



Article

The Interplay between Binge Watching and Suicide Risk: Daytime Sleepiness and Maladaptive Daydreaming as Mediators

Valeria Saladino ¹, Danilo Calaresi ^{2,*}, Francesca Cuzzocrea ² and Valeria Verrastro ²

¹ Department of Human Sciences, Society and Health, University of Cassino and Southern Lazio, 03043 Cassino, Italy; v.saladino@unicas.it

² Department of Health Sciences, University "Magna Graecia" of Catanzaro, 88100 Catanzaro, Italy; fcuzzocrea@unicz.it (F.C.); valeriaverrastro@unicz.it (V.V.)

* Correspondence: danilo.calaresi@unicz.it

Abstract: Binge watching, which entails consecutively viewing numerous episodes of a TV series or a selection of movies over an extended timeframe, often without pause, is notably widespread among young adults skilled in digital media usage. Nevertheless, this escalating habit can lead to problematic and addictive behavior, with potential associations including disruptions in sleep patterns, dreaming, and an elevated risk of suicide. The primary objective of this research was to assess whether daytime sleepiness and maladaptive daydreaming may impact the connection between binge watching and suicide risk and whether the hypothesized model is gender invariant. Self-report questionnaires were administered to a sample of 1012 emerging adults (50% girls) aged 18–25 ($M = 21.73$, $SD = 2.28$). Multivariate analysis of covariance (MANCOVA), structural equation modeling (SEM) with latent variables, and multiple-group path analysis (MGPA) were conducted. All direct and indirect paths were found to be statistically significant, and gender was found to be invariant. Specifically, the findings highlighted that higher binge watching, coupled with daytime sleepiness and maladaptive daydreaming, heightened suicide risk in both genders. Binge watching and sleep and dream issues are important factors to consider in the assessment of suicide risk, particularly among emerging adults who are already at a higher risk. It is thus important to prioritize the promotion of healthy media habits.

Keywords: binge watching; daytime sleepiness; maladaptive daydreaming; suicide risk; emerging adults



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1. Introduction

Technology and easy access to the virtual world are on the rise, particularly among young people, who are increasingly likely to utilize the internet for entertainment, such as streaming services via smartphones and laptops (Liza et al. 2023). Furthermore, these online services offer a variety of programs and movies without any commercial breaks (Panda and Pandey 2017). As a result, it has become the most convenient and useful way for teenagers and people in general to watch television spending leisure time (Rubenking and Bracken 2021). This proclivity has resulted in a new developing behavior known as binge watching, which is described as watching many episodes of a television series in a single session, similar to a marathon (Castro et al. 2021). This activity, while not intrinsically harmful, can lead to a problematic, compulsive, and addictive habit in which individuals lose control of their behavior, with urges to view more content and trouble quitting even when they wish to (Forte et al. 2021). Indeed, the literature highlights that extreme binge watching behaviors share similarities with other behavioral addictions like excessive gaming, internet use, or problematic social media engagement (Riddle et al. 2018; Starosta and Izydorczyk 2020). This might be since this deeply absorbing activity offers instant satisfaction, potentially resulting in a loss of self-regulation and prolonged viewing beyond the individual's intended limits (Walton-Pattison et al. 2018). Binge watching, being

incredibly captivating, offers a chance for deep cognitive and emotional involvement with the storyline, potentially resulting in a lack of control over the time invested in this pursuit. Hence, while it can be immensely enjoyable and enriching, it is crucial to recognize that its immersive nature also carries the risk of problematic and addictive habits (Starosta and Izydorczyk 2020). Problematic binge watching is thus increasingly being researched due to the possible hazards connected with other health and quality of life variables, such as sleep disorders (Starosta and Izydorczyk 2020; Raza et al. 2021).

The literature shows that problematic binge watching has an influence on sleep quality, mostly by altering the sleep–wake cycle and biological rhythms of those who continually stimulate their thoughts, inhibiting rest (Exelmans and Van den Bulck 2017). As a result, people may experience themselves as tired and exhausted, which affects their everyday life. According to Alfonsi et al. (2023), problematic binge watching and daytime sleepiness are connected to a variety of factors that may impact and exacerbate both, creating a vicious cycle. Specifically, they observed that poor sleepers were more likely to binge watch to cope with negative sensations. Similarly, Exelmans and Van den Bulck (2017) investigated the incidence of problematic binge watching and sleepiness in young people, finding a relationship between increasing binge watching and lower sleep quality, fatigue, and insomnia symptoms.

