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Smartphone Addiction in Undergraduate Athletes: Reasons and Effects of Using Instagram Intensively

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Abstract

Instagram has become a popular social network software based primarily on the concept of sharing visual content. As the most popular mobile application among university students, it is thought to be a major component of excessive smartphone use cases due to the need of its users for frequently checking updates. As a result, heavy Instagram-use for both sharing personally generated content and checking on others' updates is thought to be a contributor to smartphone addiction. The purpose of this study is to examine the effects of Instagram social network usage characteristics upon smartphone addiction levels of university students, specifically those enrolled in the Athletics Departments, in order to examine the particular case of young athletes that use Instagram extensively. Therefore, the study group consists of 97 undergraduate students enrolled in the Athletics Department of a state university located in the Thrace regions of Turkey during the 2017-2018 academic year, who were also taking up a pedagogical formation certification course for becoming prospective K12 physical education teachers. Adopting a mixed method research model, the study has shown that, as far as young athletes who report Instagram as their favorite smartphone application is concerned, heavy Instagram use statistically predicts smartphone addiction. Moreover, according to qualitative data, the Occam's Razor rule applies with these young athletes' interaction with Instagram. Problematic use patterns are more easily explained by passive-observant behavior associated with a certain Fear of Missing Out, rather than a strong desire to exhibit their body image and sports success.

Introduction

In a general sense, addiction occurs due to two-way interaction between various factors such as biological or genetic predisposition, psyche and social environment of an individual, in addition to the specific nature of the activity or substance one might get addicted to (Griffiths, 2003). The notion of addiction to information technology has developed in the recent years, alongside rapid advances in the field and in human-computer interaction. The advent of smartphones has mostly brought ease to the lives of individuals around the globe and their associated mobile applications enabled tedious daily routine tasks to either be automated or reduced to simple screen taps. However, the deep penetration of smartphones into human lives has consequentially introduced certain psychological phenomena, some of which have negative effects on individuals. The most prominent among these is smartphone addiction.

Smartphone addiction is thought to be a form of addiction to IT tools (Lin et al., 2014), which results in individuals losing control over their smartphone usage habits (Jeong and Lee, 2015), turning smartphone use into a harmful activity (Won-Jun, 2013). In their comprehensive study for establishing criteria for Smartphone Addiction, Lin et al. (2016) propose three categories. Indicating a maladaptive pattern of smartphone use that leads to clinically significant impairment or distress, Category A requires three out of the following six symptoms to be occurring any time within the same 3-month period: a) recurrent failure to resist the impulse to use the smartphone; b) withdrawal, as manifested by dysphoria, anxiety and/or irritability after a period without smartphone use; c) smartphone use for a period longer than intended; d) persistent desire and/or unsuccessful attempts to quit or reduce smartphone use; e) excessive time spent on using or quitting the smartphone use; and, e) continued excessive smartphone use despite knowledge of having a persistent or recurrent physical or psychological problem resulting from smartphone overuse. Whereas, Category B indicates functional impairment and requires two or more of the following symptoms to be present: a) Excessive smartphone use resulting in persistent or recurrent physical or psychological problem; b) smartphone use in a physically hazardous situation (e.g., smartphone use while driving, or crossing the street), or having other negative impacts on daily life; c) smartphone use resulting in impairment of social relationships, school achievement, or job

performance; d) excessive smartphone use that is causing significant subjective distress or is time-consuming. Lastly, the exclusion criteria of Category C denote the smartphone addictive behavior not being better accounted for by obsessive-compulsive disorder or by bipolar disorder. In cases of smartphone addiction, the addicted individual typically makes heavy use of the phone device to access applications or services therein, especially those that involve social media (Padir, 2017). The youth of the world is thought to be under risk of smartphone addiction due to having lived most of their lives in an environment where information technology has become ubiquitous (Aktaş and Yilmaz, 2017).

Research efforts that focus on smartphone addiction are mainly comprised of either scale development studies (Demirci et al., 2014; Kwon et al., 2013; Kwon, Kim, Cho and Yang, 2013; Lopez-Fernandez, 2017; Noyan, Darçın, et al., 2015) or studies that investigate the relationships between smartphone usage durations/modes and several psychological factors. These factors include loneliness (Aktaş and Yılmaz, 2017; Aktürk, Budak, Gültekin and Özdemir, 2018; Bian and Leung, 2015; Çakır and Oğuz, 2017; Dikeç, Yalnız, Bektaş, Turhan, and Çevik, 2017; Enez et al., 2016; Gao et al., 2016; Kim, Cho and Kim, 2017; Yuh, 2016), self-esteem (Bianchi and Phillips, 2005), stress (Kuss, Kanjo, Crook-Rumsey et al.; 2018; Samaha and Hawi, 2016), depression (Demirci, Akgönül and Akpınar, 2015; Kuss, Kanjo, Crook-Rumsey et al.; 2018; Kwon and Paek, 2016); as well as demographic variables (Bagci and Peksen, 2018; Gezgin et al., 2018; Kuss, Kanjo, Crook-Rumsey et al.; 2018; Kuyucu, 2017).

Smartphones provide a high-degree of connectivity and open the doors to a new world for their users, owing to a large array of useful and/or entertaining applications. Among these, however, it seems to be that the most frequently used ones are the so-called social media apps. In fact, an extensive recent study (Lopez-Fernandez, 2017) conducted among European young adults has shown that, irrelevant of problematic use cases, the second most frequent activity displayed by European young adults on smartphones was social networking (62.6%), which was preceded by e-mailing (64.1%) as the most frequently displayed activity. The same report suggests that social networking displays the greatest potential for perceived dependence on mobile phone use.

It is accepted that the high-degree of mobility afforded by smart phone devices, which some of their users have been shown referring to as an artificial "organ" of their body (Gezgin et al., 2019), enables individuals to effortlessly access social network services and remain constantly connected (Jeong, Kim, Yum and Hwang, 2016). In a study conducted with university students in the UK, Pearson and Hussain (2016) noted that with 87% coverage, social media apps are the most popular ones among these individuals; followed by instant messengers, music players and camera apps, respectively. As in the case of Turkey, a study conducted by Gezgin, Hamutoğlu, Samur and Yıldırım (2018) with 301 undergraduate students indicate that with 88% coverage of the sample, the most popular reason of using the smartphone for university students is to connect with one another and spend time on social networking services. Other studies in Turkey have shown similar results. Sanal and Özer (2017) have shown in their study of 157 Turkish undergraduates that students prioritized social media applications among their reasons for using smartphones, with Instagram -a social network app- being the 2nd most popular application with 85.4%, following the instant messaging application Whatsapp with 93.6%. Students that frequently used these two applications comprised more than 50% of the study group. Similarly; Gezgin, Hamutoğlu, Gemikonaklı and Raman (2016) studied 363 Turkish undergraduate pre-service teachers and concluded that the smartphone applications used most frequently by the study group was Instagram and Whatsapp. Last but not least, Kuyucu (2017) conducted research with 620 Turkish undergraduates, 520 of which reported heavy Instagram use. As shown by all these studies, social media is primary driver for smartphone use among young Turkish university students and Instagram is the most popular social media application.

