

Teenagers in the New Media Era: The Dual Dilemma of Sleep and Anxiety

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Abstract. With the popularization of digital technology and the rapid development of mobile Internet technology, new media has become an important part of teenagers' daily lives. Social media is becoming the core platform for them to obtain information and engage in social interaction. This study focuses on the adolescent group and systematically explores the influence mechanism of new media content and dissemination methods on their sleep quality and anxiety. Research has found that the impact of new media on the mental health of teenagers exhibited a multi-path characteristic: new media intensifies teenager's catastrophic cognition through the information cocoon effect and big data push, triggers a crisis of social confidence through social comparison, and disrupts sleep rhythms by altering their circadian rhythms. It is inducing the magnification of appearance anxiety and other factors that exacerbate the anxiety of teenagers. The research finally puts forward targeted suggestions from multiple aspects such as individuals, families and schools, providing theoretical references for improving the mental health status of teenagers.

Keywords: New media, teenager, sleep quality, anxiety

1. Introduction

Teenagers around the world are undergoing profound changes brought about by digital technology. According to the 2024 Report on Chinese Adolescents' Internet Usage by Beijing Normal University: By 2024, Internet users aged 10 to 19 accounted for 13.6% of global Internet users, with their average daily online time exceeding three hours. Among them, social media, short-video platforms and instant messaging tools are the: teenagers primarily use social media short-video platforms and instant messaging tools. New media profoundly influences the cognitive patterns and emotional regulation of teenagers through personalized algorithms, immersive interaction design and virtual identity construction. However, this technological empowerment comes with significant risks: According to data from the World Health Organization (WHO), 28% of teenagers worldwide suffer from sleep disorders, among which 43% report moderate to severe anxiety symptoms. The popularization of new media highly coincides with the high incidence of mental health problems among teenagers in terms of time. This study aims to reveal how new media content and dissemination methods affect sleep and anxiety through cognitive and behavioral pathways, such as information cocoons, erosion of social confidence, and the spread of bad behaviors.

2. Core concept definition

2.1. The definition and characteristics of new media

New media is a concept that differs from traditional media such as newspapers, radio and television. It refers to a form of communication that relies on digital technology, network technology and mobile communication technology, and provides information and entertainment services to users through channels such as the Internet, wireless communication networks and satellites, with terminals such as computers, mobile phones and tablets as the carriers [1].

Its core functions include personalized recommendation, achieving precise content delivery through user profiling, such as the "For You" page of Tik Tok [2]. Multimodal interaction, integrating short videos, live streaming, and virtual reality (VR), enhances immersive experiences [3].

With the deep integration of new media into daily life, its implicit and explicit impacts on individuals' physical and mental health are continuously drawing attention from both the academic community and society. Teenagers, as the most active group in using new media, are in a critical period of physical and psychological development. Their sleep quality, emotional state and other aspects, influenced by the unique mechanism of new media, have become important topics for in-depth analysis.

2.2. Measurement of anxiety disorders and sleep quality

Anxiety levels and sleep quality are important indicators reflecting the physical and mental health of adolescents.

Anxiety disorder is a group of mental disorders characterized by mental health conditions marked by persistent worry as the main clinical manifestation. Adolescent anxiety disorder is age specific. It is often manifested as excessive worry about studies, social interactions, appearance and other aspects [4]. Unlike situational anxiety, pathological anxiety is characterized by persistence (lasting for more than six months), a sense of loss of control (unable to be relieved through self-regulation), and functional damage (affecting study, life and interpersonal communication). Common types of anxiety among teenagers include social anxiety disorder (fear of being evaluated), generalized anxiety disorder (excessive worry about multiple things), and specific phobias (such as fear of facial defects).

