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Investigation of Smartphone Addiction Levels Among University Students

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ABSTRACT

The purpose of this study is to examine the smartphone addiction levels among university students. For this purpose, first of all, students' addiction levels were determined, and then it was examined whether these levels differed according to the gender of the students, the purpose of using the internet on the smartphone, and the usage times of smartphones. The causal comparison method was used in the research as a quantitative research method and the sampling of the research consisted of 435 students studying in the Faculty of Theology at Ondokuz Mayıs University and who were determined by the accessible sampling method. In order to determine the smartphone addiction levels of university students, the data was obtained with the Smartphone Addiction Scale. Descriptive statistics, the independent samples t-test, and one-way analysis of variance were used to analyze the obtained data. The results of the research showed that students studying in the Faculty of Theology had low levels of smartphone addiction, male students had higher levels of smartphone addiction compared to female students, the use of social media via smartphones increased the risk of addiction, and that students with a higher average daily smartphone usage also had higher levels of addiction.

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Keywords:

smartphone addiction, the purpose of internet usage, duration of use

1. Introduction

Smartphones, which are one of the fastest developing and changing tools of information and communication technologies, have become more than interpersonal communication tools as they provide internet access today (Argumosa-Villar, Boada-Grau and Vigil-Colet, 2018; Gezgin and Çakır, 2016). In addition to the traditional features of mobile phones such as calls and SMS; mobile applications, which enable interactions including browsing and sharing on social networking sites, playing games, and shopping, make smartphones an indispensable technology in individuals' lives (Samaha & Hawi, 2016). Because, this technology enables individuals to perform their daily life practices more efficiently, such as shopping, socializing, and accessing the news. Besides, the fact that individuals enjoy real-life activities in a virtual environment that provides a digital identity makes this technology more widespread (Gökçearslan, Mumcu, Haşlamam and Çevik, 2016). Pew Research Center (2019) states that 94% of adults in developed economies and 83% of adults in developing countries have mobile phones. According to TSI's (Turkish Statistical Institute) (2019) Household Information Technologies Usage Survey, the present rate of the availability of mobile phones in households in Turkey is 98.7%. The intensive use of smartphones in daily life practices can turn into problematic use, effecting interpersonal communication, human health, and happiness. The problematic use of mobile phoned can be classified as harmful use (using mobile phones in traffic), improper use (using mobile phones in the classroom, in a meeting, or in the cinema) and excessive use (Walsh, White, & Young, 2007). The components of smartphone addiction that refers to excessive use of mobile phones are stated as tolerance, withdrawal,

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obsessive-compulsive symptoms, and functional disorders. (Pamuk & Kutlu, 2017; Lin et al., 2014). Smartphone addiction is defined as the case that individuals do not reduce but increase the use of smartphones in the face of disturbing situations such as psychological problems like anxiety and stress and physiological problems like hand and neck dysfunctions, headache, and poor sleep quality as they more intensely feel the need for smartphones (Padir, 2017; Torrecillas, 2007). Increased use of smartphones is seen as an impulse disorder that brings along the uncontrollable use and negative effects in other areas of life (Park & Lee, 2012; Gezgin, Hamutoğlu, Samur and Yildirim, 2018). Although smartphone addiction is similar to other technological addictions, it can be much more dangerous than others due to its unique features such as portability and ease of connection (Demirci, Orhan, Demirdaş, Akpınar and Sert, 2014).

Smartphones can be said to have a more widespread usage among today's youth thanks to their features that satisfy the users or make them feel good, as a result of increased need for communication, security, and control, instrumental functions, status and identity, the use of social networking sites, a sense of permanent accessibility, sharing feelings and thoughts, having fun, and playing games (TUİK, 2019; Aktaş & Yılmaz, 2017; Aljomaa et al., 2016; Zhitomirsky-Geffet & Blau, 2016; Corbonell, Oberst & Beranuy, 2013). However, the transformation of this widespread use of smartphones to addiction has been reported to have negative effects on the feeling of satisfaction with life, happiness levels, and subjective well-being of young people (Kozan, Kavaklı, & Cutter, 2019; Çelik, 2018; Samaha & Hawi, 2016; Lepp, Barkley and Karpinski, 2014; Park and Lee, 2012). Apart from the stated psychological problems, hand and neck dysfunctions, headache, and poor sleep quality physiological problems are also among the negative effects of smartphone addiction (Sülün, Günay, Sarman and Dertli, 2020; Günal and Pekçetin, 2019; Koças and Şaşmaz, 2019; Randjelović, Stojilković, Radulović, Stojanović and Ilić, 2019; Keskin Ergan, Başkurt and Başkurt, 2018; Yorulmaz, Kırac and Sabırlı, 2018; Demirci, Akgönül and Akpınar, 2015).

