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DEVELOPING THE ONLINE PORNOGRAPHY ADDICTION SCALE AND EXAMINING ITS ASSOCIATIONS WITH PSYCHOSOCIAL FACTORS

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Abstract

This study aims to develop the Online Pornography Addiction Scale (OPAS) using the behavioral addiction model and to explore the relationships between the scale, demographic variables, psychosocial variables, and pornography viewing behaviors. Two studies were conducted, the first of which involved two phases. The findings from Study 1a and Study 1b reveal that the OPAS comprises 23 items organized into four sub-scales: Compulsiveness-Uncontrollability, Psychosocial Effects, Sexual Effects, and Tolerance-Withdrawal. Overall, the scale demonstrates consistency and reliability. The results of Study 2 indicate that the OPAS correlates with gender, access to professional support, levels of hopelessness, communication with partners, degree of religious affiliation, engagement with sexual videos, frequency of pornography consumption, time devoted to pornography viewing, longest duration without pornography, impact of pornography on sexual experiences, and influence of pornography on daily life. Communication with partners of the opposite sex, engagement with sexual videos, impact on daily life, and religious affiliation levels are also significant predictors of the OPAS score. These findings are discussed in relation to relevant literature.

KEY WORDS: *pornography addiction, watching pornography, hopelessness, religiosity, communication*.

Resumen

Este estudio pretende desarrollar la Escala de Adicción a la Pornografía Online (OPAS) utilizando el modelo de adicción conductual y explorar las relaciones entre la escala, las variables demográficas, las variables psicosociales y las conductas de visionado de pornografía. Se realizaron dos estudios, el primero de ellos en dos fases. Los resultados del Estudio 1a y del Estudio 1b revelan que la OPAS consta de 23 ítems organizados en cuatro subescalas: Compulsividad-incontrolabilidad, Efectos psicosociales, Efectos sexuales y Tolerancia-retirada. En general, la escala demuestra consistencia y fiabilidad. Los resultados del Estudio 2 indican que la OPAS correlaciona con el sexo, el acceso a apoyo profesional, los niveles de desesperanza, la comunicación con la pareja, el grado de afiliación religiosa, el

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compromiso con vídeos sexuales, la frecuencia de consumo de pornografía, el tiempo dedicado a ver pornografía, la mayor duración sin pornografía, el impacto de la pornografía en las experiencias sexuales y la influencia de la pornografía en la vida diaria. La comunicación con parejas del sexo opuesto, el compromiso con vídeos sexuales, el impacto en la vida diaria y los niveles de afiliación religiosa también son predictores significativos de la puntuación en la OPAS. Estos resultados se discuten en relación con la literatura relevante.
PALABRAS CLAVE: *adicción a la pornografía, ver pornografía, desesperanza, religiosidad, comunicación.*

Introduction

Studies on pornography addiction have seen a gradual increase since 1970 (Duffy et al., 2016), particularly in light of the expanding accessibility of the internet, which led to a rise in individuals spending time on websites and forums featuring sexual content (Griffiths, 2012). Notably, research highlights that pornography websites rank among the top 50 most visited sites globally (Burtăverde et al., 2021). Recent online pornography statistics reveal that 93.2% of men and 62.1% of women view their first pornographic material before the age of 18, and 65% of men along with 18% of women report engaging in weekly pornographic consumption (Pickering, 2022). Wise (2022) points out that approximately 2.5 million individuals visit pornography websites every minute, underscoring the escalating nature of this issue.

Pornography addiction has garnered significant attention, leading to numerous studies addressing the matter. While certain research suggests potential positive outcomes linked to viewing pornography for individuals (Grubbs & Perry, 2019), a majority of studies have concentrated on problematic pornography consumption or addiction. Furthermore, recent research has emphasized problematic pornography use, as the complete array of addiction factors has yet to be definitively established. Additionally, there remains a lack of clear conceptual and methodological understanding, as well as assessment tools, for pornography addiction. Hence, the current study centers on the adverse repercussions of pornography consumption, striving to devise a novel measurement for evaluating pornography addiction by encompassing all constituent elements of addiction.

Certain psychopathological symptoms, such as compulsive behaviors and uncontrollable attitudes, have been observed to emerge following prolonged exposure to pornography. Individuals may find themselves consuming pornography uncontrollably and engaging in such behaviors compulsively (Cacioppo et al., 2018). Despite the presence of these behavioral patterns in relation to pornography consumption, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (APA, 2013) and the International Classification of Diseases 11th Revision (ICD-11) (Kraus et al., 2018; WHO, 2019) do not presently recognize the frequency of pornography viewing as a diagnostic criterion for addiction. However, it's noteworthy that the World Health Organization (WHO) has recently introduced the diagnosis of compulsive sexual behavior disorder (CSBD) into the ICD-11 (WHO, 2019; Grubbs et al., 2020). This signifies that in the future, the diagnostic criteria

for CSBD in the ICD-11 could potentially offer a framework for standardizing the assessment of pornography addiction (Fernandez & Griffiths, 2021).

Recognizing a behavior as an addiction entails not only compulsivity and uncontrollability but also withdrawal, tolerance, consequences, and other essential addiction components (APA, 2013; Fernandez & Griffiths, 2021). From this perspective, if problematic pornography use is to be conceptualized as addiction, comprehensive research in this field should encompass all components of addiction. However, the conceptualization of pornography addiction remains multifaceted and lacks a unified perspective (Duffy et al., 2016). Various descriptions have been used, ranging from identifying it as 'compulsive pornography consumption' (Noor et al., 2014, p. 240) to labeling it as 'high frequency of viewing sexual images' (Ley et al., 2014, p. 94), or even terming it as "internet sex addiction," encompassing online activities like viewing, downloading, and trading pornography (Griffiths, 2012; Young, 2008).

While pornography hasn't been universally integrated into the realm of addiction (APA, 2013; Ley et al., 2014), some researchers contend that excessive pornography consumption can indeed be classified as an addiction (Cacioppo et al., 2018; Kühn & Gallinat, 2014; Wilson, 2012, 2016; Zimbardo & Coulombe, 2016), due to its potential impact on sexual dysfunctions (Park et al., 2016), erectile dysfunction, and orgasm difficulties (Sutton et al., 2015; Wéry & Billieux, 2016; Zimbardo & Coulombe, 2016). These scholars assert that pornography should be designated as an addiction due to compulsive attitudes towards consumption and the resultant uncontrollable behavior and consequences (Manning, 2006; Spenhoff et al., 2013). Beyond the behavioral addiction model, which involves a compulsion to engage in a fulfilling non-substance-related behavior (Griffiths, 2005), the biological addiction model also suggests that the brain activity of individuals addicted to substances mirrors that of those addicted to pornography (Kraus et al., 2016; Voon et al., 2014). Consequently, researchers studying pornography contend that excessive consumption should indeed be diagnosed as an addiction due to the heightened frequency of engagement.

Research indicates that problematic pornography use can lead to a range of sexual, social, physical, and psychological consequences. Firstly, excessive consumption of pornography has been associated with diminished motivation for academic pursuits, reduced academic achievements, increased social shyness, and withdrawal from social interactions (Zimbardo & Coulombe, 2016). Zimbardo and Coulombe (2016) noted that pornography addiction, particularly prevalent among men due to higher male viewership, significantly impacts men's lives and has contributed to a decline in academic achievements among young men in the USA due to the misuse of pornography and technology.

Secondly, individuals who frequently engage with pornography or are addicted to it may experience sexual dysfunctions (Park et al., 2016; Sutton et al., 2015; Wilson, 2016). These dysfunctions can manifest as problems with achieving and maintaining erections, diminished attention to real sexual activities, reduced interest in sexual performance, heightened reliance on arousal from pornography, and difficulties in sustaining erections (Sun et al., 2015; Zimbardo & Coulombe, 2016). Additionally, pornography addiction has been linked to disruptions in family life and

marital relationships (Morgan, 2011) and a decrease in interest in real-life partners (Wilson, 2014).

