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Research Article

An eSport research: psychological well-being differences of teenagers in terms of several variables

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Abstract

Purpose of this study is to reveal psychological well-being differences of teenagers from the aspect of working status and daily game-play times. Teenagers who tend to have an esport career are steadily increased while e-port is trending for more than a decade. As esport sector offers job opportunities and massive earnings, it is predictable that why teenagers desire to become a professional esport player or to work in esport sector. On the other hand, massive gameplay times may lead to psychological problems. As current employment and earnings effect mental health in several aspects, uncertainty of esport sector's effect is an enigma. Convenient sample method was used to select appropriate sample with consisting of 368 participants from all over the world. Web-based questionnaire and psychological well-being scale was used to collect the data which had been collected via Steam Community and Facebook. In this study we compared psychological well-beings of teenagers with aspect of their employment status and daily game play times. In accordance with the results, professional esport players have significantly lower psychological well-being than other two working groups. Also group of two playing more than average of 6 hours a day have significantly lower psychological well-being than the groups of two playing less than average of 6 hours a day.

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Introduction

Esports are undoubtedly one of the most popular trending area around the globe. Teenagers seem more interested in esports than traditional sports. Competitive gaming has always been existed with the 80's games coming on stage. By the time, gaming culture has been transformed to esports with the help of developed games and increased awards. Esports contain various kind of games like Dota 2, Leagues of Legends, Counter Strike, Fortnite, Pubg. These esport games are offering massive prizes for players to win tournaments which have been organized all over the globe in different times per year. The very first known prize in esports was John Carmack's 1987 model Ferrari for Red Annihilation tournament (Kampmann, 2001). With the creation of ladder system in another tournament which gave 2000 euro prize for winner was organized in Sweden, the competition level between the gamers had reached to another level (Jonasson & Thiburg, 2010). Thus, every player was challenging to another player who is at the same skill level. While top players in gaming culture were competing each other, Valve announced Dota 2 world championship tournament named as 'The International' with the $1,6 million prize pool. The International was the highest prized tournament ever organized. Over the following years it reached massive amount of money, in 2019, prize pool of Dota 2 world championship was $34,3 million. Also, some of the professional esport players are earning significantly more than any other gamers. For example, Faker who is a World-known League of Legends player earns $2,5 million annually base salary excluding his earnings from prize pools and streams (Newell, 2018). When esport games have this much income it is not surprising to see young generation's interest being shifted towards esport games from traditional sports. Even if teenagers don't play esport games, they are watching and following streamers to have fun. There are

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several reasons to tend into esport games: Teenagers may see professional players as role models, they use the games to escape from their personal or social problems or they just might be passionate about games (Co, 2014; Hamari & Sjöblom, 2017; Kocadağ, 2019). Whichever reason cause teenagers to play games or not, at the end of the day, most of the young esport followers and young gamers see esport sector as a job opportunity.

There are millions of teenagers around the globe have been dreaming of having an esport career. On the other hand, players or gamers need to be skillful and need to practice hard on their expertise games to become a professional esport player. Hereby, they are trying to improve their gaming abilities by playing esport related games at least 4 to 6 hours a day (Nilsson & Lee, 2019). The fact is not all of these teenagers skilled enough to become an esport professional. In addition, professional es-port players have response times in milliseconds not likely any other new gamers. Esport players at professional level can perform up to 500 action moves per minute compared to novice gamers with 10 action moves per minute (Lejacq, 2018). Desiring to have an esport career doesn't offer to achieve profession on esport games for any gamer by only playing for extreme hours. Additionally, many of pro players suffering psychological and physical problems because of playing extreme hours (DiFrancisco-Donoghue, Balentine, Schmidt, & Zwibel, 2019; Erzberger, 2018). However, esport teams are working with psychologists to deal with psychological demands of training and competition lately (Smith, Birch, & Bright, 2019).

