

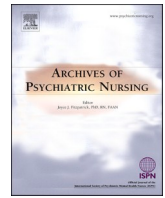


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The effect of COVID-19 uncertainty on internet addiction, happiness and life satisfaction in adolescents

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ABSTRACT

This study aimed to determine the effects of the events during the COVID-19 epidemic on adolescents' levels of intolerance of uncertainty, internet addiction, happiness, and life satisfaction. Structural Equation Modeling was used in the analysis of the data. Adolescents' internet use increased during the epidemic process. It was found that COVID-19 events increased intolerance of uncertainty, and negatively affected internet addiction and happiness ($p < 0.001$). In this process, internet addiction and happiness is a mediator ($p < 0.001$). It is recommended to monitor adolescents' internet use during the COVID-19 process and to provide information about COVID-19.

Introduction

Adolescence is generally the transition period from childhood to adulthood. Rapid bio-psychosocial changes are experienced in adolescents during this period. It is seen that the individual's inquiries about himself and his future are intense with this process of change. Emotional features such as emotional fluctuations, timidity, anxiety, restlessness, and quick excitement stand out during adolescence. Due to these features, changes in living conditions for adolescents can be an important source of stress and can cause them to cope harder, negatively affect their mental and social development (Compas et al., 2017; Heller and Casey, 2016). Recently the coronavirus epidemic has affected the whole of society all over the world undoubtedly and has been an important source of stress for adolescents.

Coronavirus in Turkey as well as all over the world have a profound impact on life and led to the adoption of serious measures (Priesemann et al., 2021). Several measures have been implemented in the country as a precaution, such as closing social areas, schools, and all important commercial organizations and protecting physical distance to prevent virus spread (Turkey Emergency Covid-19 Health Project: Stakeholder Engagement Plan, 2020). There is a restriction in many regions in Turkey on the curfew of adolescents under the age of 20 because they pose a great risk of spread (CNNTÜRK, 2020). Additionally, primary, secondary, and high school students who have been educated have started "distance education" via television and internet and free internet usage quotas have been increased (MEB Distance Education, 2020). Consequently, adolescents under the age of 20 had to carry out almost

all their activities over the internet.

It is reported that internet use has increased in the world during the coronavirus epidemic (BEREC, 2020). It is known that internet usage in Turkey increased steadily over the years before coronavirus (TurkStat, 2020) and it is estimated that this epidemic has increased the internet usage rate even more. Adolescents often use the internet for many useful activities such as communication, education, and entertainment. However, on the other hand, it is known that with the prolongation of time spent on the Internet, pathological internet use or internet addiction occurs in addition to the negative effects such as neglect of daily work, insomnia, pornography (Baturay and Toker, 2019; Singh, 2019; Upadhyay et al., 2017).

It is stated that pathological internet use negatively affects the vital activities of individuals. However, it is stated that both the coronavirus epidemic itself and the restrictions caused by the coronavirus epidemic, which is a crisis, can adversely affect the mental health and life satisfaction of individuals (Torales et al., 2020; Zhang et al., 2020). In particular, it is reported that maintaining social distance and long-term quarantines will negatively affect the physical and mental well-being of society, intra-family relations, and social/emotional support networks (Cheung et al., 2021). Also, mental disturbances such as anxiety (Shanafelt et al., 2020), depression (Xiang et al., 2020), post-traumatic stress symptoms, loneliness, and weakness (Xiang et al., 2020) are reported to occur due to the coronavirus.

It is known that positive mood, life satisfaction, and happiness have an important role in preventing the development of mental disorders. It is also stated that these concepts both positively affect each other and

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are closely related to spiritual healing (Demirci et al., 2017; Lambert D'raven et al., 2015). Individuals with high levels of happiness are more likely to be more optimistic, more resistant to adverse environmental conditions, and more likely to develop effective coping skills to manage the stressful situation (Afshari et al., 2018; Tejada-Gallardo et al., 2020).

