

ZOOM FATIGUE AND ITS IMPACT ON ACADEMICIANS: THE CASE OF UNIVERSITIES IN ANKARA*

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Abstract

Video conferencing gained popularity during the COVID-19 pandemic and is increasingly used today, making its role in academic life undeniable. Therefore, it is crucial to investigate the psychosocial effects of video conferencing on academics. This study was conducted to determine the impact of Zoom fatigue on the mental workload and quality of life of academics. A total of 164 academicians participated in the study. Data were collected using the Zoom Fatigue Scale, the Mental Workload Scale (CarMen-Q), and the Quality of Life Scale for Employees. We analyzed the study data using SPSS 22.0 software. It was found that 87.2% of the participating academicians were female, 60.4% were married, and their average age was 34.09 ± 7.28 . The study revealed a significant relationship between Zoom fatigue and mental workload ($F=48.988, p<0.05$), burnout ($F=20.045, p<0.05$), and compassion fatigue ($F=22.233, p<0.05$). The findings indicate that Zoom fatigue contributes to an increased mental workload and a decreased quality of life. Based on the results obtained, it is considered important to investigate the long-term effects of Zoom fatigue in the context of preventive mental health. In this regard, supportive interventions aimed at reducing Zoom fatigue are necessary to improve the quality of life of academicians.

Keywords: Zoom Fatigue, Mental Workload, Quality Of Life, Academician.

ZOOM YORGUNLUĞU VE AKADEMİSYENLER ÜZERİNDEKİ ETKİLERİ: ANKARA'DAKİ ÜNİVERSİTELER ÖRNEĞİ

Öz

Bu çalışmada Zoom yorgunluğunun akademisyenlerin zihinsel iş yükü ve COVID-19 döneminde popülerlik kazanan ve günümüzde giderek daha fazla kullanılan video konferans kullanımının akademik yaşamdaki rolü yadsınamaz. Bu nedenle akademisyenlerde video konferans kullanımının psikososyal etkilerinin araştırılması kritik öneme sahiptir. Bu araştırma, zoom yorgunluğunun akademisyenlerin zihinsel iş yükü ve yaşam kalitesi üzerindeki etkisini belirlemek

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amacıyla yapılmıştır. Araştırmaya 164 akademisyen katılmıştır. Veriler Zoom Yorgunluğu Ölçeği, Zihinsel İş Yüğü Ölçeği (CarMen-Q) ve Çalışanlar için Yaşam Kalitesi Ölçeği kullanılarak toplanmıştır. Araştırmanın verileri SPSS 22.0 programı kullanılarak analiz edilmiştir. Araştırmaya katılan akademisyenlerin %87,2'sinin kadın, %60,4'ünün evli ve yaş ortalamalarının $34,091 \pm 7,276$ olduğu belirlenmiştir. Araştırmada zoom yorgunluğu ile zihinsel iş yükü ($F=48.988, p<0.05$), tükenmişlik ($F=20.045, p<0.05$) ve şefkat yorgunluğu ($F=22.233, p<0.05$) arasında anlamlı bir ilişki olduğu tespit edilmiştir. Bulgular zoom yorgunluğunun zihinsel iş yükünün artmasına ve yaşam kalitesinin düşmesine katkıda bulunduğunu göstermektedir. Araştırma verilerinden elde edilen sonuçlara göre zoom yorgunluğunun uzun vadeli etkilerini araştırmanın, koruyucu ruh sağlığı açısından önemli olduğu değerlendirilmektedir. Bu bağlamda akademisyenlerin yaşam kalitesini artırmak için, zoom yorgunluğunu azaltmayı amaçlayan destekleyici müdahalelere ihtiyaç duyulmaktadır.

Anahtar Kelimeler: Zoom Yorgunluğu, Zihinsel İşyükü, Yaşam Kalitesi, Akademisyen.

Introduction

With the COVID-19 pandemic, mechanisms such as the imposition of restrictions, social isolation, and quarantine have resulted in education and academic activities being conducted remotely (WHO, 2020). Technology use, and consequently the number of online video chats, courses, and meetings, has expanded rapidly during this period. Communication between students and educators has continued thanks to online platforms in the realm of education, where continuity is crucial. The Zoom app was downloaded 485 million times in 2020 alone, and it will be the seventh most downloaded software among mobile apps in 2022 (We are social, 2022). With the widespread usage of videoconferencing programs that give such ease of use and access, academics who must use these applications for extended periods of time have found themselves in a new predicament in which their physical and mental burden has increased (Oducado et al., 2022). Bailenson (2021) introduced the concept of 'Zoom fatigue' to describe the psychological strain caused by prolonged video conferencing (Bailenson, 2021). The mental load in videoconference communication is said to be significantly higher than in face-to-face communication, as a result of extremely long and tiring eye contact, fatigue caused by seeing oneself constantly and in real time during video chats, and a significant decrease in normal mobility (Fauville et al., 2021; Riedl, 2022; Shoshan, Wehrt, 2022). Factors that generate higher mental stress have been specifically considered in Zoom fatigue studies. For example, while many feelings and thoughts can be easily expressed by gestures and facial expressions, even if they are not uttered in face-to-face interaction, it may be essential to make an extra effort to convey ourselves online (Fauville et al., 2021; Takac et al., 2019). A study that looked at academics' perspectives on online education during the pandemic discovered that academics' motives

