

The Role of Infinite Scrolling and Algorithmic Recommendations in Cognitive Decline Among Short-Form Video Users

Majedah Alrooqi¹, Nouf Alblwiy¹, Nourah Aldosari¹, Mostafa Elgayar¹

Department of Computer Science, Arab East Colleges, Riyadh 11583, Saudi Arabia

Email address: mmalgayar@arabeast.edu.sa

Abstract— Short-form video platforms like TikTok, Instagram Reels, YouTube Shorts, and Snapchat Spotlight are widely used by young people. While they offer entertainment and interaction, excessive use may contribute to attention problems, cognitive fatigue, shallow processing, and reduced self-control, often described as “Brain Rot.” This study examines how infinite scrolling and algorithmic recommendations may intensify these symptoms by encouraging prolonged use and limiting stopping cues. It proposes a quantitative survey to measure usage patterns, platform features, and related cognitive symptoms.

Keywords— Short-form videos; Infinite scrolling; Algorithmic recommendations; Brain Rot; Attention difficulties; Cognitive fatigue; Executive function; Social media use.

I. INTRODUCTION

Short-form video platforms TikTok and Instagram Reels and YouTube Shorts and Snapchat Spotlight have become the primary method for online entertainment and socializing among high school students and college students. The design of short-form video applications creates an experience where users can watch short videos that show dynamic visual content which updates at a fast pace. The platform achieves its success through interface components which enable users to watch endless streams of personalized content without needing to make any effort to find new videos according to previous research studies which showed this effect (Y. Duan et al, 2024) & (R. F. Alruwaili, 2025). The design mechanisms of the platform enable users to watch new videos by using simple methods which require no conscious choice to continue their viewing experience.

The rapid growth of short-form video consumption has raised concerns about its possible cognitive and psychological consequences. Previous studies have linked problematic short-form video use with reduced attention control and poor self-regulation and cognitive fatigue and impaired executive functioning and lower academic engagement. The results of multiple research studies show that excessive video watching leads to three negative outcomes which affect both mental and physical health and sleep quality and overall life satisfaction. Short-form video consumption creates two distinct impacts on users which include both entertainment preferences and a behavioral pattern that results in measurable cognitive and psychological changes.

Short-form video platforms achieve high levels of user engagement because they utilize algorithm-driven recommendation systems. The systems use user activity data

which includes watching time and liking and sharing and commenting and pausing and replaying and scrolling activities to create content predictions that maintain audience interest (Yang, 2025), (Qin, 2023). Users find personalized content more relevant but this system creates repetitive feedback loops which constantly show users highly stimulating content. The process leads people to rely more on media which provides instant emotional satisfaction while they find about studying and reading and problem-solving and deep thinking to be less appealing.

The design element of infinite scrolling serves as a major factor which promotes users to engage in extended and regular platform usage. The standard media interfaces of traditional media provide viewers with natural content breaks which occur at points like page boundaries and episode endings and content selection times. Infinite scrolling technology enables users to access fresh material without interruption because it keeps supplying content during their scrolling activities (A. Weinstein et al, 2024). The design creates a frictionless experience which results in users losing track of time while their viewing sessions extend beyond their planned duration and they keep watching material until their original goal has been achieved. Users who experience infinite scrolling with algorithm-driven recommendations will develop compulsive behavior because the system provides them with continuous fresh content that matches their interests.

People started using the term “Brain Rot” to describe how their minds function after they watch short videos that require little effort to understand. Brain Rot lacks official recognition as a clinical diagnosis, but users apply the term to describe their experience of diminished attention capacity, mental exhaustion, difficulties with focus, limited processing ability, and reduced desire to engage in difficult mental activities. The research concepts of cognitive overload, attentional fragmentation, executive dysfunction and problematic digital media usage show a similarity with these experiences (J.-H. Ye et al, 2025). Brain Rot functions as a descriptive term in this study because it describes the cognitive difficulties people experience when they watch excessive short-form videos, which they associate with their digital consumption habits.

The number of studies about short-form video addiction has grown, yet research on this topic still contains major research deficits. Previous studies have focused on studying these areas general problematic usage, addiction symptoms and mental health results and academic effects. Research on Brain Rot

cognitive symptoms needs dedicated studies which investigate how platform design elements like infinite scrolling and algorithmic recommendation systems affect user behavior. The existing literature investigates social media usage patterns yet short-form video platforms introduce specific features which distinguish them through their brief content intervals and their tendency to produce new material. The way users engage with these platforms produces cognitive outcomes which differ from their social media activities and their long-form video viewing patterns.

