Age-Based Analysis of Self-Harm Behaviors Among Instagram Users

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ABSTRACT: Suicide rates among adolescent and young adults have risen to the second leading cause of death in the world. Research on the influence of social media on the suicide risk or reduction of risk among young people is a relatively new and rapidly increasing field of study that requires the attention of a wide variety of specialists working in the field of mental health services. This research aims to describe the condition of self-harm based on the age of individuals who use the Instagram platform. Because Instagram is popular among teens and young adults, the study focused on it to study self-harm in vulnerable age groups. This research is comparative research obtained through purposive sampling. The sample for this research was 288 respondents consisting of various ages. Data were collected using a self-harm instrument with 18 items in a four-point response format. The analysis technique uses an item response theory (IRT) approach with Rasch Model analysis, this approach provides a robust framework for examining the properties of test items and participant responses. This research tested descriptive and differences using Anova with the help of WINSTEPS Version 5.0.0. The results show that there is a significant difference between self-harm among Instagram users based on age. In addition, Instagram users aged 18–20 in late teenage development fill out the self-harm instrument more than other age groups. This study recommends that policymakers and scholars should monitor social media mental health trends.

INTRODUCTION

The prevalence of self-harm among teenagers and young adults has significantly increased, reaching a concerning magnitude. Consequently, it is a critical issue that is a burgeoning public health concern, resulting in adverse emotional, physical, and economic effects on family members (Favril et al., 2020; Skegg, 2005; Witt et al., 2021). The Diagnostic and Statistical Manual of Mental Disorders (DSM–5) fifth edition differentiated between suicidal behavior disorder (SBD) and non-suicidal self-injury (NSSI) and designated both as conditions that warrant additional investigation (Fisher & Roget, 2014). Despite the fact that self-harm is conceptually distinct from suicidal behaviors in terms of the desire and intent involved, the most concerning aspect of self-harm is its close association with suicide, which is a prominent cause of death among adolescents worldwide (WHO, 2022).

Deliberate self-harm is a behavior that certain individuals employ to manage their emotions or challenges. It has become the second most common cause of death among young people aged 15 to 19 and the tenth most common cause of death among those aged 10 to 14 (Muehlenkamp et al., 2012). According to the National Alliance on Mental Illness 1, approximately 2 million adolescents

and young adults have sustained injuries. In another study conducted in Britain (Hawton et al., 2002), it was revealed that over 6.5% of 400 students aged 14-16 reported that they had self-inflicted injury within the past year. Studies have consistently found that the average age at which non-suicidal self-injury (NSSI) begins is around 14 years old (Ammerman et al., 2018; Gandhi et al., 2018). However, recent research suggests that there are significant differences in the age at which NSSI starts. Plener et al. (2015) conducted a review of longitudinal studies on non-suicidal self-injury (NSSI) and discovered that the occurrence of NSSI consistently rises until the age of 12, reaches its highest point between the ages of 14 and 16, and then starts to decline around the age of 18. In comprehensive epidemiological research of Belgian teenagers, Gandhi et al. (2018) discovered that the greatest likelihood of initiating non-suicidal self-injury (NSSI) occurred at ages 14 and 15, with the probability gradually decreasing after reaching age 18. Several studies have found that the age range of 18-20 is the second most frequent period for the emergence of NSSI, following age 14. This indicates that adolescence is a crucial phase for the development of NSSI (Muehlenkamp et al., 2019).

Although the onset of self-harm (SH) often occurs around the age of 13 among community teenagers, there has been less research on recent trends in adolescent SH, particularly about variations in the age of onset, within the general adolescent population. Prior research has indicated that starting self-harm at a younger age, usually 12 years old or younger, is linked to more frequent, varied, and severe types of self-harm (Ammerman et al., 2018; Muehlenkamp et al., 2019; O'Connor et al., 2018). Although the potential impact of the onset of more widespread self-harm on suicide risk is recognized, its link has not been adequately demonstrated, particularly in a community sample of early teenagers (Knipe et al., 2022). A small proportion of individuals seek medical assistance after engaging in self-harm, highlighting the importance of gaining a deeper understanding of informal methods of seeking aid. Given the widespread usage of social media among young people, it is evident that they have the potential to serve as a valuable resource. Nevertheless, social media is frequently debated not as a beneficial tool, but rather as a contributing factor to the rising prevalence of self-harm, particularly among teens. Academics, doctors, and other individuals have raised concerns over whether social media platforms promote self-harm. This can occur either by normalizing the behavior or by connecting young individuals with those who participate in and endorse it (Duggan et al., 2012; Lewis & Baker, 2011).