The COVID-19 epidemic is a period that contains uncertainties in terms of its emergence and subsequent process. The spread of the virus has also caused the spread of threat perception in individuals. As individuals' perception of threat increases, their tendency to evaluate the situation as a complex and insoluble process also increases. This situation is defined as intolerance to uncertainty (Budner, 1962). It is reported that intolerance to uncertainty also includes the tendency to react negatively emotionally, cognitively and behaviorally to uncertain events and situations (Buhr and Dugas, 2002). It is known that intolerance to uncertainty negatively affects individuals' happiness and life satisfaction and is associated with an increase in internet use (Karataş and Tagay, 2021; Luo et al., 2022; Sarıçam, 2015).

Current study

It is emphasized that the majority of adolescents between the ages of 12–29 are online, 25 % are in “constant connection” and problematic internet use is an important problem among adolescents (D'Angelo and Moreno, 2020). In this process, both adolescence (Blakemore, 2019), coronavirus, and the measures taken (Xiang et al., 2020), and internet addiction (D'Angelo and Moreno, 2020) are known to pose a risk for mental illness. Therefore, whether coronavirus preventive measures will increase the likelihood of psychiatric morbidity (Cheung et al., 2021) and morbidity prevention measures need to be investigated further. The research planned within this context aims to reveal the impact of events in the COVID-19 process on intolerance, internet addiction, happiness, and life satisfaction in adolescents between the ages of 12 and 20 in Turkey who are covered by the curfew.

Materials and methods

Participants and Procedure

Research data were collected from the 2019–2020 academic year spring semester students aged 12–20 in a province located in the Central Anatolia region of Turkey. Approval was received for this research from Republic of Turkey the Ministry of Health Scientific Research Studies Commission on COVID-19 (Approval Code: 2020-05-15T22.35.59; Approval Date: 19.05.2020) and the Social and Human Sciences Ethics Committee (Approval number: 85; Approval Date: 27.05.2020). Also, consent was obtained from participants over the age of 18 with an informed volunteer consent form, and with an informed parent volunteer consent form for participants under 18. Since the current situation related to the coronavirus epidemic in the world and our country is not fully clear, the data forms were delivered to the students via the internet and asked to fill out. “Informed Volunteer Consent Form” and “Informed Parent Volunteer Form” were put on the internet and the voluntary consent or parent consent tab was made obligatory.

There is no clear consensus on the number of samples in structural equation modeling (Tarka, 2018). According to the proposal of the literature, the sample of the research was accounted for 375 adolescents which between 10 and 20 times the number of variables in the model and not <200 (Kline, 2011). Post-hoc power analysis was performed in the G-Power (Version 3.1.9.2) program for the sufficiency of the sample. In the analysis, the power of the model, in which the total value of the effect of events is established as a dependent variable; internet addiction, happiness, and life satisfaction are established as an independent variable, was statistically found to be 99.9 % in a 5 % error share (Type-I error).

The mean age of the participants is 16.03 ± 2.76 , 66.4 % is female, 74.4 % is middle-income, 81.6 % is nuclear family type, 41.3 % use the

internet for lessons, games, social media monitoring, etc. and there was no mental illness diagnosed in almost the entire group.

64.5 % of the adolescents reported that the time spent on the internet increased compared to the pre-COVID-19 epidemic, 84.0 % stated that they decided the time spent on the internet and their daily internet usage time was determined to be 4.75 ± 3.01 h on average.

Data collection forms

Impact of Event Scale (IES)

The scale developed by Horowitz et al. (1979) was revised by Weiss and Marmar (1997). The Turkish validity and reliability of the scale were made by Çorapçioğlu et al. (2006). The scale was developed to evaluate each effect and severity of the traumatic event, and consists of three sub-dimensions: “hyper-arousal (HA)”, “re-experiencing (RE)” and “avoidance (A)” (Horowitz et al., 1979). The scale consists of 22 items and each item is scored between 0 and 4. High scores indicate that the person is affected more by the traumatic event. In the validity and reliability study of the Turkish version, total IES score ($r = 0.705$, $p < 0.001$) and intrusion ($r = 0.693$, $p < 0.001$), hyperarousal ($r = 0.639$, $p < 0.001$), avoidance ($r = 0.491$, $p < 0.001$) IES subscale scores were found to correlated with the corresponding scores of Clinician Administered Post Traumatic Stress Disorder Scale with Spearman analysis. The area under the ROC curve was defined as 0.878 ± 0.031 ($p < 0.001$). For cut-off points of IES between 24 and 33, both sensitivity and specificity were over 70 %. Cronbach a was 0.937 ($p < 0.0001$) (Çorapçioğlu et al., 2006). This value was determined as 0.92 in our study.

