Smartphone and Self-Harm: A study of Social Media Use as a Risk Factor

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ABSTRACT: In recent years, the use of social media and the internet has become an inseparable part of everyday life, especially among adolescents. Social media offers a variety of benefits, including ease of communication, access to information, and entertainment. However, concerns have emerged about its negative impact on mental health, especially in relation to self-harm behavior. Adolescents often imitate the trend of self-harm and join in posting the results of scratches on social media. The aim of this study was to determine variations in self-harm in adolescents which are related to the duration of internet use in one day and the use of social media. The research method uses a comparative descriptive approach and Two-Way ANOVA analysis to explore interactions between these variables. Data was collected through an online survey with a self-harm instrument consisting of 18 statements, with respondents choosing from 4 alternative answers available. The results of the analysis show that there are significant differences in self-harm behavior based on the duration of internet use per day and the type of social media used. Adolescents who use the TikTok platform show a higher self-harm score compared to other platforms, especially with longer duration of internet use. These findings indicate that the type and way of using social media has a significant influence on self-harm behavior.

INTRODUCTION

Self-harm among young individuals is a notable issue in public health. Research suggests that over 15% of young people in the community admit to self-harming, and this behaviour is often repeated and associated with an increased risk of suicide (Bennardi et al., 2016; Hawton et al., 2012; Morey et al., 2017). The reasons for self-harm are intricate and diverse, however there is a growing hypothesis regarding the possible adverse effects of social media and smartphone usage on the mental health of young people. Six Adolescents are the primary consumers of social media and smartphones, as evidenced by the fact that 91% of individuals aged 12-15 in the UK utilize social media, and 98% of 13-year-olds possess a smartphone (Ofcom, 2020). Certain individuals engage in

deliberate self-harm as a means of managing their emotions or challenges. It has become the second most prevalent cause of death among young individuals aged 15 to 19 and the tenth most prevalent cause of death among those aged 10 to 14 (Muehlenkamp et al., 2012). Approximately 2 million adolescents and young adults have sustained injuries, according to the National Alliance on Mental Illness 1. In a separate study conducted in Britain (Hawton et al., 2002), it was discovered that over 6.5% of 400 students aged 14-16 reported experiencing self-inflicted injury within the previous year. Research has consistently demonstrated that the average age at which non-suicidal self-injury (NSSI) commences is approximately 14 years old (Ammerman et al., 2018; Gandhi et al., 2018). Nevertheless, recent research indicates that there are substantial disparities in the age at which NSSI commences. After conducting a review of longitudinal studies on non-suicidal self-injury (NSSI), (Plener et al., 2015) found that the incidence of NSSI consistently increases until the age of 12, reaches its peak between the ages of 14 and 16, and then begins to decline around the age of 18. Gandhi et al. (2018) conducted a comprehensive epidemiological study of Belgian adolescents and found that the likelihood of initiating non-suicidal self-injury (NSSI) was highest at ages 14 and 15, and that the probability progressively decreased after the age of 18. The age range of 18-20 is the second most common period for the emergence of NSSI, following the age of 14. This has been determined by numerous studies. This suggests that the development of NSSI is significantly influenced by the adolescent phase (Muehlenkamp et al., 2019).

In the last ten years, the use of social media and phones cell has significantly changed the way young individuals allocate their time and engage in social interactions with their peers (Afdal et al., 2019; Syahputra et al., 2022; Twenge et al., 2019). This aligns with a significant surge in the rates of self-inflicted damage, especially among teenage females (Morgan et al., 2017). Given the extensive use of social media and phones cell, comprehending the consequences for the mental health of young people is crucial (Syahputra et al., 2024). Using data from nine cross-sectional studies published between 2012 and 2018, a recent review found that problematic internet and social media use is independently associated with suicide attempts among young people (Sedgwick et al., 2019).