According to the literature, binge watching might be utilized to escape from emotional troubles and unpleasant sensations while also creating another world through an immersive experience (Alfonsi et al. 2023; Barberis et al. 2019). In particular, research suggests that this predisposition, along with tiredness, may be related with a distinct psychological condition known as maladaptive daydreaming (Carciofo et al. 2014). Soffer-Dudek and Somer (2022) defined maladaptive daydreaming as an extended obsessive activity based on absorption in vivid imaginations, similar to dissociative experiences, in which individuals lose contact with reality and time to participate in their own fantasies. Specifically, maladaptive daydreaming can be considered a condition characterized by extensive fantasy activity that replaces human interaction and/or interferes with academic, interpersonal, or vocational functioning (Schimmenti et al. 2019). Individuals with maladaptive daydreaming may spend hours lost in elaborate daydreams, often triggered by real-life events or emotions, daydreams that can be vivid, immersive, and highly detailed, sometimes to the point where the person loses touch with reality (Schimmenti et al. 2019; Soffer-Dudek and Somer 2022). Although daydreaming itself is surely a common and normal human experience that can also act as an effective coping mechanism (Vyas et al. 2023), it becomes problematic and maladaptive when it disrupts daily life and global or specific functioning of individuals (Ross et al. 2020). Maladaptive daydreaming might increase vulnerability to dysfunction and distress in daily functioning and stimulates rewarding and time-consuming behaviors associated with problematic binge watching (Schimmenti et al. 2019).

Suicidal thoughts—according to the Centers for Disease Control and Prevention (2023), a respected service agency committed to maintaining public health—are a serious public health problem and one of the top causes of mortality among young people. The data provided by the Italian National Institute of Statistics (ISTAT 2023) add weight to this thesis, providing a grim picture of the young suicide pandemic. Indeed, suicide appears to be the fourth leading cause of death among those aged 15 to 19. It must also be highlighted that a relevant study (Somer et al. 2017) observed an unusually strong relationship between maladaptive daydreaming and suicide, with more than 28% of maladaptive daydreamers of their sample having attempted suicide. It would be thus reasonable to argue that problematic binge watching could be directly related to suicide but also indirectly connected due to their associations with sleep and daydreaming problems, as well as depression, anxiety, and other psychological and health issues.

Another important subject in the related research is the possibility for gender inequalities in the aforementioned factors. Steins-Loeber et al. (2020) showed no gender differences in binge watching habits; however, Starosta et al. (2019) suggested that women may have more entertainment incentive, which helps with loneliness, and social motivation than men.

There is also a complicated association between suicide and gender, with some studies linking girls to more suicide attempts and boys to more suicide fatalities (Miranda-Mendizabal et al. 2019).

Even as binge watching becomes increasingly prevalent among young people, alongside concerning spikes in youth suicide rates and their associations with sleep-related difficulties, the specific nature of the relationship between problematic binge watching and suicide risk remains unknown. Furthermore, the effects of daytime sleepiness and maladaptive daydreaming on this nexus have yet to be thoroughly understood. Furthermore, it is unclear if gender disparities exist in the aforementioned factors and relationships. For the reasons stated above and based on the evaluated literature, the current study seeks to fill such knowledge gaps. The primary goal of this study was to determine if daytime sleepiness and maladaptive daydreaming influence the connection between problematic binge viewing and suicide risk (Figure 1). The second goal was to see if the aforementioned model was consistent across genders.

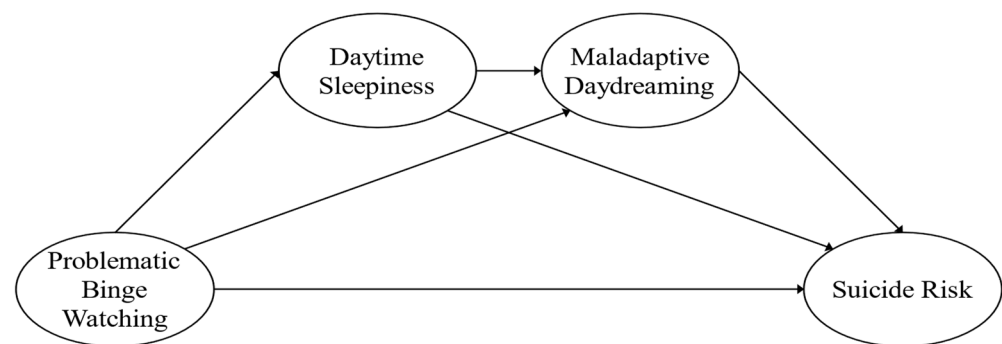


Figure 1. Hypothesized model.