Finally, there appears to be a positive correlation between pornography addiction and conditions such as Attention-Deficit Hyperactivity Disorder (ADHD) (Reid et al., 2013; Zimbardo & Coulombe, 2016), depression (Weaver et al., 2011), anxiety (Voon et al., 2014), and even inclinations towards suicide (Zimbardo & Coulombe, 2016). The act of consuming pornography can become compulsive and uncontrollable for some individuals. Consequently, during times of challenging psychological states like depression and anxiety, watching pornography can offer temporary relief, helping individuals feel more relaxed and free from stressors (Manning, 2006; Patterson & Price, 2012; Spenhoff et al., 2013).

Although numerous measurements have been devised to assess pornography addiction or problematic pornography use, a significant proportion of these measurements have not adequately addressed the fundamental components of addiction, including withdrawal and tolerance (Fernandez & Griffiths, 2021). According to Fernandez and Griffiths (2021), out of 22 measurements, only five assessed all six core addiction components, and a mere three of these even employed the title of "pornography addiction." Furthermore, a systematic review on pornography addiction conducted by Duffy et al. (2016) highlighted the limitations of self-perceived pornography addiction measurements. They contended that these measurements often utilized simplistic analyses and operationalizations, and their findings were constrained by a homogenous sample recruitment approach. The review recommended that future research should persist in the development of novel measurements while incorporating representative samples for more comprehensive insights. Another systematic review addressing pornography addiction revealed that the challenges in pathologically identifying pornography addiction stem from factors like sample bias, the tools employed for diagnosis, and findings that lack relevance (de Alarcón et al., 2019).

In Turkey, there has been a notable absence of studies related to online pornography addiction, and consequently, no measurement tools addressing this topic have been developed to date. This study endeavors to fill this gap by creating a measurement tool based on insights drawn from existing literature on pornography addiction, behavioral addiction components, the adaptation of items from existing measurement tools, insights garnered from the author's accumulated experience in counseling sessions, and expert opinions within the field. This approach calls for a combination of deductive and inductive processes in item generation, aligning with the approach advocated by Morgado et al. (2017).

To this end, the process of item creation should carefully consider the six core components of addiction, namely mood modification, withdrawal, tolerance, salience, relapse, and conflict, as outlined by Griffiths (2005). Developing a culturally appropriate, sensitive, and representative measurement tool is paramount. Notably, previous scales targeting pornography addiction have been designed using WEIRD (Western, educated, industrialized, rich, and democratic) samples, which can limit the generalizability of findings. Recognizing that addiction is not confined to this specific sample, it becomes essential to contribute by creating a scale encompassing non-WEIRD samples. This pursuit, however, brings its own set of challenges. For

instance, gathering data from a Muslim sample on the phenomena under investigation presents significant difficulties.

Studies on pornography addiction have revealed controversial findings. For example, some studies show that a higher frequency of watching pornography is negatively correlated with lower sexual satisfaction (Wright et al., 2017), while others indicated no correlation between these variables (Milas et al., 2020). According to the implications of the studies reported in the literature, individuals' pornography attitudes may increase their happiness, but findings did not support that. However, most studies indicated that watching pornography may become problematic due to enormous porn use and moral incongruence (e.g., Grubbs & Kraus, 2021). Additionally, some psychological factors such as anxiety (Voon et al., 2014), depression (Weaver et al., 2011), psychological distress (Egan & Parmar, 2013), happiness, and religiosity (Paterson & Price, 2012) were associated with the high frequency of pornography consumption. Moreover, Zimbardo and Coulombe (2016) claimed that watching pornography and addiction to online games can increase individuals' shyness and withdrawal from social interaction. The literature on pornography addiction found a correlation between pornography addiction and several psychosocial factors such as religiosity, frequency of watching pornography, stress level, and feeling happiness, etc. Therefore, it is important to use these variables with the new scale developed in this study and to discover an association between further psychological and social factors and pornography addiction in different cultures. Specifically, relationships between pornography addiction, social, psychological, and sexual factors should be explored. In the current study, relationships between pornography addiction and some social, psychological, and sexual factors, such as life satisfaction, hopelessness level, the level of stress, feeling happiness, communication between partners/opposite sex, sexual self-efficacy, and the level of feeling religious were tested.

Although the classification of pornography as an addiction remains contested, scholars have pointed out that many individuals struggle to cease watching pornography, with some engaging in compulsive and uncontrollable consumption (e.g., Manning, 2006; Spenhoff et al., 2013). The act of watching pornography can significantly impact family dynamics, particularly by straining partner relationships and giving rise to social and psychological disruptions, including feelings of shame, guilt, and perceptions of judgment from friends and family (Cacioppo et al., 2018; Delmonico & Miller, 2003).

In light of these considerations, the present study aimed to investigate the effectiveness of a newly developed scale rooted in the behavioral addiction model. This assessment was accomplished by examining the scale in conjunction with select social-psychological variables. Building on these foundational principles, two distinct studies were conducted. The objectives of these studies were as follows: (1) to develop an online pornography addiction scale using exploratory factor analysis (EFA) (Study 1a), (2) to validate the scale through confirmatory factor analysis (CFA) (Study 1b), and (3) to investigate the relationships between the scale and demographic variables (e.g., age and gender), psychosocial variables (such as stress, hopelessness, life satisfaction, communication patterns with partners/opposite sex, and the extent of religious sentiment), and patterns of pornography consumption

(including the frequency of online pornography viewing and the age of initial exposure to pornography) (Study 2).

Study 1a: Item development and EFA of the Online Pornography Addiction Scale (OPAS)

The objectives of study 1a encompassed four main aspects: (1) the development of items concerning online pornography addiction, (2) the generation of initial scale items via exploratory factor analysis (EFA), (3) the determination of scale structures, and (4) the assessment of the internal consistency of the Online Pornography Addiction Scale (OPAS).

Method

Participants

I collected data from participants about gender, relationship status, and frequency of watching pornography. The data collection process was conducted through an online questionnaire utilizing social media snowball sampling. A total of 295 (n_{Women}= 114, n_{Men}= 180, n_{Others}= 1) individuals over the age of 18 participated in Study 1a. However, 43 participants who did not fill out the control questions correctly were dropped from the study. In the end, 252 (99 Women, 152 Men, and 1 Other) participants' data were calculated for EFA. The age range of the participants was between 18 and 50 (M= 29.18, SD= 20.36). Considering the relationship status, 86 (34%) participants were single and had no relationships, 73 (29%) participants were not married and had a relationship, 66 (26.2%) participants were married and had a single partner, 23 (9.1%) participants were single and had relationships with more than one partner, 2 (0.8%) participants were married and had extramarital relationships, and 2 (0.8%) were divorced. The majority of the participants was university students and graduates (74.2 %) and was heterosexual (94.8 %).

Instrument

The initial version of the *Online Pornography Addiction Scale* (OPAS) has 43 items. The response options are 5-point Likert type (0= Never, 1= Rarely, 2= Occasionally, 3= Sometimes, and 4= Often). These items assess the level of pornography addiction when people watch online pornography. A higher score of the OPAS indicates a higher level of pornography addiction.