were harmed, they were unable to interact effectively with students, and they were anxious (Sayan, 2021).

Although technology provides limitless accessibility and speed, it also pushes the boundaries of personal space and has a negative impact on quality of life (Deniz et al., 2022). In the workplace context, quality of life encompasses various dimensions, including physical, mental, social, and emotional well-being. It is well-established that quality of life is not solely determined by physical conditions but is also significantly shaped by psychological and social factors (Boekhorst et al., 2017). The mirror effect caused by commonly used videoconferencing programs induces self-focus and negative self-evaluation, resulting in burnout and a reduction in people's quality of life (Elbogen et al., 2022). Long-term technological intrusion in people's personal spaces is said to make them feel overwhelmed and exhausted, negatively affecting their subjective well-being (Singh et al., 2022).

In this context, it is thought that revealing the effects of zoom fatigue on the mental workload and quality of life of academicians who frequently teach for long hours in front of the computer and participate in video conferences and meetings as part of their work is important in terms of revealing problems that may be encountered in this field and taking the necessary precautions. Although numerous review articles explore the concept of Zoom fatigue, its causes, and its consequences, descriptive and empirical studies on the subject remain relatively scarce. Existing research predominantly focuses on its effects on students and the general population. In this context, this study aims to examine the impact of Zoom fatigue on academics' mental workload and quality of life, contributing to the development of healthier academic work environments and laying the groundwork for preventive mental health strategies.

This study aimed to investigate the impact of Zoom fatigue on academics' mental workload and quality of life, focusing on the research question: "Does Zoom fatigue affect academics' mental workload and quality of life?"

1. MATERIALS AND METHODS

This study utilized a descriptive and correlational design.

1.1. Population and Sample of the Study

The study population consisted of 680 academicians working in health sciences faculties at state and foundation universities in Ankara during the 2022-2023 academic year. A sample size of 116 was determined, ensuring a 95% confidence interval with a $\pm 5\%$ margin of error. The study successfully reached 164 academicians, which was sufficient to represent the population.

1.2. Measures

The data collection tools used in the study were The Professional Quality of Life Scale, the Zoom Exhaustion & Fatigue Questionnaire, and the Mental Workload Scale.

1.2.1. The Professional Quality of Life Scale:

Originally developed by Stamm and adapted into Turkish by Yeşil et al. (Stamm 2005; Yeşil et al., 2010). Comprises 30 items and 3 subscales. These subscales are compassion satisfaction, burnout, and compassion fatigue. In this study, the Cronbach's alpha scores were calculated as 0.86 for compassion satisfaction and 0.87 for both burnout and compassion fatigue.

1.2.2. Zoom Exhaustion & Fatigue Questionnaire (ZEFQ):

Akduman conducted the Turkish validity and reliability study of the ZEFQ, which was introduced to the literature by Fauville et al. in 2021 (Fauville et.al., 2021; Akduman, 2021). The scale has 15 items in 5 categories, no reverse coded items, and is scored on a 5-point Likert scale. The subscales of the scale are listed as general fatigue, visual fatigue, social fatigue, motivational fatigue and emotional fatigue. Zoom fatigue worsens as the scale score rises. The Cronbach Alpha coefficient was 0.94 in the Turkish validity and reliability study of the scale. The Cronbach alpha value in this study is 0.92.

1.2.3. The Mental Workload Scale (CarMen-Q):

Developed by Rubio-Valdehita et al. in 2017, was translated and adapted into Turkish by Yavuz et al. in 2020 (Rubio-Valdehita, et al., 2017; Yavuz et al., 2020). The scale includes 25 items and is divided into four sub-dimensions: 'cognitive demands', 'temporal demands', 'emotional demands', and 'performance demands'. It contains no reverse-scored items. In the Turkish validity and reliability study, the Cronbach's Alpha value was found to be 0.90, while in this study, it was calculated as 0.89."