The investigation of the impact of social media on self-harm practices among young individuals is a recently emerging and swiftly growing area of study. In contemporary times, individuals are progressively using social media tools, such as Twitter and Flickr, to disseminate their opinions and daily endeavors. The widespread presence of smart phones and tablets has further facilitated the process of sharing, making it both convenient and immediate. Therefore, social media offers a way to collect behavioral characteristics that are pertinent to an individual's cognition, emotional state, personal interests, and social interactions (Sesva et al., 2022). Understanding this field of research is essential, given the profound influence that social media has on the mental well-being of young people (Syahputra et al., 2022). In the tangible realm, individuals seeking assistance for mental health concerns often lack knowledge about whom to approach for support. Comprehending the impact of social media on self-harm behaviors necessitates the focused involvement of a diverse range of experts in mental health services (Sandjaja & Syahputra, 2019; Syahputra et al., 2023). Additionally, they may harbor apprehensions about potential breaches of trust or the possibility of exacerbating their difficulties by seeking help (Houghton & Joinson, 2012). Conversely, they may be highly engaged and transparent on social media when it comes to discussing the issue of self-harm (Dyson et al., 2016). Psychologists, psychiatrists, social workers, and public health specialists should work together to investigate this intricate connection.

According to co-construction theory, the posts made by adolescents on social media are likely to mirror their beliefs and behaviors in real life (Subrahmanyam et al., 2006). Consequently, teenagers who regularly endorse self-harm content on social media are more prone to participating

in such actions in real life. According to social cognitive theory and transformation techniques, the material that teenagers view online, including posts from the public and their friends, can influence their thoughts and emotions offline (Breault & Lester, 1988; Nesi et al., 2018). The current research gap lies in a deeper understanding of how different age groups respond to and are affected by self-harm content on Instagram. In addition, there is still not much research identifying effective interventions to reduce the risk of self-harm on social media platforms. This research tries to fill this gap by providing empirical data regarding self-harm behavior among Instagram users based on age. For this reason, this research aims to describe the condition of self-harm based on age in individual users of the Instagram platform.

METHODS

This study is a form of comparative research that was conducted using purposive sampling. The target demographic consists of individuals who utilize the Instagram platform for social media purposes. Sampling will be conducted by distributing a scale through online advertisements, emails, blogs, social media, and professional groups. Electronic informed permission was obtained before to collecting data from the participants. The study included a sample of 288 Instagram users, categorized into four age groups: 3.8% were between the ages of 11 and 14; 3.5% were between the ages of 15 and 17; 59% were between the ages of 18 and 20; and 33.7% were between the ages of 21 and 40. This study is not representative due to the distribution of the instrument through online advertisements, emails, blogs, social media. This method is more effective in reaching older users, especially those in the 18–20 age range, who tend to be more active on the Instagram social media platform and have more access to information related to the study.

Measures

The self-harm scale was developed from theory (Vrouva et al., 2010). Vrouva et al. (2010) theory was chosen specifically because it covers critical aspects of self-harm that align with the behaviors being measured in study, such as mutilation, self-injury, overdose, and suicide attempts. These aspects are central to understanding how adolescents, especially those influenced by social media, engage in self-harm as a way to cope with emotional distress. By addressing these specific behaviors, the theory provides a solid framework for developing a comprehensive self-harm instrument tailored to measure these harmful actions in the context of social media use, such as on Instagram. This scale has 18 items in which items are answered in a four-point response format ranging from never to many times. Example items include “Have you ever forced the injured body part to move with the intention of hurting yourself?”. This scale has acceptable reliability (Cronbach's of 0.86; item reliability on Rasch 0.98) and satisfactory validity (Center, 2020; M. M. Fisher et al., 2014; Levinson et al., 2019; National Institute of Mental Health, 2017) and has a Raw variance explained by measures value of 45.7%, meaning that 18 items are representative for measuring self-harm. Raw Variance Explained by Measures refers to the proportion of total variance in the data that is explained by the Rasch model's measures (i.e., person and item estimates). It indicates how well the data fit the model by showing how much of the observed variance can be attributed to the latent trait being measured (e.g., self-harm behavior).