Developed in 2010, Instagram began its journey as a photo sharing app and rapidly gained popularity thanks to high-quality and entertaining visual filters. In time, Instagram turned into a social outlet for its users where they could easily capture and vividly share their life moments, thanks to photographs and videos enhanced with aesthetic filters (Hu, Manikonda and Kambhampati, 2014). The application regularly gained new features and reached an even wider audience as time passed. The ability to share temporary "stories", a feature borrowed from another popular video messaging application called Snapchat, has led Instagram to reach unprecedented popularity. A digital report announced by the We Are Social (2018) initiative has shown Instagram to be the third most popular social media network globally; and made special mention of Turkey, where Instagram as a brand has gained a "lovemark" status, indicating critical acclaim and widespread public adoption in advertising terms. This report also mentioned Turkey being 5th in the list of countries ranked by Instagram general popularity. About a third of Instagram users belong in the 18-34 age group and, as opposed to the case of Facebook, popularity of Instagram decreases as user age grows. The fact that Instagram is getting more and more popular among an audience of younger individuals is associated with Instagram being the perfect medium

for photos, videos, animations and instant stories to be shared with the purpose of gratifying the desire for publicity and appreciation of individuals (Gündüz, Attar and Altun, 2018).

Social media applications offer an attractive environment for young populace where they can spend their spare time connecting with their peers, engage in and sharing entertaining multimedia content or play games. But scientific literature indicates that social media applications increase the risk of smartphone addiction (Salehan and Negahban, 2013). A study by Ding, Xu, Chen and Xu (2016) concludes that smartphone addiction is actually triggered by not the device itself per se, but by software applications (apps). Findings from their study reveal that communication apps and social media apps are the leading factors that affect smartphone usage habits and smartphone addiction incidence in university students, who have reported difficulty in managing time spent using social media apps. Indeed, there exist studies in the literature showing that using social network apps is a significant predictor of smartphone addiction (Jeong et al., 2016; Salehan and Negahban, 2013).

Under the light of this information, it may be worthy of effort to investigate the relationship between smartphone addiction and Instagram in a population of university students, consisting particularly of athletics department students. The reason of purposefully targeting athletics department students in this research is due to findings indicating that athletes are inclined to be particularly interested in Instagram for self-presentation by showcasing their physical efforts (Smith and Sanderson, 2015; Geurin-Eagleman and Burch, 2016). In these studies, samples of photos shared by athletes on Instagram have been investigated and it was found that, alongside family-driven or commercial brand-endorsing portraits, athletes were also especially interested in portraying themselves as "dedicated athletes" (Smith and Sanderson, 2015). Indeed, body-exhibiting self-portrayals played a major role in athletes' Instagram shares; and content analysis revealed female athletes posting more photos of themselves online and sexually suggestive photos garnering greater attention in both genders (Geurin-Eagleman and Burch, 2016). Özçelik and Gezgin (2018) have also reported students in the athletic department frequently mentioning Instagram use for the purpose of sharing their personal body images and sports activities with which they feel proud. Question is, do these activities bear the risk of turning into addiction? To answer this, a study group consisting of athletes may represent a special population that is particularly under risk of smartphone addiction due to excessive and problematic Instagram use. In addition, studies conducted in the literature already show that university students use Instagram mostly (Hoşgör, Koç-Tütüncü, Gündüz-Hoşgör and Tandoğan, 2017). Well, it is thought that it is important to reveal whether the undergraduate athletes uses the Instagram intensely do this for the purpose of sharing for body exposition or for some purpose like narcissism, or because of fear of missing out, which is one of the predictors of smartphone addiction (Gezgin, 2018). Findings from this research may shed light as to whether young athletes who make heavy use of Instagram are prone to smartphone addiction and if so, under what circumstances. Therefore, the following questions have been asked:

1. What is the relationship between heavily Instagram using Turkish undergraduate athletes' smartphone addiction levels and their
   a. age,
   b. average daily time spent using smartphones,
   c. average daily time spent using the Instagram mobile application, and;
   d. average daily frequency of checking Instagram updates?
2. Do the variables of average daily time spent using smartphones, time spent using Instagram in particular and frequency checking Instagram in a given day, individually or collectively predict smartphone addiction in heavily Instagram using Turkish undergraduate athletes?
3. How do heavily Instagram using Turkish Undergraduate athletes interact with Instagram?

Methodology

In the study, sequential mixed method, which is frequently used in mixed method designs and one of the most frequently described types in the literature, was used (Creswell, Plano Clark, Gutmann, & Hanson, 2003; Johnson & Onwuegbuzie, 2004). Sequential mixed method sampling involves selecting probability and purposive sampling strategies for a mixed method study in the order of sampling as Quantitative-Qualitative or Qualitative-Quantitative. Sequential Quantitative-Qualitative technique was used in the study. In this direction, the relationship between the smartphone and instagram usage forms and the smartphone addiction were examined in the sample of the sports department students who stated that the most used application on their smart phones is instagram. Subsequently, based on the answers given to the questionnaire, interviews were conducted with a group of participants from the highest or most different scores.

Study Group

The study group consists of 97 Turkish undergraduate athletes ranging between 18 to 30 years of age (with an average of 21.79); from various classes who were enrolled at Recreational Athletics, Athletic Coaching or Sports Administration departments of a state university in the Thrace region during the 2017-2018 academic seasons. Data were collected from participants in a voluntary basis via a form developed by researchers. Participation opportunity in the study has been advertised to participants face to face by their instructor in classrooms during enrollment in a pedagogical formation course. In this study, probability and purposive sampling approach was used to include only the participants who reported having Instagram installed on their smartphone and only those who have stated their most frequently used smartphone application to be Instagram.

Data Collection Tools

Data collection tools consist of the Instagram Experience Questionnaire, demographic information form and a form consisting of a shortened version of the Smartphone Addiction Scale.

