

COVID-19 Pandemic, Loneliness and Digital Game Addiction

NURULLAH EMIR EKİNCİ¹, EZGI KARAALI², BERFU PARÇALI³, AKAY SUNER⁴, SINAN ERDEM SATILMIŞ⁵

¹ Yalova University, Recreation Department, Yalova/Turkey

² Mustafa Kemal University, Msc Student, Hatay/Turkey

³ Osmangazi University, Bio-Statistic Department, Eskişehir/Turkey

⁴ Mustafa Kemal University, Msc Student, Hatay/Turkey

⁵ Yalova University, Recreation Department, Yalova/Turkey

Correspondence to: RA Sinan Erdem SATILMIŞ, Email. sinan-kartal@hotmail.com Cell: +905066472300

ABSTRACT

Aim: The recent pandemic has spread all over the world and has become a common global problem. Pandemics leave significant marks on the memories. Going beyond a cause of disease or death, they can have consequences in many aspects; social, physical, and psychological. Aim of this study is to investigate the impact of the pandemic period on students' loneliness and digital game addiction levels.

Methods: The study group consisted of 398 volunteer 5th-8th grade students from Altın Vuruş Karate Center and Defne Middle School in Hatay, Turkey. As data collection tools, "Digital Game Addiction Scale" developed by Lemmens et al. (2009), and "UCLA Loneliness Scale" developed by Russell et al. (1980) were used. The SPSS program was used for the analysis of the data.

Results: According to research findings, it was found that there was a statistically low positive correlation between digital game addiction and loneliness ($p=0.002$, $r=0.155$). The game addiction and loneliness level of students increased during the Covid-19 pandemic ($p<0, 05$). As the age of students increases their level of addiction also increases ($p<0.05$).

Conclusion: Being a licensed athlete didn't have significant effect on the game addiction level of students during the Covid-19 period ($p>0, 05$), however they felt more lonely during the period ($p<0.05$).

Keywords: COVID-19 Process; Game Addiction; Loneliness; Students; Sport

INTRODUCTION

In December 2019, a viral outbreak of pneumonia of unknown origin occurred in Wuhan, China. On 9 January 2020, the World Health Organization (WHO) officially announced the discovery of a novel coronavirus: SARS-Cov2. This new virus is the pathogen responsible for this infection respiratory disease called COVID-19 (Coronavirus Disease)¹. The most typical symptoms of the disease are fever, myalgia, fatigue, and dry cough. Other referred symptoms are chills, rhinitis, sore throat, nausea, vomiting, and diarrhea².

Covid-19 has been one of the biggest threats facing the world in recent years. Just in three months, Covid-19 has become a worldwide pandemic with more than 353,000 cases confirmed on March 23rd 2020. According to World Health Organization (WHO) reports, because of Covid-19 3.6 million people died worldwide by May 21, 2021³. The whole world has mobilized and immediately taken various measures against this rapidly spreading virus, which emerged at a time when no one expected it⁴. The Covid-19 virus spreads from person to person via virus-laden respiratory droplets produced when an infected person talks, coughs, exhales, or sneezes. These droplets can be inhaled by the people nearby, and/or fall over objects and surfaces, which another person can touch, and then touch their nose, eyes or mouth and get infected⁵.

Among the prevention methods recommended by the World Health Organization (WHO) such as wearing mask, keeping rooms well ventilated, cleaning your hands, and coughing into bent elbow or a tissue, avoiding crowds and physical distancing. On March 11, 2020, the Turkish Ministry of Health declared the first Covid-19 case. On March 13 2020, the Turkish Ministry of Education stopped face- to-face education until 21 of September⁶. This whole situation has drastically changed the lives of students living

in Turkey in a matter of days. The students are experiencing a new, unpredictable, and rapidly changing situation. They have to stay confined at home and therefore family dynamics have remarkably changed.

The pandemic, which has been going on for over a year, caused several problems such as; increase in suicide rates⁷, socio-economic problems^{8,9}, anxiety, stress, and depression¹⁰, mental, physical and psychosocial^{11,12,13,14,15}, educational¹⁶, and there has been a reduction in times spent on leisure activities and social life⁵. Particularly, children and adolescents' lifestyle behaviors, such as physical activity and sedentary behavior may have been drastically impacted due to the prolonged school closures and home confinement during the Covid-19 pandemic¹². When the literature is examined the recent studies showed that the pandemic period affected people in terms of loneliness^{17,18,11} and digital game addiction^{19,20,21,22} level of individuals. However, there wasn't any study which conducted before and during the pandemic period. Our motivation to do this study is to help to fill the literature gap.

