

Media Usage, Anxiety, and Sleep

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The prevalence of media and sleep deprivation have influenced researchers to investigate what is causing individuals to lose sleep. Previous research has shown media usage and anxiety impacting the sleep quality of individuals. By administering self-report questionnaires, researchers gathered data to investigate if media usage and anxiety have impacted sleep in adults. Results concluded that media usage and sleep quality are not significantly related. The amount of screens in the bedroom and amount of media used does not impact sleep quality in either gender. However, media usage and anxiety are significantly related. No one gender has higher anxiety, but higher media usage does lead to higher anxiety levels. High anxiety levels impacts sleep quality. As expected, participants reported that their anxiety impacts sleep quality more than media usage. This study provides evidence as to why media usage can negatively impact the well-being of individuals.

In the past few years, the behaviors of adults have changed because of the prevalence of media. Researchers have found a link between media usage, sleep reduction, and anxiety negatively impacting the lives of those in today's society (Excelmans & Van den Bulck, 2017; Vannucci, Flannery, & Ohannessian, 2017). Media takes the form of several different electronic devices, such as television viewing, general social media use, and email. Sleep is vital because of the important role it plays in mood, motor functions, and cognitive abilities. This paper adds to sleep research by further investigating the relationship between media usage and sleep quality, while investigating the source of anxiety.

Disadvantages of Media Usage

The accessibility of media has lead researchers to making connections between newly emerging behaviors and the poor sleep quality observed in today's society. A newly emerged behavior observed in society today is adults using beds for behaviors other than sleeping (Excelmans & Van den Bulck, 2017). Beds are now being associated with texting, emailing, television, and video gaming (Excelmans & Van den Bulck, 2017).

To demonstrate how media has changed our lives, Excelmans and Van den Bulck (2017) concluded that individuals spend on average 17 hours and 55 minutes on media devices before bed in just one week. Cell phones alone consisted of 3 hours and 41 minutes of nighttime media use. Twenge, Krizan, and Hisler (2017) concluded that individuals in 2015 were 16-17% less likely to report obtaining 7 hours of sleep most nights than those in 2009. Prolonged media usage is causing adults to extend their bedtime for up to 46.6

minutes each night (Fossum, Nordnes, Storemark, Bjorvatn, & Pallesen, 2014). For example, adults have reported laying down in bed at 11:00 PM, and commonly getting out of bed at 8:00 AM (Whipps, Byra, Gerow, & Guseman, 2018). Indicating that individuals spend, on average, 8.12 hours in bed each night. However, many adults only have a sleep duration of 7.26 hours. The difference of 0.86 of an hour indicates that adults are spending a portion of their night using media in bed.

However, the overall time in bed does not include any media-related sleep disturbances the individual may experience. Researchers have gathered data on the effects of big and small screened media devices in the bedroom throughout all hours of the night (Falbe, Davison, Franckle, Ganter, Gortmaker, Smith, ... Taveras, 2015). Those who sleep with large screens in their room receive on average 18 fewer minutes of sleep each night, and small screens resulted in individuals losing on average 20.6 minutes of sleep. Small screens can cause a more disrupted sleep duration because of media's ability to emit notifications that can wake the individual up at any point throughout the night. This indicates that having any form of media in the bedroom can cause negative effects on sleep quality. Many wake up feeling unrested, and this is due to the delayed bedtime and interrupted sleep (Falbe et al., 2015).

When using media late into the night, many do not feel fatigued. As a result, the individual stays up later and later into the night. Later bedtimes can be traced back to lights from electronic devices at bedtime prohibiting the brain to signal sleep (King et al., 2014;

2014; Orzech, Grandner, Roane, & Carskadon, 2016). When adults are exposed to bright lights shortly before bed, the pineal gland fails to release melatonin to make the individual feel tired (Orzech et al., 2016). The lack of melatonin being released disrupts the body's circadian rhythm. When circadian rhythms are disrupted, the individual will have poor sleep quality and will not wake feeling well rested. Instead, he will find himself sleeping later and taking naps the next day (King et al., 2014). For example, the mobile game "Pokemon Go" impacted individual's fatigue level and brought them out onto the street at late hours of the night rather than them sleeping (Excelmans & Van den Bulck, 2017). As the accessibility of media devices becomes easier, it is likely that sleep will fail to be prioritized as more important than media usage (Excelmans & Van den Bulck, 2017).