Researches on smartphone addiction levels among young people focus on psychological variables (Pamuk and Kutlu, 2017) such smartphone usage time, gender and age (Gezgin et al., 2018; Konan, Durmuş, Ağiroğlu and Türkoğlu, 2018; Chen, Liu, Ding, Ying, Wang and Wen, 2017; Van Deursen et al., 2015), type of content engaged or the purpose of smartphone usage (Kuss et al., 2013; Salehan and Negahban, 2013), academic success (Yağın et al., 2020; Samaha and Hawi, 2016), loneliness (Aktaş and Yılmaz, 2017; Gezgin, Ümmet and Hamutoğlu, 2020), satisfaction with life (Kula, Ayhan, Kaçay and Soyer, 2020; Kuang-Tsan and Fu-Yuan, 2018; Samaha and Hawi, 2016), subjective well-being (Yıldırım and Ayas, 2020), stress and social anxiety (Enez Darcin et al., 2016; Sapacz, Rockman, & Clark, 2016; Van Deursen et al., 2015; Chiu, 2014; Lee et al., 2014). It is also stated that smartphone addiction is associated with pathological personality traits such as impulsivity and neuroticism (Carvalho, Sette and Ferrari, 2018). The research by Lopez-Fernandez et al. (2017) shows that gender, using social networking sites, and spending a long time with smartphones are among the predictor variables of young people's smartphone addiction. It is stated that online mobile games and social networking sites pose a risk factor for smartphone addiction in terms of the type of content engaged on smartphones (Lopez-Fernandez et al., 2018; Jeong et al., 2016; Lee, 2015; Kuss et al., 2013; Salehan and Negahban, 2013).

When the studies conducted are examined, it is noteworthy that smartphone addiction is significantly high among university students. This situation reveals the potential risk for university students in terms of smartphone addiction. When the literature is examined, no study was found on smartphone addiction among students studying in the Faculty of Theology. Only the nomophobia levels among the students studying in the Faculty of Theology have been examined in terms of various variables (Turan and Becit İşçitürk, 2018). Researches in the literature show that it is important to examine the level of smartphone addiction among university students in terms of gender, the purpose of internet use, and smartphone usage time. In this context, the aim of the research is to examine the smartphone addiction levels among the students studying in the Faculty of Theology. Answers to the following research questions will be sought for this purpose:

- What are the university students' smartphone addiction levels?
- Do the university students' smartphone addiction levels differ depending on their gender?
- Do the university students' smartphone addiction levels differ depending on their purpose to use the internet?
- Do the students' smartphone addiction levels differ depending on their smartphone usage time?
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2. Methodology

2.1. Research Design

This research is designed by a using causal comparison method, one of the quantitative research methods. In causal comparison studies, the causes of an existing or naturally occurring condition and the variables that affect these causes, or the results of an effect are determined (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz and Demirel, 2010).

2.2. Population and Sample of the Research

The population of this research consisted of students studying in the Faculty of Theology at Ondokuz Mayıs University in the 2018-2019 academic year. The sample of the research consisted of 435 students studying in the Faculty of Theology at Ondokuz Mayıs University in the 2018-2019 academic year, determined by the accessible (easy) sampling method. In this method, the researcher tries to achieve the sample size needed by starting from the most easily accessible responders (Büyüköztürk et al., 2010). Since the students' possession of a smartphone was deemed important for the purposes of the research, attention was paid to the voluntary participation students who have a smartphone. The demographic characteristics of the students in the sample are shown in Table 1.

