



The relationship between suicidal ideation and internet gaming disorder and the role of game genres among adolescents

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Abstract

ARTICLE INFO

Keywords:

Suicidal ideation

Internet gaming disorder

Game genres

Received: Jul 07, 2023

Accepted: Sep 15, 2023

Available Online: 27.09.2023

DOI:

[10.5455/annalsmedres.2023.07.152](https://doi.org/10.5455/annalsmedres.2023.07.152)

Aim: Psychiatric disorders can cause the development of suicidal ideation. One of the disorders is called internet gaming disorder and can be influenced by the genres of the games which is played. However, there is limited information available on whether the game genres cause the development of suicidal ideation. Thus, the current study seeks to investigate the relationship between suicidal ideation and internet gaming disorder by also considering the game genres.

Materials and Methods: In total 1337 adolescent participants between the age range of 12-18 years were included in the study. The participants were invited to fill in the sociodemographic and online game data forms, game addiction scale-short form and children's depression scales. A comparison was made between the two groups that reported suicidal ideation and those that did not.

Results: In the comparison, female gender, internet gaming disorder and major depressive disorder were significant between the groups. A significant difference was found only in multiplayer online battle arena (MOBA) games among the game genres.

Conclusion: Suicidal ideation is an important public problem and can lead to planning, attempting as well as completing suicide. Problematic use of internet video games in adolescents is increasing. Therefore, it can be assumed that some genres of games mediate the development of suicidal ideation.



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Introduction

Problematic use of internet video games can create psychiatric problems, especially among adolescents. There are limited number of studies reporting the relationship between problematic use of internet video games and suicidal behavior. Recent studies have found problematic use of internet video games among adolescents who reported suicidal ideation [1]. Although longitudinal studies are insufficient, cross-sectional studies have focused on suicidal ideation. It was recognized that some genres of games play a greater role in studies analyzing the problematic use of internet video games according to the game genres. Multiplayer online role-playing game (MMORPG), multiplayer online battle arena (MOBA), first-person shooter (FPS) game genres are reported to have the most influence in causing the development of the internet gaming disorder (IGD) [2,3]. In fact, these genres of games give rise to psychiatric problems and cause the development of internet gaming disorder [3,4]. However, there is no record in

the literature yet that these genres of games affect suicidal ideation and behavior. Hence, this study will be the first study in the literature which is aimed to investigate the relationship between game genres and suicidal ideation.

Major depressive disorder (MDD) is the most common cause of suicidal ideation among psychiatric disorders [5]. However, there are also studies in the literature which showed that suicidal ideation can develop even without a diagnosis of MDD [6,7]. Suicidal ideation; involves thinking, planning and completing suicidal behavior. It ranks the third among the causes of death in adolescents [1,8,9]. Although there is enough data about the relationship between internet gaming disorder and suicidal ideation, which is an important public health problem, no data and clarity on the role of game genres was drawn yet.

The aim of this study is to investigate whether there is a relationship between internet gaming disorder, and whether there is a relationship between game genres and suicidal ideation in adolescents reporting suicidal ideation.

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Materials and Methods

This current study was conducted cross-sectional in 2 secondary and 2 high schools with the permission and knowledge of the provincial directorate of national education. The study was approved by the Malatya Clinical Research Ethics Committee and was completed in accordance with the Helsinki Declaration (2019/14).

A total of 1,412 participants aged 12-18 were interviewed for this study. Participants were asked to complete the sociodemographic data form, online game data form, internet game addiction scale-short form, and child depression scales under the supervision of their teachers. Participants who filled in the forms incompletely were excluded from the study and therefore the total number of participants included in the study was 1,337.

In the online game data form, the participants were asked to write down and rank the three internet games they play the most. The game names written by the participants were searched in the GameFAQs forum on the GameSpot website and the game genres were determined. A list of the game genre categories was adapted: massive multiplayer online role-playing game (MMORPG), multiplayer online battle arena (MOBA), first-person shooter (FPS), action-adventure, real-time strategy (RTS), simulation, sports and driving [10].

MMORPG: Players in multiplayer online role-playing games in which players develop a character and interact cooperatively and competitively with other players in a shared online world.

MOBA: Multiplayer online battle arena games are a sub-genre of real-time strategy games in which two teams of typically five players compete against each other whereas each player controls a single character.

FPS: Fast, violent action kill-or-kill games, usually with a military or sci-fi theme.

Action-Adventure: A broad category of games which are geared towards action and exploration, mostly in a third-person perspective.

Real-Time Strategy: Strategic, combat-oriented games from an aerial perspective, with no waiting between moves.

Simulation: Video games often designed to closely simulate real-world situations.

Sports: Realistic simulations, especially team sports, interactive motion controlled sports and training games.

Driving: Basically car racing games.

