grade						
1. grade	9.97±2.90	9.77±2.86	9.35±3.02	9.28±3.40	8.77±3.69	47.18±13.72
2. grade	10.94±3.25	10.85±3.12	10.30±3.26	10.16±3.41	9.90±3.65	52.25±15.33
3. grade	9.77±3.17	9.40±3.51	8.38±3.50	7.98±3.17	7.78±3.60	44.32±13.32
4. grade	11.36±3.34	11.41±3.45	9.50±3.60	9.60±3.90	9.74±4.12	51.60±16.27
	X=21.369 p=0.001	X=19.921 p=0.001	X=18.19 p=0.001	X=23.29 p=0.001	X=22.87 p=0.001	X=22.62 p=0.001
Frequency of participation in the videoconference						
None	10.18±3.71	10.58±2.86	9.45±3.49	9.54±3.79	9.38±3.95	49.14±17.14
About once a month	11.08±2.56	10.95±2.86	10.12±2.95	10.19±3.46	10.10±3.59	52.46±13.35
About once a week	10.27±3.25	10.39±3.37	8.97±3.40	8.78±3.51	8.52±3.85	46.96±14.66
about once a day	11.48±3.29	11.51±3.57	10.92±3.66	10.0±3.79	10.85±3.79	55.18±6.24
More than once a day	11.82±2.24	11.69±2.30	10.47±2.84	10.82±2.32	10.56±3.04	55.39±10.25
	X=9.947 p=0.050	X=7.262 p=0.123	X=14.056 p=0.007	X=15.14 p=0.004	X=18.39 p=0.001	X=17.31 p=0.002
The duration of the videoconference						
Less than 15 minutes	9.40±4.57	9.60±4.64	8.90±4.62	9.40±4.55	9.60±4.64	46.90±22.72
15-30 minutes	10.65±3.67	10.46±3.25	10.00±3.72	9.73±4.04	9.26±4.02	50.11±16.87
31-45 minutes	10.14±3.05	10.28±3.20	9.45±3.32	9.34±3.43	8.85±3.67	48.09±14.19
46-60 minutes	10.44±3.14	10.61±3.21	8.96±3.18	8.63±3.47	8.82±3.87	47.48±14.19
More than 1 hour	11.44±3.28	11.49±3.35	9.64±3.71	9.77±3.64	9.71±4.11	52.06±15.51
	X=12.06 p=0.017	X=8.96 p=0.062	X=3.10 p=0.0541	X=6.078 p=0.193	X=3.750 p=0.441	X=5.92 p=0.205
Time between two videoconferences						
Less than 15 minutes	9.40±4.57	9.60±4.64	8.90±4.62	9.40±4.55	9.60±4.64	46.90±22.72
15-30 minutes	10.65±3.67	10.46±3.32	10.00±3.72	9.73±4.04	9.26±4.02	50.11±16.87
31-45 minutes	10.14±3.05	10.28±3.20	9.45±3.32	9.34±3.43	8.85±3.67	48.09±14.49
46-60 minutes	10.44±3.14	10.61±3.21	8.96±3.18	8.63±3.47	8.82±3.87	47.48±14.19
More than 1 hour	11.44±3.28	11.49±3.35	9.64±3.71	9.77±3.64	9.71±4.11	52.06±15.51
	X=7.68 p=0.104	X=4.30 p=0.361	X=2.68 p=0.611	X=9.03 p=0.060	X=7.410 p=0.116	X=5.905 p=0.206
Opinion on video videoconferencing						
I love participating in videoconferencing.	10.71±3.44	11.08±3.15	9.61±3.59	9.53±3.79	9.43±4.29	50.37±16.20
I think videoconferences are unnecessary.	10.35±3.06	10.26±3.37	9.17±3.27	9.02±3.36	8.78±3.48	47.60±13.95
	Z= -1.285 p=0.199	Z= -2.401 p=0.016	Z= -1.331 p=0.183	Z= -1.609 p=0.108	Z= -1.762 p=0.078	Z= -1.844 p=0.065

X: Kruskal Wallis Test, Z: Mann-Whitney U Test; ZFS: Zoom Fatigue Scale

The students' total mean scores of ZFS and OMLS total ($r=-0.144$, $p= 0.003$), intrinsic motivation to know ($r= -0.148$, $p= 0.002$), intrinsic motivation to achieve ($r= -0.118$, $p= 0.014$), intrinsic motivation to experience stimulation ($r= -0.142$, $p= 0.003$), determined regulation ($r=-0.128$, $p= 0.008$), introspective regulation ($r=-0.109$, $p= 0.024$), and amotivation ($r= -0.198$, $p = 0.001$), a negative and weak correlation was found between the mean scores of the sub-dimension. There was no statistically significant difference between the mean scores of ZFS total and external regulation sub-dimension ($r=-0.094$, $p= 0.051$) (Table 4).

