

Brain Rot in the Digital Age: A Reflective Review of Short-Form Video Consumption and Cognitive Habits

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تعفن الدماغ في العصر الرقمي: مراجعة تأملية لاستهلاك مقاطع الفيديو القصيرة والعادات المعرفية

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Abstract

The popular expression “brain rot” captures concern that repeated exposure to fast, highly stimulating online content may make sustained thinking more difficult. This reflective narrative review examines what current evidence does and does not show about short-form video (SFV) use, attention, memory, and learning. A targeted, non-systematic search of indexed and publisher sources identified recent SFV-specific studies, a 2025 systematic review and meta-analysis, foundational cognitive theory, and one Libyan study of general social-network use. The meta-analysis combined 71 studies and 98,299 participants and reported associations between greater SFV use and poorer cognitive outcomes ($r = -.34$), especially attention ($r = -.38$) and inhibitory control ($r = -.41$). These are associations, not estimates of permanent damage or proof of causation. Direct studies remain methodologically varied: a small EEG study found a task-related neural association but no significant relationship with behavioral attention-network performance, while a cross-sectional Jordanian survey linked problematic SFV use with attention and self-reported memory. Evidence on memory, reasoning, and long-term change remains comparatively limited. The review proposes a framework in which platform features and viewing patterns may influence attention allocation and encoding, conditional on individual and contextual factors. Short videos can also support microlearning, public communication, and accessibility when content and use are purposeful. In Libya, available studies describe social-media habits rather than SFV-specific cognitive outcomes. The defensible conclusion is that intensive or automatic use is associated with selected cognitive measures, while causal direction, practical magnitude, and long-term consequences remain uncertain.

Keywords: short-form video; attention; inhibitory control; memory; digital media; reflective review; Libya.

المخلص

يعكس المصطلح الشائع "تَعَفَنَ الدماغ (Brain Rot)" القلق المتزايد من أن التعرض المتكرر للمحتوى الرقمي السريع وعالي التحفيز قد يجعل الحفاظ على التفكير العميق والمستمر أكثر صعوبة. تستعرض هذه المراجعة السردية التأملية ما توصلت إليه الأدلة الحالية وما لا يمكنها إثباته بشأن استخدام مقاطع الفيديو القصيرة (Short-Form Video, SFV) وتأثيرها المحتمل على الانتباه والذاكرة والتعلم. أُجري بحث موجّه وغير منهجي في المصادر المفهرسة ومصادر الناشرين، شمل الدراسات الحديثة الخاصة بمقاطع الفيديو القصيرة، ومراجعة منهجية وتحليلًا تلويًا منشورًا عام 2025، والنظريات الأساسية في علم الإدراك، بالإضافة إلى دراسة ليبية تناولت استخدام شبكات التواصل الاجتماعي بشكل عام. جمعت المراجعة التحليلية التلوية 71 دراسة شملت 98,299 مشاركًا، وأظهرت وجود ارتباط بين زيادة استخدام مقاطع الفيديو القصيرة وضعف بعض النتائج المعرفية ($r = -0.34$)، وكان الارتباط أوضح في مجالي الانتباه ($r = -0.38$) والتحكم التثبيطي ($r = -0.41$) (Inhibitory Control) ومع ذلك، فإن هذه النتائج تمثل ارتباطات إحصائية وليست دليلًا على حدوث ضرر دائم أو إثباتًا للعلاقة السببية. تظل الدراسات المباشرة حول تأثير مقاطع الفيديو القصيرة متنوعة من حيث المنهجية؛ فقد وجدت دراسة صغيرة باستخدام تخطيط الدماغ الكهربائي (EEG) ارتباطًا عصبياً متعلقًا بالمهمة، لكنها لم تجد علاقة ذات دلالة بين الاستخدام وأداء شبكات الانتباه السلوكية. كما ربطت دراسة مقطعية أُجريت في الأردن بين الاستخدام الإشكالي لمقاطع الفيديو القصيرة وبين ضعف الانتباه والذاكرة المبلغ عنها ذاتيًا. ولا تزال الأدلة المتعلقة بالذاكرة، والاستدلال، والتغيرات المعرفية طويلة المدى محدودة نسبيًا. وتقتصر هذه المراجعة إطارًا مفاهيميًا يوضح أن خصائص المنصات الرقمية وأنماط المشاهدة قد تؤثر في طريقة توزيع الانتباه وعمليات ترميز المعلومات، وذلك اعتمادًا على العوامل الفردية والسياقية. وفي المقابل، يمكن لمقاطع الفيديو القصيرة أن تسهم في التعلم المصغر (Microlearning)، والتواصل الصحي والعلمي، وزيادة سهولة الوصول إلى المعلومات عندما يكون استخدامها هادفًا ومنظمًا. أما في ليبيا، فإن الدراسات المتاحة تركز على أنماط استخدام وسائل التواصل الاجتماعي عمومًا، وليس على التأثيرات المعرفية الخاصة بمقاطع الفيديو القصيرة. لذلك، فإن الاستنتاج الأكثر قابلية للدفاع علميًا هو أن الاستخدام المكثف أو التلقائي لمقاطع الفيديو القصيرة يرتبط ببعض المؤشرات المعرفية المحددة، بينما لا تزال طبيعة العلاقة السببية، وحجم التأثير العملي، والنتائج طويلة المدى غير محسومة.