Smartphones have become ubiquitous in modern society, and greatly influence many aspects of daily life, including social interaction and entertainment. Social media platforms are frequently employed by individuals with mental health issues to communicate their personal experiences and solicit assistance (Daine et al., 2013). The individual (Choudhury & De, 2014) may interpret the received feedback as helpful. Therefore, the use of social media can help reduce feelings of loneliness and social isolation in young people with mental health issues by allowing them to strengthen existing friendships and form new social connections. However, excessive time spent online instead of engaging in offline social interactions can worsen feelings of loneliness, concerns arise regarding the potential negative impact on mental health, especially related to self-harming behavior.

TikTok is chosen as the focus due to its rapid rise in popularity among teenagers, distinct algorithm-driven content, and unique short video format, which create specific engagement patterns and influence youth behavior and mental health differently from other social media platforms. The growth of TikTok, a popular social media platform known for its short video content, has raised questions about its impact on user behavior and mental health. TikTok's algorithm-based content recommendation system exposes users to a wide variety of videos, which can include uplifting content and potentially triggering content related to self-harm. Understanding how these dynamics impact users is critical to developing interventions and policies that support safe digital environments. In the tangible sphere, individuals who are seeking assistance for mental health concerns frequently lack knowledge regarding the appropriate individuals to contact for support. The focused involvement of a diverse variety of experts in mental health services is required to comprehend the impact of social media on self-harm behaviours (Miswanto et al., 2016; Syahputra, 2024). Furthermore, they may be concerned about the potential for trust breaches or the risk of exacerbating their problems by seeking assistance (Houghton & Joinson, 2012). In contrast, they may

be highly engaged and transparent on social media when it comes to discussing the issue of self-harm (Dyson et al., 2016). Public health specialists, psychiatrists, psychologists, and social workers should collaborate to examine this complex relationship.

Nevertheless, there is a lack of research that examines self-harm behavior in relation to the duration of internet use per day and the use of social media. This condition has resulted in a substantial lacuna in the current research literature, particularly in Indonesia. Until now, no comprehensive analysis has been conducted to investigate the differences in self-harm behavior among adolescents based on the duration of time spent on the internet each day and the social media platforms they use. It is imperative to comprehend the ways in which these factors contribute to self-harm behavior in order to develop more effective interventions and policies that can mitigate the detrimental effects of social media use on the mental health of adolescents, as they are a group that is particularly susceptible to its influence. Consequently, the objective of this study is to investigate the variations in adolescent self-harm that are associated with the duration of internet use in a single day and the use of social media.

METHODS

Participants

The target group for this research includes adolescents who are active users of social media. To collect data, the researchers used a sampling technique that involved distributing the research survey through multiple channels, such as online advertisements, emails, blogs, social media platforms, and professional organizations. Before respondents began the survey, electronic informed consent was obtained. This research involved 523 adolescents as respondents who were active social media users (details in table 2). Respondents consisted of 83.2% women and 16.8% men. Adolescents who were respondents were active social media users on the platforms Facebook (3.6%), Instagram (51.1%), TikTok (41%), and Twitter (4.4%).

Procedures

This research method adopts a comparative descriptive approach to investigate the differences between the duration of internet use per day and the type of social media use and the level of self-harm. Respondents were given a self-harm instrument form consisting of 18 statements which were distributed online.

Measures

Data for each test group was collected using the Self-harm instrument developed by (Vrouva et al., 2010). The results of the instrument analysis show that person reliability is 0.75 and item reliability is 0.99. This shows that the quality of the answers given by the person on each test is good and the quality of the items used in the measurement is very good. Meanwhile, the value of each test on Cronbach's alpha (KR-20) is 0.87, this shows that the interaction between person and item is very good. Furthermore, the value of raw variance explained by measures is 48%, this shows that the minimum unidimensional requirement of 47.1% has been fulfilled (Linacre, 2012). In addition, the item response sensitivity pattern value of +1.08 logit (INFIT MNSQ) and the overall item response pattern sensitivity value of +0.95 logit (OUTFIT MNSQ) indicate that they are in the ideal range. This indicates that the self-harm instrument has very good quality for the measurement conditions carried out (details in table 1).