2. Materials and Methods

2.1. Participants

This study involved a sample of 1012 emerging adults in Italy, with an equal number of females (506) and males (506), aged between 18 and 25 years old ($M = 21.73$, $SD = 2.28$). A team of 25 randomly selected, trained assistants, situated across Italy, recruited the participants using both offline and online methods over one month. Monte Carlo power analysis for mediation models highlighted that at least 639 participants would be required to achieve 0.80 statistical power, and at least 788 participants would be required to achieve 0.95 statistical power (Schoemann et al. 2017). In regard to educational level, 14% of the participants had completed middle school, 49% had a high school diploma, 34% had a university degree, and 3% had a postgraduate degree. Concerning occupational status, 42% of the participants were students, 8% were unemployed, 36% were employed, and 14% were self-employed. Regarding marital status, of the participants 39% were single, 40% were engaged, 12% were living with a partner, and 9% were married.

2.2. Procedures

The present study adhered to the ethical guidelines outlined by the Helsinki Declaration and the Italian Association of Psychology (AIP) and was approved by the "Placeholder for Peer Reviewing" (reference number: "Placeholder for Peer Reviewing"). Participants completed an online survey, and all questions were required, resulting in no missing data. Only participants who signed the informed consent were included in this study, and participation was voluntary and uncompensated. Throughout all stages of this study, participants' privacy was ensured.

2.3. Measures

2.3.1. Problematic Binge Watching

Problematic binge watching was assessed with the Italian version of the Binge Watching Addiction Questionnaire (BWAQ; Forte et al. 2021). Participants were asked to respond to 20 items by indicating the severity of binge watching problematic behaviors (e.g., “Do you happen to find yourself saying ‘one more episode and I’ll turn it off’ when you watch movies or TV series?”; “Do you find yourself snapping, raising your voice, or responding abruptly if someone interrupts you while you’re watching movies or TV series?”; “Do you find yourself choosing to spend more time watching movies or TV series rather than going out with others?”). All items were rated on a 5-point Likert scale ranging from 0 (never) to 4 (always). The responses were averaged across all 20 items. Higher scores indicate higher levels of problematic binge watching. In the current study, the internal consistency was good (Table 1).

Table 1. Descriptive analyses and correlations.

	M	SD	α	1	2	3
1. Problematic binge watching	1.24	0.79	0.93	-	-	-
2. Daytime sleepiness	1.05	0.60	0.80	0.30 *	-	-
3. Maladaptive daydreaming	3.26	1.98	0.93	0.43 *	0.29 *	-
4. Suicide risk	1.43	0.88	0.83	0.38 *	0.27 *	0.40 *

Note: $N = 1012$. * $p < 0.01$.

2.3.2. Daytime Sleepiness

Daytime Sleepiness was measured with the Italian version of the Epworth Sleepiness Scale (ESS; Vignatelli et al. 2003). The ESS is an 8-item self-report questionnaire that measures how likely an individual is to fall asleep in typical daytime situations (e.g., when “while sitting and reading”; “in the car, stopped for a few minutes in traffic.”; “lying down to rest in the afternoon, when there’s the opportunity.”). Participants respond to each item using a 4-point Likert scale ranging from 0 (would never doze) to 3 (high chance of dozing). Higher scores on the ESS indicate greater levels of daytime sleepiness. In the current study, the internal consistency was good (Table 1).

2.3.3. Maladaptive Daydreaming

Maladaptive daydreaming was assessed with the Italian version of the Maladaptive Daydreaming Scale (MDS-16; Schimmenti et al. 2020). The MDS-16 is a 20-item self-report questionnaire that measures maladaptive daydreaming (e.g., “Some people have the experience of their daydreaming hindering the things that are most important to them. How much do you feel that your daydreaming activities interfere with achieving your overall life goals?”; “If you go through a period of time when you are not able to daydream as much as usual due to real-world obligations, how distressed are you by your inability to find time to daydream?”). Participants respond to each item on a 11-point scale ranging from 0% (never/none of the time) to 100% (all of the time/extreme amounts). Higher scores on the MDS-16 indicate greater levels of maladaptive daydreaming. In the current study, the internal consistency was good (Table 1).