Teenagers are absolutely into having an esport career, however they are in the most important period of their lifetime to make career decisions as being high school or college students. At the same time, parents are mostly having negative attitudes about having an esport career duo to fear of economic unsustainability depending on esport industry for their children (Nilsson & Lee, 2019). High earnings of esport players might show e-sport careers attractive to teenagers. However even if they can achieve this career option, teenagers might not be satisfied or happy as they expected before. As it mentioned above, working conditions, unpredictable future, toxicity might reduce psychological well-being levels of teenagers. Additionally, esports might be seem as a career opportunity, also this career option should be evaluated and considered carefully for teenager's future. In youth years, teenagers may not think about having an esport career in every detail as they may achieve to become an esport player or streamer as well as they might not have any esports career is also a possibility.

Effects of Esports on Mental Health

Sitting in front of a computer screen for long hours a day might have negative consequences on teenagers' physical health, mental processing, mental health, depression, social and emotional problems. Additionally, significant challenges face esport players and workers alike: toxicity in the community, agency-player-game owner problems, non-professionalized business (Steinkuehler, 2019). These kinds of stressors may cause suppressing effects on player's capability, life satisfaction and game performance. For example, in the countries like China and South Korea, when esport team loses a big event, professional players might get threatened for their lives by passionate followers in their country (Joindota, 2016). In many competitions, esport players are exposed to physiological and psychological stresses (Hallman & Giel, 2018). Such as, being a top dog against the underdog in front of the crowd puts more pressure on the top dog team players to not being humiliated for losing or staying undefeated for months and they are playing to keep these stats alive.

Esports players may stay under pressure from different aspects. Internal stressors depend on team issues like in-game communication, criticism, lack of confidence may cause stress on individual player when it happens aggressively (Nilsson & Lee, 2019). Team criticism puts pressure on player causing anxiety for game performance or potential drop from the roster. External stressors may come from audiences or opponent teams and may be formed at different levels such as being bullied on social media, abusive opponents etc. (Smith, Birch, & Bright, 2019). According to The Anti-Defamation League's findings, players have experienced harassment like physical threats, stalking, psychological pressure in online games. Most toxic game is Dota 2, four games follow up – Counter Strike: Global Offensive, Overwatch, PUBG and League of Legends, Minecraft is at the bottom of the list with %51 of players reporting harassment (Talbot, 2019). Common feature of the most toxic games is these games offering massive amount of prizes for tourneys. Being toxic is such an usual situation that even professional esport players are used to be toxic, then they get banned by Valve which is a publisher company of Dota 2 (Raghuram, 2020).

Playing computer games are effecting mental process as well as effecting mental health. Thinking process is also affected by computer games. It is reported that critical thinking level of students engaged in esports is lower than non esport students. Esport students' conceptual thinking is the most effected ability, esport students are struggling to identify and refer the object to a particular category. It is mentioned that esport students are more characterized by linearity and unidirectional thinking (Pishchik, Molokhina, Petrenko, & Milova Yu, 2019). Also, esport games are

causing mental exhaustion and it starts to block players' thinking, decision making, hand-eye coordination, problem solving and giving reaction skills (Red Bull, 2019).

Working hours are also high for esport players. Esport players and gamers spend at least 12-14 hours of play per day on esport related games. Just 4 hours of sleep might be physically and mentally exhausting for esport players (Holden, Kaburakis, & Rodenberg, 2018). People are working average of 34.5 hours per week in traditional work in United States (Doyle, 2019). Also, computer monitors expose blue light which is negatively effecting sleep latency and duration by melatonin suppression. Altered sleep patterns and insomnia may cause mood disorders and substance abuse (Tosini, Ferguson, & Tsubota, 2016). We shouldn't forget that gaming community may develop its own culture and rules (Bonnar, Lee, Gradisar, & Suh, 2019). Gaming community promotes excessive practice times up to 13 hours per day. 'Ninja' is one the most popular streamers in the World streamed on average of 8.8 hours, another streamer 'Edison Park' streamed content for 17 hours per day over 30 days (Goodling, 2019). However, by practicing more, a player would have higher confidence in the tourneys. Moreover, Jesse 'Jerax' Vainikka said that he lost his passion for Dota 2, the process is too exhausting, and it doesn't make him happy anymore when he retires from competitive Dota 2 scene (Krustofski, 2020).