Sleep quality refers to the effectiveness and satisfaction of the sleep process, including dimensions such as time to fall asleep, sleep duration, sleep continuity and sleep depth [5]. Teenagers (aged 13 to 19) need 8 to 10 hours of sleep every day. Poor sleep quality can lead to problems such as inattention, large mood swings, and weakened immunity. The measurement indicators include sleep latency (more than 30 minutes is abnormal), the number of awakenings at night (more than 2 times is abnormal), and sleep efficiency (less than 85% is abnormal). Studies have shown that insufficient sleep (<7 hours per day) increases the risk of anxiety by 2.3 times [2].

3. The impact of new media on the sleep quality of teenagers

3.1. Disorder of physiological rhythms

The blue light emitted by new media devices (such as mobile phones and tablets) can inhibit the secretion of melatonin, which is a key hormone regulating the sleep-wake cycle. A follow-up study on teenagers aged 15 to 18, Among the 200 adolescent participants in the study, the male-to-female

ratio was 1:1. The result shows that teenagers who use their mobile phones one hour before going to bed secrete 37% less melatonin than those who do not. The average delay in falling asleep for them is 48 minutes [6]. For instance, many teenagers are accustomed to watching short videos before going to bed. The continuous blue light from the screen stimulates the retina, causing the brain to misinterpret cues as indicators of daytime, and thus, disrupting the biological clock. In addition, the "emotional awakening" effect of new media content intensifies physical excitement. Violent games, thrilling short videos and other stimulating content can increase the heart rate and cortisol (stress hormone) levels of teenagers. Even if it is stopped, it still takes several hours for teenagers to return to a relaxed physiological state and prolong the latency to sleep [7].

3.2. The disruption of sleep continuity caused by information overload

Stimulating content recommended by algorithms (such as violence, sex, disaster news) can cause cognitive excitement in teenagers, making it difficult for them to fall into slow-wave sleep or REM stages. The "immediacy" and "unlimited content flow" design of new media have led teenagers to "passively stay up late". For instance, the "pull-down refresh" feature of short-video platforms and the "continuous attraction" recommended by algorithms make teenagers keep using them under the psychological suggestion of "watch the last one", directly reducing their sleep time. In addition, nighttime message notifications disrupt sleep continuity. To maintain social connections, teenagers often set their mobile phones to "never mute" mode. At night, message alerts from social apps like WeChat and QQ frequently disrupt their deep sleep. Studies have found that teenagers who frequently check their mobile phone messages at night have 2.3 times more nocturnal awakenings than those who do not check, and this fragmented sleep can seriously reduce sleep quality [8].

3.3. A comparative analysis of previous empirical research designs

From the perspective of the selection of research subjects, the international academic community pays more attention to the representativeness and heterogeneity of the samples. The transnational study covered 87,000 adolescents aged 11-19 in 15 countries in Europe, North America and East Asia [9]. Through three-dimensional stratified sampling of family income, parents' educational level and urban-rural attributes, the moderating role of SES in media use and sleep quality and new media usage on sleep was discovered: Teenagers with low SES, due to the lack of family guidance on "digital boundary management", such as parental regulation over nighttime screen use. They use their mobile phones 2.1 times more frequently before going to bed than those with high SES, and the incidence of sleep disorders is 37% higher. This study overcame through the limitation of a single-nation sampling and revealed the moderating effect of the social environment on the relationship between new media and sleep.

Chinese research, focuses more on the particularity of local educational scenarios. One prior study conducted a comparison between Chinese teenagers in the compulsory education stage (grades 7-9) and those in the high school stage (grades 10-12) [10]. A sample size of 3,200 people (58% junior high school students and 42% senior high school students) was found to have developed a "compensatory usage" pattern among senior high school students due to the pressure of further education. Although the average daily usage duration (2.1 hours) was lower than that of junior high school students (2.8 hours), the "obsession degree" of using it before going to bed (such as the self-reported proportion of "unable to fall asleep without using the phone") was significantly higher (62% vs 41%), and the negative correlation between sleep efficiency and usage duration was

stronger ($r=-0.43$ vs -0.31). This discovery echoes the "stress-media dependence" theory, which suggests that academic pressure may intensify the disruptive effect of new media on sleep.