Procedure

There were no pornography addiction measures adapted to the Turkish context. Therefore, based on researcher's expertise in this field and studies in the Western literature, 41 items were prepared based on relevant core criteria of behavioral addiction proposed by Griffiths' (2005) theory: mood modification, withdrawal, tolerance, salience, relapse, and conflict, research of problematic

pornography use/pornography addiction and experience of counselling sessions with clients who had a problem with pornography use. Then, the items were evaluated by a total of 12 experts (three psychiatrists, five academics from psychology field and psychological counselling and guidance field, one clinical psychologist, and three psychological counseling experts). The assessment of the items was done in two steps. In the first step, each item was evaluated as items that were 'suitable', 'unsuitable', and 'should be revised (given any suggestion for developing the items)'. At the end of the revision form, reviewers were asked if they had any suggestions about the items. In the second step, the experts were asked to evaluate all items by six criteria measured on a 7-point rating (1= *I never agree*, 7= *I totally agree*). We also calculated a two-way random model to see consistency and agreement between evaluators by using reliability analysis due to having continuous variables (Can, 2018).

According to the first step evaluations, five items were revised, four items were rewritten, and two suggested items were added. After the experts' feedback, the initial version of the OPAS was applied. Before conducting the study, the research was approved by Mardin Artuklu Ethical Commission (Date: 09.11.2020, Decision no: 34233153-050.06.04).

Data analysis

First, the evaluation of the items of the original OPAS by experts is examined on 7-point rating and then a two-way random model was calculated to see consistency and agreement between evaluators by using reliability analysis due to having continuous variables (Can, 2018).

Second, explanatory factor analysis (EFA) using the principal components method was conducted in the SPSS v. 23 application to examine the internal structure of the 43 items of the OPAS. Based on Eigenvalues and screen plot, visual inspection was observed for the extraction of the factor(s). Direct oblimin which provides higher correlation between factors, was used for rotation, and analysis was performed by making the Delta value '0' (Tabachnick & Fidell, 2007).

Results

Table 1 shows that the experts evaluate the items of the original OPAS very highly (between 5.83-6.75) on 7-point rating. In addition, there was no significant difference in the criteria between the professional groups. The result of the two-way random model indicates that α= .76 and single measures value which shows correlation between items is .43.

Table 1
Criteria for items evaluations by experts

Criteria	Min.	Max.	*M*	*SD*
1. There is a sufficient number of items to measure the compulsive behavior of individuals related to the problem in the item pool.	5	7	6.33	.65
2. There is a sufficient number of items to measure individuals' uncontrollable behaviors related to the problem in the item pool.	4	7	6.42	.99
3. There is a sufficient number of items related to the possible effects and consequences of the problem in the item pool.	5	7	6.17	.84
4. I think "pornographic addiction" can be measured with these items.	5	7	5.83	.84
5. The prepared items can be understood by everyone.	6	7	6.75	.45
6. The prepared items are suitable to be applied to individuals in Turkish society.	5	7	6.33	.78

The result of CFA using the principal components method initially shows that seven factors with 38 items in total appeared in the evaluations of all items. The factors explained 67.32% of the total variance. In the first application, the common variance value of each item was over .5. The selection of the factors was done according to two criteria: (1) Eigenvalue should be above 1, and (2) there should be more than two items in a factor (Costello & Osborne, 2005). In the analysis with all questions, two items were found in two factors, but the other five factors' item numbers were above two. In addition, the internal reliability values of the two factors were .57 and .67. Moreover, in the analysis, the way the items were distributed to the factors was also based on two criteria: (1) for the selection of strong items, the item's loading should be over 0.5, and (2) even if an item was 0.5 and above, the loading of that item should not be over .32 under two different factors. If an item's loading was seen to be over .32 under more than a factor, that item was removed from the analysis, and EFA was conducted with the remaining items again (Tabachnick & Fidell, 2007). After all possibilities were repeated until the very end, re-processing was carried out on the remaining items.

According to the latest review, Bartlett's test of sphericity was significant, $\chi^2(378)= 4747.296$, $p< .001$, and according to the Kaiser-Meyer-Olkin test result (KMO= .92), the sample size was sufficient (Tabachnick & Fidell, 2007). It was observed that four factors with an eigenvalue above 1.00 occurred and these four factors explained 63.08% of the total variance (Table 2).

As a result, the OPAS consisted of a total of 24 items and four factors. The pattern loads of the factors that made up the factors were found to be conceptually meaningful, consistent, and distinctive. The first factor, consisting of seven items and named 'Compulsiveness and Uncontrollability', states that individuals are unable to control watching pornography. In other words, this factor captures those who still watch because of impulsive coercion despite all their efforts. The second factor, consisting of five items and called 'Psycho-Social Effect', expresses the concerns and situations that pornography watching may impact on the individual

Table 2
OPAS's items and factor loadings obtained with exploratory factor analysis

Items	Factor			
	C-UN	P-S	SE	T-W
1. Even if I do not want to visit pornographic sites, I find myself visiting them.	**.68**	-.26	.02	.22
2. Even if I try, I cannot stop visiting pornographic sites.	**.86**	.14	-.04	-.06
3. Although I promised myself that I would not visit pornographic sites, I cannot keep my word.	**.64**	.24	.04	.07
4. I get desperate since I cannot stop visiting pornographic sites.	**.72**	.21	.05	-.01
5. I cannot stop myself from visiting pornographic sites.	**.85**	.05	-.01	.04
6. I think I need professional support to stop visiting pornographic sites.	**.87**	.05	-.12	.04
7. I have difficulty in concentrating on my work due to the pornographic images, thoughts, or fantasies formed in my mind.	**.73**	-.00	.12	.01
8. I feel morally/spiritually contaminated when I visit pornographic sites.	-.04	**.86**	.01	.06
9. I am ashamed of myself after visiting pornographic sites.	.00	**.92**	.01	-.04
10. If it is noticed that I visit pornographic sites, I am afraid that my relationships with my acquaintances (spouse/parents /friends) will be adversely affected.	.03	**.75**	.07	-.05
11. I feel like a bad person for visiting pornographic sites.	.13	**.81**	-.08	.01
12. I feel guilty after visiting pornographic sites.	.06	**.87**	-.03	.01
13. Visiting pornographic sites reduces my interest in active sexuality.	-.12	.18	**.63**	-.04
14. Visiting pornographic sites causes me to see my spouse/partner as sexually inadequate.	.12	.01	**.81**	-.14
15. Visiting pornographic sites decreases the sexual pleasure that I have with my spouse/partner.	.00	-.00	**.92**	-.10
16. Without visiting pornographic sites, I would have no sexual desire.	-.05	.05	**.64**	.18
17. I feel a decrease in my sexual desire for my spouse/partner due to visiting pornographic sites.	.19	-.10	**.84**	-.15
18. I find it more satisfying to visit pornographic sites and have orgasm/ejaculation by touching myself (masturbation) than real sexual intercourse.	-.18	-.09	**.66**	.24
19. I feel nervous when I do not visit pornographic sites.	.25	.00	-.16	**.60**
20. 20. I feel emotionally down (nervous/angry /upset, etc.) when I do not visit pornographic sites.	-.23	.30	.14	**.65**
21. I reduce my stress by visiting pornographic sites.	.13	-.12	.01	**.78**
22. Visiting pornographic sites reduces my feeling of loneliness.	-.16	.02	.10	**.83**
23. I feel relaxed by visiting pornographic sites when I feel emotionally down (nervous, angry, upset, etc.).	.29	-.12	-.05	**.64**
24. I feel incomplete in the days when I do not visit pornographic sites.	.24	.03	-.09	**.58**
Unrotated eigenvalues total	10.96	3.23	2.34	1.13
% of variance accounted for following rotation	39.15	11.54	8.37	4.02

Notes: N= 252. Rotated loadings of EFA above 0.5 are shown in bold. OPAS= Online Pornography Addiction Scale; C-UN= Compulsiveness and Uncontrollability; P-S= Psycho-Social Effect; SE= Sexual Effect; T-W= Tolerance-Withdrawal.

and their social environment. The third factor, consisting of six items and called 'Sexual Effect', expresses the effects of pornography watching on the sexual life of the individual and their partner. Finally, the fourth factor, consisting of six items and called 'Tolerance-Withdrawal', indicates the consequences experienced when pornography is not watched, and pornography is watched for overcoming stress factors. All four factors statistically and significantly correlated with each other. The sub-factors had a very strong relationship with the total score of the scale, but the relationship between the sub-factors was not very high but acceptable (Table 3).

