

Research Article

Is binge watching among medical students associated with depression and anxiety?

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Keywords: Anxiety; Binge-watching; Depression; Medical students; Video on demand



Abstract

Objectives: Investigate binge-watching (BW) behavior among students and assess its correlation with anxiety and depressive symptoms.

Methods: Medical students who met the definition of BW were divided, according to their viewing frequency, into three groups: G1: once a month or less, G2: once a week or once every two weeks, and G3: twice a week or more. Beck Depression Inventory and State-Trait Anxiety Inventory were used.

Results: Ninety-four participants were recruited. The prevalence of BW was 72.3%. Depression and anxiety scores didn't differ between binge watchers and the non-binge watcher group. G2 was found to be significantly less depressed ($p = 0.014$) and had a lower anxiety state ($p = 0.05$) and anxiety trait scores ($p = 0.026$) than the control group. Feeling tired was the most prevalent reason to stop viewing among G3 ($p = 0.001$).

Conclusion: Binge-watching could be when used in a specific manner, a way to cope with negative feelings.

Introduction

With the technological advances and the development of the Internet over the years, there has been a change in the way we consume media. Watching TV has not been spared by this evolution and has moved online with the raise of video-on-demand (VoD) services and streaming sites. Viewers are now no longer constrained to follow a scheduled broadcast of their favorite shows and can watch them anytime and anywhere they want without a specific device restriction. This kind of freedom made the use of VoD portals a more valuable way to watch TV and the fact that the flow of shows isn't interrupted by commercials made it even more advantageous. Since this shift in consumption and because of the ability to access entire seasons and episodes of numerous TV shows, a new behavioral phenomenon has emerged called binge-watching. It refers to viewer engagement in "watching multiple episodes of a television program in rapid succession, typically by means

of DVDs or digital streaming" [1]. Even if this description of the phenomenon is commonly used, its quantification diverges significantly. Jenner (2014) defines binge-watching as watching more than two hours of content in one setting [2]. Other authors proposed that the move from two to three episodes was the cut-off distinguishing between standard and binge-watching TV defined then as watching more than two consecutive episodes of the same TV show in the same setting [3]. In a survey taken by the Netflix Company, one of the most influential VoD platforms, 73% of the consumers defined binge-watching as watching between 2-6 episodes of the same TV show in one setting. Even bingeing behavior like binge eating (feeling unable to stop eating and consuming abnormal amounts of food) or binge drinking (excessive alcohol use) was associated with a lack of control and self-harming behavior; binge-watching was frequently associated with positive connotations by consumers. Whether or not this behavior reflects emotional difficulties has been poorly studied. This

study aimed to investigate binge-watching behavior among medical students and assess its correlation with anxiety and depressive symptoms using specific assessment tools.

Methods

Sample

Medical students were recruited at the University of Tunis El Manar of Tunisia. The selection of participants was random without regard to gender, age, level of medical studies, or socioeconomic status. The survey was conducted after informed consent was obtained.

The sample was afterward divided according to whether the participants used to binge-watch TV or not. Binge-watching was defined as watching more than two consecutive episodes of the same television show in one setting. The non-binge watcher group was assigned as Group 0. Binge watchers were secondarily divided according to the frequency of their viewing behavior as follows: those who binge-watched TV shows at the frequency once a month or less (Group 1), once a week, or once every two weeks (Group 2) and those who binge-watched TV shows at the frequency of twice a week or more (Group 3).

Measurements

TV binge-watching behavior: To explore the binge-watching behavior, participants who met the definition fulfilled a questionnaire regarding the frequency with which they engaged in this behavior, the time spent watching TV in one setting, the circumstances of the binge-watching, the device used and the way they watched TV shows. Motivations of binge-watching were assessed according to the uses and gratifications theory of media use [4]. Feelings before and after binge-watching were explored and gathered into positive and negative ones. Participants were also asked to mention the reasons that made them stop binge-viewing.

Depression

Depression is a mood disorder that causes the feeling of inner emptiness, sadness, exhaustion, loss of interest, and thinking and sleeping turmoil. To assess depression, participants completed the Beck Depression Inventory short-form (BDI-SF) in its French version [5], which is an abbreviated form of the original 21-item BDI [6]. This brief and self-administered scale is composed of 13 items. For each item, the rating ranges from 0 to 3. The depression severity thresholds used are the following scores equal or above 16: severe depression; scores ranging from 8 to 15: moderate depression and scores ranging from 4 to 7: slight depression.