In recent years, a lot of technological developments have been experienced and the convenience of accessing technological devices (computer, tablet, and phone) accordingly constitute a great obstacle for the students to achieve a healthy lifestyle²³. Excessive and inappropriate use of computers and the internet by the students in school-age can cause negative effects on social relations, physical, mental and, adversely affect both academic and personal development^{24,25,26}. In the literature, game addiction has been described as an impulse control disorder characterized by symptoms such as "the inability to control the time spent on game-playing", "a loss of interest in other activities", "continuing to play despite the adverse effects" and "feeling psychologically deprived when not being able to play"^{27,28}. In 2019 the WHO called

game addiction a sign of mental disorder and warned people against increasing game addiction. With the increase of technological developments, the time that individuals take to themselves and to their environment is decreasing, which causes the individual to be isolated from the society the person lives in and becomes lonely²⁹. According to Kuss and Griffiths game addiction may lower teenagers' motivation for communicating with other people and consequently impose negative effects on their social relationships³⁰. Therefore, we can say that game addiction causes students to become lonely.

Loneliness is a multidimensional concept with different meanings under different causes and conditions³¹. When the literature is examined, we encounter different definitions of loneliness. Even before the coronavirus crisis, loneliness was a public health issue because it is widespread and associated with an increased risk of morbidity and mortality¹⁸. According to Groarke et al. loneliness is associated with worse physical and mental health issues and increases mortality risk¹⁷. Rook defines it as a constant increasing feeling when one is rejected by others, is misunderstood, and has no suitable friends or partners to perform the desired activities³². Studies of quarantine have found that individuals struggle to adapt to a way of life incongruent with humans' social nature and report a range of negative psychological reactions to quarantine, including loneliness¹⁷. Especially, the Covid-19 crisis presents many challenges for dealing with loneliness. For these reasons, the present study aims to determine how Covid-19 period affect the loneliness and digital game addiction level of middle school students according to various variables.

MATERIAL AND METHOD

Research Model: The research is based on a quantitative research design and descriptive cross-sectional study. A general screening model was applied in order to arrive at a general judgment about the universe, in which the whole universe or a sample taken from it was scanned³³. According to Gratton and Jones, this method is perhaps the most commonly used method in social and sport-based studies³⁴.

Research Sample: A total of 398 [(n=203, 51%) female, (n=195, 49%) male] primary school students was chosen via a simple random sampling method. The first survey was conducted before the Covid-19 pandemic from Altın Yuruş Karate Center and Defne Middle School 2 to 6 March 2020 and the second survey from 21 to 25 September 2020 (during the new educational term). Students participated as volunteers in the study.

Data Collection Tool: UCLA Loneliness Scale consists of 20 items (11 positives and 9 negatives). The 20 items are

rated on a 4-point scale in accordance with the rate of frequency, ranging from never (1) to always (4). Scores on the scale range from 20 to 80 with higher scores reflecting greater loneliness³⁵. The validity and reliability tests of the scale were carried out by Demir³⁶. The internal consistency factor of the Turkish version of the scale is .96, and test-retest reliability is .94. In the scale, 1, 5, 6, 9, 10, 12, 15, 16, 19, and 20 numbered items were reverse coded.

Digital Game Addiction Scale (DGAS-7) developed by Lemmens et al.³⁷ was used in order to determine digital game addiction levels²⁷ The Turkish adaptation study of the scale was carried out by Irmak and Erdogan²⁸. The DGAS-7 is a 5-item likert type; a single-dimension scale consists of 7 questions. The Cronbach's alpha coefficient was found 0,72.

Analysis Of Data: For the data obtained in the study, the SPSS package program was used and frequency (f) and percent (%) distributions of the variables were calculated. The Skewness and Kurtosis values were checked for normal distribution of the data. The Skewness and Kurtosis were considered to be valued at -2 to +2³⁸. According to the statistical results, it was seen that the data did not show normal distribution. Therefore, Mann Whitney U, Kruskal Wallis and, Pearson Correlation test were used. Bonferroni test was used to determine the insignificant differences between the groups.