The research problem addressed in this study is that short-form video users may experience perceived cognitive decline, including attention difficulties, cognitive fatigue, reduced self-control, and shallow thinking, as a result of prolonged exposure to infinite scrolling and algorithmically recommended content. However, the relationship between these platform features and Brain Rot-related symptoms remains insufficiently examined. Understanding this relationship is important because short-form video platforms are now deeply integrated into students' daily routines, and their excessive use may affect academic performance, learning habits, emotional regulation, and long-term cognitive engagement.

The study aims to find out how infinite scrolling and algorithm recommendation systems affect short-form video users who experience Brain Rot cognitive symptoms. The study investigates whether short-form videos cause users to experience attention problems and cognitive exhaustion and executive function impairment and diminished ability to think deeply and develop compulsive viewing habits. The study investigates how infinite scrolling and algorithm recommendations lead to these symptoms through their design which promotes users to watch content in a. The study investigates how platform design elements affect user behavior through their relationship with technological design elements.

The research analyzes platform design effects on cognitive outcomes through its examination of short-form video user behavior as both an individual habit and self-control challenge. The study adds to existing research by investigating how digital media use affects cognitive function through its impact on persuasive technology. The findings help students and educators and parents and platform designers and the government understand how short-form video platforms affect cognitive risk and develop strategies for healthier digital media consumption. This study makes three main contributions. The study investigates Brain Rot symptoms through its analysis of short-form video viewing habits. The study identifies two platform features which cause these symptoms through their system of infinite scrolling and their algorithm-based content recommendation system.

II. RELATED WORK

A. Short-Form Video Use and Problematic Consumption

Research studies focus on short-form video platforms because these platforms create extreme user interaction rates. The platforms operate differently from standard social media platforms by using short content times together with instant content transitions and automatic content playback and unlimited content viewing and user-specific content

suggestions. Users achieve the ability to watch various types of content during brief time intervals because they require minimal mental processing. The research studies define problematic short-form video viewing as a behavioral pattern which people watch videos uncontrollably for extended periods while repeatedly checking their usage of videos and finding difficulty to stop viewing and continue watching despite experiencing bad outcomes (Y. Duan et al. 2025), (J. Zhu et al.2025).

The researchers from (Duan et al. 2025) investigated how short-video addiction interacts with mental health and executive function abilities through their study. The researchers used longitudinal methodology to study short-form video usage because they discovered that it creates psychological problems which develop into cognitive control issues throughout time. The research shows that short-form video addiction should be examined as a complex behavioral process instead of being treated as an ordinary form of entertainment. The research by (Liu et al.2025) discovered that TikTok users who encountered problems with the platform used self-control techniques which affected their ability to concentrate on their academic work at school.

Research has also examined the psychological predictors and consequences of problematic short-form video use. (Hou et al. 2025) discussed problematic TikTok use in relation to cognitive absorption, nomophobia, and life stress. Their findings suggest that users may become deeply absorbed in TikTok content, especially when the platform is used as a coping mechanism for stress or emotional discomfort. This is relevant to the present study because cognitive absorption may increase the likelihood of extended scrolling sessions and reduce awareness of time spent on the platform.

Although these studies provide strong evidence that short-form video use can become problematic, many of them focus primarily on addiction symptoms, psychological distress, or academic engagement. Less attention has been given to the specific technological features that may drive this behavior. The present study addresses this limitation by focusing on infinite scrolling and algorithmic recommendation systems as design mechanisms that may contribute to Brain Rot-related symptoms.

B. Short-Form Video Use, Attention, and Cognitive Fatigue

Your research shows that scientists study attention as one of the main cognitive processes which people use to watch short-form videos. Short-form videos use fast transitions and music and captions and visual effects and emotional cues and novel elements to achieve their purpose of quick audience attention capture. The features of the system drive user engagement but users who watch fast-paced content with strong visual stimulation will develop problems maintaining focus on activities which have lower visual intensity.

The study conducted by (Alruwaili, 2025) examined how Saudi social media users interact with scroll immersion and short-form video content while showing that short-form video viewing results in three main effects which are attention loss and memory impairment and fatigue. The study provides regional evidence through its Saudi user research which makes

the study valuable for researchers studying similar cultural and digital contexts. The research results indicate that short-form video usage leads to cognitive fatigue which makes it hard for people to keep their focus on activities that require prolonged attention which are the main symptoms of Brain Rot.

The research by (Yan et al. 2024) discovered that people who become addicted to short-videos on mobile phones tend to experience decreased ability to maintain their focus. The research showed that users who belong to the short-video addiction group exhibit both weak self-control abilities and decreased executive functions which help them direct their focus. People who experience problematic short-form video viewing will spend more time online while they struggle to control their focus and stay away from interruptions.

(Ye et al. 2025) examined short video usage intensity, perceived mood enhancement, and attention control among adolescents. Their work is relevant because it connects usage intensity with attention-related outcomes and the idea of "TikTok Brain," a term commonly used to describe difficulty concentrating after frequent exposure to short-form video content. Although such terms are not clinical diagnoses, they reflect user experiences that overlap with cognitive fatigue, reduced attention control, and shallow processing.