Anxiety

Anxiety is a psychic disorder causing a persistent feeling of worry, anguish, and nervous tension, caused by a state of expectation, uncertainty, or fear. The French version of

the State-Trait Anxiety Inventory (STAI) Form Y originally developed by Spielberger, et al. was used to assess state anxiety (A-State) and trait anxiety (A-Trait) [7]. This relatively brief scale consists of 40 self-report items, with 20 statements for each subscale. All items are rated on a 4-point scale and higher scores indicate greater anxiety [8].

Data analysis

Analysis was carried out with the 20.0 version of SPSS. Mann-Whitney and Kruskal-Wallis non-parametric tests were used when comparing the average depression and anxiety scores between binge watcher groups and the control group. The chi-square test was used to compare sociodemographic characteristics and binge-watching features. In the case of statistical significance in the chi-square test and the invalidity of this test, the comparison of 2 percentages were made by the F-test of equality of variances. The significance level retained was $p < 0.05$.

Results

Participants

Ninety-four participants were recruited. Their average age was of 23 years and the sex ratio was 0.3 (24 males and 70 females). The majority of students were in the second cycle of their medical studies (66%). Among them, 68 (72.3%) claimed that they used to binge-watch TV shows and according to their binge-watching frequency, those for whom these data were available, were sampled as follows: Group 1: $n = 15$, Group 2: $n = 25$ and Group 3: $n = 25$. The non-binge watcher group was composed of 25 participants (Group 0: $n = 25$) and gender distribution within all groups was equivalent.

The socio-demographic characteristics of the binge viewers are specified in Table 1.

Table 1: Socio-Demographic characteristics of the binge viewers.

Socio-Demographic Features	Statistics
Sex	F: 47 (69,1%) M: 21 (30,9%)
Age (Years)	Mean: 22,7 (Min/Max: 19/31)
Academic Level	1 st Cycle: 15 (22,1%) 2 nd Cycle: 49 (72,1%)
Marital Status	Single: 64 (94,1%) Married: 4 (5,9%)
Habitation	Family House: 47 (69,1%) Academic Home: 3 (4,4%) Rented House: Alone: 2 (2,9%) With Roommates: 16 (23,5%) Personal Bedroom Owner: 60 (88,2%)
Electronic Devices And Internet Connection Availability	Tv: 50 (73,5) Desktop Computer: 14 (20,6%) Laptop: 67 (98,5%) Smartphone: 60 (88,2%) Tablet: 31 (45,6%) Dvd Player: 17 (25%) Internet Connection: 64 (94,1%)



Binge-watching characteristics and viewing features

Binge watching was found to be mostly a solitary (89.6%) and nocturnal (85.2%) activity that is practiced in a personal bedroom (63.2%) at the frequency of twice a week or more in 36.8% of cases, weekends being the most frequent periods of viewing (47.1%). Laptops were the most used device for binge-watching and the most common way to watch TV shows was video streaming using the Internet (80.9%). The most watched TV shows were Game of Thrones, Grey’s Anatomy, and Narcos and more than half of the respondents claimed that they followed more than one TV show at the same time.

Engagement in binge-watching was not intended in 53.7% of cases and was preceded by positive feelings. The purpose of taking part in this activity was primarily to know the outcome of an interesting plot (60.3%), to take pleasure (54.4%) and to pass time (38.2%).

The average time spent in TV viewing in one sitting was 3.78 hours (SD = 5.72) and the most cited reason that made participants stop watching was the fact that they get sleepy followed by the obligation to switch to another activity and the unavailability of other episodes to watch. After binge-watching mainly positive feelings were reported (Table 2).

When studying the motives of binge-watching according to its intentionality, seeking sociability and catching up on TV show seasons were the two factors that were significantly associated with intention to binge watching (respectively $p = 0.041$ and $p = 0.015$) (Table 3).

Binge-watching features, depression and anxiety

Within the overall sample studied scores on the BDI ranged from 0 to 31 with an average of 5.28 (SD = 5.06) and corresponded to slight depression in 34% of cases, moderate depression in 17% of cases, and severe depression in 4.3% of cases. State anxiety scores and trait anxiety scores averaged respectively 38.32 (SD = 12) and 42.33 (SD = 11.83) and were above the 95th percentile in 9.5% of cases for state anxiety and 10.7% for trait anxiety.

In order to study the correlation between binge-watching, depression, and anxiety, the means of depression and anxiety scores were compared using the t-test for independent samples between the non-binge watcher’s group (G0) on the one hand and each of the three binge-watcher groups (G1, G2 and G3) and the overall binge-viewers in the other hand.

Depression and anxiety scores were lower among overall binge-watchers compared to the non-binge-watcher group without reaching statistical significance.