Data Analysis

Research data was analysed using Two-Way ANOVA to explore the interaction between the variables of duration of internet use per day and type of social media use on levels of self-harm. This

analysis is supported by visualization using a raincloud plot, which helps to show the data distribution and differences between the groups being compared clearly and informatively.

Table 1. Self-harm instrument quality

Estimation	Score
Item Reliabilities	.99
Person Reliabilities	.75
Cronbach alpha (KR-20)	.87
Separation index of Person	1.73
Mean Item	0.00
Mean Person	-1.71
Mean INTFIT MNSQ Item	1.08
Mean INFIT MNSQ Person	.99
Mean OUTFIT MNSQ Item	.95
Mean OUTFIT MNSQ Person	.95
Raw Variance Explained by measures	47.1 %

RESULTS AND DISCUSSION

Discussion of the results of this research regarding differences in adolescent self-harm based on the duration of internet use per day and use of social media. Furthermore, a different test of adolescent self-harm based on the duration of playing the internet per day and the use of social media is presented in Table 2 below.

Table 2. Differences in Self-Harm in terms of internet and social media duration (n = 523)

Differentiated Aspects	Distinct Item	N	Self-Harm Mean	Tests of Between	
				F	Sig.
Internet Duration	> 8 Hour	111	12.68	7.02	.001
	1 – 3 Hour	148	8.64		
	4 – 6 Hour	164	8.67		
	6 – 8 Hour	99	10.39		
Social Media	Facebook	19	8	3.40	.018
	Instagram	267	8.94		
	TikTok	214	11.17		
	Twitter	23	9.04		
Internet duration*social media				0.92	.505

Adolescent self-harm shows that the average duration of internet play per day for adolescents is at the highest level, namely more than 8 hours using internet access. Spending more than 8 hours per day on the internet, especially on platforms like TikTok, makes adolescents more vulnerable to exposure to negative content. Content that contains bullying, body shaming, or dangerous trends can affect adolescents' mental conditions. Adolescents who are frequently exposed to this kind of content can feel isolated, anxious, or experience decreased self-esteem, which ultimately encourages them to engage in self-harm as a form of escape or coping mechanism.

Furthermore, the research results show that there is a significant difference in self-harm based on the duration of internet use per day, as seen from the P-Value results of 0.001, which is smaller than 0.05 (Table 2). The research results also show significant differences in social media use, with a P-Value of 0.018. This shows that the type and way of using social media also influences self-harm behavior. The most frequently used social media platforms, such as TikTok, can play a role in amplifying or exacerbating mental health problems, especially if the content consumed is negative or damaging. However, this study also found that self-harm based on duration of internet use per day and overall social media use did not show a significant difference. This condition is caused by the quality of social interaction through social media which can also provide significant emotional support. Teens who use social media to maintain relationships with friends and family, as well as get support

from the community, may not experience an increased risk of self-harm. Support from the environment and family can function as a protector that reduces the negative impacts of internet use. For more details, you can see from Figure 1 the differences in self-harm based on the duration of playing the internet per day and the use of social media.