Both international and Chinese studies have confirmed that new media use has a significant negative impact on adolescents' sleep, social environmental and individual stress factors. Such as socioeconomic status and academic pressure will strengthen this association. However, both share common limitations, including inadequate sample coverage, insufficient verification of causal relationships, and a lack of long-term tracking data.

4. The influence of new media on the anxiety level of teenagers

4.1. Information cocoon and the solidification of disaster-oriented thinking

New media algorithms push homogeneous content through user profiling, forming an "information cocoon". The algorithm achieves invisible manipulation of cognition through selective push, which is essentially a form of "mental manipulation". It takes advantage of teenagers' curiosity and sense of unease to repeatedly reinforce specific viewpoints, causing them to lose their independent judgment ability and fall into the cognitive framework set by the algorithm. Some teenagers, due to frequently coming across the term "infidelity in love", firmly believe that everyone will be betrayed, thus developing a fear of love and feeling anxious and uneasy in it. Teenagers who have been exposed to disaster news for a long time will worry that constantly fear for their family members' safety. Even if they come home a little late, they will become overly anxious and their emotions will break down. This mechanism distorts teenagers' judgment of risk probability by repeatedly presenting negative cases, magnifying low-probability events as "inevitable" disasters [11]. The above phenomena may lead to an increase in the anxiety levels of teenagers.

4.2. Erosion of social confidence

For introverts: Introverted teenagers are usually passive and sensitive in real social interactions, while the anonymity and delayed response functions on social media make it easier for them to express themselves. However, for a long time, the textual embellishment, the assistance of emoticons and the "think twice before you act" responses in online communication have made them unable to adapt in face-to-face communication and even more self-conscious. Teenagers who spend more than 20 hours a week on online socializing are 3.1 times more likely to experience anxiety symptoms such as incoherent speech and avoiding eye contact in real social interactions than ordinary teenagers.

For extroverts, social anxiety is more common: Although extroverted teenagers are passionate about socializing, the "performative" nature of social media can exacerbate their anxiety. They need to maintain a "popular" image (such as high likes and many comments) and constantly compare themselves with others' "perfect lives". A study of Instagram users, Among the 350 13- to 17-year-old adolescent samples participating in the study, the ratio of male to female was 52% to 48%. The study found that the proportion of extroverted teenagers experiencing anxiety due to the fear of "no attention on their posts" reached 68%, significantly higher than that of introverts [12].

4.3. Appearance anxiety and body shape anxiety

Social media has constructed single aesthetic standards. through filters, photo editing tools and the effect of Internet celebrities. After teenagers repeatedly encounter these ideal figures, they will internalize these idealized body image as the standards for self-evaluation and become dissatisfied

with their own appearance and figure. On social media, when they post their own videos or photos on Tik, Tok or Instagram, the evaluations of others can also affect their perception of themselves, causing anxiety and a lack of confidence. Some junior high school students imitate the "fasting weight loss method" of Internet celebrities, which leads to adverse effects such as malnutrition, sleep disorders and menstrual irregularities.

Anxiety further drives some irrational behaviors: Some teenagers, to become more beautiful quickly, choose unregulated medical aesthetic procedures (such as injecting illegal hyaluronic acid), which result in facial infections. Some others devote too much energy to "becoming beautiful", neglecting their studies and academic responsibilities and extracurricular pursuits. When their appearance fails to meet expectations, they fall into deeper self-denial.