Compared to the non-binge watcher group, the means of depression and anxiety scores of groups 1 and 3 showed no significant differences. However, group 2 was found to be significantly less depressed ($p = 0.014$) and had a lower

Table 2: Binge watching characteristics and viewing features.

BW/viewing features	Statistics
Devices used for binge watching	TV: 17 (25%) Desktop computer: none Laptop: 55 (80,9%) Smartphone: 6 (8,8%) Tablet: 6 (8,8%) DVD player: none
Circumstances of the binge watching	The place: At home: 65 (95,6%) At a friend’s house: 3 (4,4%) The room: Personal bedroom: 43 (63,2%) Living room: 10 (14,7%) Time of the day: Morning: none Afternoon: 32 (47%) Evening: 58 (85,2%) Company: Alone: 60 (89,6%) With friends: 8 (11,7%)
Frequency of viewing	≥ Twice a week: 25 (36,8%) Once a week: 22 (30,9%) Twice a month: 3 (4,4%) Once a month: 9 (13,2%) < Once a month: 6 (8,8%)
Periods with more frequent viewing	Weekends: 32 (47,1%) Exams: 14 (20,6%) Vacation: 19 (27,9%)
Feelings before binge watching	Positive feelings: 36 (61%) Negative feelings: 23 (39%)
Intend to binge watch	Yes: 31 (46,3%) No: 36 (53,7%)
Purpose of binge watching	Take pleasure: 37 (54,4%) Pass time: 26 (38,2%) Know the outcome of a plot: 41 (60,3%) Catch up seasons: 13 (19,1%) Sociability: 7 (10,3%) Escape daily life: 15 (22,1%) Sleep seeking: 10 (14,7%)
Time spent binge watching in one sitting (Hour)	Mean: 3,78 (Min/Max: 0,5/12) SD: 5,72
Reasons for stopping viewing	Self-made decision to stop: 16 (23,5%) Someone else makes you stop: 9 (13,2%) No more episodes: 26 (38,2%) Obligation to switch to another activity: 27 (39,7%) Feeling tired: 26 (38,2%) Getting sleepy: 32 (47,1%) Getting starved: 6 (8,8%)
Feelings after binge watching	Positive feelings: 44 (64,7%) Negative feelings: 18 (26,4%)

Table 3: Correlation between intentionality of binge watching and its motivations.

Binge-watching motivations		Intend to binge watch		Statistical Significance (p)
		Yes	No	
Take pleasure	Yes	18	19	0,58
	No	13	18	
Pass Time	Yes	13	14	0,731
	No	14	23	
Know the outcome of a plot	Yes	18	23	0,731
	No	23	14	
Catch up seasons	Yes	10	3	0,015*
	No	21	34	
Sociability	Yes	6	1	0,041*
	No	25	36	
Escape daily life	Yes	9	7	0,327
	No	22	30	
Sleep seeking	Yes	4	6	0,745
	No	27	31	



anxiety state ($p = 0.05$) and trait scores ($p = 0.026$) than the control group (Table 4).

The same trend of these results was found when we compared, among binge-watchers students, the age and gender-matched groups: group 2 and group 3. The latter was found to be more depressed ($p = 0.039$) and scored higher in STAI-Trait Anxiety scale ($p = 0.038$).

Many of the binge-watching characteristics did not differ between these two groups such as the intent to binge, the average exposure time in one setting, and the feelings before and after the binge-watching. Meanwhile, some of the viewing features were found to be significantly prevalent in group 3. The students within this group reported more frequently that the purpose of their binge-watching was to catch up on previous seasons of TV shows ($p = 0.047$) and the ending of the TV viewing was mainly due to the fact that they felt tired ($p = 0.001$) and the decision to stop was more taken by others than by themselves ($p = 0.042$).

Discussion

The purpose of this study was to investigate binge-watching behavior among medical students and assess its correlation with anxiety and depressive symptoms. This population was chosen for the study since binge-watching has been most prevalent in young people [9] and medical students were described as the potential population at risk of problematic viewing time [10].

Using the definition of binge-watching as watching more than two consecutive episodes of the same television show in one setting, the prevalence in our sample was 72.3%. Video streaming using the Internet was the most common way to watch TV shows using mainly laptops. Binge-watching was mostly a solitary and nocturnal activity undertaken mainly during weekends with an average time spent in TV viewing in one sitting of 3.78 hours. In literature, the epidemiological data differed depending on the country of the study, the population studied, and the definition of binge-watching used. Prevalence ranged from 33% to 62% [11] and the most cited platforms used to binge-watch TV were Netflix, Amazon, and Hulu [2] mainly on a TV screen [3] while computers were used secondarily among North Americans and European youth [9,12]. Regarding the social context of viewing, some studies reported that binge-watching is not necessarily an activity preferred to do alone while others agreed that it is a solitary activity occurring often at home and late in the evening [13].