When sleep is not a top priority, the wellbeing, health, and affect regulations of the individual are negatively impacted (Johnson, 2018; Weinberg, Noble, & Hammond, 2016). Even though sleep is just as important as physical fitness or nutrition, media is preventing it from receiving the attention it deserves. The National Sleep Foundation conducted a study that examined the relationship between sleep and next day effectiveness (Johnson, 2018). Researchers concluded that poor sleep has detrimental impacts on how productive individuals are in their daily lives. After using media the previous night, half of adults report fatigue and yawning the following day (Moulin & Chung, 2017). This observation is important because when individuals are notably fatigued they often are not productive and fail to have a good mental state. As a result, they will fail to have good affect regulation. When affect regulation is

suffering negatively, the person will fail to maintain a positive wellbeing (Weignburg et al., 2016). Even though, researchers are obtaining growing knowledge of the negative effects of media usage, males and females are still extensively engaging in variety of media platforms.

Previous research has shown that males spend more time using media than females. King, Zwaans, and Kaptsis (2014) determined that males use media for approximately 218 minutes on weekdays, and 280 minutes a day on weekends. Whereas, females spend 190 minutes a day using media during the week, and use media 223 minutes a day on the weekend. Researchers concluded that the extended media use has resulted in both males and females suffering from bedtime delay, a prolonged sleep onset latency, and sleep interference (King et al., 2014).

Bedtime delay, prolonged sleep onset latency, and sleep interference can be a result of emotional media content impacting sleep quality. Late night fearful post were associated with poorer sleep quality. Early evening hour media usage and positive emotions were associated with better sleep quality (Garret, Liu, & Young, 2018).

Researchers are now investigating if media is a coping mechanism for sleep problems or if media truly delays sleep? By conducting a 3 year longitudinal study, Tarvernier and Willoughby (2014) concluded that those with sleep problems used media as a coping mechanism for insomnia rather than prolonging bedtime as a result of extended media use. This is important because the discovery of media being used as a coping mechanism could lead to future research invalidating prior research regarding media use.

Advantages of Media Usage

Researchers have extensively investigated the negative effects of media use, but using music as a form of media can improve one's sleep quality (Harmat, Takács, & Bódizs, 2008). Harmat, Takács, and Bódizs (2008) demonstrated that listening to classical music for 45 minutes prior to bed can improve sleep quality by relaxing muscles and distracting the individual from his thoughts. This is important because it provides a safe and cheap treatment route for sleep disruptions.

The Relationship Between Media Usage, Anxiety, and Sleep Quality.

As of 2019, few have investigated the role anxiety plays in regards to media usage and sleep quality. However, Woods and Scott (2016) gathered evidence to begin understanding the concept of media usage causing anxiety and impacting sleep. In his study, those who were emotionally invested in media usage had higher anxiety levels (Woods & Scott, 2016). Analyses showed that frequent media users had anxiety symptoms severe enough to be diagnosed with an anxiety disorder. Indicating that media usage causes high anxiety levels (Woods & Scott, 2016). In relation to sleep, poor sleep quality causes anxiety (Mullin, Pyle, Haraden, Riederer, Brim, Kaplan, & Novins, 2017). Self-report diaries and actigraphy readings, lead researchers to determining that poor sleep patterns resulted in individuals having higher anxiety the following day.

As media has become increasingly popular, the lives of media users has drastically changed. The high prevalence of media, anxiety, and sleep disturbances has resulted in

researchers expecting to find six new discoveries. Researchers expect participants, who have more media devices in the bedroom, to have poorer sleep quality (H1). Males will have poorer sleep quality than females (H2). Participants, who frequently use media, will have poor sleep quality (H3). Participants, who frequently use media, will have higher anxiety levels (H4). Those who have high anxiety levels will have a poorer sleep quality (H5). Lastly, participants will predict that anxiety impacts sleep quality more than media usage (H6).