According to reports and research outcomes, playing computer games more than 2-3 hours per day may cause addicted behaviors for teenagers. According to American Psychological Association, continued excessive play of games may cause symptoms such as psychological problems, loss of interests, functional impairment, deception, withdrawal (APA, 2013). Esports players' psychological well-being levels who are interested in having an esport career are significantly different by daily game playing times. Teenagers who spend less amount of times per day on playing computer games have higher psychological well-being levels. With the lower psychological well-being, players mostly tend to be caught by depression. Even professional players, streamer, commentators fall into this situation. Dota 2 player Janne 'Gorgc' Stefanovski publicly joined an interview with a psychiatrist on Twitch. He talked about his mental health problems related to Dota 2 (Krustofski, 2019). Another example is from Paul 'Redeye' Chaloner. A former math teacher, Dota 2 commentator suffers from a depression as in his own words "It doesn't matter what your life looks like or how comfortable you are, what a great job you have, what an amazing partner you have alongside you, chemicals in your brain don't care about these things and so BAM, it hits you, depression, out of nowhere." (Joindota, 2019). Additionally, bad team management, organizer fails, chaotic game houses or bootcamps, worse streaming houses make esport players feel psychologically frustrated that may cause mental health problems to them (TheScore Esports, 2019; TheScore Esports, 2019).

In addition to computer games' effect on psychological well-being, also spectating esport games via online may cause to develop problematic gambling behaviors and spending money habits. From the aspect of spending money, viewers are spending money on streamers, games and betting. Most of the viewers are donating high value money on the explanatory and game-play talents and skills of the streamer. Physical attractiveness of streamer is not the primary reason to donate for spectators (Wohn & Freeman, 2020). Additionally, gamers are buying customs, items etc., in games which are mostly free to play. These kinds of options are making little ecosystem in esports with followers' support. Other behavioral effect is, as there have been online gambling services, they are also giving advertisements next to esport channels. Just like how people betting to traditional sports or playing kind of gambling games, esport followers have started to tend to bet for es-port matches to make successful predictions and to earn money (Macey & Hamari, 2018). Betting on esports has increased in popularity for viewers and may cause underage gambling due to younger age of esport followers. Gambling by adults is generally accepted, however teenagers are being attracted to betting by providers and there is no control mechanism for this (Griffiths, 2017). Also, there are countless parents whose children have used their credit cards without their knowledge to bet on esport gaming and to buy in-game items, skins and customs (Melbourne & Campbell, 2019). For now, adult es-port followers can bet or spend money on esports with the earning of their own. Unfortunately, teenagers don't have any job and they aren't earning moreover, if they continue to play games most of the time of the day without any interest to any other jobs they won't be getting any earnings at their adulthood too.

With the rise of esports under the competitive gaming cover, gaming disorder might not be a concern for professional esport players. However, this is a significant public health concern for amateur esport players (Chung, Sum, Monique, Lai, & Cheng, 2019). Both kind of players are spending excessive amount of times on esport games, but amateur players are not earning to meet their needs while professional esport players do.

Elite esport players might spend 12-14 hours per day on esport related activities including team meetings, video analysis, finding strategies and other stuffs (Jabos, 2015; Stanton, 2015; Kari & Karhulati, 2016). On the other hand,

esport players are more active in sports than the average population, with no less than %95 of having physical exercises (Hebbel-Seeger, 2012). Esport players having physical exercise 1.08 hours every day which is more than World Health Organization's (2010) physical activity recommendation for children of 5-15 years (60 minutes daily) and adults of 18-64 years (21 minutes daily). Most of the esport players are aware of concerning the benefits of healthy lifestyle but not to improve their competitive performance (Pereiara, Figueiredo, Seabra, & Brito, 2019).