Short Form of Intolerance of Uncertainty Scale (IUS-12)

The scale was developed by Carleton et al. (2007). Turkish validity and reliability adaptation was done by Sarıçam et al. (2014). The scale, which was developed to evaluate the tendency to react emotionally, cognitively, and behaviorally to uncertain events and situations, consists of two sub-dimensions, “anxiety towards the future (AF)” and “preventive anxiety (PA)”. The high score obtained indicates that the person's tendency to react emotionally, cognitively, and behaviorally to uncertainty increases. In the validity and reliability study of the Turkish version, results confirmatory factor analyses demonstrated that 12 items, and each item is scored between 0 and 5 yielded two factor as original form and that the two-dimensional model was well fit ($\chi^2 = 147.20$, $df = 48$, $RMSEA = 0.073$, $CFI = 0.95$, $IFI = 0.95$, $GFI = 0.94$, and $SRMR = 0.046$). Factor loadings ranged from 0.55 to 0.87. Cronbach alpha internal consistency coefficient was found as 0.88 for overall scale, 84 for prospective anxiety subscale and 0.77 for inhibitory anxiety subscale. In the concurrent validity significant relationships were found between the Intolerance of Uncertainty Scale (IUS-12) and Coping Flexibility Scale, Educational Stress Scale ($r = -0.43$, 0.41 respectively). Test-retest reliability coefficient was 0.74. Corrected item-total correlations ranged from 0.42 to 0.68 (Sarıçam et al., 2014). Cronbach alpha internal consistency coefficient was 0.84 in our study.

Young's Internet Addiction Test Short Form (YIAT-SF)

The Turkish validity and reliability of the scale, which was developed by Young (1998) and converted into short-form by Pawlikowski et al. (2013), was carried out by Kutlu et al. (2016). The scale developed to measure the Internet addiction level of individuals consists of 12 items, each item is scored between 0 and 5, and a single dimension. High scores from the scale indicate a high level of internet addiction. The fit index values of the scale were determined as $\chi^2 = 141.93$, $sd = 51$, $RMSEA = 0.080$, $GFI = 0.90$, $CFI = 0.90$ and $IFI = 0.90$. The test-retest correlation coefficient of the scale was found to be 0.86 in adolescents. Cronbach's alpha internal consistency reliability coefficient was reported to be 0.86 for the total scale in adolescents (Kutlu et al., 2016), and this value is 0.87 for our study.

Oxford Happiness Questionnaire Short Form (OHQ-SF)

The Turkish adaptation of the scale developed by Hills and Argyle (2002) was made by Doğan and Çötök (2011). The scale developed to evaluate the level of happiness consists of 7 items, The scale developed to measure the Internet addiction level of individuals consists of 12 items, each item is scored between 0 and 5, and a single dimension and a single dimension. The high score expresses the high level of the individual's happiness. The fit index values of the scale were determined as $\chi^2 = 36.05$, $sd = 13$, $RMSEA = 0.074$, $GFI = 0.97$, $CFI = 0.95$ and $IFI = 0.95$. The test-retest correlation coefficient of the scale was found to be 0.85. Cronbach's alpha internal consistency coefficient of the scale was reported as 0.74 (Doğan and Çötök, 2011), and it was 0.77 in our study.

Satisfaction with Life Scale (SWLS)

The Turkish validity and reliability study of the scale, developed by Diener et al. (1985), was conducted by Dağlı and Baysal (2016). The scale developed to measure individuals' satisfaction with life consists of 5 items; The scale developed to measure the Internet addiction level of individuals consists of 12 items, each item is scored between 0 and 5, and a single dimension. The high score obtained indicates the high level of life satisfaction of the individual. The fit index values of the scale were determined as $\chi^2/sd = 1.17$, $RMSEA = 0.030$, $GFI = 0.99$, $CFI = 1.00$ and $NFI = 0.99$. The test-retest correlation coefficient of the scale was found to be 0.97. The Cronbach's alpha internal consistency reliability coefficient for the total of the scale was reported to be 0.88 (Dağlı and Baysal, 2016), and this value was 0.86 in our study.