Methods

Participants

This study was conducted using an online survey. A total of 116 (74.1% female, $N=86$) participants ($M=37$ years old, $SD=14$ years) took part in the study. Eighty-six percent of participants identified as European Americans. Participants were 18 years old or older and were recruited through an online subject pool at Indiana University Southeast and Facebook.

Measures

Media use. The variable, media usage, was measured using a 44 item media, technology usage, and attitudes scale (Rosen, Whaling, Carrier, Cheever, & Rökkum, 2013). In the scale, nine items related to smartphone usage and general social media usage. Four items related to internet searching, emailing, media sharing, and text messaging. Three of the items related to video gaming. Two items related to friendships, online friendships, Facebook friendships, calling, and television viewing. For items 1-40, a 10-point frequency scale was used. For example, the participants selected 1 if they never used media and 10 if they used media all the time. Items 41-44 addressed Facebook and other online friendships. The items were measured using a 9- point scale. Participants had the options of rating their online friendships to 1-0

friends, 2-1-50 friends, 3-51-100 friends, 4-101-175 friends, 5-176-250 friends, 6-251-375 friends, 7-376-500 friends, 8-501-750 friends, or 751 or more friends. The original questionnaire contained an additional 16 items that measured the attitudes of the participants. However, that portion was not used in the survey provided to the participants in this study. Researchers scored the questionnaire by tallying up points for each answer. For example, if the participant selected that he never uses media, he would receive zero points for the statement. However, if he selects that he uses media all the time, he would receive 10 points. A score of 200 or above indicates that the participant has high media usage.

Sleep quality. The Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality (Buysee, Reynolds, Monk, Berman, & Kupfer, 1989). The index specifically measured sleep duration, sleep disturbance, sleep latency, day dysfunction due to sleepiness, sleep efficiency, overall sleep quality, and if medicine is needed to sleep. By using a Likert Scale, participants had the option of selecting answers that held a value of 0 to 3 points. If the participant continuously selected answers that have a value of zero, they received a score of zero for their PSQI score. Zero indicates that the individual has good sleep quality.

Anxiety. A 10 item anxiety self-rating scale was used to measure the levels of anxiety participants feel in their daily lives (*Anxiety Self-Rating Scale*, n.d.). The scale measured feelings of tension, nervousness, restlessness, agitation, anxiousness, fear, worries, difficulty sleeping, eating, digesting food, relaxation, concentration, memory, thinking, and physiological symptoms. Participants used a Likert Scale with answers holding values ranging from zero to four. A rating of zero indicated that feelings of anxiety never occurred to the participant. A rating of one indicated that anxious feelings sometimes applies to the participant. A rating of two

indicated that anxious feelings occurred to the participant half the time. Three indicated that anxious feelings happen to the participant frequently. Four indicated that anxious feelings always applies to the participant. The participant's anxiety ratings were tallied up and each participant was given a score. The participant's anxiety levels were categorized.

Media Device Availability. To measure how media usage is impacting sleep quality, researchers gathered data regarding how many media devices participants have in their rooms throughout all hours of the night. Research has concluded that the more devices are present in the bedroom at night the more sleep quality is impaired. To gather data, researchers asked the open-ended question "How many electronic devices do you have in your room?" The researchers provided examples of common electronic devices found in bedrooms. Examples included: Televisions, Mobile Phones, Video Gaming Systems, Laptops, Tablets, etc. Participants entered a numerical value to represent how many devices are in their bedroom.

Results

T-test analyses were used to determine differences between males and females on sleep quality and anxiety. A t-test analysis revealed that there was no significant difference between males and females in regards to sleep quality. A t-test analysis revealed no significant findings between gender and anxiety levels.