According to a study, psychological well-being levels of teenagers who are playing low hours per day is higher (Kocadağ, 2019). Psychological well-being levels of teenagers are one of the most crucial aspects for their mental health. Most of the teenagers who are interested in esports are following esport games, or they are playing desperately to become an esport player and descent numbers of gamers can become an esport player successfully. Earning situation, working in a business which you love or being professional esport player might help you to meet your needs or much more for living. But when we spotlight to playing games even if people may earn massive prizes, it is not certain to keep mental health wholesome. Also, while professional players are earning to afford their needs, rest of the teenagers might not earn anything and might not have any career neither in their future too. The results of this study may assist school counselors and mental health workers to shape teenagers' life conditions on gaming and to realize what are we facing with the esport trend.

Esport players are usually playing games at least 10 hours per day and they are suffering from mental illnesses. Also, employment status and earnings may have effects on people's well-being. Psychological well-beings of players may differentiate from each other. So that, Employment status and daily game-play times of game players are main themes of this research to be investigated.

Method

Research Model

While having difficulties with finding esport players and employers manually, we accepted participants who fill the survey as being appropriate for this study. In this study, convenient sample method was used to select appropriate sample according to research (Gravetter & Forzano, 2012). Psychological well-beings levels of teenagers are dependent variable, while employment status and daily game-play times are independent variables.

Study Group

The research's study group consists of teenagers who are working young adult or students in high schools and colleges over the globe. The data had been collected by web-based questionnaire which is composed in Google Forms, published at forum pages of Steam Community and Facebook. 368 of the participants ranging from 15 to 25 years of age, 42 of them are professional esport players, 77 of them are working in esports sector, 121 of them are working in different sector than esports and 128 of them are not working in any jobs.

Measurement Tools

Demographic Information Questionnaire.

Simply two noteworthy questions are investigated in this study. The first one is related to teenagers' working status which includes four choices: Being professional esport player, Working in esports sector, Working in a sector not related to esports and Not working in any jobs. By examining the literature for negative effects of gaming on mental health, it is considered that playing less than 2 hours per day not dangerous, playing more than 2 hours per day may cause addictive behaviors, playing more than 6 hours per day is effecting mental health extremely and playing more than 12 hours per day belongs to mostly esport players and as it mentioned earlier some of them having problems with toxic community, bad team management and mental issues (Pediatrics, 2001; Wu, Scott, & Yang, 2007; Kim & Kim, 2015; Hawi & Rupert, 2015; NPD, 2010; Jabos, 2015; Stanton, 2015; Kari & Karhulati, 2016). Thus, choices were set to "0-2 hours per day", "2-6 hours per day", "6-12 hours per day" and "more than 12 hours per day".

Psychological Well-Being Scale

Diener et al. (2009) first named the scale as the Psychological Well-Being Scale. However, they later changed the name of the scale to "Flourishing Scale" which is thought to reflect the content of well-being more accurately. The items of the Psychological Well-Being Scale is responded as with the range of Strongly disagree (1) to Strongly agree (7). All items are positively expressed. The scores range from 8 (If strongly agree with all items) and 56 (If strongly disagree with all items). A high score indicates that you have the psychological resources and power. The validity study was carried out with college students was composed of one factor and the total explained variance was detected as 53%.

The factor loads of the scale items vary between .61 and .77. The Cronbach's alpha internal consistency coefficient of the scale was calculated as .87 (Diener, et al., 2010).

Data Analysis

In this research, SPSS 24 was used for data analyzes. One way ANOVA was used to determine significant differences of psychological well-being levels of teenagers between the groups which are separated by working status and daily game-play times. Scheffe post hoc approach will be used in case ANOVA test come out significant to determine where the significance is.

Findings

Sub-problem 1: Differentiation of Well-Being Levels of Teenagers who are Playing eSport-related Games by Working Status

After finding skewness and kurtosis values in normal range (min -1,5 and max +1,5) for psychological well-being levels, one way ANOVA test was performed (Tabachnik & Fidel, 2007). One way ANOVA test was performed to see the psychological well-being differences among the three groups in term of working status: Professional esport players (n=42), Working in esport sector (77), working in a sector not related to esports (n=121) and not working in any job (n=128). According to results of homogeneity of variance test, there was no significant difference between the groups of working status. ANOVA test's result showed valuable significant difference ($p<.001$) between the groups. So that, Post hoc tests (Scheffe) were used for the groups' multiple comparisons (See Table 1).