Statistical analysis

The data obtained from the research were evaluated in the SPSS 25 (IBM SPSS Statistics Standard Concurrent User V 25) package program. Validity analysis and explanatory factor analysis were performed on the scales before evaluating the data. Cronbach's alpha internal consistency coefficients of the scales are given in the introduction part of the scales. The principal component analysis was applied for the Exploratory Factor analysis. It was determined that the Kaiser-Meyer-Olkin (KMO) test value was >0.80 for all scales and $p < 0.01$ for Bartlett's test of sphericity. It is seen in line with these findings that the scales can be used safely without removing any items from the scales (Gürbüz and Şahin, 2018). Mardia's multivariate kurtosis coefficient critical rate was used to evaluate the conformity of the data to a normal distribution ($p < 0.05$; critical rate < 1.96). It was observed that the data were not normally distributed ($p < 0.05$). Therefore, the Spearman correlation test was used for correlation analysis.

The following indices were used to test the appropriateness of the structural equation modeling implemented through the LISREL 8.71 (Jöreskog and Sörbom, 2004) program: $CMIN/df < 5$; $RMSEA < 0.08$; $GFI > 0.90$; $AGFI > 0.90$; and $CFI > 0.90$ were considered significant (Gürbüz and Şahin, 2018; Kline, 2011). As the data are not normally

distributed, the Asymptotically Distribution Free (ADF) method has been applied (Kline, 2011). A value of $p < 0.05$ was considered statistically significant in comparisons. The hypothesis model tested is given below (Fig. 1).

The hypotheses of the study

The following hypotheses were tested in the study:

- H1. Events during COVID-19 affect intolerance of uncertainty in adolescents.
- H2. Intolerance of uncertainty affected by events during COVID-19 affects internet addiction in adolescents.
- H3. Intolerance of the uncertainty affected by events during the COVID-19 period affects happiness in adolescents.
- H4. Intolerance of uncertainty affected by events of the COVID-19 period affects life satisfaction in adolescents.
- H5. Intolerance of uncertainty is the mediator in the interaction between events during the COVID-19 period and internet addiction in adolescents.
- H6. Intolerance of uncertainty is a mediator in the interaction between events of the COVID-19 period and happiness in adolescents.
- H7. Intolerance of uncertainty is a mediator in the interaction between events during the COVID-19 period and life satisfaction in adolescents.

Results

Descriptive statistics and correlations

The mean age of the adolescents participating in the study was 16.03 ± 2.76 . When the mean scores obtained from the scales are examined, it is seen that the IES mean scores are low and the YIAT mean scores are moderate. IUS, OHQ and SWLS mean scores were found to be high. Scales mean score and correlational information between study variables are given in Table 1.

According to Table 1, impact of COVID-19 event are positively and significant related with the intolerance of uncertainty and internet addiction ($p < 0.01$), negatively and significant related to happiness ($p < 0.01$), and there is no significant relationship with life satisfaction ($p > 0.05$) in adolescents aged 12–20 years. Likewise, the intolerance of uncertainty variable has a positive relation with internet addiction, a negative and significant relationship with happiness ($p < 0.01$), and there is no significant relationship with life satisfaction ($p > 0.05$). Internet addiction was found to have a significant and negative relationship with happiness and life satisfaction ($p < 0.01$). There is a significant and positive strong relationship between happiness and life