2.3.4. Suicide Risk

Suicide risk was measured using the Suicidal Behaviors Questionnaire—Revised (SBQ-R; Osman et al. 2001), which has been found to have good validity in Italian participants (Falgares et al. 2017). The SBQ-R is a 4-item self-report questionnaire that measures lifetime suicide ideation and attempts (e.g., “Have you ever thought about or attempted to kill yourself?”; “Have you ever told someone that you were going to commit suicide, or that you might do it?”). Higher scores on the SBQ-R indicate greater levels of suicide risk. In the current study, the internal consistency was good (Table 1).

2.4. Statistical Analyses

IBM SPSS was used to conduct descriptive statistics, correlations, and preliminary analyses, while the lavaan package in RStudio was utilized for main analyses. In this study, no data exclusion or removal of outliers was performed. The entire dataset was used for all analyses to maintain the integrity and completeness of the data.

To account for the potential impact of gender, a multivariate analysis of variance (MANOVA) was carried out, with problematic binge watching, daytime sleepiness, maladaptive daydreaming, and suicide risk as dependent variables, and gender as fixed factor.

A structural equation modeling (SEM) with latent variables was also conducted to test the mediation model, with problematic binge watching as predictor, daytime sleepiness as first mediator, maladaptive daydreaming as second mediator, and suicide risk as outcome. The bootstrap-generated bias-corrected confidence interval approach with 5000 resamples was used to assess the significance of the indirect effects.

Finally, a multigroup path analysis (MGPA) was conducted with gender as a group variable to investigate whether structural paths varied between males and females.

3. Results

3.1. Descriptive Statistics, Correlations, and Preliminary Analyses

Table 1 displays the descriptive statistics and correlations among the variables under investigation. The means are consistent with those observed in prior studies (Açikel and Özkent 2023; Lin et al. 2021; Schimmenti et al. 2020; Lew et al. 2020).

The study variables were subject to preliminary analyses to examine the influence of gender. A multivariate analysis of variance (MANOVA) was performed, and the results indicated that there were no multivariate effects for gender; Wilks's $\lambda = 0.998$, $F(4, 1007) = 0.49$, $p = 0.75$, $\eta^2 = 0.002$.

3.2. Mediation Model

The hypothesized model was evaluated using structural equation modeling (SEM) with latent variables (Figure 2) and results demonstrated that the model fit the data well, $\chi^2(48) = 220.08$; $p < 0.001$, CFI = 0.98, RMSEA = 0.06 (90% CI = 0.05–0.07), SRMR = 0.04. Significant direct and indirect paths were found between all the study variables (Table 2).

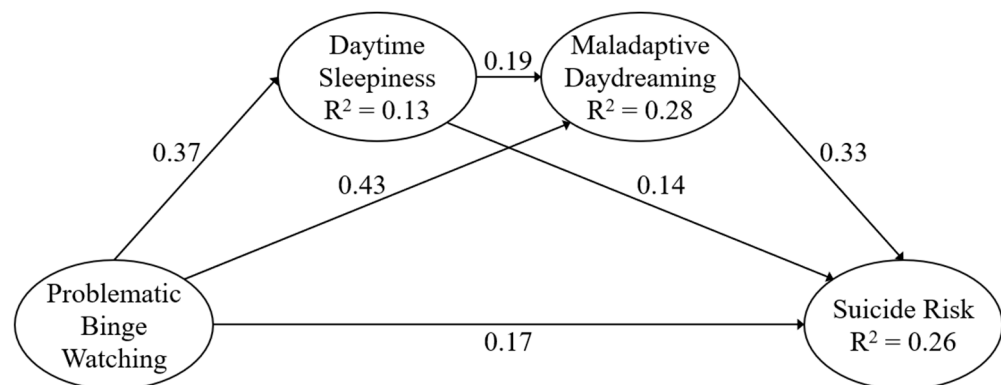


Figure 2. Structural Model. Note: only direct paths are reported for clarity purposes; parcels were not reported for clarity purposes.

Table 2. Path estimates, SEs, and 95% CIs.