Table 1.

Scheffe Post Hoc Results by Teenagers' Working Status

Groups (i)	Groups (j)	Mean Difference	Std. Error	Sig.
Professional esport players	Related to esports	-9,342	1,182	.000
	Not related to esports	-15,654	1,148	.000
	Not working	-2,342	1,212	.296
Related to esports	Professional esport players	9,342	1,182	.000
	Not related to esports	-6,312	.838	.000
	Not working	7,000	.923	.000
Not related to esports	Professional esport players	15,654	1,148	.000
	Related to esports	6,312	.838	.000
	Not working	13,312	.880	.000
Not working	Professional esport players	2,342	1,212	.296
	Related to esports	-7,000	.923	.000
	Not related to esports	-13,312	.880	.000

*The mean difference is significant at the 0.05 level.

According to Scheffe results, psychological well-being levels of 'Professional esport players' (Mean=29,62) group is significantly lower than other two working groups ($p<.001$ for both comparisons). On the other hand, there is no significant difference found between the 'Professional esport players' and 'Not working in any job' (Mean=31,96) groups ($p>0.05$). Psychological well-being levels of 'Not working in any job' group was also significantly lower than other two groups ($p<.001$ for both comparisons). Also, 'Working in a sector not related to esports' (Mean=45,27) group has significantly higher psychological well-being levels among the other three groups ($p<.001$ for all comparisons) while 'Working in esport sector' (Mean=38,96) group has significantly higher psychological well-being levels than 'Not working in any job' group ($p<.001$).

Sub-problem 2: Differentiation of Well-Being Levels of Teenagers who are Playing eSport-related Games by Daily Game-Play Times

One way ANOVA test was performed to see the psychological well-being differences among the four groups in term of daily game-play times: 0-2 hours (n=170), 2-6 hours (204), 6-12 hours (n=44) and more than 12 hours (n=50). According to results of homogeneity of variance test, there was no significant difference between the groups of daily game-play times. ANOVA test's result showed valuable significant difference ($p<.001$) between the groups. So that, Post hoc tests (Scheffe) were used for the groups' multiple comparisons (See Table 2).

Table 2.
Scheffe Posthoc Results by Teenagers' Daily Game-play Times

Groups (i)	Groups (j)	Mean Difference	Std. Error	Sig.
0-2 hours	2-6 hours	6,987	.780	.000
	6-12 hours	15,225	1,060	.000
	More than 12 hours	16.792	1.008	.000
2-6 hours	0-2 hours	-6,987	.780	.000
	6-12 hours	8,239	1,127	.000
	More than 12 hours	9,805	1,078	.000
6-12 hours	0-2 hours	-15,225	1,060	.000
	2-6 hours	-8,239	1,127	.000
	More than 12 hours	1,566	1,295	.691
More than 12 hours	0-2 hours	-16,792	1,008	.000
	2-6 hours	-9,805	1,078	.000
	6-12 hours	-1,566	1,295	.691

*The mean difference is significant at the 0.05 level.

According to Scheffe results, psychological well-being levels of 'More than 12 hours' (Mean=26,82) group is significantly lower than other two groups which are '0-2 hours' (Mean=43,61) and '2-6 hours' (Mean=36,63), ($p<.001$ for both comparisons). On the other hand, there is no significant difference found between the 'More than 12 hours' and '6-12 hours' (Mean=28,39) groups ($p>0.05$). Psychological well-being levels of '6-12 hours' group was also significantly lower than other two groups which are '0-2 hours' and '2-6 hours' ($p<.001$ for both comparisons). Also, '0-2 hours' group has significantly higher psychological well-being levels among the other three groups ($p<.001$ for all comparisons) while '2-6 hours' group has significantly higher psychological well-being levels than '6-12 hours' group ($p<.001$).

Additionally, while 5 of the 42 professional esport players have 6-12 hours game-play time per day, rest of them have more than 12 hours game-play time. Also, none of any teenagers who are working in esport sector or in a sector not related to esports have 6-12 hours or more than 12 hours daily game-play time.