Table 1. Demographic characteristics of university students

Variables	Groups	N	%
Gender	Female	293	67,4
	Male	142	32,6
Age	18-19 years	27	6,2
	20-21 years	185	42,5
	22-23 years	168	38,6
	24-25 years	34	7,8
	26 years and over	21	4,8
Class	First Grade	103	23,7
	Second Grade	119	27,4
	3rd Grade	142	32,6
	4th Grade	71	16,3

According to Table 1, 67% of the students participating in the study were female and 33% were male. In addition, it is seen that 81% of students were between the ages of 20 and 23.

2.3. Data Collection Tools

In the research, the "Smartphone Addiction Scale", developed by Kwon et al. (2013) and adapted into Turkish by Demirci et al. (2014), was used as a data collection tool to determine the smartphone addiction levels among university students. Data on students' demographic characteristics were obtained through a personal information form. The Smartphone Addiction Scale consists of 33 items and seven factors as "disturbance in daily life and tolerance" (8 items), "withdrawal symptoms" (7 items), "positive expectation" (5 items), "cyber-oriented relations" (4 items), "overuse" (4 items), "social network addiction" (2 items), and "physical symptoms" (3 items). In the adaptation study by Demirci et al. (2014), it was determined that the factor loads of the scale items ranged between 0.35 and 0.82. Cronbach's alpha internal consistency coefficient of the scale was 0.95, Guttman split halves reliability was 0.89, test-retest reliability was 0.81. Cronbach's alpha internal consistency coefficients for the factors of the scale ranged from 0.57 to 0.92. The seven factors of the scale explain 66.4% of the total variance. The grading options of the Likert type scale used are "1-Strongly Disagree 6-Strongly Agree". The scores that can be obtained from the scale vary between 33 and 198 points. The

increase in the score obtained from the scale indicates the increased risk of smartphone addiction (Demirci et al., 2014).

With the data obtained in this study, the Cronbach's alpha internal consistency coefficient of the scale was determined as 0.93. Cronbach's alpha internal consistency coefficients for the factors of the scale ranged from 0.65 to 0.88. Also, according to the results of exploratory factor analysis, it was observed that the first factor loads before the scale items were between 0.76 and 0.38. The item-total score correlation coefficients of the items varied between 0.37 and 0.74. Also, according to the results of exploratory factor analysis, it was observed that the first factor loads before the scale items were returned were between 0.76 and 0.38. The fact that the load value of each item was over 0.30 is considered sufficient in creating a factor pattern (Çokluk, Şekercioğlu & Büyüköztürk, 2012; Tavşancıl, 2010). The fact that the first-factor load values of all items were above 0.30 indicates that the scale may have a general factor (Büyüköztürk, 2018). Thus, the total score was obtained from the scale used and the analyzes were made using the total score.

2.4. Data Collection and Analysis

The data of the research were collected by the researchers during the class hours. During the data collection process, the students were first informed about the purpose of the research, the data collection tool, and that the data will be kept confidential, and then it was reminded that the participation in the research was voluntary and students were asked to answer the scale. The answering process was completed in 10-15 minutes.

Whether the data showed a normal distribution before the analysis was examined on the distribution of the total scores obtained from the scale according to the central distribution, skewness, and kurtosis values, based on the Kolmogorov-Smirnov test significance levels ($p > .05$). (Büyüköztürk, 2018; Morgan, Leech, Gloeckner and Barrett, 2004). It was determined that the data obtained according to Table 2 provided the normality assumption and there were no excessive skewness or kurtosis problems. After the normality tests, students' smartphone addiction levels were analyzed with descriptive statistics, whether the addiction scores differ according to gender was analyzed with independent samples t-test analysis, and whether the addiction scores differ according to the purpose of using the internet on the smartphone and the usage times of the smartphone were analyzed with one-way analysis of variance (ANOVA).