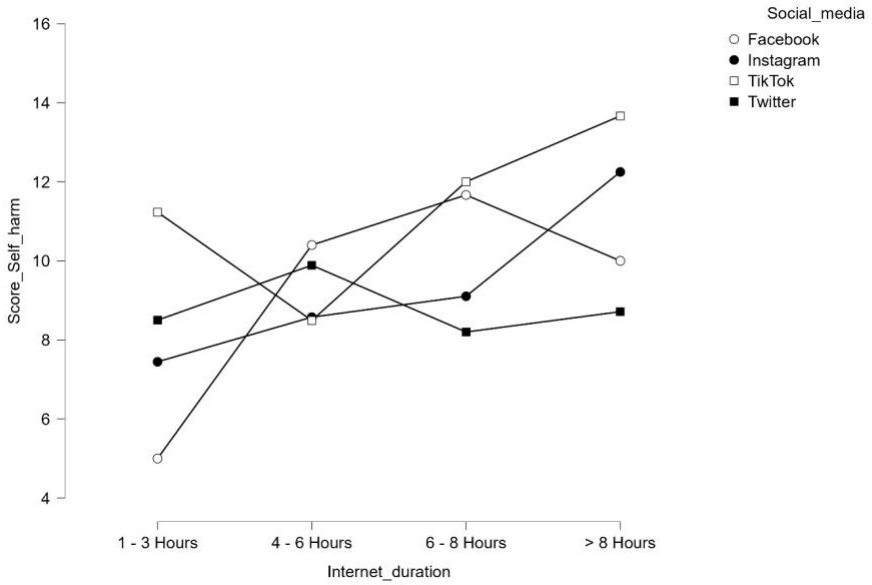

Figure 1. Descriptive plots about self-harm based on internet and social media duration

Figure 1 shows that longer duration of internet use is associated with increased self-harm scores in adolescents, especially among TikTok and Facebook users. At a duration of more than 8 hours per day, the self-harm score for TikTok users reaches its highest peak of around 15, while for Facebook users it reaches around 14. Instagram also shows a significant increase at long durations of use, but Twitter tends to be more stable. The significant increase on TikTok and Facebook is due to content characteristics and algorithms that attract users to linger, resulting in greater exposure to negative or damaging content. This indicates that the type of social media platform and duration of use can influence the level of self-harm in adolescents. Therefore, it is important to monitor and limit the duration of social media use in adolescents to reduce mental health risks, as well as provide adequate digital education and social support. This indicates that the type of social media platform and duration of use can influence the level of self-harm in adolescents.

Discussion

Presently, over 3.7 billion individuals around the globe utilize the internet (InternetWorldStats, 2016). The telecoms sector has reported a significant rise in the acquisition of smartphones with 4G network capabilities, reaching up to a 50% increase (Çelik et al., 2015; GfK, 2015). Specifically, a large number of people utilize online communication programs and social networking sites, such as Facebook, WhatsApp, Twitter, and Instagram, for the purpose of communication and interaction (Beyens et al., 2016). This issue is worsened by the advanced features of smartphones, which offer several apps and platforms, leading to their growing popularity among individuals of all age groups. These programs and platforms let users to create personal profiles online by sharing personal information, images, and videos. They also allow users to maintain contact with friends who are geographically distant and remain updated on current events (Amichai-Hamburger & Vinitzky, 2010; Kuss & Griffiths, 2011). Therefore, social networking sites frequently serve as a platform for introverted or isolated persons to engage with others. Within this particular framework, it is more convenient to fulfill social requirements via online means rather than in-person connection (Banjanin et al., 2015; Jin, 2013; Shelly Bhagat, 2015). According to Young (2011), 98% of those aged 16-20 who use the internet currently possess a smartphone and spend four hours a day online using their

smartphone. The usage of smartphones at Turkish universities for a duration of 24 hours is as follows: less than 1 hour (23.4%), 1 to 2 hours (27%), 2 to 3 hours (13.1%), 3 to 4 hours (5.1%), 4 to 5 hours (4.9%), and more than 5 hours (14.4%) (Zafer et al., 2016).

The research results show that there is a significant difference in self-harm based on the duration of internet use per day, as seen from the P-Value results of 0.001, which is smaller than 0.05 (Table 2). The research results also show significant differences in social media use, with a P-Value of 0.018. This shows that the type and way of using social media also influences self-harm behavior. The most frequently used social media platforms, such as TikTok, can play a role in amplifying or exacerbating mental health problems, especially if the content consumed is negative or damaging. Two recent systematic evaluations of internet and social media use have indicated that exposure to self-harm content is associated with the normalization of self-harm behaviour, which has the potential to cause injury through triggering, competition, or contagion (Dyson et al., 2016; Marchant et al., 2017). Nevertheless, both also identified potential advantages of crisis advice and support in terms of preventing self-harm, reducing social isolation, and exploring the potential for therapy and outreach by health professionals. In a separate review, all 15 studies demonstrated detrimental effects from viewing self-harm and suicide-related images. However, nine of the studies reported similar protective mechanisms, including the promotion of self-harm recovery and the mitigation or reduction of self-harm (Susi et al., 2023).