Demographics Form

The demographic form serves to collect information from undergraduate students such as their age and gender, in addition to (a) having Instagram installed on their smartphone (b) ranking of most frequently used smartphone applications, (c) average daily time spent using smartphones (ADTSUS), (d) average daily time spent using Instagram (ADTSUI) app and (e) average daily frequency of checking Instagram (ADFCI) updates. Students who reported not having Instagram app on their phones and not having Instagram ranked number 1 in the list of their most frequently used smartphone apps have been deduced and a study group of 97 students was formed. Detailed statistics were shared in Table 1.

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Table 1. Frequency-percentile Values Established via Demographics Form

Variables		N	%
Gender	Male	62	63.9
	Female	35	36.1
Department	Recreational Athletics	23	23.7
	Sports Administration	15	15.5
	Athletic Coaching	59	60.8
Total		97	100.0

Smartphone Addiction Scale – Short Version

Smartphone Addiction Scale – Short Version (SAS-SV) has been developed by Kwon and colleagues (2013) for the purpose of measuring smartphone addiction risk levels in adolescents and adapted to Turkish by Noyan et al. (2015). It consists of 10 items on a 6-level Likert Scale, with scores ranging between 1 to 6 for each item. Range of possible scores therefore varies between 10 to 60. Greater score indicates greater risk of smartphone addiction. The scale consists of a single factor and the Turkish version possesses an internal consistency coefficient of .80.

Instagram Experience Questionnaire

In order to gather data on the experience that undergraduate athletes go through while using Instagram, an Instagram Experience Questionnaire has been developed and administered to participants on a voluntary basis. The questionnaire, which has been administered over Google Forms and was responded by 28 anonymous volunteers from among the study group, comprised of the following 7 questions:

1. Please describe what you do during the time you spend on Instagram.
2. Please describe how you usually feel and what you usually think during time spent using Instagram.
3. How would you describe majority of the content shared by others that you give Likes to?
4. How would you describe majority of the content shared by you that is given Likes to by others?

5. If Instagram was thought to be comprised of two elements of sharing own content or observing others' content, which would you say is more important for you and why?
6. What new features would you like added to Instagram?
7. What would make you say "I'm not using Instagram anymore"?

Data Analysis

As for qualitative data, normality tests were initially carried out in order to determine the analysis method. Shapiro-Wilk test results have shown that all data sets except smartphone addiction scores are non-normally distributed. However, an examination of skewness and kurtosis values for all data sets has shown the values to be between -1.96 and +1.96, which according to Tabachnick and Fidell (2007) may be considered as normally distributed data (see Table 2). Assumptions of linearity, multicollinearity and residuals were met and step-wise regression test has thus been carried out over IBM SPSS 23.0 software. Content coding method has been used for analyzing qualitative data obtained through the Instagram Experience Questionnaire. Themes and sub-themes in the answers of 28 anonymous volunteers have been coded in the QSR NVivo 10 software. In this process, initial themes have been coded by one author and the other author was asked to code data against existing themes. Interrater reliability analysis has been carried out in this manner and a Cohen's Kappa yield of 0.65, which is considered substantial, has been achieved. Matrix-coding feature has then been used in order to determine coinciding themes with questions on the Instagram Experience Questionnaire.

Findings

Findings answering research questions pertaining to Instagram Usage Experiences; relationships between smartphone addiction risk levels and age, average daily time spent using smartphones; average daily time spent using Instagram and average daily frequency checking Instagram will be covered in their respective order in the following section.

Correlations with Smartphone Addiction

As a result of Pearson's Correlation test, it was found that student age and smartphone addition risk levels are significantly negatively correlated at a weak level ($r=-.204$, $p<.05$). This finding indicates that smartphone addiction risk is greater in younger students. Significant positive correlations of smartphone addiction risk levels have also been found at moderate levels with average daily time spent using smartphones ($r=.427$, $p<.001$), at moderate levels with average daily time spent using Instagram ($r=.417$, $p<.001$) and at a weak level with average daily frequency checking Instagram ($r=.210$, $p<.05$). Correlational statistics have been given in Table 2.

Table 2. Correlational Statistics between Smartphone Addiction Risk Levels and Other Variables

	SAS Score	Age	Avg. daily time on smartphone (min.)	Avg. daily time on Instagram (min.)	Average times Instagram is checked daily
SAS Score	1				
Age	-.204*	1			
Avg. daily time on smartphone (min.)	.427**	.019	1		
Avg. daily time on Instagram (min.)	.417**	-.130	.546**	1	
Average times Instagram is checked daily	.210*	-.313**	-.029	.089	1

*p<.05, **p<.001; SAS(Smartphone Addiction Scale)

Predicting Smartphone Addiction

A stepwise regression test has been carried out with four independent variables (Age, ADTSUS, ADTSUI, ADFCI) to see whether they singularly or collectively contribute to a model for predicting smartphone addiction risk. The results of this test have been shared in Table 3.

Table 3. Stepwise Regression Test Results for Predicting Smartphone Addiction Risk in Undergraduate Athletes

	Variable	B	Std. Error	Beta	R	R^2	F	p
Model 1	Constant	21.844	1.922					
	ADTSUI	.024	.005	.427	.427	.18	21.187	.000**
Model 2	Constant	18.959	2.210					
	ADTSUI	.025	.005	.434	.481	.23	14.181	.016*
	ADFCI	.063	.026	.222				
Model 3	Constant	18.707	2.171					
	ADTSUI	.017	.006	.306				
	ADFCI	.056	.025	.198	.519	.27	11.405	.032*
	ADTSUS	.017	.008	.232				

** p<.001, * p<.05 level of significance. Average daily time spent using smartphones (ADTSUS), Average daily time spent using Instagram (ADTSUI) app and Average daily frequency of checking Instagram (ADFCI)

As seen in Table 5, the age variable has been excluded from analysis, since it fails to predict smartphone addiction risk at a statistically significant level. Remaining variables have been taken through stepwise inclusion process into the regression model. The first variable included into the model, average daily time spent using Instagram, has been found to explain 18% of smartphone addiction risk. Whereas, the second variable included, daily frequency checking Instagram has been found to explain 5% of smartphone addiction risk. Lastly, average daily time spent using smartphones was also found to explain 4% of smartphone addiction risk. Altogether, these three variables predict 27% of smartphone addiction risk.

Instagram Usage Experience

After the analysis of answers, 442 references have been coded in total. The number of references were shared between 6 main theme nodes; namely Behavior (105 references, 24% of total), Communities (25.6%), Content (143.32%), Etiquette (4.1%), Instagram Features (81.18%) and Feelings (84.19%). Answers to open ended questions found in the Instagram Experience Questionnaire has been collected from 28 anonymous volunteers from the study group. The overall outlook of themes that emerged during content coding and the respective tree map diagram has been shown in Figures 1 and 2, respectively.