Discussion

According to this study, professional esport players have lower psychological well-being levels than the other two working groups and there is no significant difference between the teenagers who are not working (Erzberger, 2018; Joindota, 2019; Krustofski, 2019). This result makes us think about professional players might earn massive prizes continuously with being passionate about gaming, however they might suffer from mental health duo to extreme hours of game-play. Several cases have been noted such as being depressed by excessive game-play times per day, exhausting gaming experiences, organization fails are leading players to get disappointed or players who are seeking success in virtual world in order to real life. As we mentioned earlier, online games are effecting mental health as having toxic community, organization issues, team problems, depression, social and emotional problems etc. This conclusion is also not approving Sumail's motivation for the game which he mentioned that he loves the game (Dota 2), but earning money is priority for him in comparison with achieving to become second time The International Champion (Put Tank in a Mall, 2018). Sumail who had earn 6 million dollars with his team at the age of 16 is one of the best mid-lane players in Dota 2. To be happy and satisfied, people all over the world want to work in a job which they love. Most people might think about having a job they want to work with less payment is their first preference instead of getting rich with high salary with unenjoyable job. This idea might be too imaginary, because earning much money than expected is also good motivation for living. On the other hand, controversially working in a sector which you love might be much motivational and may effect psychological well-beings on positive way. It could work both way depending on human's personality. Apparently, gaming is not working that way. Whether or not you earn massive money from esports, psychological well-being is decreasing with playing more hours. In addition to that, players who are not working in any job playing video games for massive hours need to get psychological support. While not working in any job is devastating, these teenagers won't be going anywhere soon by playing video games with massive hours. This could be endless circle for them.

There are many reasons to play video games such as escaping from problems, spending leisure time or just being passionate about. While game players who are working in different than esport sector might feel well better in their daily life duo to fact that they are playing games less hours than the others. So that, they are facing with less issues which are related to gaming such as toxic community. Playing esport related games which they follow for years just to spend time and to have fun might be much healthier for mental conditions. We can consider that people working in a sector not-related to esports probably achieved their career goals and also playing games as hobby. The important part of this situation is these players who are working in different sector than esports got what they expected from career or life approximately. There is less distressing situation for them depending on having a job not likely the jobless groups who are playing games whole day. This study sample may interrelate there are thousands of teenagers around the world playing video games massively and they are in their most efficient lifetimes to make important decisions. At this point social support system have to arrange correct approach for esport trend. Teenagers love esports, it is trending, very popular all over the world, companies want to get in this business, governments want to support however it may have harmful effects on youngsters and society without deep knowledge before take an action.

Conclusion

With the role models and tournament prizes it is possible to earn enough money to meet life needs. It is not surprising that teenagers are desiring to have an esport career whether or not they are skilled enough to become. Furthermore, esport is trending all over the globe and governments, sport organizations, official committees are following this trending effect without any doubt and regulations. If we evaluate the esport situation from technology, investment, publicity, tourism or other aspects, it is very beneficial as contribution. However, we have to consider esport from education, public health, social aspects too. Regulating gaming habits, considering game addiction and adapting to education accurately will be much helpful for teenagers and the future of society. This study focuses on mental health aspect of esports' effects, well organized and executed esport workshops with expert participants from many sector should be considered to guide corporative studies.

Limitations

The data of this study was collected from only eSport-related game players by via Steam Community and Facebook. While being difficult to find people to fill survey from eSport scene, participants of this study might show limited psychological well-beings with considering depressive people might not tend to fill any survey. Also, this study has only gamer participants even if they would be working most of the day, they are still playing games.

Recommendations

For further studies, players would be compared by earning amounts and much comprehensive psychological well-being scale would be used to get much reliable data. Also, other mental aspects of gamers might be compared and evaluated. Psychological well-being scale may not be very effective to measure mental health from many aspects duo to being brief. Considering much detailed and particular scales to measure psychological or mental situation would be more helpful for further research.

For applicants, non-gamer participants would be found for the research instead of taking data from only gamers to get much generic information to use in comparison. Experimental research might use to evaluate change of psychological well-beings by developing beneficial program for mental health. At the end, we need to support teenagers' mental health for future of public health.

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