RESULTS

Table 1. Correlation Between Digital Game Addiction and Loneliness Attitudes

Variables	Digital Game (Attitude)	Loneliness (Attitude)
Digital Game (Attitude)	1	
Loneliness (Attitude)	0.155	1

When table 1 was examined, statistically low positive correlation found between Digital Game Attitude and Loneliness Attitude variables (p=0.002, r=0.155).

Table 2. Correlation Between Demographic Variables

Variables	Gender	Age	Licensed Athlete
Gender	1		
Age	0.151	1	
Licensed Athlete	-0.103*	0.186*	1

* p<0.05, statistically important.

When table 2 was examined, a very low negative correlation found between gender and being a licensed athlete (φ =-0.103, p<0.05), and very low positive correlation found between age and being a licensed athlete (φ=0.186, p<0.05).

Table 3. Digital Game Addiction and Loneliness Attitudes According to Gender Variable

Variables	Gender		Total	p
	Female	Male		
Digital Game (Attitude)	1.43 (1.14/1.71)	1.86 (1.43/2.29)	1.57 (1.29/2.00)	<0.001
Loneliness (Attitude)	1.60 (1.40/1.95)	1.75 (1.50/2.05)	1.68 (1.45/2.00)	0.004

*Data Median is expressed in the form of (1st Quarter/3. Quarter).

When table 3 was examined, a statistically significant difference was found between digital game addiction attitude and loneliness attitude (p<0,005) according to the gender variable.

Table 4. Loneliness and Digital Game Addiction According to Covid-19 Periods

Variables	Cov-19 Periods (before/during)		Total	p
	Before Cov-19	During Cov-19		
Digital Game (Attitude)	1.71 (1.29/2.14)	1.57 (1.29/1.86)	1.57 (1.29/2.00)	0.006
Loneliness (Attitude)	1.65 (1.45/2.06)	1.70 (1.45/1.95)	1.68 (1.45/2.00)	0.895

*Data Median is expressed in the form of (1st Quarter/3. Quarter).

When table 4 was examined, digital game attitude and loneliness variables were compared with the Covid-19 periods variable. There is a statistically significant difference between the digital game attitude variable and the Covid-19 periods variable ($p < 0.005$).

Table 5. Digital Game Addiction and Loneliness Attitudes According to Age Variable

Variables	Age					Total	p
	11	12	13	14	15		
Digital Game (Attitude)	1.57 (1.29/2.11) ^{ab}	1.57 (1.43/2.00) ^{ab}	1.57 (1.29/2.14) ^{ab}	1.43 (1.14/2.00) ^a	2.00 (1.57/3.14) ^b	1.57 (1.29/2.00)	0.039
Loneliness (Attitude)	1.65 (1.45/1.94)	1.65 (1.45/1.90)	1.70 (1.45/2.10)	1.65 (1.40/2.00)	1.70 (1.33/1.80)	1.68 (1.45/2.00)	0.647

* Data Median is expressed in the form of (1st Quarter/3. Quarter).

When table 5 was examined, a statistically significant difference was found between digital game addiction attitude and age variable ($p < 0.05$).

Table 6. Digital Game Addiction and Loneliness Attitudes According to Licensed Athlete Variable

Variables	Licenced Athlete		Total	p
	Yes	No		
Digital Game (Attitude)	1.57 (1.29/2.14)	1.57 (1.29/2.00)	1.57 (1.29/2.00)	0.396
Loneliness (Attitude)	1.60 (1.45/1.94)	1.75 (1.50/2.05)	1.68 (1.45/2.00)	0.019

* Data Median is expressed in the form of (1st Quarter/3. Quarter).

When table 6 was examined, a statistically significant difference found between loneliness attitude and being licensed athlete variable ($p < 0.05$).

DISCUSSION

The present study showed a statistically low positive correlation between digital game addiction and loneliness ($p = 0.002$, $r = 0.155$). When the relevant literature is examined; study of Durualp and Cicekoglu, concluded that as the loneliness levels of the individuals increase, the levels of internet addiction also increase³⁹. This result supports the results of our study, and it is expected that feeling alone will increase the students' addiction level to the technological devices or being addicted will increase the feeling of loneliness.