Table 3
Descriptive statistics and correlations between factor scores and overall scores

Factor	*M*	*SD*	1	2	3	4	5
1. Compulsiveness-Uncontrollability	4.45	6.18	**.93**				
2. Psychosocial Effect	6.24	6.37	0.57	**.92**			
3. Sexual Effect	3.18	4.51	0.49	0.27	**.85**		
4. Tolerance-Withdrawal	3.36	4.42	0.68	0.28	0.45	**.85**	
5. Porn Addiction Scale	19.31	19.1	0.90	0.68	0.64	0.83	**.93**

Notes: N= 252. All correlations significant at the *p*< .001 level (2-tailed). Cronbach's alphas are shown in bold.

Discussion

The items were designed based on counselling processes, core components of behavioral addiction, literature review, previously developed scales (e.g., Caciopo et al., 2018; Delmonico & Miller, 2003; Fernandez & Griffiths, 2021), and expert opinions and feedbacks. After deductively and inductively conducting the items generation (Morgado et al., 2017), EFA was conducted. As a result of the analysis, the OPAS consisting of 24 questions was developed from 43 items measured on a five-point Likert type scale. In the study, the correlations between factors were acceptable, and each factor had a strong relationship with the total score of the OPAS. Four factors shaped and were named as 'Compulsiveness and Uncontrollability', 'Psycho-social Effect', 'Sexual Effect' and 'Tolerance-Withdrawal'. These factors reflect some components of addiction Griffiths (2005) both in terms of the content of the items and the factors compared with the model of Griffiths (2005) and the behavioral addiction versus substance addiction" study reviewed by Alavi et al. (2012). In the next step, the scale was tested on a new sample to verify the factors and to confirm the results with confirmatory factor analysis (CFA).

Study 1b: CFA and validity assessment of the OPAS

The aims of study 1b were to (1) examine the factor structures of the OPAS, and the model fits through confirmatory factor analysis (CFA), (2) evaluate the validity and reliability of the scale and its subscales, and (3) examine the Sexual Self-Efficacy Scale for criterion validity.

Method

Participants

Although 200 individuals participated in the survey, only 157 participants answered all the questions and filled out the control questions correctly (n_{men}= 100, n_{women}= 49, n_{others}= 5, $n_{missing}$= 3). The ages ranged from 18 to 49 (*M*= 25.82, *SD*= 6.60). The majority of the participants were graduates and university students (49.7%) and were heterosexual (83.0%). Of the participants 65 (42.2%) were single and had no relationships, 48 (31.2%) were not married and had a relationship, and 23 (14.9%) were married and had a single partner. The estimation of watched pornographic videos in a year showed that 43 participants (27.9%) watched 100-250 videos, 41 (26.6%) watched over 1000 videos, 37 (24%) watched fewer than 100 videos, and 32 (20.8%) watched 500-1000 videos.

Instruments

a) *Online Pornography Addiction Scale* (OPAS). The OPAS consisted of 24 items measured on a 5-point Likert type scale (0= Never, 4= Often). In the present study, one item was dropped due to the standardized regression weight value (the item value was .38). The new scale consists of 23 items. IR analysis of the present study was .93 for the OPAS, .92 for C-U, .89 for PSE, .87 for SE, and .82 for T-W.
b) *Sexual Self-Efficacy Scale* (SSES; Humphreys & Kennett, 2010), adapted Turkish version by Çelik (2013). The SSES as five items measured on an 8-point Likert type scale (1= I completely disagree, 8= I completely agree) and assesses level of one's sexual self-efficacy. A higher score of SSES means having higher sexual self-efficacy. Items 3 and 4 were reversed. IR analysis of the Turkish version was .71. In the current study, the measurement IR was low (α= .61).

Procedure

The data were collected through an online questionnaire delivered via Google Forms by social media snowball sampling. The only criterion for participation in the study was being over 18 years old. Before attendance, participants were informed about the purpose and the procedure of the study.

Data analysis

CFA was conducted via Mplus v. 8 with robust maximum likelihood estimator to determine the goodness-of-fit (Muthén & Muthén, 2017). To analyze the model fit, χ^2/df ratio, comparative fit index (CFI), normed fit index (NFI), standardized root mean square residual (SRMR), and root mean square error approximation (RMSEA) were used for evaluation of the goodness-of-fit indices. Values of RMSEA ≤ .06 and SRMR ≤ .08 around were adequate for the model fit indices evaluation (Hu & Bentler, 1999). Rigdon (1996) indicates that 95% confidence bounds of RMSEA should be

between .03 and .08. When it exceeds .08, there is not a good fit model. For convergent validity, the composite reliability (CR) value should be bigger than the average variance extracted (AVE) value (Yaşlıoğlu, 2017). The result of the model fits was compared to this value for the validity of the model.

Results

There were some steps to conduct CFA. First, the item standardized regression weight was checked, and an item (item 18 under "sexual effect" factor) was found to have the value .38 (under .5). Therefore, the item was dropped. After dropping the item, the standardized regression weight of the items was over .54. Second, the model which consisted of four subscales with 23 items was analyzed using standard fit indices (χ2/df, CFI, standardized root means square residual (SRMR), and RMSEA) without modification of items. Without modification, the model was not good but had acceptable fit in terms of some indices, $\chi^2(224)= 434.49$, $p< .001$, $\chi^2/df= 1.93$, CFI= .87, TLI= .85, SRMR= .075, RMSEA= .077 (.066, .088).

Third, the model was modified by adapting a covariance path at a time based on modification indices. Investigation of model modification indices demonstrated covariance paths (Figure 1). The new model with modification indices showed more acceptable fit indices, $\chi^2(220)= 318.097$, $p< .001$, $\chi^2/df= 1.44$, CFI= .93, TLI= .93, SRMR= .071, RMSEA= .053 (.040, .066). Moreover, the OPAS and its subscales were positively correlated. However, the OPAS and sexual self-efficacy were negatively correlated (Table 4).

The AVE ad the CR were calculated to determine the reliability, convergent validity, and discriminant validity at the dimension of scale construct. The CR of each dimension's construct was higher than 0.7 (Table 5), which is sufficient for the construct reliability (Fornell & Larcker, 1981). Additionally, the AVE of the three dimensions was bigger than 0.5 (one-factor AVE value was 0.43), supporting construct validity. The AVE of the dimensions was higher than all shared variance (square of the correlations between two subscales), which shows discriminant validity between constructs (Hair et al., 2010). For the convergent validity, the CR values of all the factors were higher than the AVE values (Yaşlıoğlu, 2017).