The Behavior theme referred to participants describing their actions on Instagram. It is comprised of the Discreet (9.11%) theme, in which users refer to staying anonymous and avoiding interaction with other people on Instagram; Exciting (35.33%) theme, in which users refer to their actions on Instagram through which they share content to others, and Observant (59.56%) theme, in which users refer to actions on Instagram through which they observe content from others. The Communities theme is made up of answers in which participants are referring to groups of people that they interact with in some way over Instagram. Among all the references coded in communities, Friends is the most prominent (16.64%) with Celebrities (4.6%) and "Following" (4.6%) coming up next. "Following" sub-theme refers to participants addressing the people they interact with on Instagram simply as "the people I follow", (as opposed to friends, peers, etc.). Lastly, a single reference was made to close family (1.4%).

The Content theme covered the nature of content the participants somehow interacted with over Instagram. Coding references here fell into three main categories of Format (66.46%), which denoted the way participants refer to the format of content; Quality (6.4%), which denoted participants referring to a given quality of the content and Type (71.50%) which referred to various categories that content fall into. The Content Format subnode was comprised references to Photographs (57.86%) and Videos (9.14%). Content Quality subnode was comprised of Authenticity (2.33%), a theme where participants make mention of fidelity or sincerity of content and of people's need to be "convinced" by content. Content Type subnode is broken down into numerous categories of content objects. These are Artistic (2.3%); Athletics (17.24%), Cute Animals (1.1%), Humor (4.6%), Intellectual / Informative (10.14%), Nature (5.7%), People (26.37%), Shopping (1.1%) and Travel (5.7%). The content type most frequently referred to the participants can be described as content that depicts humans where they are the main focus. Of the references, 19 (73%) was about attractive looks and among all these references to attractive physical looks, 5 (26%) was about body figure, 2 (10%) was about fashionability and 5 (26%) was about sexual attractiveness.

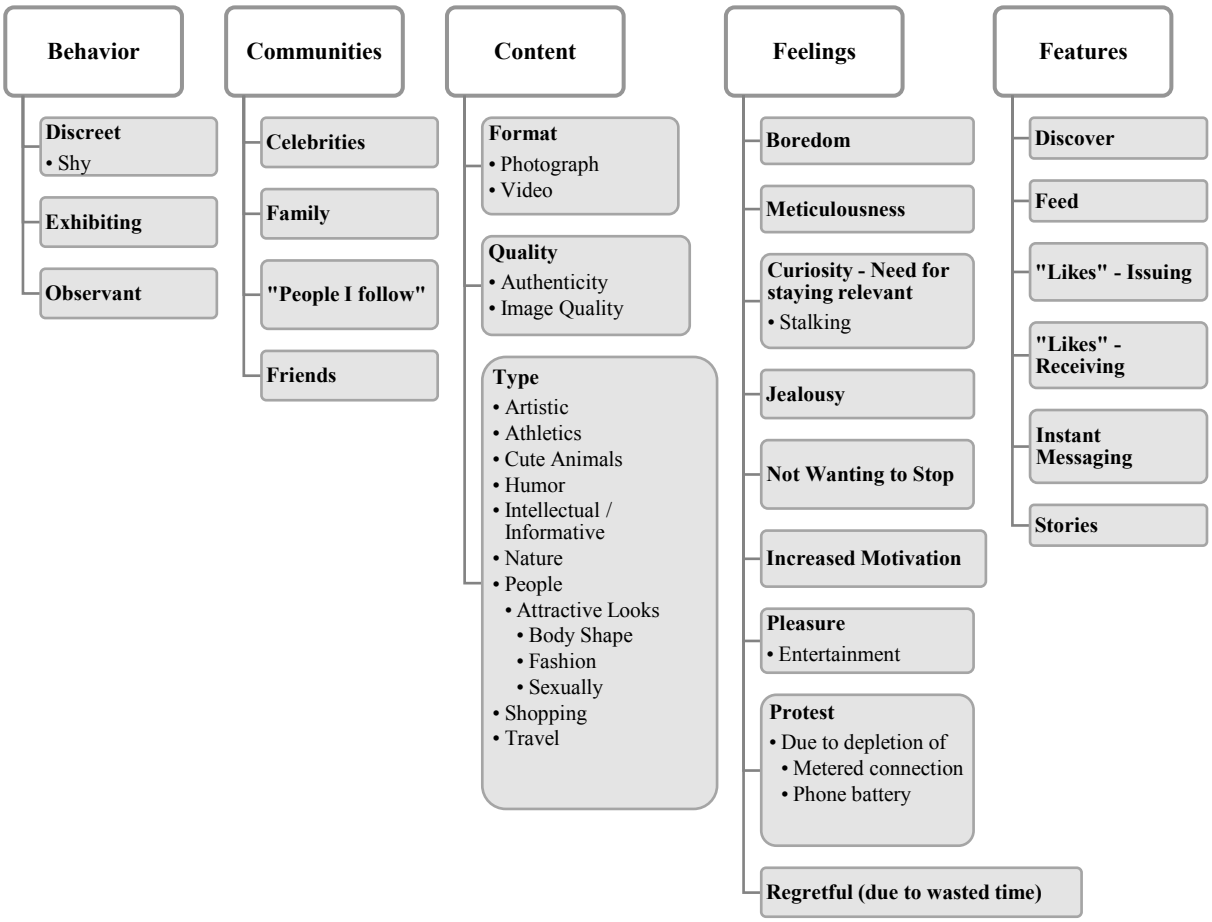

Figure 1. Theme Nodes that Emerged During Initial Content Coding of Answers to Instagram Usage Questionnaire (N = 28)