The present study showed that there were statistically significant differences between loneliness ($p < 0, 05$) and digital game addiction ($p < 0, 05$) levels of the students according to their gender. However, results showed that male students are more addicted (1.86 (1.43/2.29) than female students (1.43 (1.14/1.71)). Previous studies have also reported that male students were addicted more when it is compared to females^{40,41}. Bonanno and Kommers explained this situation as: "the gender difference in time dedicated to playing a game can be attributed to the fact that boys find digital games much more attractive and conducive to their natural cognitive processing"⁴⁰. When the relationship of gender and loneliness was examined, it is seen that male (1.75 (1.50/2.05)) students typically have higher loneliness scores than female (1.75 (1.50/2.05) students. When the related studies were examined it is seen that there are a few studies that support our findings^{41,42,43}.

The present study showed that there were statistically significant differences between game addiction and Covid-19 periods ($p < 0, 05$). When the related literature were examined there are a few studies which support our

findings^{20,22,44,45}. However, there were no significant differences between loneliness and Covid-19 periods ($p > 0, 05$) in our study. But, when the related literature was examined it is seen that a few studies showed different results than ours. The Covid-19 period affect the loneliness level of individuals in a bad way^{17,46,47,48,49}.

The present study showed that there were statistically significant differences between game addiction and the age variable ($p < 0, 05$). To find the difference between the groups Bonferroni test was used. The differences were between students who aged 14 and 15. In Turkey the students' gets an exam when they are on their 14th that's why we may say that their attention were on their exam. When the related literature were examined studies showed that as age increases the addiction level of students also increases^{50,51}. However, there were no significant differences between loneliness and the age variable ($p > 0.05$) in our study. This result may be due to the fact that the participants' ages were close to each other. When different studies were examined, it was found that, in the study of Oruc, there was no statistically significant difference between age and loneliness⁵².

The present study showed that there were statistically significant differences between loneliness ($p < 0, 05$) and being licensed athlete. The students who are licensed had low level of loneliness. Ekinci et al. suggested that participation in sports activities contributed to the socialization of the individual, and naturally, this factor caused the individual to not feel lonely²⁹. However, statistically no difference found between game addiction level of students and their sportive status ($p > 0, 05$) we may say that students who were related to sportive activities has a self-discipline and self-control on gaming.

Suggestions: Study of Messias et al. found that 5 hours or more of daily exposure to video games was associated with a higher risk of reported sadness, suicidal ideation, and suicidal planning among youths⁵³. Jiménez-Pavón et.al. mentioned that reduced physical activity and prolonged sedentary behavior are linked to both negative physical and mental health outcomes⁵⁴. The results of our study suggest that sport is an effective way of reducing game addiction and feeling of loneliness. Also, the related studies suggest that physical activity provides protection from viral infections, especially among vulnerable populations^{12,14}.

It is obvious that the Covid-19 period affect the society in a bad way. However, it is our duty to protect ourselves and the people around us: being active, filtering negative feedback of our families, friends and the news, paying more attention to the people around us, getting support from experts such as psychiatrists, psychologists, occupational therapists, social workers and doing daily sportive, exercise and recreational activities^{10,55,56,57,58,59}.

Informed Consent: Informed consent was obtained from the participants.

Author Contributions: Concept - N.E.E., Design - A.S.; Supervision - E.K.; Resources – S.E.S., E.K., B.P.; Materials - G.K., K.Ö.; Data Collection and/or Processing – E.K.; Analysis and/or Interpretation - B.P.; Literature Search – N.E.E.; Writing Manuscript - A.S.; Critical Review – S.E.S., N.E.E.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Acknowledge: This study has been presented as an oral presentation at ERPA (International Congresses on Education, 3-5 June 2021).