الكلمات المفتاحية: مقاطع الفيديو القصيرة؛ الانتباه؛ التحكم التثبيطي؛ الذاكرة؛ الوسائط الرقمية؛ المراجعة التأملية؛ ليبيا.

Introduction

The rapid expansion of digital technologies has transformed the way individuals access, consume, and interact with information. Among the most influential developments in recent years is the emergence of short-form video (SFV) platforms, including TikTok, Instagram Reels, and YouTube Shorts, which have reshaped patterns of online communication and entertainment. These platforms provide users with continuous streams of brief, visually engaging, and algorithmically personalized content that can be accessed instantly through mobile devices. Although short-form videos have introduced new opportunities for education, communication, creativity, and information sharing, concerns have increasingly emerged regarding their potential influence on human attention, memory, learning behaviors, and

broader cognitive habits. The popular term “brain rot” has become widely used in public discussions to describe the perceived mental effects of excessive exposure to highly stimulating digital content. However, this expression represents a cultural concern rather than a recognized scientific diagnosis, and its meaning requires careful examination through evidence-based research rather than assumptions or exaggerated claims. The growing concern surrounding short-form video consumption is closely related to the unique characteristics of these platforms. Unlike traditional forms of media, short-form video platforms rely on rapid transitions, endless scrolling mechanisms, personalized recommendations, and emotionally engaging audiovisual content. These features are designed to maintain user engagement and encourage repeated interactions. From a cognitive perspective, frequent exposure to rapidly changing stimuli may influence how individuals allocate attention, process information, and regulate impulses. Cognitive science emphasizes that attention is a limited resource that depends on both external stimuli and internal goals, while memory formation is strongly influenced by the depth and quality of information processing. Therefore, repeated movement between short, highly stimulating pieces of content may theoretically affect sustained attention and deeper learning processes. Nevertheless, these possible mechanisms represent hypotheses that require careful empirical investigation rather than direct evidence of cognitive decline.

The academic investigation of short-form video use has become increasingly important because digital media consumption is now deeply integrated into daily life, particularly among younger populations. Students and young adults frequently use these platforms for entertainment, social interaction, and, increasingly, educational purposes. This dual nature creates complexity in evaluating their effects. Short-form videos are not inherently harmful; they can support microlearning, simplify complex concepts, increase access to educational resources, and facilitate public communication. For example, a short educational video may provide an effective introduction to a scientific concept or language skill. However, educational benefits may depend on intentional engagement, content quality, and whether users complement short videos with deeper learning activities such as reading, discussion, and active recall.

Current research provides evidence suggesting an association between heavier short-form video use and certain cognitive outcomes, particularly attention and inhibitory control, but the available evidence does not demonstrate that these platforms cause permanent cognitive damage. A recent systematic review and meta-analysis combining 71 studies and 98,299 participants reported negative associations between greater short-form video use and cognitive outcomes, with stronger relationships observed for attention and inhibitory control. However, these findings represent statistical associations rather than proof of direct causation. Factors such as sleep quality, stress, mental health, personality traits, academic workload, and pre-existing attentional differences may influence both digital media habits and cognitive performance. Therefore, interpreting these findings requires caution and recognition of the limitations of current research methodologies.