	β	p	SE	CI	CI
				LL	UL
Direct Effect					
Problematic binge watching → daytime sleepiness	0.37	<0.001	0.03	0.25	0.37
Problematic binge watching → maladaptive daydreaming	0.43	<0.001	0.09	0.85	1.22
Problematic binge watching → suicide risk	0.17	<0.001	0.06	0.11	0.34
Daytime sleepiness → maladaptive daydreaming	0.19	<0.001	0.11	0.34	0.78
Daytime sleepiness → suicide risk	0.14	=0.002	0.07	0.07	0.35
Maladaptive daydreaming → suicide risk	0.33	<0.001	0.02	0.14	0.23
Indirect effect via daytime sleepiness					
Problematic binge watching → maladaptive daydreaming	0.07	<0.001	0.04	0.10	0.25
Problematic binge watching → suicide risk	0.05	=0.003	0.02	0.02	0.11
Indirect effect via maladaptive daydreaming					
Problematic binge watching → suicide risk	0.14	<0.001	0.03	0.13	0.25
Daytime sleepiness → suicide risk	0.06	<0.001	0.02	0.06	0.15

Note: p = level of significance; SE = standard error; BC 95% CI = confidence interval; LL = lower limit; UL = upper limit.

3.3. Moderating Role of Gender

To investigate whether there were differences in structural paths between males and females, a multigroup path analysis (MGPA) was carried out on the proposed model. A constrained model with the paths of the hypothesized model set equal across the two groups, $\chi^2(102) = 285.83$, $p < 0.001$, CFI = 0.974, was compared to an unconstrained model with all paths allowed to vary across the two groups, $\chi^2(96) = 279.16$, $p < 0.001$, CFI = 0.974. The fit indices of the unconstrained model did not significantly differ from the constrained model, demonstrating structural equivalence across the two groups, $\Delta\chi^2(6) = 5.74$, $p = 0.45$, $\Delta\text{CFI} < 0.001$. Therefore, the relations were comparable between males and females.

4. Discussion

The primary goal of this study was to determine if daytime sleepiness and maladaptive daydreaming impact the connection between problematic binge watching and suicide risk. Our findings confirmed our initial hypothesis, shedding insight on the influence of daytime sleepiness and maladaptive dreaming in the aforementioned relationship. These preliminary findings are consistent with prior studies demonstrating the harmful effects of problematic binge watching on a variety of negative mental health outcomes (e.g., [Starosta and Izydorczyk 2020](#)). Our study thus deepens the relevant literature by suggesting that problematic binge watching may also relate to a higher risk of suicide, especially considering daytime sleepiness and maladaptive daydreaming. Although the cross-sectional design of the present research does not permit to infer causation, we further discuss potential mechanisms and factors that support such associations, with the main aim to pave the way for improved clinical programs and future longitudinal and confirmative research.

According to [Alfonsi et al. \(2023\)](#), problematic binge watching appears to be linked to sleep patterns, especially shorter sleep duration, later bedtimes, and disrupted circadian rhythms. One reason why problematic binge watching has been related to excessive daytime drowsiness is the blue light emitted by electronic devices ([Zhao et al. 2018](#)), which appears to decrease the release of melatonin, a hormone that governs sleep–wake cycles. Melatonin can delay sleep start and reduce sleep quality, which may relate to greater tiredness during the day. According to research, problematic binge viewing appears to interfere with regular sleep cycles, which might lend credence to the binge watching–daytime sleepiness path. In effect, problematic binge watching appears to be linked to later bedtimes, notably a decrease in the amount of time available for sleep and a disturbance with the body’s normal circadian rhythm ([Exelmans and Van den Bulck 2017](#); [Zhao et al.](#)

2018). The problematic binge watching–daytime sleepiness link may thus signify an obsessive and compulsive behavior, as well as decreased sleep quality, increased daytime sleepiness, and worse cognitive functioning throughout the day. Finally, research appears to suggest that problematic binge watching is associated with a loss of control over watching behavior (Riddle et al. 2018), potentially implying staying up later than intended and neglecting other activities, such as exercise or social interactions, which can, in general, promote better sleep and reduce daytime sleepiness.