REFERENCES

1. Marinoni, G., Van't Land, H., & Jensen, T. The impact of Covid-19 on higher education around the world. 2020; IAU Global Survey Report.
2. Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., Han, Y. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet*, 2020; 395: 507–513. doi: 10.1016/s0140-6736(20)30211-7.
3. COVID Data Tracker. Global counts and rates. Retrieved 2021 January 21, from: <https://covid.cdc.gov/covid-data-tracker/#global-counts-rates>.
4. Uslu, S., Karavelioğlu, M.B., & Gumusgul, O. Traditional recreation games: free time assessment recommendations in the new coronavirus (covid-19) pandemic process. *Spor ve Rekreasyon Araştırmaları Dergisi*, 2020; 2(Special Issue 1): 14-25.
5. Rodríguez-Rey, R., Garrido-Hernansaiz, H., & Collado, S. Psychological impact and associated factors during the initial stage of the coronavirus (COVID-19) pandemic among the general population in Spain. *Frontiers in psychology*, 2020; 11: 1540.
6. World Health Organization. Coronavirus disease 2019 (COVID-19): situation report, 2020; 60.
7. Sher, L. The impact of the COVID-19 pandemic on suicide rates. *QJM: An International Journal of Medicine*, 2020; 113(10): 707-712.
8. Bostan, S., Erdem, R., Öztürk, Y. E., Kılıç, T., & Yılmaz, A. The effect of covid-19 pandemic on the turkish society. *Electronic Journal of General Medicine*, 2020; 17(6): em237.
9. Karcioğlu Ö. What is coronaviruses, and how can we protect ourselves?, *Phoenix Medical Journal*, 2020; 2(1): 66-71.
10. Rajkumar, R. P. COVID-19 and mental health: A review of the existing literature. *Asian Journal of Psychiatry*, 2020; 52: 102066.
11. Saltzman, L. Y., Hansel, T. C., & Bordnick, P. S. Loneliness, isolation, and social support factors in post-COVID-19 mental health. *Psychological Trauma: Theory, Research, Practice, and Policy*. 2020; 12(S1): 55-57. <http://dx.doi.org/10.1037/tra0000703>
12. Xiang, M., Zhang, Z., & Kuwahara, K. (2020). Impact of COVID-19 pandemic on children and adolescents' lifestyle behavior larger than expected. *Progress in Cardiovascular Diseases*. 63(4): 531–532.
13. Korczak, D. J., Madigan, S., & Colasanto, M. Children's physical activity and depression: a meta-analysis. *Pediatrics*, 2017; 139(4): e20162266.
14. Que, J., Le Shi, J. D., Liu, J., Zhang, L., Wu, S., Gong, Y., & Lu, L. Psychological impact of the COVID-19 pandemic on healthcare workers: a cross-sectional study in China. *General Psychiatry*, 2020; 33(3): e100259.
15. Husky, M. M., Kovess-Masfety, V., & Swendsen, J. D. Stress and anxiety among university students in France during Covid-19 mandatory confinement. *Comprehensive Psychiatry*, 2020; 102(4): 152191.
16. Murphy, R., & Wyness, G. Minority report: The impact of predicted grades on university admissions of disadvantaged groups. *Education Economics*, 2020; 28(4): 333-350.
17. Groarke, J. M., Berry, E., Graham-Wisener, L., McKenna-Plumley, P. E., McGlinchey, E., & Armour, C. Loneliness in the UK during the COVID-19 pandemic: Cross-sectional results from the COVID-19 Psychological Wellbeing Study. *PLoS One*, 2020;15(9): e0239698.
18. Luchetti, M., Lee, J. H., Aschwanden, D., Sesker, A., Strickhouser, J. E., Terracciano, A., & Sutin, A. R. The trajectory of loneliness in response to COVID-19. *American Psychologist*, 2020; 75(7), 897-908. <http://dx.doi.org/10.1037/amp0000690>
19. Glowacki, E. M., Wilcox, G. B., & Glowacki, J. B. Identifying# addiction concerns on twitter during the COVID-19 pandemic: A text mining analysis. *Substance Abuse*, 2020; 42(5): 1-8.
20. Gómez-Galán, J., Martínez-López, J. Á., Lázaro-Pérez, C., & Sarasola Sánchez-Serrano, J. L. Social networks consumption and addiction in college students during the COVID-19 pandemic: Educational approach to responsible use. *Sustainability*, 2020; 12(18): 7737.
21. Kashif, M., & Aziz-Ur-Rehman, M. K. J. Social media addiction due to coronavirus. *International Journal of Medical Science in Clinical Research and Review*, 2020; 3(04): 331-336.
22. King, D. L., Delfabbro, P. H., Billieux, J., & Potenza, M. N. Problematic online gaming and the COVID-19 pandemic. *Journal of Behavioral Addictions*, 2020; 9(2): 184-186.
23. Gürcan, A., Özhan, S., & Uslu, R. Dijital oyunlar ve çocuklar üzerindeki etkileri. *Başbakanlık Aile ve Sosyal Araştırmalar Genel Müdürlüğü*, Ankara, 2008; 1-50.
24. Qin, X., & Nan, H. Study on the causes and strategies of online game addiction among college students. In *Proceedings In Multimedia Technology (ICMT)*, International Conference, 29-31 October 2010; Institute of Electrical and Electronics Engineers (IEEE), Ningbo, China, pp.2254-2257. <https://doi.org/10.1109/ICMULT.2010.5630987>
25. Kutlu, M., Savcı, M., Demir, Y. & Aysan, F. Turkish adaptation of Young Internet Addiction Test Short Form: Validity and reliability study in university students and adolescents. *Anadolu Psikiyatri Dergisi*, 2016; 17(1): 69-76.
26. Harris, J. The effects of computer games on young children - A review of the research 2001; (RDS Occasional Paper No. 72). London: Research, Development and Statistics