Figure 1
Second-order CFA path diagram of the OPAS, the covariance between the factors and between two items

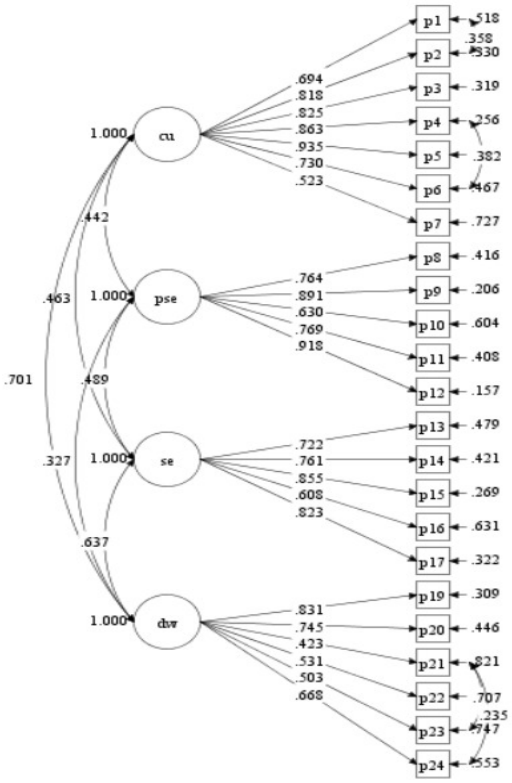

Table 4
Descriptive statistics and correlation between the OPAS and the Sexual Self-Efficacy

Instruments	*M*	*SD*	1	1.1	1.2	1.3	1.4
1. The OPAS (total)	17.74	14.88	--				
1.1. Compulsiveness-Uncontrollability	4.82	5.88	.834**	--			
1.2. Psychosocial Effect	5.15	5.24	.719**	.433**	--		
1.3. Sexual Effect	3.48	4.06	.748**	.437**	.449**	--	
1.4. Tolerance-Withdrawal	4.29	4.24	.748**	.589**	.260**	.508**	--
2. Sexual Self-Efficacy	26.43	7.52	-.193*	-.193*	-.116	-.155	-.118

Note: OPAS= Online Pornography Addiction Scale.

Table 5
Average variance extracted, composite reliability and shared variance for the subscales of the Online Pornography Addiction Scale (OPAS)

Subscales of the OPAS	AVE	CR	Shared variance			
			1	2	3	4
1. Compulsiveness-Uncontrollability	.62	.92	1			
2. Psychosocial Effect	.64	.90	.19	1		
3. Sexual Effect	.58	.87	.19	.20	1	
4. Tolerance-Withdrawal	.43	.82	.35	.07	.26	1

Note: AVE= average variance extracted; CR= composite reliability.

Discussion

In Study 1b, a comprehensive examination was undertaken, encompassing the factor structures of the OPAS, model fit assessment through CFA, the evaluation of scale and subscale validity and reliability, and the exploration of correlations between the OPAS and selected criteria to ascertain validity. The outcomes of the CFA revealed that the modified model exhibited improved fit compared to the unmodified version, and the adjusted model demonstrated a satisfactory fit when contrasted with the benchmarks established by Hu and Bentler (1999), Rigdon (1996), and Shevlin and Miles (1998). Additionally, it is pertinent to note that existing research highlights a linkage between self-efficacy and addictive behaviors (Casey et al., 2008; Oei et al., 2005). Consequently, the investigation extended to examining the correlations between the OPAS and sexual self-efficacy for criterion validity. The results indicated a statistically significant and negative correlation between the OPAS and sexual self-efficacy. In conclusion, following the removal of an item, the model consisting of 23 items measured on a five-point Likert scale exhibited satisfactory performance after modification. Moreover, the scale demonstrated commendable reliability and validity across various metrics.

Study 2: Relationships between the OPAS and feeling stress, life satisfaction, happiness, and hopelessness

Study 2 was designed to delve into the intricate relationships existing between the OPAS and a range of psychosocial variables previously associated with problematic pornography consumption, as elucidated by the researchers mentioned in the introduction. The investigation of these correlations, which have been documented in prior research (e.g., Manning, 2006; Milas et al., 2020; Morgan, 2011; Nelson et al., 2010), stands as a vital step in substantiating the validity of the OPAS. The encompassed variables included: (1) demographics such as age, gender, socioeconomic status, relationship status, and education level; (2) psychosocial factors encompassing stress, life satisfaction, happiness, communication patterns with partners/opposite sex, the impact of pornography on sexual life, the influence of pornography on daily life, and self-reported levels of religiosity; and (3) patterns of pornography consumption, including the frequency of watching sexual content,

age of initial exposure to pornography, frequency of pornography consumption within the past year, duration of pornography consumption, time spent on pornography sites during a single session, and the longest period of abstinence from pornography site visits in the previous year.

Given that the OPAS is a novel creation, it becomes essential to scrutinize these associations, thus forming the core objectives of Study 2. Specifically, the study aimed to accomplish the following: (1) assess disparities in levels of pornography addiction across genders, relationship statuses, educational levels, and the consideration of seeking professional assistance to overcome pornography consumption; (2) analyze the correlations among the aforementioned variables; and (3) identify variables that could potentially predict scores on the OPAS.

Method

Participants

Although 196 individuals participated in the survey, only148 individuals answered all questions and filled out the control questions correctly only (n_{men}= 96, n_{women}= 48, n_{others}= 4) in Turkey participated in the study. The ages ranged from 18 to 49 (*M*= 26.21, *SD*= 6.67). The age of first watching pornography ranged from 7 to 25 (*M*= 14.27, *SD*= 2.96). The majority of the participants were graduates and university students (68.9%) and heterosexual (85.1%). Of the participants 62 (41.9%) were single and had no relationships, 45 (30.4%) were not married but had a relationship, 24 (16.2%) were married and had a single partner, and 14 (9.5%) were single and had relationships with more than one partner. All participants used smartphones and had regular internet access. Among the participants 12 (8.3%) considered getting professional support due to the frequency of watching pornography.

Instruments

a) *Online Pornography Addiction Scale* (OPAS). The scale consists of 24 items measured on a 5-point Likert type scale (0= Never, 4= Often). Subscales' IR in this study ranged from α= .88 to α= .93. The final version of the OPAS in Turkish and English languages can be found at the Appendices 1 and 2 respectively.
b) *Perceived Stress Scale-Short Version* (PSS; Cohen et al., 1983), adapted Turkish version by Eskin et al. (2013). The scale consists of four items measured on a 5-point Likert type scale (0= Not at all, 4= Very often) and assesses how people perceive stressful situations in their life. There were two reversed items (items 2 and 3) on the scale. Higher scores on the scale indicate a higher level of perceived stress. IR of the Turkish version of the scale was found 0.66. Test-retest reliability coefficient of the scale is α= .72. In the current study, IR was greater than the original scale of the Turkish version (α= .72).
c) *Satisfaction with Life Scale* (SWLS; Diener et al., 1985), adapted Turkish version by Durak et al. (2010). The scale has five items measured on a seven-point scale (1= Strongly disagree, 7= Strongly agree) and assesses one's level of life

satisfaction. Higher scores on the scale indicate a higher level of life satisfaction. IR of the original scale was good (α= .81). In the current study, the Cronbach alpha value was found as .91.

d) *Happiness Scale* (HS; Demirci & Ekşi, 2018). The scale consists of 6 items measured on a 5-point Likert type scale (1= Not appropriate for me at all, 5= Totally appropriate for me) and assesses the level of happiness related to one's own life in daily and general. Higher scores on the scale show a higher level of life happiness. IR of the original scale was found to be good (α= .83). Test-retest reliability coefficient of the scale is α= 73. In the current study, the IR value was better (α= .85).

e) *Beck Hopelessness Scale* (BHS; Beck et al., 1974), adapted Turkish version by Seber et al. (1993). The scale consists of 20 true-false items and examines three aspects of hopelessness: feeling about the future, loss of motivation and expectations regarding life. The higher score indicated a higher level of hopelessness. Turkish version of the scale's IR was good (α= .86). Test-retest reliability coefficient of the scale is α= .78. In the current study, IR was better (α= .88).

f) *Ad hoc Communication Questionnaire*. Two questions were prepared by the researcher. The questions were measured on a 7-point Likert type rating (1= Very poor, 7= Excellent). The questions were (1) How good is your communication with your partner or the opposite sex? (2) How is your eye-to-eye communication skill when you are in contact with your partner or the opposite sex? The questions' internal reliability was calculated as .83.