Motivations for binge-watching TV shows were in order of frequency: knowing the outcome of an interesting plot, taking pleasure, and passing time. Uses and gratifications theory [4], primarily developed in the context of TV use, was frequently relied on for assessing binge-watching behavior. Some authors found that enjoyment, efficiency, and fandom were, among several hedonic and utilitarian motivations, those that predicted better binge-watching behavior when demographic factors and frequency of media use were controlled for [14]. The social factor, on the other hand, was significantly associated with intended binge-watching [15] which was consistent with our results.

In this study, depression and anxiety scores were lower among binge-watchers compared to the non-binge-watcher group but without reaching statistical significance. However, when the binge-watchers were divided into 3 groups according to the frequency of their viewing behavior, G2 was found to be significantly less depressed and had lower anxiety scores than the control group.

Few studies have explored the association of BW with anxiety. Addiction to media and technology or their problematic uses has been linked to insecure and anxious attachment styles [16,17]. Viewers with a secure attachment style were found to watch significantly fewer episodes in their marathon experience [18] and attachment anxiety was significantly correlated with ritualistic viewing motivations of binge-watching and the frequency of watching [19]. This study could support our results since we found when comparing binge-watcher groups G3 and G2, significantly higher scores in the STAI-Trait Anxiety scale in G3 ($p = 0.038$) where the frequency of binge-watching was higher.

In the literature, the association between binge-watching and depression had been increasingly studied. Sung, Kang, and Lee 2015 were, to our knowledge, the first authors to claim that binge-watching TV was associated with a feeling of depression and loneliness [20]. Contrary results have been found in R. A. Jacob's study (2017) that concerned 89 college-age and graduate students and found a negative correlation between time spent binge-watching and depressive symptoms [1]. This study could support our findings since although there were no significant differences between the control group and the overall group of binge-watchers in depression and anxiety scores, the binge-viewers scored lesser in both.

In other studies, assessing depression and binge-watching was conducted along with the exploration of some personality

Table 4: Comparison of depression and anxiety scores according to binge-watching frequency.

	Non-binge watchers	Binge watchers								
	Group 0	Overall			Group 1		Group 2		Group 3	
		Scores (Mean, SD)	Scores (Mean, SD)	<i>p</i>	Scores (Mean, SD)	<i>p</i>	Scores (Mean, SD)	<i>p</i>	Scores (Mean, SD)	<i>p</i>
Beck Depression Inventory	6,84 (6,56)	4,72 (4,31)	0,73	4,4 (3,86)	0,18	3,36 (3,1)	0,014*	5,96 (5,33)	0,68	
STAI - State Anxiety	41,64 (12,65)	37,13 (11,75)	0,11	39,06 (12,03)	0,64	35,32 (11,75)	0,050*	36,92 (12,07)	0,1	
STAI - Trait Anxiety	46,08 (12,84)	41,02 (11,27)	0,071	40,26 (10,85)	0,15	37,44 (11,96)	0,026*	44,32 (10,65)	0,64	



traits since dispositional factors could interact to predict TV exposure levels [14]. In their study, Tukachinsky and Eyal (2018) found that depression (but not loneliness) was positively related to the extent of marathon viewing. However, when adding the self-regulation deficiency factor, depression was no longer found as a significant predictor of binge-watching [18]. In fact, the lack of self-regulation and the need for immediate gratification was associated with the extent of binge-watching behavior [21] and the increase in viewing frequency in the case of unintentional bingeing [22].

In Literature, research of binge watching's effects on the psychological state was aligned with the concept of heavy viewing of traditional TV which was associated with depression. TV viewing among young adolescents was found to possibly contribute to depressive symptoms [23] and is associated with adults with poor general mental health [24]. However, this association was attributed by some authors to advertising that one can watch through TV and can negatively impact self-image or to newscasts that might worsen depressive mood [23,25]. Such features don't exist while binge-watching TV since the broadcast stream is uninterrupted [26,27]. Moreover, binge-watching was considered, contrary to TV watching, an active behavior rather than a product of audience passivity [18] where active engagement maximizes enjoyment. Binge-watching is likely to require higher levels of cognitive elaboration and resources to receive and process a large amount of mediated content [14]. According to some, not all TV shows are "binge-worthy" [28], and "bingeable" ones are characterized by complex plots needing a greater cognitive elaboration for comprehending the course of the story [14]. These facts could be supported by our findings since the most reported watched TV shows had such features and more than half of the respondents claimed that they followed more than one TV show at the same time. Additionally, the most cited motive to binge-watch TV shows was knowing the outcome of an interesting plot and in the case of intentional binge watch a significant association was found with catching up on a new TV show season. Along with these data, it seems conceivable that depression scores among binge viewers found in our study were lower in comparison with the non-binge watcher group since cognitive difficulties that are part of depression symptoms could prevent the engagement in this type of activity.