1.3. Procedure

After getting the relevant permissions, the researchers collected the data using the established Google form link. The connecting link was given to the e-mail addresses specified on the web pages of academicians working in the faculties of health sciences of Ankara's state and foundation universities, and the academicians were asked to respond.

1.4. Data analysis

The research data were analyzed using the SPSS 22.0 statistical software. The descriptive characteristics of the participants were assessed

through frequency and percentage analyses, while the scales were examined using mean and standard deviation statistics. The kurtosis and skewness values were examined to determine whether the research variables followed a normal distribution. According to the relevant literature, a normal distribution is indicated when the kurtosis and skewness values of the variables fall between +1.5 and -1.5 (Tabachnick & Fidell, 2013) or between +2.0 and -2.0 (George & Mallery, 2010). It was determined that the variables followed a normal distribution. Therefore, parametric methods were used for data analysis. Pearson correlation and linear regression analyses were applied to explore the relationships between the dimensions that represent the academicians' scale levels.

1.5. Ethics

This study was approved by an ethics committee from a university. Before beginning to answer the questions, participants were briefed about the study and asked to check the box expressing their agreement to participate.

2. RESULTS

The survey found that 87.2% of academicians were female, 60.4% were married, and 39.6% were single. The average age ranges from 23 to 60 (34.091 ± 7.276). Professors account for 4.3% of academics, while associate professors account for 8.5%, doctoral faculty members account for 20.7%, lecturers account for 20.1%, and research assistants account for 46.3%.

During the pandemic, 95.1% of academics taught via distant education, and 84.1% of these courses were held synchronously. Moreover, it was shown that 48.2% of teachers taught 2-4 hours per week, 16.5% taught 5-6 hours per week, and 18.3% taught 11 hours or more per week. According to the frequency of involvement in online meetings of the academicians participating in the study, 35.4% attended at least once a month, 45.7% at least once a week, 11.0% at least once a day, and 7.9% multiple times a day. It was shown that 51.8% of academicians did not attend online meetings when they were not necessary for commercial purposes. It was discovered that 43.3% of the burnout levels they experienced following online meetings were occasional, 25.6% were significant, and 3.7% were very.

It was determined that the academicians received an average of 3.140 ± 0.778 (Min = 1.2; Max = 5) from the ZEFQ and an average of 4.639 points from the "Mental Workload" scale. Among the sub-dimensions of the "Quality of Life Scale", academicians scored 34.902 ± 9.276 (Min=11; Max=50) for compassion satisfaction, 26.592 ± 5.628 (Min=16; Max=50) for burnout, 18.287 ± 8.353 (Min=2; Max = 43) for compassion fatigue.

A positive and significant relationship was found between the "Mental Workload" scale total and subscale scores and the ZEFQ total and subscale scores. A positive and significant relationship was determined between the

total scores of burnout and compassion fatigue, which are subscales of the "Quality of Life" scale, and the total scores of the "Zoom Fatigue" general and subscales. However, a negative and significant relationship was found between the "Quality of Life" scale total score and the "Zoom Fatigue" scale total and subscale scores (Table 1).

Regression analysis showed a significant relationship between ZEFQ and mental workload ($F=48.988$, $p<0.001$). The total change in the "Mental Workload" general score level was found to be an important determinant of Zoom fatigue by 22.7% ($R^2=0.227$). Increasing Zoom fatigue increases the level of mental workload general score ($\beta=0.482$).

The regression analysis performed to determine the cause and effect relationship between the ZEFQ subscales and the mental workload total score was found to be significant ($F=11.474$; $p=0.000$). The total change in the "Mental Workload" total score level is explained by 24.3% of "General Fatigue", "Visual Fatigue", "Social Fatigue", "Motivational Fatigue", "Emotional Fatigue" ($R^2 = 0.243$) (Table 2).

The regression analysis conducted to examine the cause-and-effect relationship between Zoom fatigue and burnout yielded significant results ($F=20.045$; $p=0.000$). Zoom fatigue accounts for 10.5% of the total variance in burnout levels ($R^2=0.105$). An increase in Zoom fatigue leads to a rise in overall burnout levels ($\beta=0.332$) (Table 3).