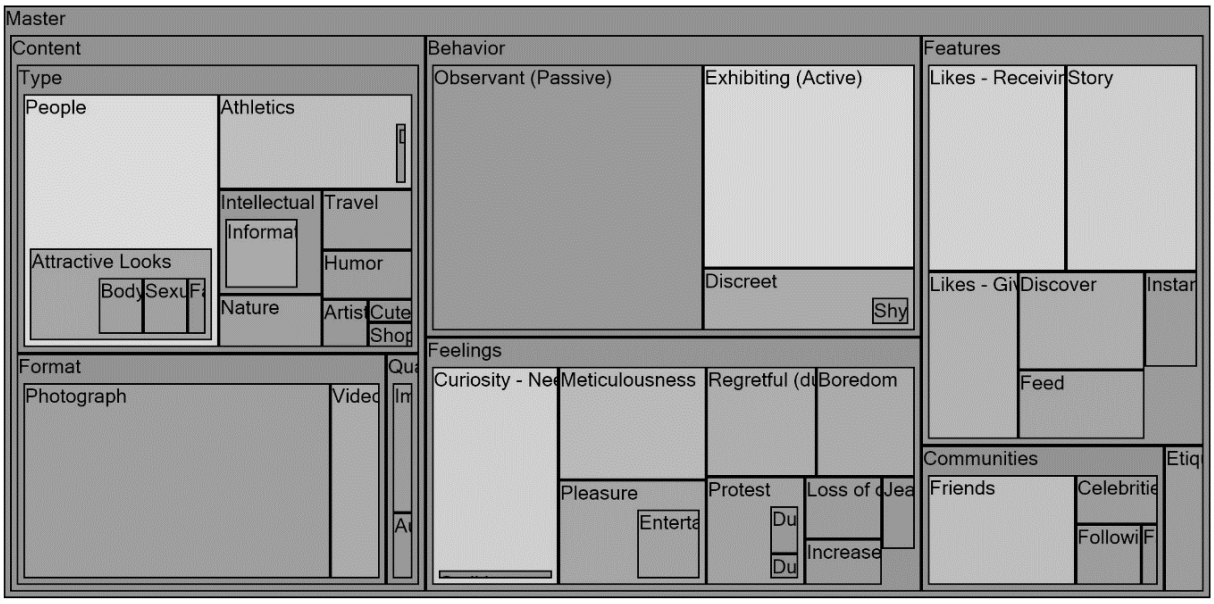

Figure 2. Themes that Emerged During Initial Content Coding of Answers to Instagram Usage Questionnaire, Nodes Compared by number of Coding References, with Colors Representing Coding References (N = 28)

A main theme of Etiquette (4.1%) emerged, albeit with a small percentage. Etiquette refers to participants referring to interactions on Instagram that obey certain social codes. English translations of quotes from this theme have been given below:

- *"I like all photos (that people share) so as not to act rude (and shame myself)"*
- *"I share photos of me or days/events special to me. So, knowing that, my friends give me likes. (so as not to be impolite)"*
- *"... I go „likes-for-likes"; you know? Like returning the favor to my friends because they liked my photos"*

Another main theme, Instagram Features involved participants referring in their answers to a given feature, i.e. functional component, of Instagram. Of all the coding references in this theme node, the most prominent was references to Receiving Likes (23.28%); followed by Stories (22.27%), Giving Likes (12.15%), Discover feature (10.12%), Main Content Feed (7. 8%) and lastly, Instant Messaging (4.5%).

The last main theme, Feelings, refers to participants making explicit or implicit mentions of their personal feelings during interactions with Instagram. Coding references in the Feelings theme node included Boredom (9.11%), Jealousy (2.2%), Increased Motivation (3.4%), Pleasure (13.15%), Protest (6.7%), Meticulousness (14.17%), Curiosity or The Need to Stay Relevant (22.26%), Not Wanting to Stop (4.5%) and Regretfulness due to Wasted Time (10.12%).

Meticulousness theme refers to participants making mention of a feeling of particular discrimination or selectiveness. English translations of quotes from this theme have been given below:

- *"I issue likes only to content that is high in image quality, taken with high quality cameras"*
- *"Only high quality content. Enough said."*
- *"Among everything I share, a high number of likes is given only upon artistic content which I shoot with a high quality camera"*

Curiosity or The Need to Stay Relevant, refers to participants expressing one's need to stay up-to-date with what is happening around the world as reflected on Instagram. English translations of quotes from this theme have been given below:

- *"I don't share many photos but I'm always curious about what others share"*
- *"I'm pleased to be posted about what the people I follow are up to"*
- *"I check the photos of my friends. I am especially curious about what things they share as stories, so I tap all stories one by one until none are left. If there's anything I particularly like, I message the owner."*
- *"I want to see my friends" photos. I think it"s a kind of curiosity. There are some who share pics or videos of their (physical) training. I get jealous about those. But that isn't very often"*

Not Wanting to Stop, refers to participants making mention of one's urge, against one's will or not, to use Instagram. English translations of quotes from this theme have been given below:

- *"When I start up the app, I wish there was a timer that tracks how much time I spend in it. After a certain time has passed, the app could lock itself and prevent access, for at least an hour."*
- *"I don't think I could quit (Instagram) in any way."*
- *"I'll never quit (Instagram)"*

Regretfulness due to Wasted Time refers to participants mentioning the feeling of regret one may experience due to wasting time on Instagram, or the feeling that one could do better things with their time than spending it on Instagram. English translations of quotes from this theme have been given below:

- *"I realize I'm wasting too much time on it"*
- *"All I do here is kill time without feeling anything"*
- *"Instagram entertains me while I'm on it, but realizing how much time has passed since I started viewing it, I feel sorry for the wasted hours"*
- *"It would be better if I used my time to read books (instead of spending it on Instagram)"*

Matrix Coding of Themes with Question Nodes

The Matrix Coding feature of NVivo 10 has been used for each question on the Instagram Experience Questionnaire to determine which themes are the most prominent for each of the questions. As a rule of the thumb, only the nodes with at least 2 references and only the 10 most frequently coded themes in lists exceeding 10 items have been included for the purposes of brevity and clarity. Question 1 asked participants to describe what they do during their time on Instagram. The graph of the most prominent theme nodes that overlap with this question node is given in Figure 3.

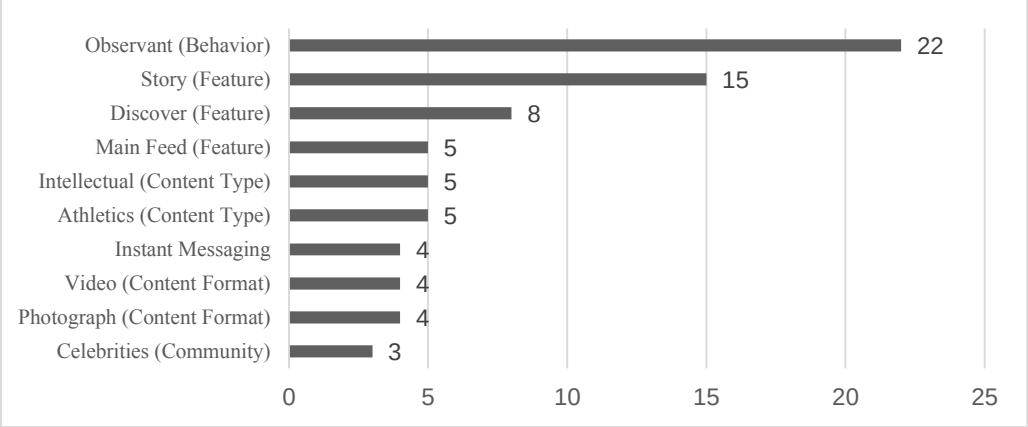

Figure 3. Emergent Themes by Number of Nodes Coded in Answers to Question 1

Question 2 asked participants to describe what they mostly feel during their time on Instagram. The graph of the most prominent theme nodes that overlap with this question node is given in Figure 4.