g) *Ad hoc Demographic Questionnaire*. Nineteen questions were prepared by the researcher to obtain information about the participants. Some questions were demographic questions such as gender, age, education level, and so on. Of the questions, 10 specifically identified behavior related to watching online pornography. The questions were not developed as a standard scale but just as a survey to determine online pornography behavior. The questions were; (1) "How often do you watch sexual videos on the Internet?" measured on an eight-point rating (1= Never, 8= More than ones a day), (2) "The age you watched the first pornographic video (as far as you can remember) (gap-filling)", (3) "How many times did you watch pornographic videos before the age of 18?" measured on a six-point rating (1= Never, 6= Over 1000) (4) "How many times have you watched pornographic videos so far?" measured on a six-point rating (1= Never, 6= Over 1000), (5) "How often do you think you entered pornographic sites in the past year?" measured on a nine-point rating (1= *Never*, 9= *More than one in a day*), (6) "How much time do you spend on average when you enter a pornographic site?" measured on a seven-point rating (1= Never, 7= More than an hour), (7) "How long has it been since you were last on a pornographic sites or watched a pornographic movie in the past year?" measured on a nine-point rating (reverse questions, 1= Never, 9= One-two days), (8) "What is the impact of pornographic sites on your sexual life?" measured on a seven-point rating (1= None 7= Very much), (9) "What is the impact of pornographic sites on your daily life?" measured on a seven-point rating (1= Never, 7= Very much), and (10)

"How religious do you think you are?" measured on a seven-point rating (1= Never, 7= Quite religious).

Procedure

The data were collected via Google Forms through an online questionnaire. The only criterion for participation in the study was being over 18 years old. Before attendance, participants were informed about the purpose and the procedure of the study.

Data analysis

To analyze the data, *t*-test and one-way ANOVA for categorical variables, the Pearson correlation coefficient for correlation between continuous variables, and multiple regression with entering method for prediction of the OPAS were calculated.

Moreover, normality, linearity, homoscedasticity, multicollinearity, and independence of errors assumptions were calculated for multiple linear regression (Hair et al., 2010). The scatter plots of the residues were examined, and the assumptions of normality, linearity, and homoscedasticity were met. For multicollinearity, the correlation coefficient between variables is less than .80, VIF (variance inflation factor) is less than 10 and Tolerance Value is greater than .10 were taken into consideration (Field, 2009). Bivariate correlations between the variables are given in Table 6. The VIF values of independent variables were between 1.22 and 5.77 (three measurements were higher than 3), the Tolerance Value was between .17 and .83 (three measurements were lower than .3), and the multicollinearity assumption was met (see Table 6 for correlation between variables). Finally, the Durbin-Watson value was calculated as 2.09, and the assumption of independence of errors was met (Field, 2009).

Results

The first aim of the study was to explore the different levels of the OPAS between categorical variables (gender, education level, relationship status, considering getting professional support for overcoming pornography addiction). According to the results, the level of the OPAS was significantly different between men and women, $t_{(142)}$= -2.52, p= .013. Men's level of OPAS (M= 18.71, SD= 15.02) was higher than women's level of the OPAS (M= 12.35, SD= 12.68). The level of the OPAS did not differ in terms of education level ($F_{(5,142)}$= .28, p= .926) and relationship status, $F_{(4,143)}$= .98, p= .609. Additionally, due to a low number of participants who considered professional support, the Mann-Whitney U test was calculated for analyzing the different levels of the OPAS among the participants considering professional support and not considering professional support. The result showed that there were significant differences between the two groups, U= 214.000, p< .001, z= -4.181, r= -.35. The participants considering getting professional support (n= 12, Mean Rank= 120.67) had a higher level of the OPAS

Table 6

Means, standard deviations, and correlation between variables

Variables (instruments)	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. OPAS	16.64	14.41	--															
2. Life satisfaction (PSS)	17.98	7.44	-.047	--														
3. Feeling stress (PSS)	7.85	3.18	.138	-.321**	--													
4. Happiness (HS)	21.48	5.34	-.119	.638**	-.316**	--												
5. Hopelessness (BHS)	5.86	4.82	.185*	-.403**	.436**	-.515**	--											
6. Communication	10.73	2.52	-.187*	.249**	-.146	.232**	-.298**	--										
7. Age	26.21	6.67	.021	.098	-.343**	.193*	-.167*	.045	--									
8. Frequency of watching pornography video	4.32	1.08	.300**	-.111	.219**	-.158	.134	.068	-.148	--								
9. First porn watch age	3.82	1.66	-.031	-.132	-.153	-.099	-.043	.047	.332**	-.256**	--							
10. Before 18 total	8.65	7.58	.046	-.115	.221**	-.127	.106	-.048	-.297**	.533**	-.427**	--						
11. Total watch	3.01	1.51	.131	-.234**	.128	-.187*	.053	.010	-.126	.586**	-.188*	.631**	--					
12. Watch frequency in the last year	3.58	1.62	.269**	-.136	.191*	-.221**	.204*	.001	-.202*	.828**	-.215**	.549**	.686**	--				
13. Spend time watch	4.51	1.98	.178*	-.098	.199*	-.130	.058	.044	-.192*	.556**	-.128	.394**	.535**	.625**	--			
14. Longest period not watching porn	5.76	1.93	-.295**	.068	-.118	.149	-.174*	-.022	.105	-.751**	.072	-.412**	-.555**	-.848**	-.564**	--		
15. Effect on sexual life	4.24	1.93	.347**	-.266**	.152	-.227**	.230**	-.082	-.015	.433**	.112	.208*	.456**	.501**	.314**	-.441**	--	
16. Effect on daily life	3.04	1.67	.519**	-.093	.043	-.100	.114	-.008	.008	.374**	.138	.132	.322**	.385**	.281**	-.403**	.649**	--
17. Religiosity	2.38	1.51	.190*	-.091	-.057	-.095	-.033	.150	.065	-.191*	.368**	-.243**	-.021	-.082	.091	.030	.179*	.239**

Notes: *p< .05, **p< .01, N= 148. OPAS= Online Pornography Addiction Scale; PSS= The Perceived Stress Scale-Short Version; HS= Happiness Scale; BHS= Beck Hopelessness Scale. Before 18 total= How many times did you watch pornographic videos before the age of 18?; Total watch= How many times have you watched pornographic videos so far?; Watch frequency in the last year= How often do you think you entered pornographic sites in the past year?; Spend time watch= How much time do you spend on average when you enter a pornographic site?; Longest period not watching porn= How long has it been since you were last on a pornographic sites or watched a pornographic movie in the past year?; Effect on sexual life= What is the impact of pornographic sites on your sexual life?; Effect on daily life= What is the impact of pornographic sites on your daily life?; Religiosity= How religious do you think you are?

than the others (*n*= 132, Mean Rank= 68.12).

The second aim of the study was to explore the correlations between the variables mentioned in Table 6. The table showed that the OPAS significantly and negatively correlated with communication with a partner/opposite sex and the longest period of not watching pornography. The OPAS also significantly and positively correlated with hopelessness, frequency of watching sex videos, frequency of entering pornography site in last year, spending time on a pornography site in one access, effect of watching pornography on sexual life and daily life, and level of feeling religious. The findings indicated that less quality of communication with a partner/opposite sex and less frequency of longest period of not watching pornography showed a higher level of the online pornography addiction or vice versa. Additionally, a higher level of hopelessness, frequency of watching sex videos, frequency of entering pornography site, spending time on a pornography site in one access, the effect of watching pornography on sexual life and daily life and feeling religious indicated a higher level of the OPAS or vice versa.

The third aim of the study was to explore which variables correlated with the OPAS and predicted the OPAS. For this reason, multiple regression with the 'enter' method was calculated. Table 7 showed that the variables together significantly predicted the OPAS, $F_{(9,136)}$= 8.56, p< .001, R^2= .36, *Adj* R^2= .32, and explained 36% of the variance. Quality of communication with a partner/opposite sex negatively and significantly predicted the OPAS while the frequency of watching sex videos, the effect of pornography watching on daily life, and level of feeling religious positively and significantly predicted the OPAS.