One major challenge in this field is distinguishing between correlation and causation. Many existing studies rely on cross-sectional designs, self-reported measures of digital use, and questionnaires assessing problematic consumption patterns. While these approaches provide

valuable insights, they cannot determine whether excessive short-form video use produces cognitive difficulties or whether individuals with existing attention challenges are more likely to engage in rapid digital content consumption. Other variables, including stress, reduced sleep, and lifestyle patterns, may also contribute to observed relationships. Consequently, researchers emphasize the need for longitudinal studies, controlled experiments, objective usage tracking, and standardized cognitive assessments to better understand the direction and magnitude of these effects. The issue is particularly relevant within the Libyan context, where digital media use has expanded rapidly, yet research specifically examining short-form video platforms and cognitive outcomes remains limited. Existing Libyan studies have mainly investigated general social-network use and perceived academic effects rather than direct relationships between platforms such as TikTok, Instagram Reels, or YouTube Shorts and measurable cognitive functions. This represents an important research gap, as local cultural, educational, and technological factors may influence patterns of digital media use and their potential consequences. Future research in Libya should therefore examine short-form video exposure using validated cognitive measures, objective usage data, and representative samples across different educational levels.

This reflective narrative review aims to critically examine what current evidence demonstrates and what remains uncertain regarding the relationship between short-form video consumption and cognitive habits. Rather than accepting the popular idea of “brain rot” as evidence of neurological damage, this review explores the scientific concepts underlying concerns about attention, memory, inhibitory control, and learning. It considers both potential risks and benefits of short-form video use while emphasizing the importance of purposeful digital engagement. The central argument is that intensive or automatic consumption patterns may be associated with changes in selected cognitive measures, particularly attention-related processes, but current evidence does not justify claims of irreversible cognitive decline. A balanced understanding is therefore necessary to promote healthier digital habits while recognizing the educational and communicative possibilities offered by modern digital platforms..

2. Article Type and Evidence-Gathering Approach

This manuscript is a reflective narrative review, not an empirical study, systematic review, or meta-analysis. It combines a focused synthesis of published evidence with a reasoned interpretation of what that evidence means for everyday attention and academic learning. The authors did not collect participant data, calculate new pooled estimates, or conduct a formal risk-of-bias assessment.

2.1 Search and selection

A targeted search was conducted for this revision on 2 October 2026 using PubMed records and publisher or journal records, followed by reference checking for relevant primary and synthesis studies. Search terms included “short-form video,” “short video,” “TikTok,” “Instagram Reels,” “YouTube Shorts,” “attention,” “cognitive control,” “inhibitory control,” “memory,” “learning,” “digital media consumption,” and “social media academic achievement Libya.” Priority was given to peer-reviewed studies that examined SFV exposure or

problematic SFV use and cognitive or learning-related outcomes, systematic reviews and meta-analyses, foundational theory used to interpret the mechanisms, and Libyan research needed to describe local context.

Studies on general smartphone use or media multitasking were retained only as indirect background and are identified as such. Non-academic commentary, unsupported claims about “brain damage,” and studies unrelated to digital exposure or the outcomes discussed here were excluded from the synthesis. Because the search was targeted rather than exhaustive, and no duplicate screening, preregistration, or formal quality appraisal was performed, the selection should not be interpreted as a systematic evidence map. The distinction between direct SFV evidence and evidence from broader digital behaviors is maintained throughout.

3. A Conceptual Framework for Interpreting “Brain Rot”

The phrase can be treated as a shorthand for a subjective experience: mental fatigue, difficulty disengaging, or a sense that sustained work feels less rewarding after prolonged scrolling. Those experiences merit attention, but they are not themselves evidence of neurological injury. Cognitive science offers more precise constructs: selective and sustained attention, inhibitory control, working-memory demands, and depth of encoding. Attention is limited and allocated according to both goal relevance and stimulus salience (Knudsen, 2007; Posner & Petersen, 1990). Memory is more likely to benefit when information is processed meaningfully rather than merely encountered (Craik & Lockhart, 1972).

SFV feeds combine several features that may matter for these processes: short segments, rapid novelty, personalized recommendation, audiovisual salience, and low-friction transitions to the next item. These features may increase attentional capture and switching. Whether that exposure changes performance on demanding tasks is a further empirical question. Content, purpose, session length, prior attentional differences, sleep, stress, and self-regulation may strengthen, weaken, or alter any link. The model below is therefore a set of testable pathways, not a claim that platform use inevitably produces cognitive decline.