Data Analysis

The analysis technique uses an item response theory (IRT) approach with Rasch Model analysis, this approach provides a robust framework for examining the properties of test items and participant responses. This research tests descriptive and differences using Anova (Bond et al., 2020; Syahputra et al., 2024; Syahputra & Erwinda, 2020) with the help of WINSTEPS Version 5.0.0 (Linacre, 2022). WINSTEPS 5.0.0 was chosen because it provides advanced tools for Rasch Model analysis, which is essential for accurately assessing the psychometric properties of the self-harm instruments used in

this study, especially studies testing differences, for which differential item functioning (DIF) analysis is a solution to display good visualization.

RESULTS AND DISCUSSION

Results

This research uses two types of analysis to examine self-harm behavior among Instagram users based on age. The first analysis is a descriptive test which aims to describe the characteristics of self-harm among Instagram users based on certain age groups. The results of this descriptive test are presented in detail in Table 1 below. The second analysis is a difference test which serves to identify significant differences in self-harm behavior between various age groups of Instagram users. This difference test allows researchers to see whether there are meaningful variations in self-harm behavior between different age groups.

Descriptive Test of Self-Harm of Instagram Users Based on Age

A descriptive analysis of Instagram users' self-harm by age revealed an interesting pattern. There is significant variation in levels of self-harm among different age groups of Instagram users. These findings provide valuable insights in understanding the dynamics of self-harm behavior among users of these platforms.

Table 1. Descriptive Self-Harm Based on Age

Person Count	Mean Measure	S.E. Mean	Median	SD	Model Separation	Model Reliability	RMSE	Code
288	-2.14	.08	-1.95	1.05	1.46	.68	.72	*
11	-3.13	.39	-3.69	.74	.74	.35	1.00	1
10	-1.71	.39	-1.52	.99	1.52	.70	.65	2
170	-2.05	.09	-1.95	.98	1.46	.68	.67	3
97	-2.23	.14	-2.10	1.14	1.46	.68	.78	4

Information: * = Total; 1 = Early teens (11 - 14 Years); 2 = Middle teens (15 - 17 Years); 3 = Late teens (18 - 20 Years); 4 = Early adulthood (21 - 40 Years)

In table 1 above, it can be seen that in the 18–20-year age range, late adolescent development is significantly more likely to fill out the self-harm instrument compared to other age ranges. The study found that Instagram users showed relatively low levels of self-harm, indicating low levels of self-harm among users of the platform. Overall, the reliability of the model formed from filling in the self-harm instrument is considered quite good with a reliability coefficient of 0.68. The low standard error of the mean indicates good accuracy in the measurement, with the model being able to separate respondents into two clear groups: those with high and low levels of self-harm. Figure 1 provides a clearer picture of the distribution of self-harm data among Instagram users.

The first image illustrates two bubble colors which show two categories, namely orange which represents the individual (person) and blue which represents the object (item). The results show that the orange bubble distribution is at the bottom of the blue bubble distribution. This indicates that the level of self-harm among Instagram users tends to be low. This difference in distribution highlights that self-harm activities may not be a primary focus or priority in Instagram users' interactions, providing insight into the relative levels of well-being within the community.