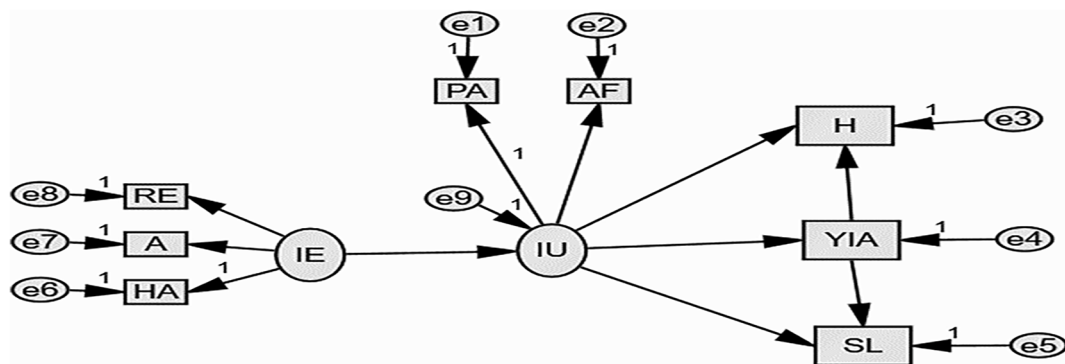


Fig. 1. Hypothesis Model to Test

*IE: Impact of Event; IU: Intolerance of Uncertainty; YIA: Young's Internet Addiction; H: Happiness; SL: Satisfaction with Life.

Table 1
Average, standard deviation and correlation values of study variables.

Variables	1.	2.	3.	4.	5.	6.	7.
1. Age	–						
2. TSID	0.146**	–					
3. IE	0.213**	0.071	–				
4. IU	0.217**	0.127*	0.541**	–			
5. YIA	0.209**	0.426**	0.306**	0.325**	–		
6. H	–0.266**	–0.281**	–0.192**	–0.250**	–0.381**	–	
7. SL	–0.243**	–0.204**	–0.070	–0.080	–0.278**	0.692**	–
Mean ± SD	16.03 ± 2.76	4.75 ± 3.01	31.26 ± 17.99	37.68 ± 10.74	27.19 ± 9.39	24.04 ± 5.55	15.90 ± 4.77

Note: IE: Impact of Event; IU: Intolerance of Uncertainty; YIA: Young Internet Addiction; H: Happiness; SL: Satisfaction with Life; TSID: Time Spent on The İnternet Daily.

* p < 0.05.

** p < 0.01 (p values according to the Spearman’s rho test).

satisfaction (p < 0.01) (Fig. 2).

Results on structural equation model analysis

Structural equation model analyzes were conducted in this section to reveal the effect of the COVID-19 incident on the intolerance of uncertainty, internet addiction, happiness, and life satisfaction in adolescents and the interaction between variables (Table 1).

According to the test results of the structural equation model established in Fig. 2, it is seen that Chi-square = 35,440, df = 16 and p = 003 < 0.05. It is seen that the model established according to these values is a fully saturated model (df > 0.05), p < 0.05 makes it necessary to evaluate the goodness of the model fit index values. When we look at the model fit index values of the established model, the model fit index values were determined as CMIN/df = 2.21 < 5, GFI = 0.98, AGFI = 0.95, CFI = 0.98, RMSEA = 0.06. These values show that the data support the model and the fit indices are acceptable (Gürbüz and Şahin, 2018; Kline, 2011).

Fig. 2 and Table 2 show the results of the structural equation model analysis established to determine how much the COVID-19 incident affects intolerance of uncertainty, internet addiction, happiness, and life satisfaction in adolescents. It is observed in adolescents that the events taking place in the COVID-19 process significantly affect the intolerance of uncertainty statistically (p < 0.001). The intolerance of uncertainty that arises in this process affects both internet addiction and happiness in a statistically significant way (p < 0.001). However, intolerance to uncertainty does not have a significant effect on life satisfaction (p > 0.05). Internet addiction also negatively affects happiness and life satisfaction at a statistically significant level (p < 0.001).

Also, it is seen that 38.3 % of the changes in intolerance of uncertainty, 13.9 % of changes in internet addiction, 16.8 % of changes in

happiness, and 5.8 % of changes in life satisfaction that emerged during the COVID-19 process are explained by this model.