Correlational analyses were used to determine relationships between media usage and sleep quality. A correlational analysis revealed that those who had more media devices in the bedroom did not have poorer sleep quality $r(80) = .113, p > .05$. A correlational analysis indicated that there was no significant relationships between eleven media usage subscales and sleep quality.

A correlational analysis was used to determine if a significant relationship existed between anxiety levels and sleep quality. The analysis revealed a positive correlation between anxiety levels and sleep quality, indicating that higher anxiety levels results in poorer sleep quality $r(92)=.614, p<.01$.

Correlational analyses were used to determine if a relationship existed between media usage subscales and anxiety. A correlational analysis indicated that five specific areas of media usage resulted in higher anxiety levels. Participants that searched the internet more frequently had higher anxiety levels. Participants that often did activities on social networking sites had higher anxiety levels $r(94)=.353, p<.01$. Participants who did more activity on their mobile phones had higher levels of anxiety $r(100)=.304, p<.02$. Participants who sent and received text messages, checked for voicemails, and used their mobile phones during school and work hours had higher levels of anxiety $r(102)=.229, p<.05$. Participants who interacted with unmet in person online friends had higher levels of anxiety $r(92)=.295, p<.04$. Refer to Table 1 for correlational strengths of media usage and anxiety.

By running a frequency analysis, researchers determined that 57.8% of participants predicted that their anxiety levels impacted their sleep quality more than media usage.

Table 1

Media Usage and Anxiety

	Anxiety
Media Usage	
Email	-.06

Phone Call	.03
TV Viewing	.18
Internet Searching	.37**
Media Sharing	.56
General Social Media	.35**
Smart Phones	.30*
Texting	.23*
Videogaming	.17
Facebook Friendship	.09
Online Friendship	.30*

Numbers are correlations.

* $p < .05$, ** $p < .01$.

Discussion

The present study sought to examine the relationship between media usage, anxiety, and sleep quality. Results from this study revealed that there is no significant relationship between sleep quality and media usage. However, there is a significant relationship between sleep quality and anxiety. The strongest association was found in regards to more media usage resulting in higher anxiety levels. The relationship between media usage and anxiety levels was greatest for those who actively use internet searching, general social media, smartphones, texting, and have online friendships.

These results highlight the importance of limiting media use as a way to reduce anxiety levels. In our study, men and women had equal reports of anxiety, but their ages greatly differed. Future research may benefit from restricting age groups when measuring anxiety to understand generational differences. Generational differences may appear due to younger participants being

more stressed as a result of school and finances. However, as a result of our broad age range, our anxiety levels may have better reflected the general population because we did not restrict our age range to college students.

As expected, the prediction of anxiety impacting sleep quality more than media usage was present. Specifically, researchers observed that as anxiety increases, the PSQI score does as well. This indicates that participants with higher anxiety had poorer sleep quality. The significant findings are potentially due to how stressful everyday life can be. The stress of missing out on social media or experiencing restlessness from lack of sleep can disrupt how an individual functions in daily life. Regardless of the cause, perceived anxiety results in poor sleep quality.

Studies, such as Whipps, Byra, Gerow, and Guseman's (2018), concluded that individuals with cellphones or tablets in their room are significantly more likely to be woken during nighttime hours. However, data has revealed that is not true. Having a media device in the bedroom throughout all hours of the night can be helpful. Media may emit music that helps the individual fall asleep or provide reassurance that one will be up on time by acting as an alarm clock (Harmat et al., 2008). The presence of media in the bedroom does not significantly impact sleep quality in either gender.

However, in this study, the researchers suspected that males would have poorer sleep quality due to video gaming, but that was not reflected in the data. Future research should expand upon this topic by measuring participant's media usage two hours prior to bed. Possible psychological and physiological arousal close to bedtime could prohibit the release of melatonin and prevent fatigue.

There are strengths of the current study, including the wide range of participants recruited, multiple databases were searched, and quality assessments were used to measure the study's variables. However, our conclusions have limitations. When participants complete self-report measures, there is a chance of their answers containing biases.

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