Evaluation and measurements

Game Addiction Scale (GAS) short form

The game addiction scale-short form (GAS) was used for the definition of IGD. The scale was developed by Lemmens et al. to determine problematic digital game playing behavior in adolescents aged from 12 to 18 [11]. The Cronbach α value of the scale was found to be 0.92, showing that it can be used for adolescents. The items of the scale are presented in the form of a five-point Likert scale with the goal of assessing the level of agreement to the given questions. The participants were asked to choose the best answer applicable for them by considering the options

never, rarely, sometimes, often and very often. Individuals are considered digital game addicts if at least four of the seven questions are answered with sometimes, often or very often [11]. Turkish validity and reliability studies of the scale were carried out by Irmak and Erdoğan [12].

Children's Depression Scale (CDI)

The CDI consists of 27 self-report items covering cognitive, behavioral and emotional symptoms of depression [13]. Each item of the scale includes three response options and the score for each item can be 0, 1, or 2, depending on the severity of the symptom. The total score of the scale can vary between 0 and 54. The reliability and validity of the CDI for the Turkish population was confirmed for children aged 6-17 years, and a cut-off score of 19 was recommended for the diagnosis of depression [14].

Study design

Data about age, gender, family status, socioeconomic level and course achievement levels were gathered and measured in the demographic data form. The most played game genre was noted in the online game data sheet. In the short form of GAS, those who marked 4 items out of 7 as sometimes, often or very often were considered as game addicts. In addition, those who marked "I think about killing myself, but I won't" and "I am thinking about killing myself" in the 14th item of the children's depression scale, formed the "patient group who described suicidal ideations". In the contrary, those who marked "I don't want to kill myself" were determined as the control group.

Statistical analysis

Statistical analyzes were completed by using the Statistics Program for Social Sciences (SPSS 22.0). Descriptive data on quantitative variables were given as mean (\bar{x}) \pm standard deviation (SD) and minimum-maximum, while data on qualitative variables were given as numbers and percentages. The groups that either reported or not reported suicidal ideation were compared in terms of demographic characteristics, internet gaming disorder-game genres, and depression score. Fisher Chi-Square test was used in the analysis of qualitative variables, and Independent Sample T test was used in the analysis of quantitative variables. In addition, non-probable method was used as statistical sample of research.

Results

According to the sociodemographic data of the participants the sample of the study contained 513 female participants (38.4%) and 824 male (61.6%) participants (Table 1). When comparing the groups with suicidal ideation and the groups without suicidal ideation in the gender category, the result was found to be significant ($\chi^2 = 7.789$, $p=0.006$). The mean age of the participants included in the 12-18 age range was 15.2 ± 1.7 years. The mean age in the group with suicidal ideation was 15.2 ± 1.7 . However, no significant difference was found between the groups ($Z = -0.447$, $p=0.665$) (Table 2).

Furthermore, comparing the group with suicidal ideation with the groups without suicidal ideation in the context

Table 1. Participants characteristics.

		n	%
Gender	Female	513	38.4
	Male	824	61.6
Residential area	Rural	384	28.7
	Urban	953	71.3
Family structure	Nuclear	1174	87.8
	Extended	109	8.2
	Dispersed	54	4.0
Family income	Low	686	51.3
	Middle	543	40.6
	High	108	8.1
School Success	Low	258	19.3
	Middle	815	34.1
	High	264	26.9
Age	Mean ± SD	15.2±1.7	Min-Max 12-18

N, number of participants.

Table 2. Gender and age comparison of adolescents with suicidal ideation.

		Suicidal Ideation (+)	Suicidal Ideation (-)	χ^2	P
		n (%)	n (%)		
Gender	Female	175 (44.1)	338 (36.0)	7.789	0.006**
	Male	222 (55.9)	602 (64.0)		
Age	Mean ± SD	15.2±1.7	15.1± 1.6	Z	p
				-0.447	0.655

of IGD, MDD and game genres; showed a significant difference in IGD ($\chi^2 = 23.033$, $p < 0.001$), and a significant difference in MDD ($\chi^2 = 354.247$, $p < 0.001$). In addition, comparing the groups according to the game genres showed that there was a significant difference only in the MOBA game genre ($\chi^2 = 4.466$, $p = 0.038$) (Table 3). Lastly, no significant difference was found in other game genres.

Discussion

The current study included a large sample size and aimed to investigate the relationship between suicidal ideation and IGD, MDD and game genres. Some obvious results were found. According to the results, there exists a strong relationship between suicidal ideation and the diagnosis of IGD. Especially, the very strong relationship between suicidal ideation and MDD, was an expected result of the study. On the other hand, the comparison in terms of game genres showed that there was only a relationship between MOBA games and suicidal ideation among 8 different game genres.

In fact, the relationship between internet gaming disorder and the concept of suicide is relatively new in the literature. In the recent years, the concept of IGD has also been added to the psychiatric disorders [15]. Past

studies on the relationship between the concept of suicide and IGD predict suicidal ideation [1,16]. Although the relationship of suicide attempts has been reported, studies seem to have no clear data provided on this issue yet. The lack of longitudinal studies is regarded as the main limitation [1]. However, there are also publications stating that there is an inverse relationship. According to these publications, adolescents with suicidal ideation tend to play later [16,17]. Also, in the same studies, the effects of third variables (such as depression, gender) on the development of suicidal ideation were emphasized.