The regression analysis performed to determine the cause and effect relationship between zoom fatigue and compassion fatigue was found to be significant ($F=22.233$; $p=0.000$). The total change in the level of compassion fatigue is explained by zoom fatigue at a rate of 11.5% ($R^2 = 0.115$). Zoom Fatigue increases the level of compassion fatigue ($\beta=0.347$) (Table 4)

The tolerance values for the regression model ranged from 0.652 to 0.402, indicating that there is no multicollinearity in the model, as they are above 0.1. Similarly, the VIF values ranged from 1.445 to 2.486, remaining within acceptable limits (below 10). This shows that the independent variables are not highly correlated with each other, confirming the validity of the model. In addition, the Durbin-Watson value is reported as 2.021. This value indicates that there is no autocorrelation between the error terms, and that the model is reliable, as the ideal Durbin-Watson value is close to 2. Therefore, it can be concluded that the model does not suffer from multicollinearity or autocorrelation, and the results of the analysis are reliable.

3. DISCUSSION

According to the literature, computer-mediated communication technologies, which became necessary during the COVID-19 pandemic, may have harmful impacts on humans. There have been very few reports on these consequences, known as Zoom fatigue. The zoom fatigue levels of academicians working in the field of health were investigated in this study, as

well as the relationship between zoom fatigue, mental workload, and quality of life. In this study, it is seen that academicians working in the field of health received above average scores (3.140 ± 0.778) from the "Zoom Fatigue" scale. In Fauville et al.'s study with participants using video conferencing, the average Zoom fatigue score was found to be 2.99 ± 79 (Fauville et.al., 2021).

In this study, it is seen that academicians received an above-average score (4.639) from the "Mental Workload" scale and that increasing Zoom fatigue increased the overall mental workload score ($\beta=0.482$). Riedl stated in his study that during video conference calls, the brain must work harder to compensate for deficiencies caused by asynchronized communication, insufficient use of body language, inability to establish eye contact, lack of joint interest, and difficulty in establishing coordination. Additionally, Riedl noted that the need to multitask, interruptions in connection, and interaction with multiple faces cause information overload (Riedl, 2022). Another study found that academics lacked sufficient expertise about online education and using platforms like Zoom, and that the switch to Zoom was abrupt, causing them to struggle with adaption. It has been stated that technical concerns such as online connection troubles, inability to hear people speaking when the microphone is switched off, and background noise disturb people's motivation and force them to exert extra cognitive effort to concentrate.

Furthermore, Almpanis and Joseph-Richard state in their study that academics' technological knowledge may be insufficient, that preparing educational materials for online courses requires additional knowledge and time, that there are difficulties in ensuring student participation and feedback on online platforms, and that some institutions' technological infrastructure may be insufficient to use online platforms (Almpanis&Joseph-Richard, 2022). According to a study conducted with academicians at a university in Belgium, online education has beneficial elements, but it takes more time and the academicians are not well-trained in acquiring technological support, producing challenges (Bruggeman et al., 2022). In Yang's study with students in Ireland, students said that they needed the support of their teachers in online lessons. It is thought that there are instances where academics are needed to provide technology help to students in addition to their own demands, putting an additional mental weight on them (Yang, 2021). The increased use of online platforms, lack of expertise among academics, and communication challenges contribute to Zoom fatigue and mental strain.

High levels of visual and social fatigue, both of which are zoom fatigue subscales, were found to be effective in raising mental workload in our investigation. Individuals suffering from social fatigue prefer to avoid social activities and prefer to be alone. This can lead to emotional collapse and anxiety in the long run (DeFreese&Mihalik, 2016). Academics' mental and perceptual activities such as decision-making, communication, and research may be expected to suffer as a result of social weariness and increased mental stress.

According to the findings of this study, Zoom fatigue has an effect on academicians' quality of life, and as Zoom fatigue increases, academicians' quality of life diminishes (Deniz et.al., 2022). A study of online teachers in Chile during the pandemic period found that their increased workload has an impact on their mental and physical health, lowering their quality of life (Lizana&Vega-Fernandez, 2021). Another study found that the change during the pandemic period increased teacher burnout (Sokal et.al., 2024). According to a study that compared teachers' quality of life before and after the epidemic, teachers' quality of life dropped during the pandemic (Manaf et.al., 2021). Another study conducted with academics during the pandemic period found that academics' quality of life is poorer than the general population's quality of life (Hamid et.al., 2021). Li et al. discovered a link between individuals' zoom fatigue and autistic and depressed symptoms over the COVID-19 era (Li et.al., 2023)

Zoom fatigue is thought to produce challenges with accomplishing everyday activities and may have a significant impact on quality of life, largely by causing sleep deprivation, difficulty focusing, and the resultant loss of motivation. Furthermore, given that change in the field of education was very rapid during the pandemic period and that academicians were not adequately prepared for this process, it can be said that the extra cognitive load in the use of online platforms impacted academicians' quality of life.