Table 7
Multiple regression model for predicting the OPAS

Variables	B	SE	β	*t*	*p*
Hopelessness	.131	.229	.043	.571	.569
Communication	-1.368	.433	-.237	-3.161	.002**
Frequency of watching sexual videos	2.559	1.143	.294	2.238	.027*
Watch frequency in the last year	-.741	1.200	-.102	-.617	.538
Spending time watching porn	-.678	.880	-.070	-.771	.442
Longest period not watching porn	-.464	.992	-.062	-.468	.641
Effect on sexual life	-.768	.855	-.089	-.898	.371
Effect on daily life	4.232	.897	.444	4.720	.000***
Religiosity	1.573	.608	.204	2.586	.011*

Notes: *p< .05; **p< .01; ***p< .001. *N*= 148.

Discussion

The findings of Study 2 showed that the OPAS was associated with gender, considering getting professional support, level of hopelessness, communication with partner/opposite sex, level of feeling religious, watching sexual videos, frequency of watching pornography, spending time on a pornography site in one access, the longest period of not watching pornography, the effects of pornography on sexual life and the effect on daily life. Also, men scored higher on the OPAS than women.

The participants who needed professional support had a higher level on the OPAS. The participants who thought they had less quality of communication with their partners had a higher level of OPAS. The participants who watched pornography frequently spent more time watching pornography, watching pornography affects their daily life and sexual life adversely, and those who were more religious reported a higher level of the OPAS. However, communication with the partner/opposite sex, watching sexual videos, the effect of pornography on daily life, and level of feeling religious significantly predicted the OPAS.

The outcomes of this study align consistently with prior research findings. Extensive research into pornography behavior has consistently demonstrated that men tend to consume more pornography (e.g., Patterson & Price, 2012) and are more likely to self-identify as addicted to pornography compared to women (Grubbs et al., 2019). This discovery carries significance, particularly for individuals who acknowledge a higher degree of pornography addiction and express a need for professional intervention. From a clinical perspective, it's important to note that despite not being officially recognized as an addiction by current standards (APA, 2013), pornography can significantly impact individuals' lives, prompting them to seek the guidance of mental health professionals due to the distress caused by excessive consumption. Many individuals even characterize their excessive pornography consumption as an addiction and actively seek strategies to curb this behavior.

Previous studies indicated that high frequency of watching pornography relates to sexual dysfunction (Park et al., 2016; Wilson, 2016), dysfunction in family life (Morgan, 2011), happiness and religiosity (Paterson & Price, 2012), depression and anxiety (Voon et al, 2014; Weaver et al., 2011), and tendency to sexual assaults among adolescents (Bonino et al., 2019). The current findings also indicated that higher frequency of watching pornography was significantly associated with the effects of pornography on daily and sexual life, life satisfaction, and feeling stressful. However, the current study's aim was not related to the frequency of watching pornography, it was the level of pornography addiction. Therefore, the findings were quite different from those of previous studies. The correlations between pornography addiction and level of hopelessness, communication with a partner, frequency of watching pornography, effects of pornography on sexual and daily life, and feeling religious were tested. The most important issue was to explore which variables predict pornography addiction. Level of religiosity, effects of pornography on daily life, and frequency of watching pornography positively but the quality of communication with partner negatively predicted pornography addiction.

The level of watching pornography among religious people was found to be lower in earlier studies (Nelson et al, 2010; Short et al., 2014). However, in this study, although the frequency of watching pornography was negatively associated with feeling religious, religious people who watch pornography had higher levels of pornography addiction. A recent study by Grubbs, Lee et al. (2020) also supported this finding. They found a negative correlation between the level of watching pornography but a positive correlation and more self-connected with pornography addiction. The current study's findings related to religiosity also positively predicts

pornography addiction. Therefore, this issue should be considered in more detail in further studies.

General discussion

Previous studies have provided tools to measure pornography addiction, but to my knowledge and based on a detailed literature review, no studies have adapted or developed such tools in the Turkish context. It is important to develop scales in non-Western countries using ordinary samples. Several scales related to pornography addiction have been developed in Western countries. However, these scales generally focus on measuring the compulsivity and uncontrollability of watching pornography. Some scales also aim to measure consequences of pornography addiction, such as stress release and feelings of shame (Kor et al., 2014; Cacioppo et al., 2018), while a few scales focus on the six criteria of addiction (Bőthe et al., 2018; Fernandez & Griffiths, 2021). Nevertheless, there is a need to measure more constructs related to this issue. This study specifically focuses on the real consequences of pornography addiction, such as its effects on sexual life and various social-psychological factors. The OPAS is capable of measuring tolerance and withdrawal, which are components of addiction according to Griffiths (2005), through several items.

In this research, two studies were conducted to develop a scale for testing the OPAS and a further study was done to explore relationships between the OPAS and several psychosocial behaviors. The scale was developed in three steps: item generation, theoretical analysis, and psychometric analysis (Morgado et al., 2017). All analyses showed that the scale consisting of four subscales (Compulsiveness-Uncontrollability, Psycho-Social Effects, Sexual Effects, and Tolerance-Withdrawal) statistically, theoretically, and methodologically was developed with a representative sample. A confirmatory analysis also confirmed that there were four distinct factors. Psychometric analysis of the study can be acceptable compared with fitness values in studies of Hu and Bentler (1999), Rigdon (1996), and Shevlin and Miles (1998). Most previous measurements of pornography addiction tested compulsive and uncontrollable behaviors (e.g., Cacioppo et al., 2018). In this study, the scale consists of not only compulsiveness and uncontrollability but also possible effects of pornography (sexual and psychosocial effects) and possible tolerance and withdrawal behaviors. However, if a new measurement for pornography addiction is to be developed, we strongly recommend that researchers focus on the effects of pornography and other components of addiction criteria rather than compulsiveness and uncontrollability. Because there are plenty of measurements that explore pornography addiction behavior over compulsiveness and uncontrollability (e.g., Cacioppo et al., 2018; Delmonico & Miller, 2003).

Beside developing the scale, we explored the relationships between several psychosocial variables and pornography addiction. Results revealed that the OPAS is significantly associated with some psychosocial variables (hopelessness, quality of communication between partners/opposite sex, feeling religious, and effects of pornography on daily and sexual lives), demographic variables (gender and considering getting professional support for overcoming pornography addiction),

and behavior of watching pornography attitudes (frequency of watching pornography, frequency of watching in the last year, spending time on a pornography site in one access, and the longest period of not watching pornography). Also, communication between partners/opposite sex, frequency of watching sex videos, the effect of watching pornography on daily life, and level of feeling religious significantly predicted the OPAS.

Each variable that was explored in relation to pornography addiction needs to be studied in detail. Previous studies indicated that anxiety and depression were associated with pornography addiction (Voon et al, 2014; Weaver et al., 2011). Hopelessness also had strong relationships with anxiety and depression (Cunningham et al., 2008). In the current study, hopelessness was related to -but did not predict- pornography addiction. Therefore, these findings and other psychological variables should be tested further in pornography watching behavior. Also, the quality of communication between partners was a crucial factor in this study. Higher quality of communication between partners is related to less pornography addiction. Communication is an important factor for partners to be satisfied with their relationships. If a partner does not talk about their fantasies, this may lead them to watch pornography excessively. Although this study did not discover all the factors of communication between partners, the quality of communication may be a significant factor for pornography addiction. We suggest future researchers explore this finding further and practitioners should consider the quality of communication related to sexual activity if clients have pornography addiction. In addition, the ministry of family policy, the ministry of health, and associations related to health and family should take into account the influence of pornography addiction to protect young generation and preserve family unity.