Since the lowest score that can be obtained from the smartphone addiction scale was 33 and the highest score was 198, the levels of smartphone addiction were defined as follows: Very low level; 33-65 points, low level; 66-98 points, medium level; 99-131 points, high level; 132 -164 points, and very high level; 165-198 points. When examining the levels of smartphone addiction for the purpose of internet use, the use for gaming was not included in the analysis. Because, the number of students who stated to use the internet mostly for gaming purposes was very low ($n = 5$, 1.1%). Independent sample t-test was used in terms of students' smartphone addiction levels in terms of whether they use the internet for specific purposes (doing research, using social networking sites, playing games, having fun) or not in order to explore the findings obtained by the one-way analysis of variance. In this analysis, the data of students who stated more than one purpose of use were added to the relevant category, and recoding was performed for each purpose of use. The level of statistical significance in analyzes using SPSS software was assumed to be 0.05.

3. Findings

Findings obtained from the research are presented below in the order of the research questions. Descriptive statistics about university students' smartphone addiction levels are shown in Table 2.

Table 2. Descriptive statistics on smartphone addiction levels

	N	M	SD	Median	Mode	Min	Max	Skewness	Kurtosis
Smartphone addiction	435	83.72	25.58	81	59	33	178	.526	.440

According to Table 2, smartphone addiction levels of university students ($M = 83.72$) can be said to be low overall. An independent sample t-test was used to reveal whether university students' smartphone addiction levels differ according to gender. The results of the analysis are presented in Table 3.

Table 3. t-test results of smartphone addiction levels by gender

	Gender	N	M	SD	df	t	p
Smartphone addiction	Female	293	81.73	22.70	433	-2.54	.012
	Male	142	87.81	24.88			

As seen in Table 3, there was a significant difference between female ($M = 81.73$, $SD = 22.70$) and male students ($M = 87.81$, $SD = 24.88$) in terms of smartphone addiction levels [$t_{(433)} = -2.54$, $p = .01$]. According to this finding, it can be said that male students have a higher level of smartphone addiction than female students.

The one-way analysis of variance was (ANOVA) used to determine whether the level of smartphone addiction of university students differs according to the purpose (making research, using social networking sites, playing games, having fun) of using smartphones. Descriptive statistics of smartphone addiction levels according to the purpose that students use the Internet most on their smartphones are presented in Table 4 and ANOVA results are presented in Table 5.

Table 4. Descriptive statistics of smartphone addiction levels according to the main purpose of using the Internet on mobiles phones

The main purpose of using the Internet on mobile phones	N	M	SD
1. Research (academic, lesson, homework, job, profession, health etc.)	59	72.69	22.309
2. Social networks (communication and sharing)	216	88.06	23.451
3. For entertainment purposes (listening to music, watching movies and videos, etc.)	44	79.98	17.961
4. Multi-purpose use	111	82.51	23.858
Total	430	83.69	23.435

When Table 4 is examined, it is seen that the smartphone addiction levels of university students who used the internet on their smartphone mostly to communicate and share posts on social networking sites have higher than those who used them for other purposes. It is seen that the smartphone addiction levels of those who used it for research purposes are lower than those who used it for other purposes.

Table 5. ANOVA results for smartphone addiction levels according to the main purpose of using the Internet on mobile phones

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Scheffe
Between groups	12018.046	3	4006.015	7.633	.000	
Within groups	223587.433	426	524.853			1-2, 1-4
Total	235605.479	429				

According to Table 5, in ANOVA results, a significant difference was found between smartphone addiction levels and the main purpose that university students use the internet on their smartphones. [$F_{(3,426)} = 7.633$, $p = .000$]. Scheffe test was used to determine among which groups there was a significance. According to the findings, it was determined that the smartphone addiction levels of those who used the internet mostly to communicate and share posts on social networking sites were higher than those who used it the most to make research on various subjects such as academic, lesson, homework, job, profession, and health. In addition, it was determined that students who used the Internet for more than one purpose had higher levels of smartphone addiction than those who used it to conduct research on subjects such as academic, lecture, homework, job, profession, and health. The findings show that those who use the internet on their smartphones to communicate and share posts on social network sites have high levels of smartphone

addiction, in other words, these students carry more risks in terms of smartphone addiction. In order to explore the findings obtained by single directional variance analysis, t-test was used to reveal whether there was a significant difference between the level of smartphone addiction among university students and their use of the internet on their smartphones for specific purposes (doing research, using social networking sites, playing games, having fun) or not. The findings are presented in Table 6:

Table 6. t-test results of smartphone addiction levels according to the purpose of using the internet on mobile phones