Together, these studies support the view that short-form video use is associated with attention difficulties and cognitive fatigue. However, many existing studies measure short-form video use generally, without separating the effects of platform design features. The current study builds on this literature by examining whether infinite scrolling and algorithmic recommendations may help explain why users continue consuming content even when they experience fatigue or reduced concentration.

C. Executive Function, Self-Control, and Decision-Making

The term executive function describes cognitive capabilities which enable people to complete self-control tasks and plan activities and make decisions and control their impulses and work toward their objectives. Academic learning and productivity and emotional control require these processes as fundamental components. Research indicates that people who use short-format videos in an excessive manner demonstrate deficiencies in both their executive functions and their capacity to control their actions.

(Liu et al. 2025) discovered that excessive TikTok usage created a connection between self-control problems and reduced school participation. Users who find it hard to control their TikTok usage patterns face problems related to their ability to maintain concentration and complete their schoolwork. (Zhu et al, 2025) provided more direct cognitive evidence by examining cognitive control deficits among individuals with problematic short-form video use. The researchers used eye-tracking technology and drift-diffusion modeling methods to show that users who experience problems with their vision control processes face major problems to complete their cognitive tasks without interruption.

Risk-related decision-making has also been examined in relation to short-form video use. Ye et al. [8] found that excessive short-form video use was associated with increased

risk-taking behavior. Although risk-taking is not identical to attention decline, it is related to executive control because individuals with weaker inhibitory control may be more likely to seek immediate rewards and make impulsive decisions. (Zhang and Li, 2025) also examined how short-video addiction affects risk decision-making behavior among college students using fNIRS technology, providing neurocognitive support for the relationship between short-form video addiction and decision-making processes.

These findings are important for the present study because infinite scrolling and algorithmic recommendations may affect executive control by repeatedly presenting immediate rewards. Each new video offers the possibility of entertainment, humor, social information, or emotional stimulation. This unpredictable reward pattern may make it difficult for users to stop scrolling, even when they are aware that continued use is unproductive. Therefore, Brain Rot-related symptoms may involve not only attention fatigue but also reduced ability to control media consumption.

D. Algorithmic Recommendations and Personalized Engagement Loops

Algorithmic recommendation systems are central to the success of short-form video platforms. These systems personalize content based on user behavior and continuously adapt to user preferences. In the context of TikTok and similar platforms, recommendation systems are especially powerful because users do not need to search for content manually; instead, content is delivered automatically through the "For You" or equivalent feed.

(Yang et al. 2025) studied behavioral addiction on TikTok by combining survey responses with digital trace data. Their work is important because it shows that behavioral patterns such as frequent returns to the platform and extended watching time can be analyzed through actual usage data. This supports the idea that platform behavior is measurable and that addiction-related patterns may be connected to how users interact with algorithmically delivered content.

Studies on adolescent short-video use have also highlighted the role of algorithmic recommendations. For example, research on adolescent users found that daily usage and reliance on algorithmic recommendations may predict cognitive functioning and academic performance (Qin et al,2023) . This finding is highly relevant to the present study because it directly connects recommendation reliance with cognitive outcomes. It suggests that users who depend heavily on algorithmic feeds may be more vulnerable to cognitive and academic effects.

Algorithmic recommendation systems may contribute to Brain Rot-related symptoms in several ways. First, they reduce the need for active selection, allowing users to consume content passively. Second, they increase exposure to emotionally engaging and personally relevant content, which may prolong use. Third, they create a feedback loop in which user behavior trains the system to deliver more of the same content. Fourth, they may narrow users' attention toward quick, rewarding, and repetitive media experiences. These mechanisms may reduce users' tolerance for slower cognitive tasks and contribute to perceived difficulty in reading, studying, or thinking deeply.

However, not all algorithmic recommendations are harmful. Personalization can help users discover useful, educational, or entertaining content. The problem emerges when recommendation systems are optimized mainly for engagement and watch time rather than cognitive well-being. Therefore, this study does not assume that algorithms are inherently negative. Instead, it investigates whether users' perceived exposure to algorithmic recommendations is associated with Brain Rot-related symptoms.

E. Infinite Scrolling, Frictionless Design, and Loss of Stopping Cues

Infinite scrolling is another important design feature in short-form video platforms. It allows content to load continuously without requiring users to click, search, or choose a new video. This creates a frictionless consumption experience, where the easiest action is to continue scrolling. In behavioral terms, infinite scrolling reduces stopping cues and increases the likelihood of prolonged sessions.