4.4. Imitation of bad behavior and secondary anxiety

Some parents and schools adopt a one-size-fits-all ban strategy towards new media content, such as strictly prohibiting access to sex education content and deleting social media apps. Moreover, teenagers in their rebellious period are thus aroused with an even stronger sense of curiosity. The anonymity, immediacy and easy accessibility of new media have made it a "grey channel" for some teenagers to release their anxiety. Moreover, this kind of release is essentially a case of short-term relief strategy that proves counterproductive. Instead, it will intensify anxiety through psychological backlash and further deteriorate sleep quality. The algorithmic push of pornographic content and the dissemination of distorted knowledge are typical traps of "anxiety transfer". Some teenagers, after experiencing anxiety due to academic pressure and social setbacks, will search for pornographic content through new media. The algorithm of the platform will continuously push explicit information based on the browsing records, forming a cycle of "browsing - brief pleasure - deeper emptiness". What is even more dangerous is that non-scientific sexual knowledge on new media (such as "sexual conquest proves charm") can distort their perception. Some teenagers imitate the behaviors in vulgar content to prove their self-worth, which leads to emotional disputes or unexpected consequences. This sense of "behavior-consequence" loss of control can cause their anxiety levels to rise sharply. When browsing such content at night, not only does blue light inhibit the secretion of melatonin, but the interweaving of psychological shame and excitement also prolongs the latency to sleep and may even lead to frequent awakenings at night. Cyberbullying is another distorted form of "aggressive release". The anxiety that teenagers accumulate in reality (such as being isolated and lagging behind in academic performance) can be transformed into attacks on others through the anonymous environment of new media. They will quickly cause harm through behaviors such as real-time on-screen messages (also known as "danmu"), sending private messages to abuse, and editing pictures to spread rumors, taking advantage of the platform's immediate interactivity. What is more serious is that the "digital traces" of bullying behavior (such as chat records and screenshots) may become a long-term threat. This sense of worry about being exposed at any time can transform anxiety from a "temporary release" to a "chronic distress". This further leads teenagers into a vicious cycle of "staying up late to check the traces on their phones - worse sleep - symptoms such as restlessness, Irritability, or sleep disturbances". These teenagers involved in cyberbullying may either be anxious for fear of retaliation or have moral anxiety for harming others [13].

4.5. A comparative analysis of previous empirical research designs

International research shows a diverse differentiation in the application of theoretical frameworks [14]. A meta-analysis based on the "Social Comparison Theory" (including 53 studies with a sample size of 23,000 people) found that the intensity of the association between social media use and adolescent anxiety varies depending on the direction of comparison: The effect size of the upward comparison (compared with the superior ones) ($r=0.38$) was significantly higher than that of the downward comparison ($r=0.09$), and the frequency of the upward comparison among female adolescents was 1.7 times that of male adolescents, which partly explains the gender difference in anxiety. This study, through subgroup analysis, refined the boundaries of the role of social comparison in different groups.

Chinese research, focuses more on the interaction between "face anxiety" in the context of local culture. In this study, the local culture is mainly manifested as the collectivist tendency and social mobility psychology unique to China. Collectivism makes people pay more attention to group evaluations in social interactions. Online feedback such as the number of likes is prone to cause anxiety. The strong desire of rural teenagers for "upward mobility" in the context of urban and rural areas makes them more sensitive to the "display gap" of online life. These cultural traits profoundly influence their psychological responses in new media interaction. One study based on the "Impression Management Theory", selected 1,380 adolescents (covering both urban and rural areas) and found that the predictive effect of "likes on Moments" on anxiety was more significant in groups with a strong collectivist tendency ($\beta=0.32$ vs 0.18) [15]. Moreover, rural teenagers have a stronger desire for upward mobility and are more sensitive to the "online display gap" (on a five-point self-reported anxiety scale, with a difference in anxiety scores of 1.2 out of 5). This discovery combines the Western theoretical framework with local cultural variables, expanding the applicability of the theory.

5. Discussion and suggestions

5.1. Research findings and discussions

This study confirms the impact of new media on the sleep quality and anxiety of teenagers. Its influence does not refer to through a single channel. Instead, it functions through multiple pathways such as the physiological level (blue light from the screen), the psychological level (information cocoon), and the social level (social comparison). Furthermore, improper control may exacerbate the problem. Simple prohibitions or excessive control by parents can cause rebellious psychology in teenagers. This turns them to covert use (playing with their mobile phones under the covers), increasing the risk of exposure to inappropriate content and affecting their sleep quality.