The purpose of using the Internet on mobile	Status	N	M	SD	df	t	p
1. Research (academic, lesson, homework, job, profession, health etc.)	Yes	142	77.17	22.62	433	4.105	.000
	No	293	86.89	23.42			
2. Social networks (communication and sharing)	Yes	316	86.41	23.73	433	-3.938	.000
	No	119	76.58	21.69			
3. Gaming (mobile games)	Yes	27	91.37	29.81	433	-1.745	.082
	No	408	83.21	23.07			
4. For entertainment purposes (listening to music, watching movies and videos, etc.)	Yes	113	83.50	21.64	433	.116	.908
	No	322	83.80	24.25			

When Table 6 is examined, it is seen that the smartphone addiction level ($M = 77.17$) of students who use the internet connection on their phones for research on academic, lesson, homework, job, profession, health, etc. ($M = 86.89$) was found to be lower than [$t_{(433)} = 4.105, p < .01$]. This finding can be interpreted as those who use the internet connection on the smartphone to conduct research have a lower risk of smartphone addiction. It was found that the students who use the internet connection on their phones to communicate and share posts on social network sites had a higher smartphone addiction level ($M = 86.41$) compared to those who do not use it for this purpose ($M = 76.58$) [$t_{(433)} = -3.938, p < .01$]. This finding can be interpreted as those who use the internet connection on the smartphone to communicate and share on social networking sites have a higher risk of smartphone addiction. No significant difference was found between the smartphone addiction levels of students who use the internet connection on their phones for gaming on mobile phones ($M = 91.37$) and those who do not use it for this purpose ($M = 83.21$) [$t_{(433)} = -1.745, p > .05$]. Similarly, no significant difference was found between the smartphone addiction levels of students who use the internet connection on their phones for entertainment purposes such as listening to music and watching videos or movies ($M = 83.50$) and those who do not use it for these purposes ($M = 83.80$) [$t_{(433)} = 0.116, p > .05$]. These findings show that university students who use the internet connection of their phones for gaming and entertainment on mobile have similar smartphone addiction levels compared to students who do not use them for these purposes.

One-way analysis of variance (ANOVA) was used to reveal whether university students' smartphone addiction levels differ according to the average daily smartphone usage time. Descriptive statistics of smartphone addiction levels by daily average smartphone usage time are presented in Table 7 and analysis results are presented in Table 8.

Table 7. Descriptive statistics of smartphone addiction levels by average daily smartphone usage time

Average daily smartphone usage time	N	M	SD
Less than 1 hour (1)	11	62.45	20.082
1-2 hours (2)	117	73.15	19.678
3-4 hours (3)	195	82.47	20.332
5-6 hours (4)	66	95.61	21.348
More than 6 hours (5)	46	103.93	28.301

Table 8. ANOVA results of smartphone addiction levels by daily average smartphone usage time

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Scheffe
Between groups	46485.868	4	11621.467	25.651	.000	1-4, 1-5, 2-3,
Within groups	194818.352	430	453.066			2-4, 2-5, 3-4,
Total	241304.221	434				3-5,

According to the results of the analysis, a significant difference was found between the smartphone addiction levels of university students in terms of daily average smartphone usage time [$F_{(4,430)} = 25.65$, $p = .000$]. As the group variances were not equal according to the result of the Levene test, Dunnett's C test was used to determine among which groups there was a difference. According to the findings, it was found that the level of smartphone addiction of those who used their smartphone on average 5-6 hours per day and more than 6 hours was higher than those who use it for less than 1 hour, for 1-2 hours, and for 3-4 hours. Also, it was determined that those who used their smartphone for 3-4 hours a day had higher levels of smartphone addiction than those who used it for 1-2 hours. These findings show that students with a high average of daily smartphone usage time also have high levels of smartphone addiction, in other words, those with higher smartphone usage carry more risks in this regard.