(Lukoff et al. 2023) investigated infinite scrolling and found that users often feel caught in a loop that extends social media sessions. Their study is directly relevant because it explains how infinite scrolling can lead to regretful and extended use. This supports the present study's argument that infinite scrolling is not a neutral interface feature. Instead, it may shape user behavior by making stopping more difficult.

Research on stopping behavior in social media also shows that users may need external or self-imposed frictions to interrupt use, such as reminders, app limits, or intentional pauses (Zhan and W. Zhu, 2024). This suggests that many users do not stop naturally because the platform does not provide clear boundaries. In short-form video platforms, this issue may be even stronger because each video is short, making users feel that watching "one more" video requires little time or effort. However, repeated "one more video" decisions can accumulate into long periods of use.

Infinite scrolling may contribute to Brain Rot-related symptoms by encouraging passive, repetitive, and low-effort consumption. When users move rapidly from one video to another, they may process information superficially rather than deeply. This may increase attentional fragmentation and reduce the ability to sustain focus on longer tasks. In this sense, the cognitive concern is not only the total screen time, but the structure of the content flow and the absence of natural stopping points.

F. Psychological and Emotional Outcomes of Excessive Short-Form Video Use

In addition to cognitive outcomes, excessive short-form video use has been linked to emotional and psychological difficulties. (Liu et al. 2025) found that short-video addiction was associated with lower subjective well-being through emotional deterioration and loss of life meaning. This indicates that problematic use may affect how users feel about themselves and their daily lives. (Ding et al. 2024) also examined the relationship between short-video addiction, subjective well-being, social support, personality, and core self-evaluation, showing that short-video addiction is connected to broader psychological factors.

These emotional outcomes are relevant because cognitive fatigue and emotional decline may reinforce each other. For example, users who feel stressed, bored, lonely or emotionally exhausted may turn to short-form videos for quick relief. However, extended use may increase fatigue, reduce productivity, and create guilt or dissatisfaction afterward. This cycle may lead to more scrolling as a coping strategy, creating a self-reinforcing pattern.

The present study focuses mainly on cognitive symptoms, but it recognizes that Brain Rot-related experiences may include both cognitive and emotional dimensions. Mental fatigue, reduced motivation, and difficulty concentrating may be influenced by emotional state as well as platform design. Therefore, the methodology includes psychological and behavioral variables that help explain how short-form video use relates to perceived cognitive decline.

G. Neurocognitive Evidence Related to Short-Form Video Addiction

Recent neurocognitive studies provide additional support for concerns about excessive short-form video use. (Gao et al, 2025) examined neuroanatomical and functional substrates of short-video addiction and found associations between short-video addiction symptoms and brain regions related to reward processing and cognitive control. Although such findings should be interpreted carefully, they suggest that excessive short-form video use may be associated with neural systems involved in attention, reward sensitivity, and self-regulation.

Similarly, (Zhang and Li, 2025) used fNIRS technology to examine the relationship between short-video addiction and risk decision-making among college students. Their findings contribute to the argument that problematic short-form video use may be associated with decision-making processes and executive control. These studies do not prove that short-form videos directly damage the brain, but they provide evidence that addiction-like use may be related to measurable neurocognitive differences.

This distinction is important for the present study. The term Brain Rot is used as a descriptive and user-perceived concept, not as evidence of permanent brain damage. The study investigates perceived cognitive difficulties and behavioral patterns, while avoiding unsupported claims that short-form videos directly cause clinical brain deterioration. This careful framing strengthens the academic credibility of the research.

H. Comparison of Previous Studies

Previous studies have examined short-form video use from different perspectives, including addiction, attention, self-control, cognitive fatigue, emotional well-being, academic performance, and platform design. Table 1 summarizes the most relevant studies and compares their focus, methodology, major findings, and limitations in relation to the current research.

The comparison shows that previous studies have provided strong evidence linking short-form video use with attention difficulties, cognitive fatigue, reduced self-control, and executive function problems. However, most studies examine problematic use as a general behavior rather than focusing on specific platform design features. In particular, limited research

has directly connected infinite scrolling and algorithmic recommendations with Brain Rot-related cognitive symptoms. Therefore, the current study addresses this gap by examining how these design mechanisms may contribute to perceived cognitive decline among short-form video users.