According to Table 3, it is seen that events directly affect the intolerance of uncertainty (impact value = 0.619) in the COVID-19 process. It has been determined that intolerance to uncertainty directly affects internet addiction (impact value = 0.373) and happiness (impact value = –0.215). In addition to this direct effect, intolerance of uncertainty is a significant mediator between the effect of events and internet addiction (impact value = 0.231) and happiness (impact value = –0.197) (p < 0.001). Internet addiction is seen to have a direct negative impact on happiness (impact value = –0.279) and life satisfaction (impact value = –0.218) (p < 0.001). In addition to this direct effect of internet addiction, it has been determined that there is a significant mediator effect between intolerance of uncertainty and happiness (impact value = –0.104) (p < 0.001).

Discussion

It is stated that fear and anxiety, which are reported as the most common emotions during adolescence, arise due to uncertainty and imaginary situations (Çam and Engin, 2014). COVID-19 is a source of great uncertainty for healthcare professionals and healthcare systems as well as other individuals (suspects, patients, and families, etc.) due to its unknown etiology and management. Unfortunately, this uncertainty is not a simple and easily defined concept, nor does it arise from a single factor. Uncertainty is a situation where there is insufficient understanding, a sense of lack, unclear, contradictory, and unreliable information, and inconsistent alternatives. This is also true for the COVID-19 epidemic. Uncertainty is very important in such cases regardless of its origin because uncertainty, when consciously or unconsciously suppressed or ignored, can affect individuals and their families severely

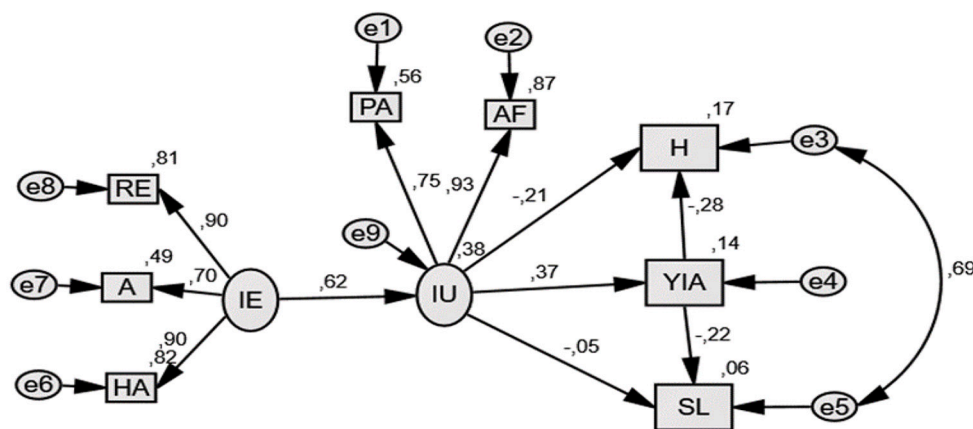


Fig. 2. Structural Equation Modeling Between Impact of Events, Intolerance of Uncertainty, Internet Addiction, Happiness, and Life Satisfaction.
*IE: Impact of Event; IU: Intolerance of Uncertainty; YIA: Young’s Internet Addiction; H: Happiness; SL: Satisfaction with Life

Table 2
Regression weights, standardized regression weights, and squared multiple correlations in the model.

Variables	Estimate		S.E.	t	P		
	Unstandardized β	Standardized β					
IU	<—	IE	0.535	0.619	0.055	9.813	0.001
YIA	<—	IU	0.779	0.373	0.113	6.906	0.001
SL	<—	YIA	-0.111	-0.218	0.028	-3.985	0.001
H	<—	YIA	-0.165	-0.279	0.030	-5.398	0.001
H	<—	IU	-0.265	-0.215	0.068	-3.882	0.001
SL	<—	IU	-0.052	-0.049	0.061	-0.841	0.400
SMC							
IU			0.383				
YIA			0.139				
H			0.168				
SL			0.058				

IE: Impact of Event; IU: Intolerance of Uncertainty; YIA: Young Internet Addiction; H: Happiness; SL: Satisfaction with Life; S.E.: Standard Error, SMC: Squared Multiple Correlations.

Table 3
Standardized estimates of direct and indirect effects on intolerance of uncertainty, internet addiction, happiness and satisfaction with life.