There is enough evidence about the relationship between suicidal ideation and female gender [18] and MDD [6,19] Depression is one of the psychiatric disorders that most likely predict the development of suicide [6,19]. However, we do not want to elaborate on the reasons for this. As many causes and reasons have been investigated, it is known that the prevention and treatment of MDD which cause the attempt of suicide and even completing suicide, is important.

MOBA represents the most popular game group in the world [20]. While the most played game in the world are games such as League of Legends, etc., in our study, MOBA was determined as the most played game. How-

Table 3. Comparison of adolescents with suicidal ideations in terms of IGD, MDD, Game Genres.

		Suicidal Ideation (+)	Suicidal Ideation (-)	χ^2	P
		n (%)	n (%)		
IGD	Absent	322 (81.1)	851 (90.5)	23.033	<0.001***
	Present	75 (18.9)	89 (9.5)		
MDD	Absent	234 (41.1)	843 (89.7)	354.247	<0.001***
	Present	163 (58.9)	97 (10.3)		
MMORPG	Absent	372 (93.7)	877 (93.3)	0.074	0.811
	Present	25 (6.3)	63 (6.7)		
MOBA	Absent	309 (77.8)	778 (82.8)	4.466	0.038*
	Present	88 (22.2)	162 (17.2)		
FPS	Absent	341 (85.9)	783 (83.3)	1.405	0.253
	Present	56 (14.1)	157 (16.7)		
RTS	Absent	328 (82.6)	792 (84.3)	0.549	0.466
	Present	69 (17.4)	148 (15.7)		
Simulation	Absent	386 (97.2)	922 (98.1)	0.964	0.411
	Present	11 (2.8)	18 (1.9)		
Driving	Absent	389 (98.0)	926 (98.5)	0.477	0.490
	Present	8 (2.0)	14 (1.5)		
Sports	Absent	341 (85.9)	805 (85.6)	0.015	0.932
	Present	56 (14.1)	135 (14.4)		
Action-Adventure	Absent	377 (95.0)	901 (95.9)	0.523	0.560
	Present	20 (5.0)	39 (4.1)		

IGD, Internet Gaming Disorder; MDD, Major Depressive Disorder; MMORPG, Massive Multiplayer Online Rol Playing Gaming; MOBA, Multiplayer Online Battle Arena; FPS, First Person Shooter; RTS, Real Time Strategy * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

ever, our result seems to be remarkable, since no study has found significant data on the development of suicidal ideation. We think that MOBA games have a very important place in the development of the e-sports industry in the world and should be therefore considered as a risk factor in the development of suicidal ideation among video games [21]. It has been emphasized that MOBA games are complex and dynamic games. So, as a result of the game, the e-sports player becomes more often impatient and disappointed and the symptoms that occur are even similar to the symptoms seen in substance addiction [22]. Lastly, the literature also pointed out that MOBA games, including FPS games, reduce social empathic features, cause the development of toxic and aggressive behaviors, and are therefore included in the group of violent games [23-25].

Limitations

Although the sample size, examination of the adolescent age group, and suicidal ideation, which is an important public health problem, are seen as the strengths of our study, it also presents some limitations. Accordingly, since the determination of suicidal ideation is not based on one-to-one clinical interviews, it is an important limitation as it does not reveal its relationship with other parameters of suicide such as death wishes-thoughts-plan. The fact that the depression scale was determined according to the items of the children with suicidal ideation, it reduces the sensitivity in forming the main 2 groups. On the other hand, by regressing the effect of MDD, the game genres with which suicidal ideation is possibly related could be re-evaluated. In addition, the significant difference between the genders limits the generalization of all results for both genders. Furthermore, the fact that the study was conducted as cross-sectional rather than longitudinal also raises doubts regarding the reliability of our results.

The primary output of our study is that not all genres of internet-based games are equal (in the context of mental health). Also, the fundamental determining effect of the presence of IGD should not be ignored. And the endpoint of the study is that measurements should be made with much more detailed measurement tools in working methods (especially MMORPG, FPS, MOBA, which are more blamed for the development of IGD). Because suicidal ideation is a very important mental health problem, finding a relationship between game genres and suicide requires serious precautions. If necessary, these games can be banned.

Conclusion

As a result, the evaluation of suicide, which is an important public problem in adolescents with suicidal ideation, is clinically important when it comes to protecting the health of adolescents. We know that suicidal ideation is associated with many psychiatric disorders. And we cannot ignore the impact of taking precautions in protecting the health of adolescents. With this study, attention was drawn to the impact of some internet video games, especially MOBA video games, which are known to have an impact on the development of IGD on suicide prevention. These games greatly affect the psychological health of adolescents. Although it is not clear whether it directly causes

suicidal ideation, it seems to pave the way for the development of suicidal ideation by possibly causing the development of psychiatric disorders such as IGD and MDD. We believe that preventive mental health measures will be beneficial in preventing suicidal ideation and its progress towards a suicide plan and attempt. However, we think that the relationship between game genres and suicidal ideation should be investigated and researched more by future longitudinal studies which will have important contributions to the literature.

Ethical approval

The study was approved by the Malatya Clinical Research Ethics Committee and was completed in accordance with the Helsinki Declaration (2019/14).

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