4. Conclusion and Discussion

In this study, in which university students' smartphone addiction levels were examined in terms of different variables, it was determined that students in the Faculty of Theology had low levels of smartphone addiction. The literature shows that university students' smartphone addiction levels are low and these students have moderate risk (Celikkalp et al., 2020; Sohn et al., 2019; Aljomaa et al., 2016). Moreover, meta-analysis studies indicate that smartphones pose a significant risk for children and adolescents, along with the ability to play games and use social networking sites (Fischer-Grote, Kothgassner & Felnhofer, 2019; Davey & Davey, 2014). In a study conducted by Turan and Becit İşçitürk (2018), it is stated that the nomophobia levels, described as the fear of being deprived of mobile phones, was moderate among students in the Faculty of Theology. It is also stated that nomophobia has similar characteristics with other psychosocial disorders including behavioral disorders, anxiety disorders, or variable mood experienced by smartphone addicts. These aforementioned problems negatively affect the individual's concentration and sleep patterns (Rosen et al., 2016; Dixit et al., 2010).

In the study, it was seen that male students had a higher level of smartphone addiction than female students. The studies examining the smartphone addiction of students in terms of gender state different results. Aljomaa et al. (2016) and Mohammadbeigi et al. (2016) stated that male students were addicted more, while Bal and Balcı (2020), Gündoğmuş, Taşdelen Kul and Çoban (2020) and Celikkalp et al. (2020) stated that female students were addicted more. In some studies, no significant difference was found in terms of gender (Kula et al., 2020; Yıldırım and Ayas, 2020; Minaz and Çetinkaya Bozkurt, 2017; Kumcagiz and Gündüz, 2016). In the context of the sample examined, it is thought that this result stems from the fact that male students spend more time in using smartphones than female students, and differences in their intended use. Because, different results in terms of gender in the literature show that it may be appropriate to examine students' addiction levels together with gender and smartphone usage purposes (Chen et al., 2017; Cocoradă, Maican, Cazan and Maican, 2018).

The results of the research show that the use of the internet on the smartphone for research purposes does not make a significant difference in the addiction and that the use for communication and sharing posts on social network sites is effective on the addiction. In addition, the addiction levels of those who use the Internet on their smartphones to communicate and share posts on social network sites are higher than those of the students who use it mostly for research purposes. These results support many research findings in the literature. The use of social media via smartphone among university students is seen as a potential determinant of smartphone addiction (Gündoğmuş, Taşdelen Kul and Shepherd, 2020; Lopez-Fernandez et al., 2017). No difference was found between the use of the internet on the smartphone for music, film, and video viewing purposes and other purposes in terms of smartphone addiction levels. Social media, one of the most important functions of smartphones, is emphasized in the studies conducted by young users. On one hand, this

widespread use makes communication with the social environment continuous and on the other hand, it causes serious time loss (Yusufoğlu, 2017).

When the smartphone addiction levels of university students were analyzed according to the average daily smartphone usage time, it was observed that the students with high smartphone usage also had high addiction levels. Researches also showed that the usage of smartphones, which covers the daily duration of smartphone use and how many times a smartphone is checked, has a significant effect on smartphone addiction (Yıldırım and Ayas, 2020; Gökçearslan et al. 2016). Students' fear of not being online and losing communication causes students to be busy with their smartphones for longer periods of time. Increasing usage time of smartphones may bring negativity in terms of academic success as it can decrease the time of studying and researching and negatively affect the interest and focus on lessons through negative stress (Erdem, Kalkın, Türen and Deniz, 2016). The literature shows that there is a negative relationship between smartphone addiction and academic performance (Rozgonjuk, Saal and Täht, 2018; Samaha and Hawi, 2016; Kibona and Mgaya, 2015). In addition, this kind of addiction increases cyberloafing behavior among young people (Gökçearslan et al. 2016). Increased usage time and cyberloafing behavior can have an impact on students' academic success. University students being busy with their smartphones during the lesson in the classroom reveal some negative situations for both the student and the lecturer. Therefore, it is recommended to take necessary measures to prevent the long-term use of smartphones by students during the course at universities.

It can be said that the purpose of using smartphones is an important factor in determining the usage conditions of smartphones more clearly. Hence, qualitative studies can be conducted that examine the purposes of smartphone usage and smartphone addiction levels together in detail. In addition, it is thought that analyzing the detailed activity data presented by smartphones about screen time together with smartphone addiction levels may be useful in achieving more descriptive results.

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