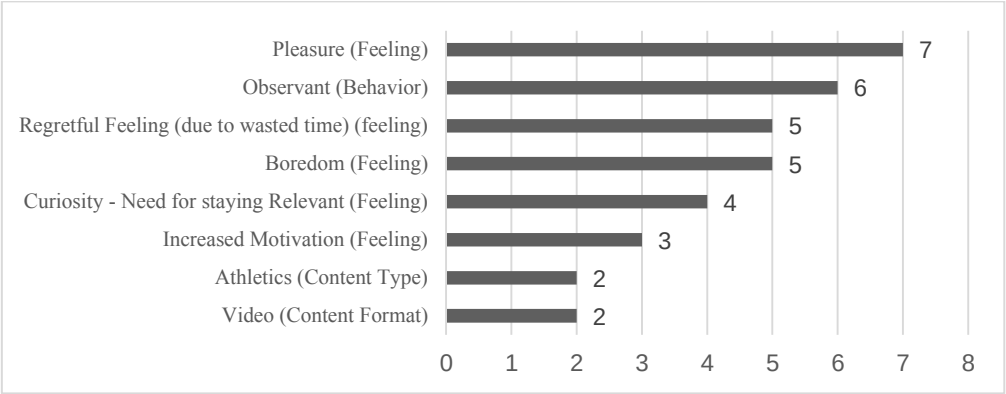

Figure 4. Emergent Themes by Number of Nodes Coded In Answers to Question 2

Question 3 asked participants to describe the features of the content that they most frequently or generally issue likes to. The graph of the most prominent theme nodes that overlap with this question node is given in Figure 5.

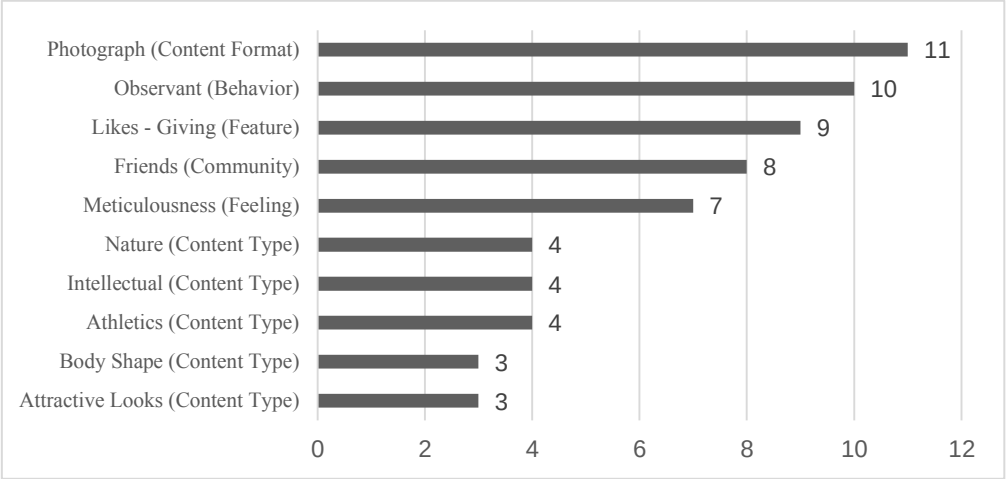

Figure 5. Emergent Themes by Number of Nodes Coded in Answers to Question 3

Question 4 asked participants to describe the features of the content that they share, which is most frequently issued Likes by people on Instagram. The graph of the most prominent theme nodes that overlap with this question node is given in Figure 6.

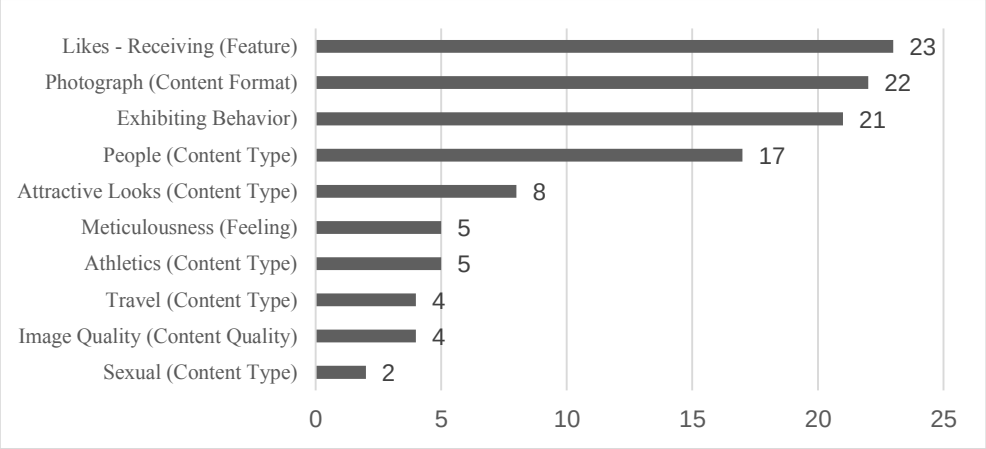

Figure 6. Emergent Themes by Number of Nodes Coded in Answers to Question 4

Question 5 asked participants to explain which feature of Instagram among sharing content or viewing content they found to be more important to them and why. The graph of the most prominent theme nodes that overlap with this question node is given in Figure 7.

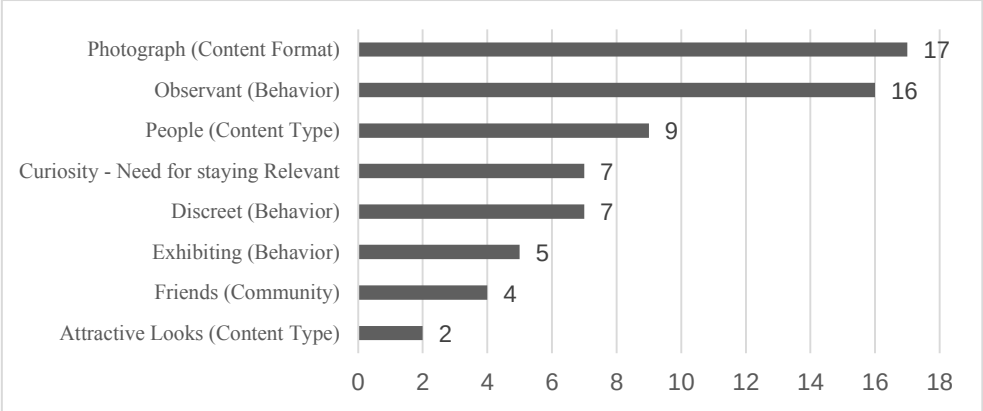

Figure 7. Emergent Themes by Number of Nodes Coded in Answers to Question 5

Question 6 asked participants which additional features they would like in Instagram. The graph of the most prominent theme nodes that overlap with this question node is given in Figure 8.