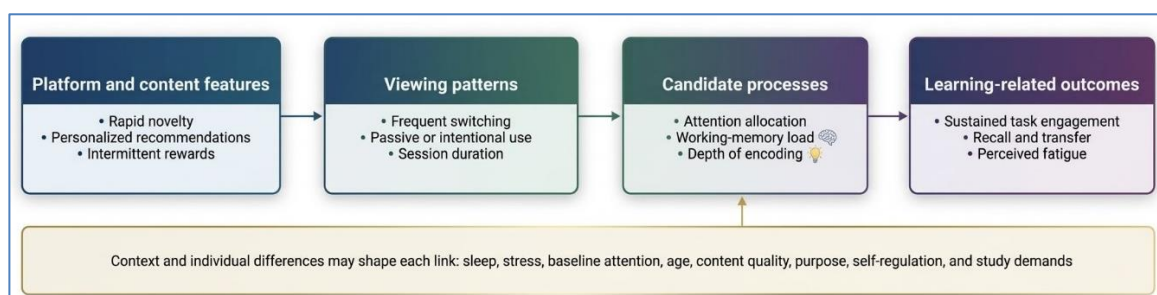


Figure 1. Proposed pathways linking short-form video features, viewing patterns, cognitive processes, and learning-related outcomes. The arrows represent hypotheses for testing; context and individual differences may moderate each link.

4. What the Evidence Shows

The strongest current synthesis is Nguyen et al.’s (2025) systematic review and meta-analysis. It included 71 studies with 98,299 participants. Greater SFV use was associated with poorer

cognitive outcomes overall (mean correlation $r = -.34$); the strongest reported associations were for attention ($r = -.38$) and inhibitory control ($r = -.41$). These are moderate-sized correlations in the authors' interpretation. The review also found a weaker association with poorer mental-health outcomes ($r = -.21$), with stress and anxiety among the stronger domains. The authors noted that relatively few studies examined memory or reasoning. A large combined sample improves precision, but it does not remove bias in the included studies, make the measures equivalent, or establish causal direction. The pooled correlations should not be described as percentage reductions in ability or as proof of lasting harm.

Primary studies illustrate why the synthesis needs careful interpretation. Yan et al. (2024) studied 48 adults using questionnaires, an attention-network task, and EEG; 45 participants were retained for EEG analysis. Short-video addiction-tendency scores correlated with a task-related frontal theta measure ($r = -.395$, $p = .007$) and self-control scores ($r = -.320$, $p = .026$). However, the authors did not find a significant association between those scores and behavioral performance on the attention-network task. This small cross-sectional study therefore offers a neural correlate, not evidence that short-video exposure caused a measurable decline in everyday attention.

Al-Leimon et al. (2025) surveyed 1,029 young people in Jordan. Their cross-sectional model found that attention partially mediated the association between short-form video addiction and memory function. Because the study relied on a survey at one time point, it cannot establish that SFV use caused changes in attention or memory; shared self-report methods and other unmeasured factors may contribute to the observed relationships. Its geographic and age-group focus also limits generalization to all users.

The studies below summarize direct SFV evidence alongside one Libyan study that is relevant only to the broader digital context. They differ in exposure measurement, outcomes, sample, and design, so they should not be read as interchangeable tests of a single causal effect.

Table 1. Selected evidence relevant to short-form video, cognition, and the Libyan context

Source	Design and sample	Exposure measured	Outcome	Main result and limitation
Nguyen et al. (2025)	Systematic review and meta-analysis; 71 studies, $N = 98,299$	Short-form video use across studies/platforms	Cognition, attention, inhibitory control; mental health	Pooled associations: cognition $r = -.34$; attention $r = -.38$; inhibitory control $r = -.41$. Synthesis is broad; memory and reasoning evidence was limited. Association does not establish causality.
Yan et al. (2024)	Cross-sectional EEG study; 48 recruited, 45 EEG analyses	Short-video addiction-tendency questionnaire	Attention-network behavior, frontal theta, self-control	Frontal task theta $r = -.395$ ($p = .007$); self-control $r = -.320$ ($p = .026$). No significant association with behavioral attention-network performance; small

				sample and cross-sectional design.
Al-Leimon et al. (2025)	Cross-sectional survey; 1,029 Jordanian youth	Short-form video addiction and user-reported patterns	Attention and memory function	Attention partially mediated the modeled association between problematic use and memory. Self-report and cross-sectional design prevent causal claims.
Abdel-Rahman (2025)	Descriptive survey; 147 students, Faculty of Arts, Sirte University	General social-network use, not SFV-specific	Perceived academic effects and study time	Reports both perceived benefits and concerns about time spent studying. Provides Libyan context only; it is not direct evidence about TikTok/Reels/Shorts or cognitive testing.