TABLE 1. Comparison of previous studies related to short-form video use and cognitive outcomes

Study	Focus	Main Findings	Research Gap
Duan et al. [1]	Short-video addiction, mental health, and executive function	Short-video addiction was associated with mental health issues and executive function difficulties.	Limited focus on platform design features such as infinite scrolling and recommendations.
Alruwaili [2]	Scroll immersion, attention, memory, and fatigue	Short-form video use was linked to attention problems, memory difficulties, and cognitive fatigue among Saudi users.	Did not clearly separate infinite scrolling from algorithmic recommendation effects.
Yan et al. [3]	Short-video addiction and attention function	Short-video addiction negatively affected attention-related functions.	Did not examine Brain Rot as a perceived cognitive symptom.
Ye et al. [4]	Usage intensity, TikTok Brain, and attention control	Higher short-video use was related to weaker attention control and perceived TikTok Brain.	Focused more on usage intensity than specific platform mechanisms.
Liu et al. [5]	Problematic TikTok use and self-control	Problematic TikTok use was associated with lower self-control and school engagement.	Did not directly examine cognitive fatigue or deep-thinking decline.
Zhu et al. [7]	Cognitive control deficits	Problematic short-form video users showed cognitive control difficulties.	Limited attention to infinite scrolling and algorithmic recommendations.
Gao et al. [14]	Neurocognitive evidence of short-video addiction	Short-video addiction was linked to brain systems related to reward and cognitive control.	Does not prove direct brain damage and should be interpreted cautiously.
Lukoff et al. [15]	Infinite scrolling and prolonged use	Infinite scrolling can extend social media sessions and make stopping more difficult.	Focused on social media generally, not specifically Brain Rot symptoms.
Weinstein et al. [16]	Stopping behavior in social media use	Users often need stopping cues or external friction to pause or stop social media use.	Did not directly measure cognitive outcomes among short-form video users.

K. Research Gap and Position of the Current Study

H. Research Gap and Position of the Current Study The reviewed literature shows that short-form video use has been associated with various negative effects which include attention problems, cognitive fatigue, self-control difficulties, executive dysfunction, emotional deterioration, reduced well-being, and academic challenges [Alruwaili.2025]–[Ding et al, 2025]. The research findings demonstrate that algorithmic recommendations together with infinite scrolling serve as

crucial elements which determine how users interact with platforms while extending their viewing time (Yang et al, 2025), (Qin and Wang, 2023), (Lukoff et al, 2023).

The research study has three main gaps which need to be addressed. The first gap in research exists because previous studies study short-form video addiction as a complete behavior without identifying specific technological elements which lead to this behavior. The research on Brain Rot-related symptoms has limited progress because Brain Rot functions as a popular and emerging term which does not have recognition as an official academic term. The research field lacks studies which combine infinite scrolling, algorithmic recommendations, and perceived cognitive symptoms into a single research framework.

The current study addresses these gaps by examining how infinite scrolling and algorithmic recommendation systems relate to Brain Rot-related symptoms among short-form video users. The study contributes to existing knowledge by shifting attention from general screen time to platform design mechanisms. The research establishes a systematic method to study Brain Rot through measurable components which include attention difficulties, cognitive fatigue, reduced self-control, compulsive scrolling, and perceived decline in deep-thinking ability.

III. METHODOLOGY

A. Research Design

This study will use a quantitative, cross-sectional research design to examine the relationship between short-form video platform features and Brain Rot-related cognitive symptoms. A quantitative approach is appropriate because the study aims to measure users' perceptions, usage patterns, and cognitive symptoms using structured survey items. The cross-sectional design allows data to be collected from participants at one point in time and analyzed to identify associations between variables.

The study focuses on two main independent variables: infinite scrolling exposure and algorithmic recommendation exposure. The dependent variable is Brain Rot-related cognitive symptoms, measured through indicators such as attention difficulties, cognitive fatigue, reduced self-control, shallow information processing, and reduced ability to engage in deep-thinking tasks. Additional variables such as daily usage duration, frequency of use, platform type, academic level, and self-reported problematic use will also be measured.

This design is suitable for the current research stage because the goal is to explore and test relationships between platform design mechanisms and perceived cognitive outcomes. Since this study does not involve experimental manipulation, it will not claim direct causality. Instead, it will identify statistically significant associations that can guide future experimental or longitudinal research.

Figure 1. Conceptual framework of the proposed study showing the relationship between short-form video usage, infinite scrolling, algorithmic recommendations, compulsive viewing behavior, and Brain Rot-related cognitive symptoms.

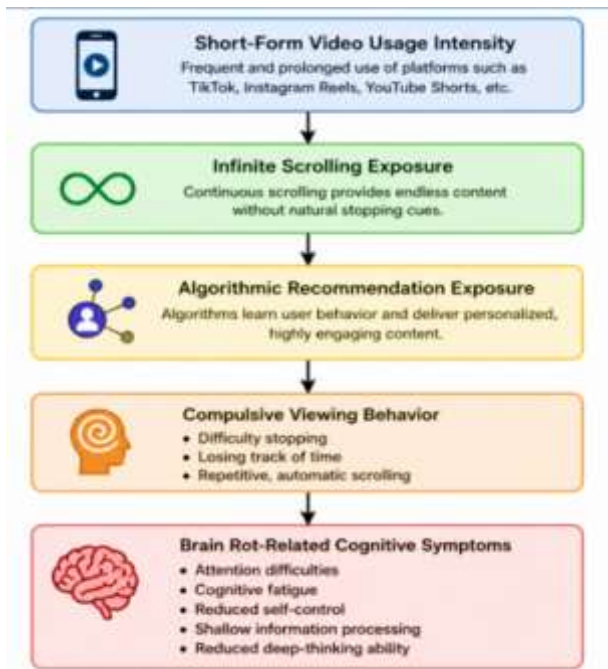


Figure 1. Conceptual Framework of the Study

B. Research Objectives

The main objective of this study is to investigate the role of infinite scrolling and algorithmic recommendation systems in Brain Rot-related cognitive symptoms among short-form video users.