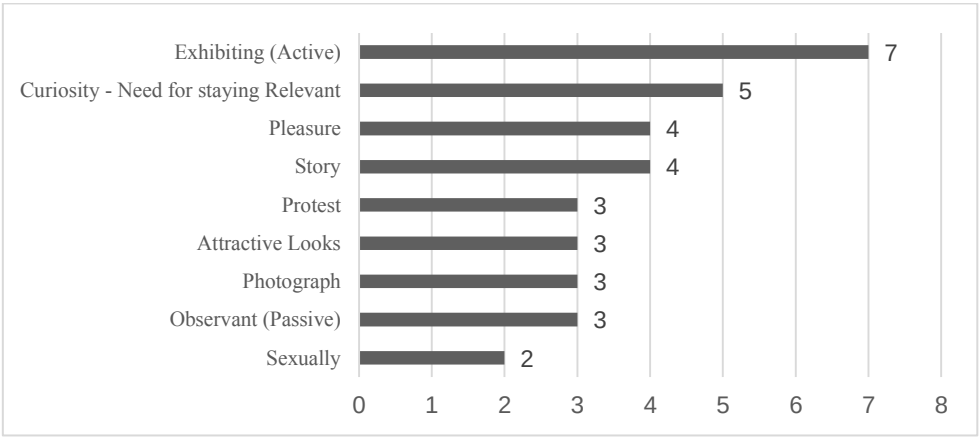

Figure 8. Emergent Themes by Number of Nodes Coded in Answers to Question 6

Question 7 asked users what it would take for them to stop using Instagram. The graph of the most prominent theme nodes that overlap with this question node is given in Figure 9.

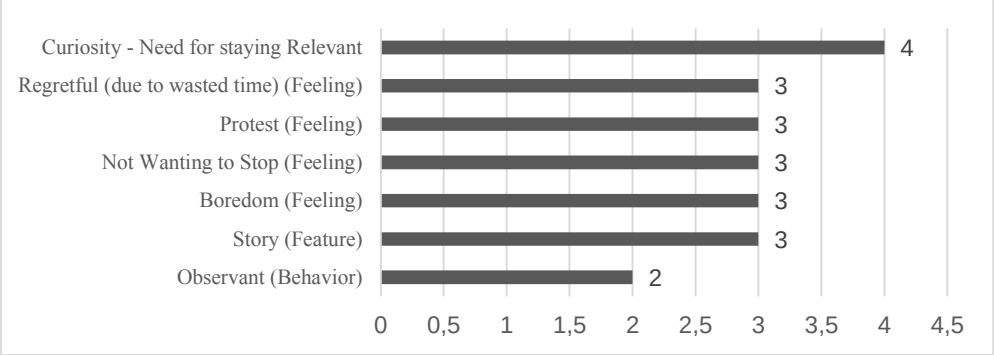

Figure 9. Emergent Themes by Number of Nodes Coded in Answers to Question 7

Results and Discussion

This study investigated the effect of daily smartphone and Instagram usage habits upon smartphone addiction risk in a subgroup of Turkish undergraduate athletes that make heavy use of Instagram. A glance at the results reveals a statistically significant, negative correlated at a weak level between age and smartphone addiction risk. This finding shows that as heavily Instagram using undergraduate athletes get younger, they fall under a greater risk of being addicted to smartphones. This finding resonates with results from another work by Aktaş and Yılmaz (2017), who studied 298 undergraduate students and found that smartphone addiction levels of participants in the 18-21 age group were significantly higher than the 22-25 and 26+ age groups. Whereas, another study in England has confirmed a relationship between younger age and problematic smartphone use. Lastly, although Kuyucu (2017) worked with 620 undergraduates and found no correlation between participant age and smartphone addiction levels, it was shown that students in the 21-23 age group were much more attached to their smartphones than students over age 27. The findings from the stepwise regression analysis in this here study, however, failed to prove student age does not predict smartphone addiction.

Unsurprisingly, a statistically significant positive and moderate level correlation between daily duration spent using smartphones and smartphone addiction risk has been found ($r = .429$; $p < .01$). The stepwise regression analysis has also shown that daily smartphone use duration significantly predicts and explains 4% of smartphone addiction risk. Most studies in the literature have reported similar results (Augner and Hacker, 2012; Hong, Chiu and Huang, 2012; Kwon, Kim, Cho and Yang, 2013; Lin et al., 2015; Altundağ and Bulut, 2017; Lopez-Fernandez et al., 2017; Durak and Seferoglu, 2018). It was reported that especially the young population is under risk of smartphone addiction due to time spent using smartphones daily (Pearson and Hussain, 2016). The frequency checking the Instagram application in a day, that is, daily times Instagram app is launched and/or viewed for one reason or other; has also been shown to be significantly positively correlated with smartphone addiction risk, albeit at a weak level ($r = .210$, $p < .01$). In addition, stepwise regression analysis has suggested causation, with daily frequency checking Instagram explaining 5% of variance in smartphone addiction risk. Results show that those who check Instagram apps more frequently, who are most probably concerned with remaining up-to-date with their own shares or with those of their peers, are under a greater risk of smartphone addiction. Academic literature refers to this phenomenon as Fear of Missing Out (FoMO) and describes it as anxiety about missing out updates on social networks due to elevated curiosity about how others are doing or constant craving for socially rewarding elements in the form of likes and comments. It was reported that individuals prone to FoMO check more frequently and spend more time in their social media accounts (Przybylski, Murayama and DeHaan, 2013; Dossey, 2014). It is evident that, as far as undergraduate athletes are concerned, all situations that trigger FoMO can be best translated into behavior observed on Instagram, where all social interaction is reduced to a simple economy with a currency of shared images and associated feedback. In addition, As far as Instagram use is concerned, a significant moderate level correlation between daily Instagram use duration and smartphone addiction risk was found ($r = .417$, $p < .001$). Stepwise regression has also found that daily Instagram usage duration significantly predicts smartphone addiction, explaining 18% of variance. Lastly, the three variables of daily smartphone use duration, daily Instagram use duration and daily frequency checking Instagram were found to explain 27% of total variance in smartphone addiction risk. A look at numbers found in descriptive statistics show that 3 out of 6 hours, which is the daily average duration of smartphone use in the study group, is comprised of Instagram use, revealing that half of the time on smartphone for these undergraduate athletes are spent using Instagram. Correlation tests also confirm this finding, showing a significant positive relationship at moderate level between time spent using smartphones and time spent using Instagram ($r = .546$, $p < .001$).