Table 2. Reported quantitative results and statistical interpretation

Study / analysis	Sample or effect count	Reported statistic	Interpretation and limit
Nguyen et al. (2025): cognition overall	14 effect sizes	$r = -.34$; 95% CI $[-.42, -.26]$; $p < .001$	Moderate pooled association. Considerable heterogeneity: $Q(13) = 304.11$, $p < .001$, $I^2 = 95.73\%$. The mean does not imply one common effect for every population or use pattern.
Nguyen et al. (2025): attention	$k = 5$	$r = -.38$; 95% CI $[-.52, -.22]$; $p < .001$	Moderate negative association. Cognitive domain moderated effects, $Q(5) = 59.63$, $p < .001$; this moderator test is not the attention subgroup I^2 .
Nguyen et al. (2025): inhibitory control	$k = 7$	$r = -.41$; 95% CI $[-.46, -.36]$; $p < .001$	Moderate negative association; observational synthesis, so it does not establish that use caused weaker inhibitory control.
Nguyen et al. (2025): memory and reasoning	$k = 1$ for each domain	Memory: $r = -.14$; 95% CI $[-.20, -.08]$, $p < .001$. Reasoning: $r = -.13$; 95% CI $[-.36, .11]$, $p = .281$.	Evidence was sparse. The memory estimate is based on one effect; the reasoning estimate was not statistically significant.
Nguyen et al. (2025): study quality	71 studies across outcomes	59% rated high and 41% low by the Mixed Methods Appraisal Tool; 48% controlled for confounders.	Quality was mixed. Common weaknesses included representativeness and nonresponse risk; fewer than half controlled for confounders.

Yan et al. (2024)	N = 48 recruited; 45 EEG analyses	Task-related frontal theta: $r = -.395$, $p = .007$. Self-control: $r = -.320$, $p = .026$. Behavioral attention- network associations: not significant.	Cross-sectional correlations involving addiction-tendency scores. The EEG finding did not correspond to a significant behavioral-task association.
Al-Leimon et al. (2025)	N = 1,029; cross-sectional survey	Mediation model fit: $\chi^2(12) = 14.11$, $p = .05$; RMSEA = .03; GFI = .99; IFI = .99; TLI = .98; CFI = .99.	Fit indices describe how well the proposed model fits the sample covariance pattern; they do not prove causal mediation or rule out confounding.

Note. r denotes a correlation coefficient; CI , confidence interval; I^2 , proportion of observed variation attributable to between-study heterogeneity; k , number of effects. Values are transcribed from the cited studies. A statistically significant result is not, by itself, evidence of causation or practical importance.

5. Interpreting the Findings: Attention, Memory, and Thinking

5.1 Attention and control

Attention is not one ability. Alerting, orienting, sustained focus, and executive control can be measured in different ways, and a change in one task or neural indicator cannot automatically be translated into a global loss of concentration. The meta-analytic pattern reported by Nguyen et al. (2025) makes attention and inhibitory control reasonable priorities for further study. Yet correlation permits at least three explanations: heavier use could contribute to attentional difficulty; people with pre-existing attentional difficulty could prefer rapid, high-stimulation feeds; or both could reflect other influences such as sleep loss, stress, mood, workload, or impulsivity.

Research on media multitasking and smartphone habits can help generate hypotheses, but it is not direct evidence about SFV platforms. For example, work on media multitasking examines simultaneous or rapidly switching media activities rather than an endless short-video feed specifically (Ophir et al., 2009; Wilmer et al., 2017). These literatures should inform questions about switching and distraction without being treated as equivalent exposure categories.

5.2 Memory and deeper learning

Memory depends partly on attention at the time information is encoded. Brief video can explain a concept clearly and make information accessible, but exposure alone does not show that a learner can retrieve, connect, or apply it. The levels-of-processing framework predicts stronger retention when learners engage semantically with material (Craik & Lockhart, 1972). This theoretical account supports a plausible pathway from interrupted attention to weaker encoding; it does not demonstrate that ordinary SFV use causes memory impairment.

The direct evidence for memory remains thinner and often relies on self-report or cross-sectional designs. The Jordanian survey by Al-Leimon et al. (2025) is relevant but cannot separate direction of effect, baseline memory, or shared-method bias. Claims that short videos

“destroy memory” therefore exceed the evidence. Better studies need objective memory tasks, delayed recall, and measures of transfer rather than impressions of forgetfulness alone.