Table 4. Correlation Between the Participants' Total Score of ZFS and OMLS

	ZFS Total	
	r	p
OMLS Total	-0.144	0.003
Intrinsic motivation to know	-0.148	0.002
Intrinsic motivation to achieve	-0.118	0.014
Intrinsic motivation to experience stimulation	-0.142	0.003
Determined regulation	-0.128	0.008
Introspective regulation	-0.109	0.024
External regulation	-0.094	0.051
Amotivation	-0.198	0.001

r: Spearman correlation test; ZFS: Zoom Fatigue Scale; OMLS: Online Learning Motivation Scale

Discussion

In this study, which examined online learning motivation and Zoom fatigue in nursing students, it was seen that the online learning motivation of nursing students was close to the average. In a study conducted with nursing students, 52.6% of the students stated that they did not find online learning useful, and 85.9% reported that the virtual environment reduced their desire to listen. ⁽¹⁶⁾ Motivation is a dynamic feature that drives certain behaviors towards achieving a goal. The displayed behavior or action is very dependent on the motives the person has. ⁽¹⁷⁾ In the study conducted by Keskin and Özer Kaya in 2020⁽¹⁸⁾ with university students, more than half of them do not find web-based distance education as effective as face-to-face education. Also students stated that they thought distance education as an alternative solution, they encountered technical problems in the distance education process, they forgot what they have learned quickly, they were comfortable with teaching staff and they could not communicate. ⁽¹⁸⁾ In 2020 Kızıltepe and Kurtgöz ⁽¹⁹⁾determined that nursing students have problems in

following and attending classes during the distance education process, have difficulties in understanding and learning, and feel inadequate in clinical practice.

It has been observed that the online learning motivation levels of the students who attend videoconferences approximately once a week are higher than those who attend approximately once a month and never attend. In addition, the online learning motivation levels of the students whose video conference duration is less than 15 minutes and 15-30 minutes were found to be lower than those who took 30-45 minutes, 45-60 minutes and more than 1 hour. This finding shows that short-term courses can also reduce students' motivation in the distance education process. In order to increase the student's online learning motivation, a certain course duration and course frequency are needed.

The online motivation levels of students studying in the third and fourth grades are higher than those of the students studying in the first and second grades. In the study conducted in 2021 by Durgun et al. ⁽²⁰⁾ with nursing students during the pandemic process, students' views on distance education were evaluated. Accordingly, it has been observed that first-year students have a more negative view of distance education than others. It is thought that this may be due to the fact that the distance education process negatively affects the university student experience of first and second year students and does not meet their expectations. On the other hand, the fact that third and fourth grade students are more conscious about vocational education and that they are close to graduation may have increased their motivation.

In this study, it was determined that the Zoom fatigue levels of nursing students were slightly above the average. In the study conducted in 2022 by Ateş and Kanık ⁽²¹⁾ with university students, it was determined that the zoom fatigue levels of my students were above the medium level. "Zoom fatigue is defined as a negative emotional state in which an individual experiences anxiety, tension, fatigue and exhaustion due to frequent and high-intensity virtual interactions". ⁽¹⁵⁾ The education of the students during the pandemic period was carried out remotely online. It is thought that factors such as being exposed to the screen for a long time, limited interaction, and limitation of movement area cause students to experience zoom fatigue. In a study examining the physical, mental and emotional effects of Zoom fatigue, it has been reported that zoom fatigue causes burnout and stress, and increases mental and cognitive load. ⁽²²⁾

When the zoom fatigue levels of the students according to the class they study are examined, the zoom fatigue levels of the first and third grade students were found to be lower than the second and fourth grade students. This data is interesting. The low level of fatigue of first-year

students is associated with the fact that the curriculum is not intense. When the second grade is considered as the beginning of the intensive vocational courses, it is thought that the fatigue levels of the students may be higher, and that their fatigue levels may have decreased by adapting to this intensive program in the third grade.

It has been determined that as the frequency of students' participation in video conferencing increases, the levels of general fatigue, social fatigue, motivational fatigue, emotional fatigue and zoom fatigue increase. As the screen exposure rate increases, it is seen that the zoom fatigue levels of the students also increase. In the study conducted in 2020 by Büyükgebiz Koca and Tunca ⁽²³⁾ with high school students, it was concluded that students with internet and social addictions feel more tired and encounter failures in lessons. The high frequency of students participating in videoconferences reveals the fatigue caused by screen exposure. On the other hand, it was determined that the general fatigue levels of the students increased as the duration of a videoconference attended increased. It is thought that trying to concentrate on the lesson for a long time may have caused fatigue in the students.

It was found that the visual fatigue levels of the students who stated that they liked to participate in video interviews were higher than those of the students who thought that video interviews were unnecessary. This finding is interesting, and it is thought that it may be related to the fact that students who like to participate in video interviews participate in these interviews for a longer period of time, depending on their enjoyment.

Conclusion and Recommendations

In this study, which was conducted with nursing students during the pandemic period, it was seen that students' motivation levels for online learning were close to the average, while their zoom fatigue levels were slightly above the average. A low negative correlation was found between Zoom fatigue and online learning motivation. It was found that the online motivation levels of the students studying in the third and fourth grades and who participate in videoconferences approximately once a week, whose video conference duration is more than 30 minutes, are higher. The zoom fatigue levels of the first and third grade students who attended videoconferences approximately once a week were found to be lower. According to the results of this research, in order to reduce the fatigue levels of the students and increase their motivation in the distance education process, it is recommended that the number and duration of the lessons are kept short, and that qualified learning methods that will use time effectively are preferred.

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