Impact status		Bias-corrected 95% effect value (lower/upper)		
		IE	IU	YIA
Direct effects	IU	0.619*** (0.507/0.710)	—	—
	YIA	—	0.373*** (0.276/0.477)	—
	H	—	-0.215** (-0.331/ -0.092)	-0.279*** (-0.392/ -0.163)
Indirect effects	SL	—	-0.049 (-0.181/0.099)	-0.218*** (-0.333/ -0.113)
	IU	—	—	—
	YIA	0.231*** (0.156/0.317)	—	—
	H	-0.197*** (-0.275/ -0.130)	-0.104*** (-0.156/ -0.062)	—
	SL	-0.080 (-0.152/ -0.004)	-0.081 (-0.134/ -0.043)	—

IE: Impact of event; IU: intolerance of uncertainty; YIA: young internet addiction; H: happiness; SL: satisfaction with life.

** p<0.01.

*** p<0.001.

emotionally (Koffman et al., 2020). Rumination, fear, and intolerance of uncertainty arise due to these emotional negativities, and individuals' mental states are negatively affected (Satici et al., 2020). It was determined in our study that the events in the COVID-19 period affected the intolerance of uncertainty (Tables 1, 2, 3, Fig. 2) and H1 was accepted in line with this result. In this process, the cause of intolerance of uncertainty may be the feeling of losing control, impairment of daily routine work and functions, and insufficiency of social support mechanisms (Satici et al., 2020). Another reason is that feelings such as desperation, fear of death, or getting sick may occur in individuals during epidemic periods. The changes in the cognitive system that occur due to these emotions (Dozois et al., 2019) may also trigger intolerance of uncertainty.

The time spent at home increased with the uncertainty in the COVID-19 epidemic causing the daily routines of adolescents to deteriorate. Disruption of routines brings along mental distress (stress, anxiety, depression, etc.). Addictive behaviors such as the use of psychoactive substances, video games, social media use, pornography viewing, or surfing the internet (as an escape) to alleviate mental impact can be used

as coping skills. These behavioral patterns that comfort adolescents in the short term may turn into larger and more difficult behavior patterns to cope with in the long term (Király et al., 2020). It was determined in our study that intolerance of uncertainty, which was affected by the events in the COVID-19 period, directly affected internet addiction (Table 1, Tables 2, 3, Fig. 2). Also, it has revealed the mediator role of intolerance of uncertainty in the interaction between the events of the COVID-19 period and internet addiction (Table 3). H2 and H5 were accepted based on these results. A curfew was declared in the city where the study was conducted, as in the world in the process of COVID-19 (CNNTÜRK, 2020), and individuals were encouraged to stay at home. With the increase in staying at home, adolescents may have had to face more with feelings and thoughts such as uncertainty about COVID-19, getting sick, or dying. Internet may be the way that adolescents choose to get off or escape these difficult and problematic thoughts (Király et al., 2020). The duration of internet use increases with situations such as stress, anxiety, depression, social isolation depending on the uncertainty of COVID-19. This situation turns into a vicious circle (Dubey et al., 2020; Király et al., 2020).

It is known that the COVID-19 process causes both physical and mental stress on individuals (Chen et al., 2020; Phelan et al., 2020; Zhang et al., 2020). It is predicted that this restrictive and unknown process will be more stressful for adolescents considering the age period characteristics of them. It is known that the intense stress experienced negatively affects happiness, life satisfaction, and quality of life (Yang and Ma, 2020; Zhang et al., 2020). It was determined in our study that the intolerance of uncertainty affected by the events in the COVID-19 period directly affects happiness in adolescents (Table 1, Table 2, Table 3, Fig. 2). Also, the mediator role of intolerance of uncertainty has been identified in the interaction between the events of the COVID-19 period and happiness (Table 3). Therefore, H3 and H6 were accepted. Also, it was found that intolerance of uncertainty affected by the events in the COVID-19 period had no direct or indirect effect on life satisfaction (Tables 1, 2, 3, Fig. 2), so H4 and H7 were rejected. It is stated that individuals' perceptions affect happiness in the COVID-19 epidemic (Yang and Ma, 2020). The fact that the group in which the study was conducted was adolescent may cause these individuals to have low-risk perceptions regarding the COVID-19 epidemic, so the direct and indirect effects of the events on life satisfaction during the COVID-19 period may not have been observed because, in an environment where roles and functions are disrupted, social interaction decreases, physical and mental health and happiness are affected, inevitably, life satisfaction will not be affected.