5.3 Causality, confounding, and measurement

Several limitations apply across this evidence base. Reverse causation is plausible: individuals who struggle to sustain attention may seek short, frequently changing content. Confounding is also likely. Sleep quality, stress, mental health, academic workload, age, personality, and self-control can relate both to viewing habits and to cognitive outcomes. Many studies use self-reported duration or problematic-use scales, which can be affected by recall error and may not capture actual exposure. Objective usage logs, content classification, and repeated cognitive assessment would strengthen inference.

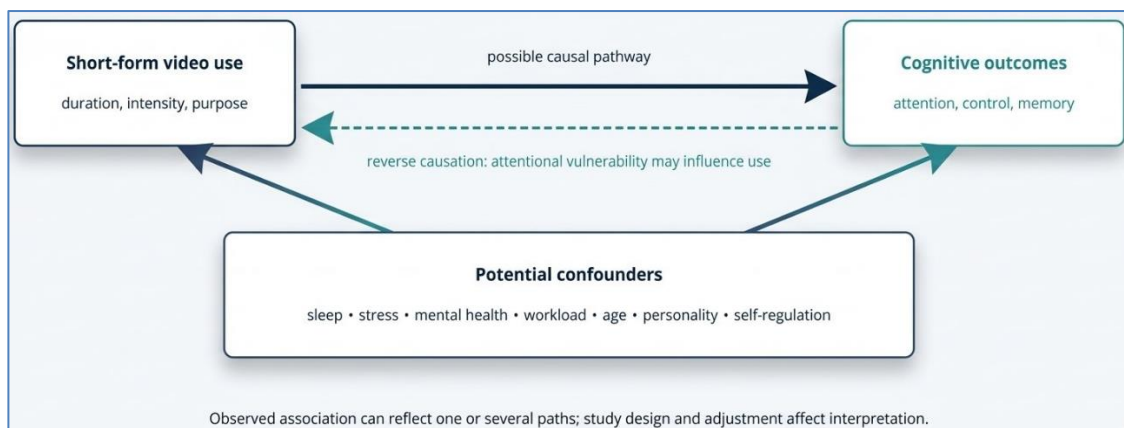


Figure 2. Competing explanations for an observed association between short-form video use and cognitive outcomes. The diagram distinguishes a possible exposure pathway from reverse causation and shared confounders; it does not assert that any pathway has been established.

Exposure itself is not uniform. Watching a planned three-minute science explanation differs from hours of passive scrolling through unrelated clips. Time spent, session structure, active versus passive engagement, content quality, and whether a person multitasks during viewing should be measured separately. “Short-form video use” should not be operationalized as a single dose without describing these distinctions.

6. Benefits, Learning, and the Libyan Context

SFV platforms are not inherently harmful. Short videos can serve educational microlearning, public-health messaging, science communication, language learning, and rapid demonstrations. Their brevity can lower barriers to entry, help learners preview a topic, and make information available in accessible formats. Benefits depend on accuracy, accessibility, thoughtful sequencing, and whether the learner is invited to retrieve or apply the material. An educational clip can be a useful starting point while still needing to be paired with reading, discussion, practice, or reflection for complex topics.

For academic life, a practical distinction is between intentional and automatic use. A student who opens a selected tutorial to answer a defined question is engaging differently from a student

who scrolls without a stopping point during a study session. Reducing nonessential notifications, setting a clear purpose and time limit, and alternating video with retrieval practice or uninterrupted reading are reasonable self-regulation strategies. These are low-cost practices consistent with the mechanisms discussed here; the present review does not claim that they have been validated as clinical interventions for SFV-related cognitive harm.

6.1 Research gap in the Libyan context

The verified Libyan study identified for this review surveyed 147 students at the Faculty of Arts, Sirte University, about social-network use and perceived academic effects (Abdel-Rahman, 2025). It provides useful local context, including perceived uses and concerns, but it did not isolate TikTok, Reels, or Shorts and did not measure attention or memory using cognitive tasks. It therefore cannot support a claim that short-form videos have specific cognitive effects among Libyan students. Direct Libyan research on SFV exposure and cognitive outcomes remains a clear gap.

A Libyan study could combine consent-based device-use logs with a validated measure of problematic SFV use, task-based sustained attention and inhibitory control, and objective learning or delayed-recall measures. Sampling across secondary-school and university settings, regions, age groups, and gender would help assess whether results generalize. Researchers should also record sleep, stress, mental health, workload, and the educational or entertainment purpose of viewing, and should distinguish algorithmic feed use from selected educational viewing.