As a result, as far as Turkish undergraduate athletes who report Instagram to be their favorite smartphone application are concerned, it is safe to say that increasing time spent using Instagram in a day leads to greater risk of smartphone addiction. This finding is in line with results from Minaz and Bozkurt (2017), who surveyed 385 generic undergraduate students and discovered that the main reason for using smartphones among the study group was to use social networks. A study by Gezgin et al. (2018) with a sample size of 301 undergraduates also found similar results. As previously stated, it is not the device that triggers addiction but rather apps and particularly social networking apps. In the case of undergraduate athletes, Instagram has been identified as a culprit that significantly contributes into smartphone addiction risk. Why Instagram among all, then?

University students reported perceiving Instagram likes and comments as interpersonal connections and a means to decrease the feeling of loneliness (Pittman and Reich, 2016). With features such as video and photo sharing facilities, instant stories and instantly gratifying rewarding mechanisms in the form of public likes and comments, Instagram has also been found to be linked with exhibitionist behavior such as excessive sharing of self-portrait images –*selfies*- and frequent changing of profile pictures (Fox and Rooney, 2015; Moon et al., 2016). Social media applications that are globally popular among youth, such as Instagram, have been defined as ideal environments for individuals who seek to gather attention and satisfy their ego (Ryan and Xenos, 2011; Wang et al., 2012). In the study conducted by Kircaburun and Griffiths (2019) with 333 high school and university students, the number of individuals using Instagram is problematic, but the problematic Instagram usage related to watching live streams, liking and commenting on others' posts on Instagram, having a higher sense of presence and escape from reality. Participants of this here study have been designated as students enrolled in athletics-related departments where courses that involve as much bodily practice as theory. Attending long hours of sports training each week, it is known that body visual image is considered fairly important among these students. Therefore, an initial assumption of the underlying cause for problematic Instagram use was a desire for exhibiting body image and/or garnering appreciation, which, in turn, may escalate into smartphone addiction.

According to data however, there seems to exist an important another actor in play: Fear of Missing Out. FoMO is defined as the common anxiety of an individual caused by a desire to go through rewarding experiences in social media use (Przybylski, Murayama, & DeHaan, 2013, Dossey, 2014). It was shown that individuals with FoMO are prone to be distressed by not having their updates viewed or liked over social networks (Hato, 2013; Przybylski, Murayama, & DeHaan, 2013). Therefore, one may initially assume the so-called rewarding experiences in the context of Instagram to be receiving Likes and, perhaps, amassing Views on shared videos and photographs, which are all reactions to a behavior of exhibiting. But it is also stated that individuals going through FoMO have the desire to use social media for staying constantly up-to-date with what others are doing (Przybylski, Murayama, & DeHaan, 2013, Dossey, 2014). This passive, observant behavior; as opposed to exhibiting behavior, may also lead users to spend much time on Instagram and frequently access their smartphones to check on the status of other people's accounts. Wolniewicz et al. (2018) reported the results of a study with 296 participants and stated that FoMO is associated with problematic smartphone use. Qualitative data in this study has shown that problematic Instagram use in undergraduate athletes, who are assumed to be more inclined towards exhibiting their achievements and body image, may actually be more associated with the passive observant dimension of FoMO, just like everyone else. The students in this study have reported regret on time spent using Instagram, which they used due to a greater curiosity towards activities of friends or celebrities, mainly through stories and photographs. Although a need for actively sharing content and especially achieving Likes has been expressed, this need falls behind observant behavior. Some of the students even expressed a need to avoid showcasing themselves by sharing content, remaining discreet as well as passive. In this sense, it may be thought that there is a relationship between passive aspect of FoMO and problematic Instagram use, which leads to smartphone addiction. Gezgin et al. (2017) has shown in a previous study that social media users that display significantly higher FoMO were users of Instagram, Snapchat and Swarm, all of which may be considered social networks emphasizing momentary sharing of one's personal status. Long duration and high frequency checking Instagram due to FoMO lead to a problematic attachment to one's smartphone, which, in turn increases the risk of addiction (Hong, Chiu, & Huang, 2012). Altundağ and Bulut (2017) also support this claim, stating that problematic smartphone use is usually caused by social applications such as Instagram and Whatsapp. These two applications have also shown to be most popular ones among undergraduates (Hoşgör, Koç-Tütüncü, Gündüz-Hoşgör, & Tandoğan, 2017), which puts them all under risk.

There are certain shortcomings and limitations associated with this study. One such shortcoming, for instance, is the majority of the study group participants not responding to the Instagram Usage Questionnaire. This, coupled with the fact that questionnaire approach has not been highly successful as to procure in-depth information compared to face to face interviews, has led to a less detailed account of how young athletes that makes heavy use of Instagram actually interact with it. As for limitations, it should be considered that the study group

consisted only of Turkish undergraduate athletes that reported to having Instagram as their most frequently used application in their mobile phones. It is therefore advised not to interpret the results of this study to represent all undergraduate athletes and reach to a conclusion of increased Instagram use predicting addiction risk in the entire population. Nevertheless; it was shown that FoMO, increased daily Instagram usage frequency and smartphone addiction risk may actually have the potential of forming a hazardous triangular pattern for some Turkish undergraduate athletes. It was also hinted that rather than being a special community more inclined to exhibit themselves on Instagram, athletes' problematic use of the application may rather be driven by the same affliction that drives everyone else: keeping tally of others' lives.

Recommendations

Future studies may focus on discovering peripheral factors, psychological or otherwise, affecting excessive Instagram use, or on the details as to the motivations of young athletes' using Instagram excessively, by making use of qualitative data. Relationships between excessive Instagram use and FoMO and/or social media addiction may also be examined. It must be noted that usage data employed in this study are self-reported by participants. Metrics such as number of photographs/videos shared, number of likes/comments sent/received, number of followers or number of stories viewed/shared may all be taken into account in future research efforts, particularly by using software for automatic and accurate collection of data. In addition, academic literature suggests that individuals with FoMO are usually those who feel lonely in their lives outside of social media. In this sense, future studies may be concentrated on proposing a model that involves smartphone addiction, FoMO and loneliness and explore the role of the rewarding experiences on Instagram on this model.

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