Conclusion

This study discovered academicians' levels of zoom fatigue, as well as a link between zoom fatigue, mental strain, and quality of life. According to our findings, rising zoom fatigue increases mental workload and lowers quality of life. As video conferencing becomes a permanent fixture in academia, studying its long-term effects is essential for promoting mental well-being. Furthermore, in accordance with the study's findings, supporting interventions to improve the quality of life of those exposed to zoom fatigue are required.

In addition, this study highlights the necessity of developing supportive interventions tailored to the needs of academicians. Stress management programs, ergonomic training, and resources aimed at fostering work-life balance could significantly enhance the quality of life for those exposed to high levels of Zoom fatigue. These interventions could also contribute to preventive mental health strategies, ensuring that academicians maintain their well-being and productivity in increasingly digitalized work environments.

Table 1. Correlation Analysis Between Zoom Fatigue, Mental Workload And Quality Of Life Scores

Scales		Zoom fatigue total score	General fatigue	Visual fatigue	Social fatigue	Motivational fatigue	Emotional fatigue
Mental workload total score	r	0.482**	0.372**	0.415**	0.399**	0.308**	0.390**
	p	0.000	0.000	0.000	0.000	0.000	0.000
Cognitive demands	r	0.358**	0.283**	0.330**	0.279**	0.215**	0.293**
	p	0.000	0.000	0.000	0.000	0.006	0.000
Temporal demands	r	0.359**	0.255**	0.332**	0.300**	0.220**	0.293**
	p	0.000	0.001	0.000	0.000	0.005	0.000
Emotional demands	r	0.557**	0.413**	0.431**	0.495**	0.386**	0.453**
	p	0.000	0.000	0.000	0.000	0.000	0.000
Performance demands	r	0.340**	0.331**	0.305**	0.249**	0.200*	0.253**
	p	0.000	0.000	0.000	0.001	0.010	0.001
Compassion satisfaction	r	-0.118	-0.038	-0.074	-0.114	-0.114	-0.119
	p	0.132	0.631	0.350	0.146	0.146	0.130
Burnout	r	0.332**	0.196*	0.246**	0.284**	0.284**	0.287**
	p	0.000	0.012	0.002	0.000	0.000	0.000
Compassion fatigue	r	0.347**	0.207**	0.244**	0.288**	0.314**	0.306**
	p	0.000	0.008	0.002	0.000	0.000	0.000

* <0.05 ; ** <0.01 ; Pearson correlation analysis**Table 2. The Effect Of Zoom Fatigue On Mental Workload**

Independent variable	Unstandardized coefficients		Standardized coefficients	t	p	95% Confidence interval	
	B	SE				Min	Max
Constant	3.425	0.179		19.179	0.000	3.073	3.778
Zoom fatigue total score	0.386	0.055	0.482	6.999	0.000	0.277	0.496
* Dependent Variable = Mental workload total score. $R=0.482$; $R^2=0.227$; $F=48.988$; $p=0.000$; Durbin Watson Value=2.087							
Independent variable	Unstandardized coefficients		Standardized coefficients	t	p	95% Confidence interval	
	B	SE				Min	Max
Constant	3.346	0.195		17.142	0.000	2.961	3.732
General fatigue	0.116	0.060	0.162	1.919	0.057	-0.003	0.235

Visual fatigue	0.138	0.047	0.238	2.906	0.004	0.044	0.231
Social fatigue	0.144	0.059	0.238	2.439	0.016	0.027	0.261
Motivational fatigue	-0.090	0.071	-0.137	-1.274	0.205	-0.231	0.050
Emotional fatigue	0.085	0.064	0.140	1.320	0.189	-0.042	0.212

Table 3. The Effect Of Zoom Fatigue On Burnout

Independent variable	Unstandardized coefficients		Standardized coefficients	t	p	95% interval	Confidence
	B	SE				Min	Max
Constant	19.049	1.735		10.979	0.000	15.623	22.476
Zoom fatigue total score	2.402	0.536	0.332	4.477	0.000	1.342	3.461

* Dependent Variable =Burnout $R=0.332$; $R^2=0.105$; $F=20.045$; $p=0.000$; Durbin Watson Value=1.870

Table 4. The Effect Of Zoom Fatigue On Compassion Fatigue

Independent variable	Unstandardized coefficients		Standardized coefficients	t	p	95% interval	Confidence
	B	SE				Min	Max
Constant	6.568	2.560		2.566	0.011	1.513	11.623
Zoom fatigue total score	3.732	0.791	0.347	4.715	0.000	2.169	5.294

* Dependent Variable = Compassion fatigue. $R=0.347$; $R^2=0.115$; $F=22.233$; $p=0.000$; Durbin Watson Value=1.717

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