- Directorate, Communications Development Unit, Home Office.
27. İrmak, A. Y., & Erdoğan, S. Ergen ve genç erişkinlerde dijital oyun bağımlılığı: Güncel bir bakış. *Türk Psikiyatri Dergisi*, 2016; 27(2): 128-137.
 28. İrmak, A. Y., & Erdoğan, S. Validity and reliability of the Turkish version of the Digital Game Addiction Scale. *Anadolu Psikiyatri Dergisi*, 2015; 16(S1): 10-19.
 29. Ekinci, N. E., Demirel, M., Demirel, D. H., & Işık, U. lise öğrencilerinin yalnızlık algılarının rekreasyonel etkinliklere katılımları ve bireysel değişkenlere göre incelenmesi. *Sportif Bakış: Spor ve Eğitim Bilimleri Dergisi*, 2015; 2(2): 71-78.
 30. Kuss, D. J., & Griffiths, M. D. Online gaming addiction in children and adolescents: A review of empirical research. *Journal of Behavioral Addictions*, 2012; 1(1): 3-22.
 31. Arslan, Ö. TV dizilerinin yer alan karakterler ile kurulan parasosyal etkileşim: bağlanma biçimleri ve yalnızlık açısından bir inceleme. Master Thesis, Ankara Üniversitesi, Sosyal Bilimler Enstitüsü, 2013; Ankara, Turkey.
 32. Rook, K. Promoting social bonding: Strategies for helping the lonely and socially isolated. *American Psychologist*, 1984; 39(2): 1389-1407. <https://doi.org/10.1037/0003-066X.39.12.1389>
 33. Karasar, N. *Bilimsel Araştırma Yöntemi*. 2012; Ankara: Bilim Kitap Kirtasiye Yayınevi.
 34. Gratton, C., & Jones, I. *Research methods for sports studies*. 2014; Routledge.
 35. Russel, D., Peplau, L. A., & Cutrona, C. The revised UCLA loneliness Scale: Concurrent and discriminant validity eviidence. *Journal of Personality and Social Psychology*, 1980; 39(3): 472-480.
 36. Demir, A. UCLA yalnızlık ölçeğinin geçerlik ve güvenilirliği. *Psikoloji Dergisi*. 1990; 7(23): 14-18.
 37. Lemmens, J. S., Valkenburg, P. M., & Gentile, D. A. The internet gaming disorder scale. *Psychological Assessment*, 2015; 27(2): 567-582. <https://doi.org/10.1037/pas0000062>
 38. George, D., & Mallery, M.P. *Using SPSS for Windows Step By Step: A Simple Guide and Reference (7th ed.)*. 2006; Allyn & Bacon: Boston, USA, ISBN 0205515851.
 39. Durualp, E., & Çiçekoğlu, P. Yetiştirme yurdunda kalan ergenlerin yalnızlık düzeylerinin internet bağımlılığı ve çeşitli değişkenler açısından incelenmesi. *Dokuz Eylül Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 2013; 15(1): 29-46.
 40. Bonanno, P., & Kommers, P.A.M. Gender differences and styles in the use of digital games. *Educational Psychology*, 2005; 25(1): 13-41. <https://doi.org/10.1080/0144341042000294877>
 41. Borys, S., & Perlman, D. Gender differences in loneliness. *Personality and Social Psychology Bulletin*, 1985; 11(1): 63-74.
 42. Rokach, A. The effect of gender and culture on loneliness: A mini review. *Emerging Science Journal*, 2018; 2(2): 59-64.
 43. Barreto, M., Victor, C., Hammond, C., Eccles, A., Richins, M. T., & Qualter, P. Loneliness around the world: Age, gender, and cultural differences in loneliness. *Personality and Individual Differences*, 2021; 169: 110066.
 44. Sun, Y., Li, Y., Bao, Y., Meng, S., Sun, Y., Schumann, G., & Shi, J. Brief report: increased addictive internet and substance use behavior during the COVID-19 pandemic in China. *The American Journal on Addictions*, 2020; 29(4): 268-270.