In the same line, research reveals that daytime sleepiness may be connected to maladaptive daydreaming, possibly by an increase in the likelihood of individuals falling into a reverie (Carciofo et al. 2014). Research suggests that sleep deprivation or excessive daytime lethargy can impair concentration and focus on tasks (Komarov et al. 2020). This may thus be connected to maladaptive daydreaming, which may serve as a coping strategy for stress and negative emotions (Dujčić et al. 2020). Daydreaming can therefore arise as a means of escape and dealing with adversity; nevertheless, this mechanism may conceivably slide into maladaptive territory if it disrupts daily routines and impedes involvement in beneficial tasks. Furthermore, the notable link between daytime sleepiness and maladaptive daydreaming may also be traced back to the effects of sleep loss on brain function (Hudson et al. 2020). Sleep deprivation appears to influence brain areas responsible for cognitive control, attention, and mood regulation, all of which are important for handling daydreaming inclinations. Indeed, research reveals that when these brain regions are impaired, people may struggle to control their daydreaming tendencies, which might be connected to more frequent and intense daydreaming episodes (Sándor et al. 2021).

Thus, it stands to reason that maladaptive daydreaming may be significantly related with the threat of suicide, probably attributable to an array of reasons. According to Conte et al. (2022), this condition is frequently associated with a variety of psychological and emotional problems. Schimmenti et al. (2019) emphasize this issue, stating that persons entrapped by maladaptive daydreaming typically have more severe mental health symptoms than their non-maladaptive peers. From a theoretical viewpoint, this phenomenon may be attributed to the sensation of being imprisoned in a vortex of maladaptive daydreaming, in which one's thoughts spin uncontrolled, possibly related to intense emotions of despair and a gloomy outlook for the future. However, once this coping technique begins to invade everyday life and restrict participation in productive tasks, it can quickly transform into maladaptive strategies (Soffer-Dudek and Somer 2022). As a result, it might be reasonable to argue that this may impair one's ability to picture a future free of hardship, which is associated with a proclivity for suicidal ideation and conducts (Somer et al. 2017). Furthermore, maladaptive daydreaming appears to have a potential impact on social ties, cultivating feelings of solitude and social isolation (Abu-Rayya et al. 2020), factors that research has linked to a higher risk of suicide (Aran et al. 2023).

The second goal of this study was to determine whether the suggested model was gender invariant. The findings demonstrated that the structural associations in the model were consistent across males and females. This suggests that daytime sleepiness and maladaptive daydreaming may play similar roles in regulating the association between problematic binge viewing and suicide risk for both genders. Taken together, these data indicate the generalizability of our findings across genders.

5. Conclusions

5.1. Limitations

Our study includes the following limitations: (a) The direction of causation cannot be determined since research design is cross-sectional. It could thus be possible that higher degrees of suicidal ideation may result in higher levels of problematic binge viewing. Nonetheless, the lack of simpler correlational investigations in the literature prompted the current work. As a result, the current findings may potentially serve as a forerunner to further longitudinal investigations and, eventually, experimental inquiries targeted at verifying and broadening the discoveries of this exploratory study; (b) this study relied

solely on self-reported data, which may induce bias in interpretation. Other assessment measures could be included in collecting data to lessen the possibility of bias for future research; (c) this study only collected data online, which may restrict the findings' applicability to persons without internet access. To increase the accuracy of the findings, future studies should use many sources of data; (d) finally, there are still various uncertainties that prevent precise judgments. While the current findings shed light on the relationship between problematic binge watching and suicide risk, there may be a variety of cognitive processes and beliefs that contribute to the path that were not investigated in this study. As a result, we recommend future research to investigate additional potentially relevant constructs and their interactions with the factors studied to expand understanding in this research field.

5.2. Future Implications

The preliminary results of the present study could be useful for professionals in promoting interventions focus on media consumption education and in mitigating negative impact of problematic use of online devices and platforms. Interventions could aim to re-establish contact with the rhythms of one's body, such as the sleep cycle, and gradually reducing the tendency to fantasize, which is often associated with dissatisfaction and anxieties in daily life, reducing suicide risk. Future research should look at the influence of problematic binge watching on mental health outcomes, as well as potential protective variables that might counteract its detrimental consequences. Furthermore, the current study found no significant gender differences in the variables and pathways addressed, underscoring the potential therapeutic significance of therapies for both boys and girls who binge watch in a problematic manner. Future study should also investigate the generalizability of these therapies to teenagers and children, who may have begun to develop problematic binge watching practices without yet experiencing their potential negative consequences.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of the Institutional Review Board of the Institute for the Study of Psychotherapy, School of Specialization in Brief Psychotherapies with a Strategic Approach (protocol code: ISP-IRB-2023-4; date of approval: 9 January 2023).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors on request.

Conflicts of Interest: The authors declare no conflict of interest.

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