Research limitations and future orientations

In our study, it was found that events in the COVID-19 process

directly affect the intolerance of uncertainty in adolescents and that this increase negatively affects internet addiction and happiness. Although our study contributes to the literature with this aspect, it has some limitations. Therefore, the findings should be interpreted in the context of these limitations. The cross-sectional nature of the data limits the causal or temporal interpretation. For this reason, it is assumed that longitudinal planning in future studies will increase the interpretation ability on this issue. Also, our study includes adolescents in a single city, located in a specific region in Turkey, and this situation limits the generalizability of the study. For this reason, it is thought that it would be appropriate to conduct studies in the future that include more than one region, city, or country and have large sample groups. Also, the data in the present study were measured with scales, and the answers were given and the scores obtained were limited to the scales. For this reason, it is assumed that in the future, quantitative-qualitative (mixed) studies or conducting qualitative studies based on these data will be useful in revealing the unknowns on this subject. Also, this study is limited to the epidemic period. Planning the studies to be conducted to evaluate the pre-epidemic and post-epidemic will facilitate a clearer understanding of the impact of the COVID-19 epidemic on this issue. Finally, the study is limited to adolescents only. It is considered that choosing mixed sample groups such as adolescent-adult, adolescent-child or adolescent-adult-child in future studies is important in terms of clarifying the subject, and such studies are recommended. Also, it is remarkable in this study that while intolerance of uncertainty affects happiness, it does not affect life satisfaction. Conducting studies on happiness and life satisfaction during the COVID-19 process will help clarify this remarkable issue.

Conclusion and recommendations

Many aspects of life have been adversely affected during the COVID-19 process. There are many studies examining mental and social influence. This study is a valuable study in which the perception of uncertainty caused by the psychological stress experienced during the epidemic and its effect on internet use, happiness and life satisfaction are evaluated as a whole. It was determined in our study that the average daily internet usage time of adolescents was 4.75 ± 3.01 h, the time most of them spent on the internet compared to before the COVID-19 epidemic increased, and most of them decided the time spent on the internet. Again, it has been determined that the effects of the events taking place during the COVID-19 process negatively affect adolescents' intolerance of uncertainty levels. Similarly, it has been determined that the levels of intolerance of uncertainty negatively affect internet addiction. Intolerance of uncertainty is a mediator in adolescents in the interaction between the events of the COVID-19 period and internet addiction and happiness. Nurses, especially psychiatric nurses, have important roles in epidemics. In this respect, it is thought that psychiatric nurses should implement practices for adolescents and their families. It is thought that it would be beneficial for parents to closely monitor adolescents' internet usage status and to plan different activities as entertainment activities to do together with other than the internet. The nurse should guide the family in this regard. It is important to inform about the COVID-19 process to reduce the uncertainty in adolescents. Simple informative materials should be used enough in this information to enable adolescents to take precautions, but not to increase their anxiety and uncertainty. Nurses should make appropriate applications and planning, taking into account the age-period characteristics of adolescents. Finally, considering that adolescents are mostly together with their families in this process, it can be said that a communication atmosphere that allows families and adolescents to share their feelings is extremely important. Both family and adolescents should be included in the trainings to increase communication skills. It is important for nurses to develop practices on these issues. It is estimated that researching the results of these practices will contribute to the improvement of mental health of adolescents and society. Happiness

and life satisfaction have a protective role in the development of mental disorders such as depression and anxiety. In particular, the nature of the pandemic process itself and the stress and uncertainty created by the measures taken negatively affect the quality of life of individuals. For this reason, research and interventions on these issues are also important for the protection of mental health.

Declaration of competing interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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Contributors

Mahmut Evli, contributed conception, design, acquisition of data and analysis of the study, and to drafting and revising the article critically for important intellectual content.

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