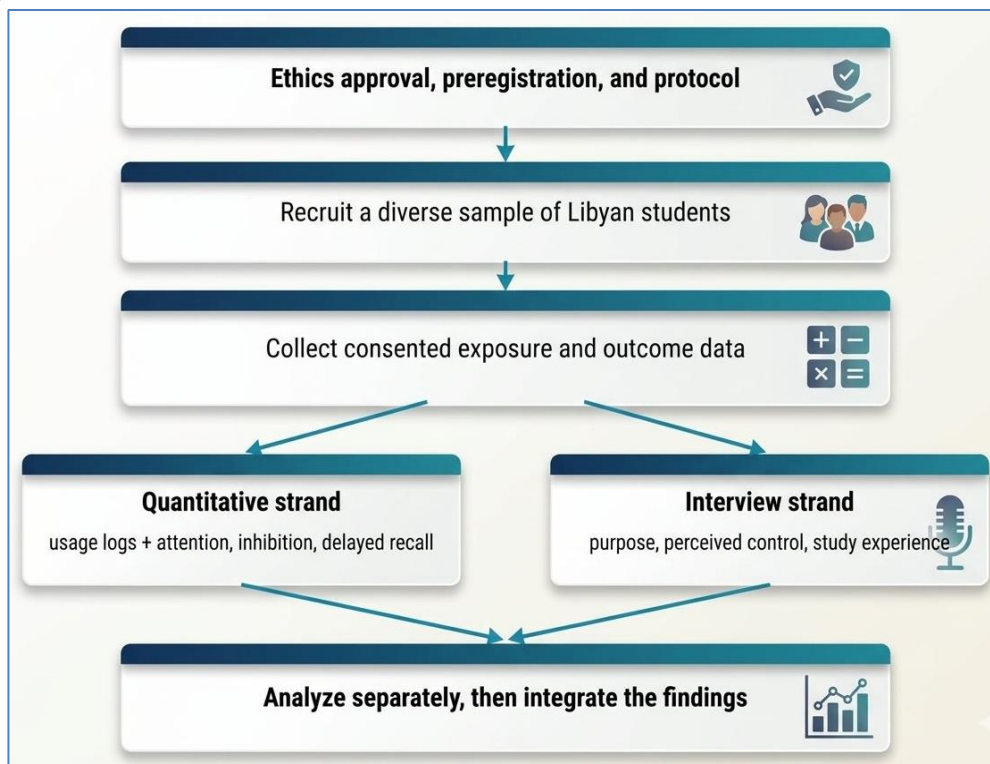


Figure 3. Proposed workflow for a future mixed-method study in Libya. Quantitative and interview evidence should first be analyzed with methods suited to each data type, then integrated; the flow describes a research plan, not completed data collection.

7. Limitations of the Present Review

This review is limited by its reflective narrative design and targeted rather than exhaustive search. It did not search every database named in a systematic-review protocol, register a protocol, use dual independent screening, pool effect sizes, or formally assess study quality. Publication and language bias may affect the evidence identified. The rapidly changing features and definitions of TikTok, Reels, Shorts, and related feeds also make studies difficult to compare over time. Finally, direct SFV research is still developing, with few longitudinal or experimental studies and comparatively limited objective evidence on memory, reasoning, and long-term academic outcomes. The conceptual framework is proposed to organize future testing; it is not a validated causal model.

8. Priorities for Future Research

The next stage of research should move beyond single-time surveys and broad screen-time estimates. Longitudinal cohorts can test whether changes in use precede changes in attention, while well-controlled experiments can compare short-video feeds with matched long-form or non-video content. These designs should measure both short-term state effects and longer-term change, without equating a brief post-viewing effect with permanent impairment.

Studies should use objective, privacy-protective digital tracking and characterize the content and viewing context, including session duration, switching frequency, active educational viewing, and passive scrolling. Researchers should preregister outcomes, report effect sizes with confidence intervals, quantify heterogeneity where synthesis is appropriate, and assess risk of bias. Outcomes should include task-based attention and inhibitory control, validated memory measures, delayed recall, reasoning, learning transfer, and academic behaviors. Analyses should test age differences and plausible moderators such as sleep, stress, mental health, baseline attention, digital literacy, and self-regulation. Finally, intervention studies can test whether notification management, purposeful viewing, feed breaks, or active-recall prompts improve attention or learning, rather than assuming that any single “digital detox” approach works for everyone.