 45. Amin, K. P., Griffiths, M. D., & Dsouza, D. D. Online gaming during the COVID-19 pandemic in India: Strategies for work-life balance. *International Journal of Mental Health and Addiction*, 2020; 1-7.
 46. Bu, F., Steptoe, A., & Fancourt, D. Who is lonely in lockdown? Cross-cohort analyses of predictors of loneliness before and during the COVID-19 pandemic. *Public Health*, 2020; 186: 31-34.
 47. Killgore, W. D., Cloonan, S. A., Taylor, E. C., & Dailey, N. S. Loneliness: A signature mental health concern in the era of COVID-19. *Psychiatry Research*, 2020; 290: 113117.
 48. Van Tilburg, T. G., Steinmetz, S., Stolte, E., van der Roest, H., & de Vries, D. H. Loneliness and mental health during the COVID-19 pandemic: A study among Dutch older adults. *The Journals of Gerontology: Series B*, 2020; 76(7): 249-255.
 49. Hwang, T. J., Rabheru, K., Peisah, C., Reichman, W., & Ikeda, M. Loneliness and social isolation during the COVID-19 pandemic. *International Psychogeriatrics*, 2020; 32(10): 1217-1220.
 50. Vollmer, C., Randler, C., Horzum, M. B., & Ayas, T. Computer game addiction in adolescents and its relationship to chronotype and personality. *Sage Open*, 2014; 4(1): 2158244013518054.
 51. Griffiths, M. *Internet and video-game addiction*. Adolescent addiction. Academic Press, 2008; 231-267.
 52. Oruç, T. Üniversite öğrencilerinde psikososyal değişkenlere göre yalnızlık ile otomatik düşünceler ilişkisinin incelenmesi. Doctoral dissertation, DEÜ Eğitim Bilimleri Enstitüsü, 2013; İzmir, Turkey.
 53. Messias, E., Castro, J., Saini, A., Usman, M., & Peebles, D. Sadness, suicide, and their association with video game and internet overuse among teens: Results from the youth risk behavior survey 2007 and 2009. *Suicide and Life-Threatening Behavior*, 2011; 41(3): 307-315. doi: 10.1111/j.1943-278X.2011.00030.x
 54. Jiménez-Pavón, D., Carbonell-Baeza, A., & Lavie, C. J. Physical exercise as therapy to fight against the mental and physical consequences of COVID-19 quarantine: Special focus in older people. *Progress in Cardiovascular Diseases*, 2020; 63(3): 386-388.
 55. Pfefferbaum, B., & North, C. S. Mental health and the Covid-19 pandemic. *New England Journal of Medicine*, 2020; 383(6): 510-512.
 56. Greenberg, N., Docherty, M., Gnanapragasam, S., & Wessely, S. Managing mental health challenges faced by healthcare workers during covid-19 pandemic. *BMJ*, 2020; 368: m1211. doi: 10.1136/bmj.m1211.
 57. Isik U., Ustun N.A, Tastan, P., & Ustun D. Fear of covid-19: Associations with trait anxiety and life satisfaction. *Pakistan Journal of Medical and Health Sciences*, 2021; 15(6): 1658-1665.
 58. Dursun, M., Yarayan, Y.E., Ari, Ç., Ulun, C., & Adas, S.K. Covid-19 in Turkey: Leisure boredom, psychological resilience, physical activity and emotional state. *International Journal of Educational Research and Innovation*, 2020; 15: 460-486.
 59. Salehian, M.H., Yadolazadeh, A., & Ranjbari, S. Comparison of the effect of cognitive-spiritual method of hope therapy and tai chi exercises on anxiety caused by corona disease in university students. *Pakistan Journal of Medical and Health Sciences*, 2021; 15(3): 938-947.