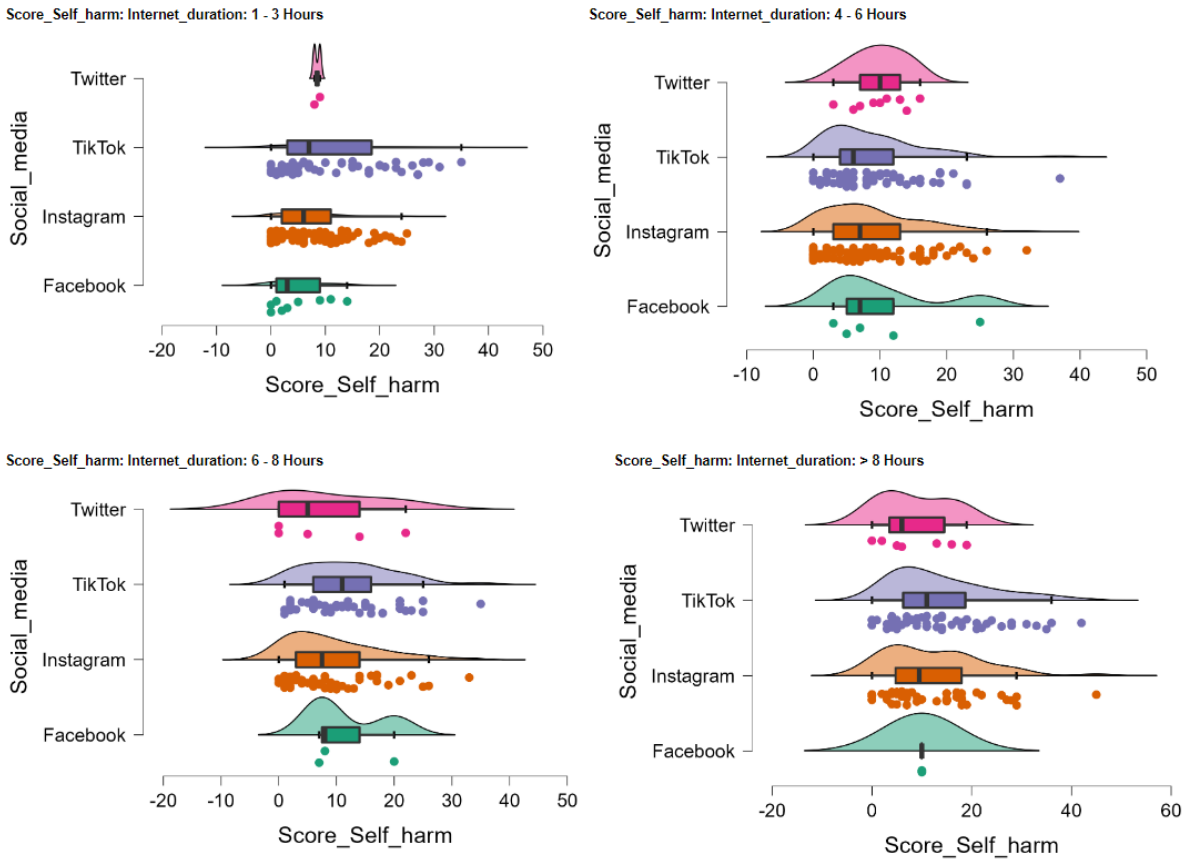

Figure 2. Conditions of Self-Harm and Social Media Based on Internet Duration Per Day

Figure 2 shows the level of self-harm and social media users based on the amount of time they spend accessing the internet every day. This graph is divided into four sections, each showing a different amount of time: 1-3 hours, 4-6 hours, 6-8 hours, and over 8 hours. TikTok, Instagram, Facebook, and Twitter are the four main social media platforms analysed. Twitter users showed large variations in self-harm scores over 1 to 3 hours of internet use, with some users having very high

scores, nearly 50, indicating that, despite relatively short periods of internet use, the negative impact on mental health can remain significant for some users.