8.1 Suggested analysis plan for future interview and mixed-method research

The source manuscript contains no interview transcripts, recordings, or participant-level dataset. Accordingly, the table below is a proposed analysis plan, not a report of interview findings or new statistical results. Interviews should be analyzed qualitatively; frequency counts may describe coded material only when the coding unit and denominator are defined, and they should not be presented as inferential statistics about a population.

Table 3. Recommended analyses for future empirical work

Data type	Suitable analysis	Values or outputs to report	Key caution
Semi-structured interviews	Thematic analysis: familiarization, coding, theme	Number recruited/interviewed, participant	Do not invent quotations or convert theme frequency into

	development, review, and illustrative quotations.	characteristics, themes, subthemes, anonymized quotations, and coding/reflexivity procedure. Optional code counts with a stated denominator.	statistical significance. No interview data were supplied for this manuscript.
Questionnaire or usage-log data	Descriptive statistics; Pearson or Spearman correlations; adjusted linear/logistic regression as appropriate.	N, missingness, mean $\pm$ SD or median [IQR], proportions, effect estimates, 95% CIs, exact p-values, and covariates.	Choose tests after checking scale, distribution, independence, and outcome type. Cross-sectional adjustment does not establish causation.
Repeated-measures experiment	Paired comparisons, repeated-measures models, or linear mixed-effects models matched to design.	Condition means, within-person effect size, 95% CI, p-value, model assumptions, and attrition.	A short-term post-viewing difference is not evidence of permanent cognitive change.
Interviews plus quantitative measures	Mixed-method integration: compare themes with usage logs and cognitive outcomes using a joint display.	Separate qualitative themes and quantitative effect estimates, then show convergence or disagreement.	Keep qualitative interpretation distinct from statistical inference; explain sampling and integration decisions.

9. Conclusion

Current evidence supports an association between greater short-form video use and less favorable measures of cognition, with the strongest pooled associations reported for attention and inhibitory control. It does not establish that short videos cause permanent brain damage, and evidence about memory and reasoning remains comparatively limited. Cross-sectional designs, self-reported exposure, reverse causation, and confounding constrain causal interpretation.

Short videos can inform, teach, and improve access to knowledge; effects depend on content, context, purpose, and pattern of use. In Libya, available studies describe general social-media behavior, leaving SFV-specific cognitive research largely unaddressed. “Brain rot” is therefore most useful as a prompt to examine attention habits, not as a scientific diagnosis. The priority is to build stronger longitudinal and experimental evidence while helping learners use brief content deliberately and preserve time for sustained reading, practice, and reflection.

10. Recommendations

Based on the current evidence and the limitations identified in this review, the following recommendations are proposed:

1. **Promote purposeful short-form video use rather than automatic scrolling.** Users should be encouraged to define the purpose and duration of viewing sessions, particularly during study or work periods, as intentional educational use may differ substantially from passive and prolonged consumption.
2. **Encourage digital self-regulation strategies among students and young adults.** Practical approaches such as reducing unnecessary notifications, setting time boundaries, taking regular breaks from algorithm-driven feeds, and combining video learning with reading, discussion, and retrieval practice should be considered.
3. **Develop digital literacy programs in educational institutions.** Schools and universities should provide guidance on healthy digital habits, attention management, evaluating online content quality, and distinguishing educational use from excessive entertainment consumption.
4. **Conduct longitudinal and experimental research to clarify causal relationships.** Future studies should move beyond cross-sectional designs by using repeated cognitive assessments, objective usage tracking, and controlled comparisons between short-form video exposure and other media formats.
5. **Improve measurement methods in future research.** Studies should include objective indicators such as device-based usage logs, validated cognitive tasks for attention and memory, and assessment of factors that may influence outcomes, including sleep, stress, workload, and self-regulation.
6. **Expand research within the Libyan context.** Since available Libyan evidence mainly concerns general social-media use rather than short-form video-specific cognitive outcomes, future Libyan studies should examine platforms such as TikTok, Instagram Reels, and YouTube Shorts using representative samples and validated cognitive measures. Brain_Rot_Reflective_Review_Rev...
7. **Avoid unsupported claims that short-form videos cause permanent cognitive damage.** Public health communication should present current findings accurately by emphasizing that evidence demonstrates associations, particularly with attention and inhibitory control, but does not prove irreversible cognitive decline.

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Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

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