The specific objectives are:

- To examine the relationship between short-form video usage intensity and Brain Rot-related cognitive symptoms.
- To investigate whether infinite scrolling is associated with prolonged use, difficulty stopping, and cognitive fatigue.
- To examine whether algorithmic recommendation systems are associated with compulsive viewing patterns and reduced attention control.
- To identify the cognitive symptoms most commonly reported by short-form video users, including attention difficulties, mental fatigue, shallow processing, and reduced deep-thinking ability.
- To determine whether infinite scrolling and algorithmic recommendations significantly predict Brain Rot-related symptoms after controlling for usage duration and demographic factors.

C. Research Questions

This study will be guided by the following research questions:

- RQ1: What is the relationship between short-form video usage intensity and Brain Rot-related cognitive symptoms?
- RQ2: How does infinite scrolling contribute to prolonged short-form video use and difficulty stopping?
- RQ3: How do algorithmic recommendation systems influence users' compulsive viewing behavior?
- RQ4: Which Brain Rot-related symptoms are most commonly reported among short-form video users?
- RQ5: Do infinite scrolling and algorithmic recommendations significantly predict Brain Rot-related cognitive symptoms?

D. Research Hypotheses

Based on the reviewed literature, the study proposes the following hypotheses:

- H1: Higher short-form video usage intensity is positively associated with Brain Rot-related cognitive symptoms.
- H2: Higher exposure to infinite scrolling is positively associated with prolonged use and difficulty stopping.
- H3: Higher perceived influence of algorithmic recommendations is positively associated with compulsive short-form video viewing.
- H4: Compulsive viewing behavior is positively associated with attention difficulties and cognitive fatigue.
- H5: Infinite scrolling and algorithmic recommendations significantly predict Brain Rot-related symptoms even after controlling for daily usage duration.

E. Population and Sample

The target population of this study consists of active short-form video users, particularly university students and young adults who use platforms such as TikTok, Instagram Reels, YouTube Shorts, or Snapchat Spotlight. This group is appropriate because previous studies show that adolescents and young adults are among the most active users of short-form video platforms and may be more vulnerable to problematic usage patterns.

The study will use a non-probability convenience sampling technique due to accessibility and time limitations. Participants will be recruited through university groups, social media platforms, and online student communities. To be eligible, participants must meet the following criteria:

- They must be at least 18 years old.
- They must use at least one short-form video platform.
- They must have used short-form video platforms within the past month.
- They must voluntarily agree to participate in the study.

The expected sample size will be between 150 and 300 participants. This range is considered suitable for survey-based quantitative analysis, including correlation and regression analysis. A larger sample size will improve the reliability of the findings and allow stronger statistical interpretation.

F. Data Collection Instrument

Data will be collected using an online questionnaire. The questionnaire will be developed based on previous studies related to short-form video addiction, attention control, self-control, cognitive fatigue, problematic social media use, and platform design features. The questionnaire will consist of five main sections.

Section 1: Demographic Information

This section will collect basic information such as age, gender, academic level, major, and average academic workload.

Section 2: Short-Form Video Usage Patterns

This section will measure participants' usage behavior, including preferred platform, average daily usage time, frequency of use, time of day most commonly used, and whether participants use short-form videos during study breaks, before sleep, or during academic tasks.

Example items:

- I use short-form video platforms every day.
- I often watch short-form videos for longer than I originally planned.
- I use short-form videos when I feel bored, stressed, or mentally tired.

Section 3: Infinite Scrolling Exposure

This section will measure users' experiences with infinite scrolling and difficulty stopping.

Example items:

- I continue scrolling because new videos appear automatically.
- I often lose track of time while scrolling through short-form videos.
- I find it difficult to stop watching because there is always another video.
- The continuous feed makes me watch more videos than I intended.

Section 4: Algorithmic Recommendation Exposure

This section will measure users' perceptions of personalized content and recommendation influence.

Example items:

The platform recommends videos that match my interests very accurately.

Recommended videos make me continue watching for a longer time.

I feel that the platform quickly learns what keeps me engaged.

I often depend on the recommended feed instead of searching for content myself.