Recent research suggests that social media can have varying effects on young people, depending on the individual and the specific circumstances. While it may have positive or neutral effects for some, it can be harmful for others. Therefore, further investigation is necessary to understand the impact of different types of social media use on individuals. The research on the impact of excessive screen time on mental health is inconclusive, perhaps due to differences in the methods and terminology used (Orben & Przybylski, 2019; Sohn et al., 2021). Sohn et al. (2021) discovered a correlation between excessive smartphone usage and heightened levels of anxiety and despair. Recent findings suggest that there is a potential connection between excessive smartphone use and thoughts of suicide, and this relationship may be influenced by emotional intelligence (Arrivillaga et al., 2020; Lung et al., 2020). Moreover, there is existing research that connects excessive smartphone usage with disruptions in sleep patterns (Carter et al., 2016).

Twitter users tended to have very high self-harm scores over 8 hours of internet use, with some people reaching scores close to 50, indicating a strong correlation between excessive Twitter use and increased self-harm scores. It was reported that one in two young individuals in the current cohort spend an inordinate amount of time (i.e., over five hours) on their smartphone on weekends and were classified as having problematic smartphone use (Bye et al., 2024). We are unaware of any other study that has examined the problematic use of smartphones in clinical samples. The results of a systematic review and meta-analysis of non-clinical studies indicated that the prevalence of problematic smartphone use among adolescents and young adults was between 10 and 30% lower (Sohn et al., 2021).

TikTok has a self-harm score that is generally between 10 and 40, indicating that excessive internet use also has a negative impact on its users. Overall, TikTok use shows a higher self-harm score compared to other platforms, especially with longer duration of internet use. In contrast, Facebook shows a lower self-harm score compared to other platforms. These findings indicate that the duration of internet use and the social media platforms used can have a significant impact on users' self-harm conditions. In addition, inadequate sleep has been associated with depression and thoughts of suicide among young individuals (Gangwisch et al., 2010). Furthermore, there is a correlation between sleep issues and suicidal thoughts and behaviours, which is independent of depression (Pigeon et al., 2012). The existing data about the link between social media, smartphone usage, and mental health and self-harm in young individuals is primarily based on findings from cross-sectional research, such as the study conducted by (Mancinelli et al., 2021). For this reason, there is a need for effective intervention programs and awareness campaigns to educate users about the dangers of negative content. Additionally, it is important to improve access and quality of counseling services for individuals negatively affected by social media use. Counseling can help in providing emotional support, teaching healthy coping strategies, and managing social media use wisely.

Implications

The implications of this research are to provide valuable insights for social media platform developers, policy makers, and mental health practitioners. By identifying the most harmful types of content, social media platforms can improve their algorithms to minimize exposure to that content. Additionally, intervention programs and awareness campaigns can be designed more effectively to educate users about the dangers of negative content and promote the consumption of more positive, mental health-supportive content (Syahputra & Erwinda, 2020). It is also important to improve access and quality of counseling services for individuals negatively impacted by social media use. Counseling can play a role in providing emotional support, teaching healthy coping strategies, and helping individuals develop skills to manage social media use more wisely. Thus, this step will not only help

reduce self-harm behavior among social media users, but also contribute to improving overall mental health in the digital society.

CONCLUSIONS

The findings show that there is a significant difference in self-harm based on the duration of internet use per day. The research results also show significant differences in social media use. This shows that the type and way of using social media also influences self-harm behavior. The most frequently used social media platform is TikTok, social media plays a role in strengthening or exacerbating mental health problems, especially if the content consumed is negative or damaging. Further study is needed to determine how social media sites like TikTok affect self-harm. This research can help build better interventions and strategies to manage juvenile mental health and social media use.

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