5.2. Targeted suggestions

Teenagers should learn to identify the information cocoon, take the initiative to get in touch with diverse information, discuss with friends and family around them, and not let their thinking become rigid. They need to enhance their social skills through discussion and communication, become more positive and confident, and replace the use of social media with exercise and meditation. Parents should not avoid excessive control either. They can spend more time with their children and reduce teenagers' reliance on new media. In response to their doubts during their growth, provide reasonable and correct suggestions. Effectively popularize sexual knowledge and prevent children

from learning related knowledge through bad websites. Schools should offer relevant media literacy courses to teach students to view new media content critically, combat inappropriate information such as cyberbullying, and guide teenagers to develop diverse, open and reasonable thinking. Schools can set up psychological counseling rooms and offer group counseling sessions to address anxiety caused by new media, such as social skills training and stress management courses. Schools can also organize offline activities (such as sports meets and club activities) to provide teenagers with real social opportunities and reduce their reliance on virtual socializing.

6. Conclusion

The influence of new media on the sleep quality and anxiety of teenagers is complex: The information cocoon constructed by algorithms solidifies catastrophic thinking, and social media weakens the confidence in social media in reality. Appropriate control by parents can lead to irrational behavior and intensify rebellious imitation. These influences are not uncontrollable but can be mitigated through the joint efforts of teenagers themselves, their families, schools and society. Through continuous attention and intervention, it is expected to build a healthier new media environment and promote the physical and mental health development of teenagers.

References

- [1] Chen, C. F. (2021). Introduction to new media (3rd ed.). China Renmin University Press.
- [2] Sun, X., et al. (2022). The impact of smartphone addiction on sleep quality among Chinese adolescents. *International Journal of Environmental Research and Public Health*, 19(12), 7345.
- [3] UNESCO. (2021). Guidelines for the protection of children from harmful content online. Paris: UNESCO Publishing.
- [4] Liu, Z. N. (2022). Diagnosis and treatment of anxiety disorders in children and adolescents. *Chinese Journal of Psychiatry*, 55(1), 12–18.
- [5] Zhang, B. (2020). Introduction to sleep medicine. People's Medical Publishing House.
- [6] Walker, M. (2021). Blue light exposure and melatonin suppression in adolescents. *Sleep*, 44(3), zsab056.
- [7] Li, X., Zhang, Y., & Wang, L. (2023). Social media use and sleep quality among adolescents: A meta-analysis. *Journal of Pediatrics*, 251, 89–96.
- [8] Zhao, J., Li, S., & Chen, H. (2022). Nighttime smartphone use and sleep continuity in Chinese adolescents. *Journal of Pediatric Psychology*, 47(2), 189–198.
- [9] Hale, L., Berger, E., & Meltzer, L. J. (2022). Socioeconomic status and screen time as predictors of adolescent sleep: A cross-national analysis. *Journal of Sleep Research*, 31(2), e13562.
- [10] Chen, L., Wang, H., & Li, N. (2023). A study on the relationship between new media usage patterns and sleep quality among adolescents in different school stages. *Chinese Journal of School Health*, 44(6), 865–869.
- [11] Zhou, S. Y. (2024). The mechanism of information cocoon's influence on adolescents' cognitive biases. *Journalism & Communication*, 31(1), 5–20.
- [12] Smith, A., & Johnson, L. (2022). Social comparison on Instagram: Differences between introverted and extroverted adolescents. *Journal of Youth and Adolescence*, 51(4), 789–803.
- [13] Li, M., Wang, Y., & Zhang, Q. (2023). Parental control and adolescents' problematic social media use: The mediating role of reactance. *Journal of Adolescence*, 98, 45–53.
- [14] Kelly, Y., Zuckerman, M., & Cao, L. (2022). Social media use and anxiety in adolescents: A meta-analysis of the role of social comparison. *Developmental Psychology*, 58(3), 456–472.
- [15] Lin, X., Zhao, P., & Fang, Y. (2024). Social media use, face anxiety, and adolescent depressive emotions: The moderating role of collectivist orientation. *Psychological Science*, 47(1), 102–109.