Section 5: Brain Rot-Related Cognitive Symptoms

This section will measure perceived cognitive symptoms associated with excessive short-form video use.

Example items:

After watching short-form videos, I find it harder to focus on studying or reading.

I feel mentally tired after long scrolling sessions.

I find it difficult to concentrate on long videos, lectures, or written texts.

I feel that my thinking becomes more shallow after excessive short-form video use.

I prefer quick and simple content over detailed or complex information.

I struggle to return to productive tasks after scrolling.

Participants will respond using a five-point Likert scale:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

G. Variables of the Study

The study includes the following variables:

Independent Variables

- Infinite scrolling exposure
- Algorithmic recommendation exposure
- Short-form video usage intensity

Dependent Variable

- Brain Rot-related cognitive symptoms

Mediating or Supporting Variables

- Compulsive viewing behavior
- Difficulty stopping
- Cognitive fatigue
- Attention difficulties

Control Variables

- Age
- Gender
- Academic level
- Daily screen time
- Main platform used
- Average study hours

H. Data Collection Procedure

The questionnaire will be distributed online using a survey platform such as Google Forms or Microsoft Forms. Participants will receive a brief explanation of the study purpose, eligibility criteria, expected time required, and their rights as participants. Before beginning the questionnaire, participants will be asked to provide informed consent.

Participation will be voluntary, and no personally identifying information will be collected unless necessary for research administration. Participants will be informed that they can withdraw from the study at any time before submitting their responses. After data collection, responses will be exported for statistical analysis.

To improve the quality of responses, the questionnaire will include clear instructions and simple wording. Incomplete responses, duplicate submissions, and responses that show random answering patterns may be excluded from the final analysis.

I. Data Analysis

The collected data will be analyzed using statistical software such as SPSS, Excel, JASP, or R. The analysis will include several stages.

First, descriptive statistics will be used to summarize demographic information and usage patterns. This will include frequencies, percentages, means, and standard deviations.

Second, reliability analysis will be conducted using Cronbach's alpha to test the internal consistency of the questionnaire scales. A Cronbach's alpha value of 0.70 or above will be considered acceptable for social science research.

Third, Pearson correlation analysis will be used to examine the relationships between infinite scrolling, algorithmic recommendations, usage intensity, compulsive viewing, and Brain Rot-related symptoms.

Fourth, multiple regression analysis will be conducted to determine whether infinite scrolling and algorithmic recommendation exposure significantly predict Brain Rot-related cognitive symptoms. Control variables such as age, gender, daily screen time, and platform type may be included to strengthen the analysis.

Finally, if the data are suitable, mediation analysis may be conducted to examine whether compulsive viewing behavior mediates the relationship between platform design features and cognitive symptoms. This would help explain whether infinite

scrolling and recommendations contribute to Brain Rot-related symptoms indirectly by increasing compulsive use.

J. Validity and Reliability

To ensure content validity, the questionnaire items will be developed based on concepts and findings from previous studies on short-form video addiction, attention control, self-control, cognitive fatigue, and problematic social media use [2]–[7], [15], [16]. The questionnaire may also be reviewed by academic supervisors or field experts before distribution.

A pilot test will be conducted with a small group of participants before the main data collection. The purpose of the pilot test is to ensure that the questions are clear, understandable, and relevant to the research objectives. Feedback from the pilot test will be used to revise unclear items.

Reliability will be assessed using Cronbach's alpha for each scale. Items with low reliability or weak item-total correlations may be revised or removed from the final analysis.

K. Ethical Considerations

This study will follow ethical research principles. Participants will be informed about the purpose of the study, the voluntary nature of participation, and their right to withdraw. No sensitive personal information will be collected. Responses will be used only for academic research purposes and will be kept confidential.

Because the study discusses digital media use and cognitive symptoms, the wording of the questionnaire will avoid diagnosing participants or labeling them as addicted. Instead, the study will use neutral terms such as "usage patterns," "perceived cognitive difficulties," and "Brain Rot-related symptoms." This helps reduce stigma and maintains academic accuracy.

L. Limitations of the Methodology

This methodology has several limitations. First, the cross-sectional design can identify associations but cannot prove causation. Second, the study relies on self-reported data, which may be affected by memory errors or social desirability bias. Third, convenience sampling may limit the generalizability of the findings. Fourth, Brain Rot is not a formal clinical diagnosis, so it must be measured through related cognitive indicators rather than treated as a medical condition.

Despite these limitations, the methodology is appropriate for an exploratory academic study. It allows the researcher to investigate an emerging phenomenon using measurable variables grounded in previous literature.