To better explore the association between features of binge-watching and depression and anxiety, binge viewers were divided into three groups depending on how often they engaged in this behavior assuming that a larger amount of media use can reflect a more problematic behavior. Results showed that individuals who binge-watched TV shows at the frequency of twice a week or more (G3) scored significantly higher in depression ($p = 0.039$) and on the STAI trait anxiety scale ($p = 0.038$) than those who did it at the frequency of once a week or once every two weeks (G2).

Wheeler (2015) found, in a sample of college students, that depression was significantly and positively correlated to the frequency of binge watching whether viewing motivations were instrumental or ritualistic. The more participants reported watching back-to-back episodes the higher they scored in loneliness [19].

The same trends were found by Ahmed A. (2017) in their study that concerned a sample of 260 arab participants aged 18 to 48 years and explored the association between binge viewing and depression. Results showed a significant difference between high and low binge-watching groups in their level of depression claiming that high binge-watchers tend to be more depressed than low ones [9]. However, it should be noted that the criteria used to define high and low binge watcher groups weren't clearly identified in this study, and distribution according to gender and age in each group wasn't mentioned although a significant difference in depression scores between male and female was found [9]. In our study, G3 and G2 were age and gender-matched groups thus controlling their effects on depression and anxiety scores. In comparison to G2, some viewing features were found to be significantly more prevalent in G3 and concerned mainly with the reasons for stopping viewing and the manner to do it. Feeling tired was the most prevalent reason to stop viewing among G3 ($p = 0.001$) and the decision to stop was more taken by others than by themselves ($p = 0.042$). These features could express clinical impairment and loss of control, patterns that one might observe in case of addictive behaviors. Some authors have argued that binge-watching could possibly be an addictive behavior with similar characteristics to other behavioral addictions [29] and that addictive symptoms were more common after unintentional binges. For others, it remains imperative to take into account the new consumer behavior patterns within the context of the digital age and to discriminate high (but healthy) engagement from problematic involvement or addiction with the assessment of functional impairment in multiple areas of one's life [30].

Our study aimed to assess depressive and anxious symptoms among binge-watchers and not among problematic or addictive binge-watching viewers but results showed that those who had a quantitatively high engagement in this behavior scored higher in depression and anxiety scales and had some different viewing features that could be attributed to depression or binge-watching patterns in case of depression. In literature, most studies have focused on the gratification and motivations of the viewing but the reasons to stop watching and the manner of doing it have been scarcely studied. To better identify features of problematic binge-watching this area of search should be given more interest in future works. Furthermore, to better understand the direction of the relationship between depression and binge-watching longitudinal studies should be carried out which may lead us to answer the question of whether binge-watching may cause



depression or represents the consequence of the condition. In fact, media could be turned to seek immediate gratifications and binge-watching could be used as a way to cope with negative feelings, escape from reality, and elicit psychological comfort [14,18]. Indeed, in our study, those who binge-watched TV shows in a “reasonable amount” (G2) were found to be significantly less depressed and had lower anxiety state and trait scores than the control group.

In addition to the small sample size, there are some other limits in our study. The population study is exclusively made of students, results cannot be generalized to the general population. Additionally, self-reports used for assessment could suffer biases such as inaccurate memory and social desirability. However, the most important limit remains the binge-watching definition used since it differs from one study to another considering a quantitative variable such as the number of episodes watched or the number of hours spent watching. Should the term “binge-watching” include in its definition qualitative variables such as those proposed by some authors or should be then qualified as problematic behavior, the subject is still debated.

Conclusion

The association between binge-watching, depression, and anxiety remains not well established, and instead, engagement in this behavior in a specific manner could have beneficial effects and elicit psychological comfort. Viewing features associated with problematic binge-watching need further studies to be identified and may include both frequency, gratification, and motivations of the viewing but also the reasons to stop watching and the manner to do it. Other individual characteristics such as gender, personality traits, medical and notably psychological history, as well as their very intention to watch (intentional vs. non-intentional BW), could be controlled in further research on the potential mediators in the relationship between binge-watching, depression, and anxiety. Another research avenue would be to investigate the psychosocial reasons underlying binge-watching to better understand this excessive behavior and assess its impact on emotional states depending on its potential causes.

Statement

The authors declare that they are the sole copyright owner and there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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