Grubbs and Perry (2019) highlighted in their review that religiousness serves as a potent predictor of pornography addiction, and individuals who perceive themselves as religious are more inclined to seek clinical assistance owing to moral incongruence. As a result, uncovering the connections between religiosity and the level of pornography addiction within the Turkish sample, particularly one that is predominantly Muslim, becomes of paramount importance. The findings of this investigation indicated a significant positive correlation and predictive relationship between religiosity and the OPAS. Notably, no significant correlation emerged between religiosity and the frequency of pornography consumption. This pattern mirrors a similar finding observed in a study conducted by Grubbs, Lee et al. (2020).

This phenomenon could potentially be explained by the presence of compulsivity. It's well-established that robust links exist between religiosity and obsessive-compulsive behaviors, particularly among Muslim samples (Ok & Gören, 2018). Compulsivity is a prominently observed facet in addiction behavior (APA, 2013). Consequently, it can be posited that individuals with heightened religiosity might not engage in frequent pornography consumption. However, those religious individuals who do consume pornography may manifest this behavior compulsively, viewing it as problematic due to their behavioral tendencies.

Future research should direct greater attention to this observation. Specifically, the degree of pornography addiction among religious individuals could be meticulously analyzed using a religiosity scale, as the current study assessed this

aspect using a solitary question, which could be deemed a limitation. Furthermore, this finding warrants further examination across diverse groups and in longitudinal studies to substantiate its robustness.

There are some limitations to this study. First, although the number of participants is adequate for developing a scale (Study 1a and 1b) and for the analysis of relationships between the OPAS and variables (Study 2), it would be better to collect data from a larger and more representative sample. In this study, it was very hard to collect data from the Turkish sample due to collective culture and to inquire about sexual factors in a Muslim culture. Second, the OPAS has sufficient psychometric values, but its subscales, specifically the "tolerance and withdraw" subscale, need to be improved. The researchers who are interested in this area should focus on other factors of addiction such as salience, withdrawal and tolerance. It is understood that behavioral addiction is different from substance addiction, but still, withdrawal and tolerance behavior is identified in behavioral addiction. If watching pornography is claimed to cause addiction, all addiction criteria should be provided (criteria for behavioral addiction, see Goodman, 1990; Griffiths, 1996). Third, it would be a great benefit to compare two groups (people who never watch porn and people who watch porn regularly) to find out the real consequences of pornography addiction. However, nowadays it might be difficult to reach people who never watch pornography. Studies comparing these two groups would be of great benefit. Last, for identifying addiction behaviors, a longitudinal study seems necessary because if participants keep watching pornography, their attitudes might change over time.

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Appendix 1
Online Pornografi Bağımlılığı Ölçeği (OPBÖ)

Aşağıdaki soruları son 12 aylık zaman dilimini baz alarak size en uygun olacak şekilde cevap veriniz.

Maddeler	Asla (0)	Nadiren (1)	Arada bir (2)	Sıklıkla (3)	Daima (4)
1. Pornografik sitelere girmek istemesem bile kendimi bu sitelere girerken buluyorum.					
2. Çabalasam da pornografik sitelere girmeyi engelleyemiyorum.					
3. Pornografik sitelere girmeyeceğime dair kendime söz vermeme rağmen sözümde duramıyorum.					
4. Pornografik sitelere girmeyi durduramadığım için umutsuzluğa kapılıyorum.					
5. Pornografik sitelere girme konusunda kendimi engelleyemiyorum.					
6. Pornografik sitelere girmeyi bırakmak için profesyonel destek almam gerektiğini düşünüyorum.					
7. Zihnimde oluşan pornografik görüntü, düşünce veya fantezilerden dolayı işlerime yoğunlaşmakta zorluk çekiyorum.					
8. Pornografik sitelere girdiğimde manevi/ruhsal olarak kirlenmiş hissediyorum.					
9. Pornografik sitelere girdikten sonra kendimden utanıyorum.					
10. Pornografik sitelere girdiğim fark edilirse yakın çevremle (eş/anne-baba/arkadaş) ilişkilerimin olumsuz etkileneceğinden korkuyorum.					
11. Pornografik sitelere girdiğim için kötü bir insan olduğumu düşünüyorum.					
12. Pornografik sitelere girdikten sonra suçluluk duyuyorum.					
13. Pornografik sitelere girmem aktif cinselliğe karşı ilgimi azaltıyor.					
14. Pornografik sitelere girmem eşimi/partnerimi cinsel olarak yetersiz görmeme neden oluyor.					
15. Pornografik sitelere girmem eşimle/partnerimle yaşadığım cinsel hazzı azaltıyor.					
16. Pornografik sitelere girmeden cinsel istek duymaz oldum.					
17. Pornografik sitelere girmemden dolayı eşime/partnerime olan cinsel arzularımda azalma hissediyorum.					
18. Pornografik sitelere girmediğimde kendimi gergin hissediyorum.					

Maddeler	Asla (0)	Nadiren (1)	Arada bir (2)	Sıklıkla (3)	Daima (4)
19. Pornografik sitelere girmediğim günler kendimi duygusal olarak kötü (gergin/ sinirli/ üzgün vb) hissediyorum.					
20. Pornografik sitelere girerek stresimi azaltıyorum.					
21. Pornografik sitelere girmek yalnızlık hissimi azaltıyor.					
22. Kendimi duygusal olarak kötü hissettiğimde (gergin, sinirli, üzgün vb) pornografik sitelere girerek rahatlıyorum.					
23. Pornografik sitelere girmediğim günler kendimi eksik hissediyorum.					
24. Pornografik sitelere girmek istemesem bile kendimi bu sitelere girerken buluyorum.					

Appendix 2
The Online Pornography Addiction Scale (OPAS)

Answer the following questions in relation to the most appropriate for you, based on your last 12 months period.

Items	Never (0)	Rarely (1)	Occasionally (2)	Often (3)	Always (4)
1. Even if I do not want to visit pornographic sites, I find myself visiting them.					
2. Even if I try, I cannot stop visiting pornographic sites.					
3. Although I promised myself that I would not visit pornographic sites, I cannot keep my word.					
4. I get desperate since I cannot stop visiting pornographic sites.					
5. I cannot stop myself from visiting pornographic sites.					
6. I think I need professional support to stop visiting pornographic sites.					
7. I have difficulty in concentrating on my work due to the pornographic images, thoughts, or fantasies formed in my mind.					
8. I feel morally/spiritually contaminated when I visit pornographic sites.					
9. I am ashamed of myself after visiting pornographic sites.					
10. If it is noticed that I visit pornographic sites, I am afraid that my relationships with my acquaintances (spouse/parents /friends) will be adversely affected.					
11. I feel like a bad person for visiting pornographic sites.					
12. I feel guilty after visiting pornographic sites.					
13. Visiting pornographic sites reduces my interest in active sexuality.					
14. Visiting pornographic sites causes me to see my spouse/partner as sexually inadequate.					
15. Visiting pornographic sites decreases the sexual pleasure that I have with my spouse/partner.					
16. Without visiting pornographic sites, I would have no sexual desire.					
17. I feel a decrease in my sexual desire for my spouse/partner due to visiting pornographic sites.					
18. I feel nervous when I do not visit pornographic sites.					
19. I feel emotionally down (nervous/angry /upset, etc.) when I do not visit pornographic sites.					
20. I reduce my stress by visiting pornographic sites.					
21. Visiting pornographic sites reduces my feeling of loneliness.					

Items	Never (0)	Rarely (1)	Occasionally (2)	Often (3)	Always (4)
22. I feel relaxed by visiting pornographic sites when I feel emotionally down (nervous, angry, upset, etc.).					
23. I feel incomplete in the days when I do not visit pornographic sites.					
24. Even if I do not want to visit pornographic sites, I find myself visiting them.					