IV. CONCLUSION

This study examined the role of infinite scrolling and algorithmic recommendations in Brain Rot-related cognitive symptoms among short-form video users. The reviewed literature shows that excessive short-form video use may be associated with attention difficulties, cognitive fatigue, reduced self-control, shallow information processing, and weaker deep-thinking ability. The study highlights that these symptoms may not result only from personal habits, but also from platform design features that encourage continuous and repetitive viewing. Infinite scrolling reduces stopping cues, while

algorithmic recommendations keep users engaged through personalized content. Therefore, this research contributes to understanding how short-form video design may influence cognitive well-being and digital behavior.

REFERENCES

- [1] Y. Duan et al., "Bidirectional relationships of short-video addiction with mental health and executive function and genetic analysis: a longitudinal study," *Journal of the American Academy of Child & Adolescent Psychiatry*, vol. 64, no. 10, p. S325, 2025.
- [2] R. F. Alruwaili, "Scroll immersion and short-form video use: Predictors of attention, memory, and fatigue among Saudi social media users," *Acta Psychologica*, vol. 260, p. 105674, 2025.
- [3] J. Yan et al., "Mobile phone short video use negatively impacts attention functions: An EEG study," *Frontiers in Human Neuroscience*, vol. 18, 2024.
- [4] J.-H. Ye et al., "Potential effect of short video usage intensity on short video addiction, perceived mood enhancement ('TikTok Brain'), and attention control among Chinese adolescents," *International Journal of Mental Health Promotion*, vol. 27, no. 3, 2025.
- [5] Q. Liu et al., "Problematic TikTok use severity, self-control, and school engagement: A one-year longitudinal study," *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, vol. 19, no. 3, 2025.
- [6] A. C. Y. Hou, T. D. Pham Thi, and X. Hou, "Understanding problematic TikTok use: Cognitive absorption, nomophobia, and life stress," *Acta Psychologica*, vol. 260, p. 105536, 2025.
- [7] J. Zhu, L. H. N. Fong, and A. Wu, "Cognitive control deficits in individuals with problematic use of short-form video: Evidence from an eye-tracking study and the drift-diffusion model," *International Journal of Mental Health and Addiction*, pp. 1–17, 2025.
- [8] L. Ye et al., "Excessive short-form video use is associated with increased risk-taking but not with altered ambiguity-based decision-making," *BMC Psychology*, vol. 13, no. 1, p. 1070, 2025.
- [9] S. Zhang and S. Li, "How short video addiction affects risk decision-making behavior in college students based on fNIRS technology," *Frontiers in Human Neuroscience*, vol. 19, p. 1542271, 2025.
- [10] H. Liu et al., "Short video addiction and subjective well-being in adolescents: A chained mediation model of emotional deterioration and loss of life meaning," *Computers in Human Behavior Reports*, vol. 20, p. 100852, 2025.
- [11] J. Ding, Z. Hu, Y. Zuo, and Y. Xv, "The relationships between short video addiction, subjective well-being, social support, personality, and core self-evaluation: A latent profile analysis," *BMC Public Health*, 2024.
- [12] C. Yang, S. Mousavi, A. Dash, K. P. Gummadi, and I. Weber, "Studying behavioral addiction by combining surveys and digital traces: A case study of TikTok," arXiv preprint, 2025.
- [13] X. Qin, Z. Zhang, and Y. Wang, "Adolescent user behaviors on short video application, cognitive functioning and academic performance," *Computers & Education*, 2023.
- [14] Y. Gao et al., "Neuroanatomical and functional substrates of the short video addiction and its association with brain transcriptomic and cellular architecture," *NeuroImage*, vol. 307, p. 121029, 2025.
- [15] K. Lukoff et al., "The loop and reasons to break it: Investigating infinite scrolling behaviour in social media applications," *Proceedings of the ACM on Human-Computer Interaction*, 2023.
- [16] A. Weinstein et al., "Do They Stop? How Do They Stop? Why Do They Stop? Whether, How, and Why Teenagers Pause or Stop Social Media Use," *International Journal of Communication*, 2024.
- [17] X. Zhan and W. Zhu, "Influencing factors of short-form video addiction among Chinese university students: A systematic review," *Frontiers in Psychology*, vol. 16, p. 1663670, 2025.
- [18] A. E. Mona et al., "Short video addiction and its impact on cognitive functioning in adolescents and youth: A systematic review," *International Journal of Adolescence and Youth*, vol. 31, no. 1, p. 2623337, 2026.
- [19] G. W. Small, J. Lee, A. Kaufman, J. Jalil, P. Siddharth, and G. Bookheimer, "Brain health consequences of digital technology use," *Dialogues in Clinical Neuroscience*, vol. 22, no. 2, pp. 179–187, 2020.
- [20] J. Xie et al., "The effect of short-form video addiction on undergraduates' academic procrastination: A moderated mediation model," *Frontiers in Psychology*, vol. 14, p. 1298361, 2023.