Table 2. Anova test of self-harm among Instagram users based

Sum of Squares	d.f.	Mean Squares	F-test	P-value
14.63	3.00	4.88	3.05	0.029

Fixed-Effects Chi-squared: 8.8002 with 3 d.f., prob. 0.032

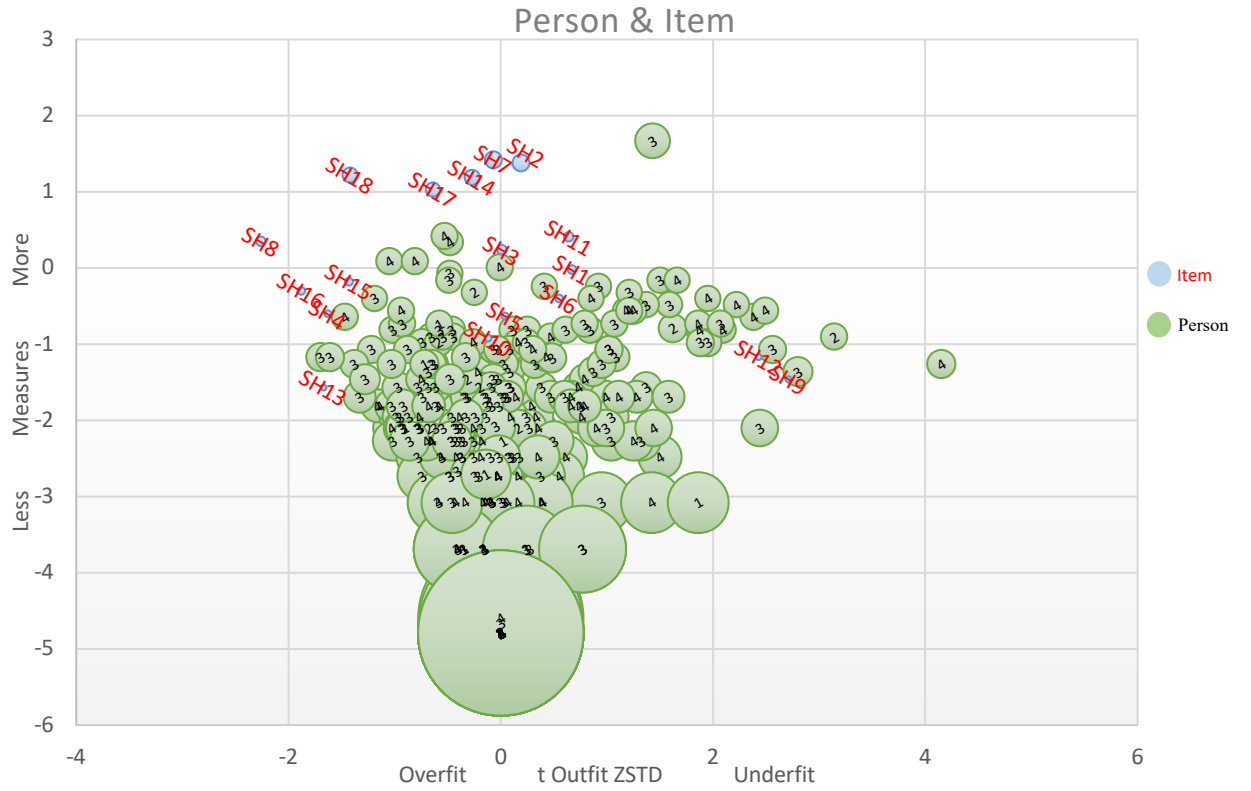

Figure 1. Conditions of self-harm among Instagram users based on age with bubble chart

Test differences in self-harm among Instagram users based on age

The p-value for the difference test is 0.029, which is less than the predetermined significance level of 0.05. This finding indicates that age-related variations in the prevalence of self-harm among Instagram users are substantial. Put differently, the data indicates that age does indeed affect the frequency or severity of self-harm incidents among Instagram users, as supported by substantial statistical evidence.

Analysis of variance using ANOVA test revealed that age-related variation in self-harm prevalence was significant, with a p-value of 0.029 indicating that age influences the frequency and severity of self-harm incidents among Instagram users. These findings provide valuable insights into the dynamics of self-harm behavior in the Instagram user community and suggest the need for further attention to mental health trends on social media platforms.

Discussion

The study found that although Instagram users indicated self-harm, the overall rate of self-harm was relatively low. An in-depth analysis of the low levels of self-harm among Instagram users could include several factors. First, Instagram may provide a platform for adolescents to express themselves and gain social support, which may serve as a protective mechanism against self-harm. Second, the existence of privacy and security settings features on Instagram might help reduce social pressure and cyberbullying, which often trigger self-harm. Supported by Dorol--Beauroy-Eustache & Mishara (2021) on factors that influence the impact of cyberbullying on suicidal and self-harm behavior. Third, increasing awareness and education about mental health on social media (O'reilly et al., 2019) may contribute to lower levels of self-harm, as users are more informed about ways to deal with stress and anxiety in healthy ways. Additionally, youth in the 18–20 age range may have better access to support resources, whether from family, friends, or mental health professionals, compared to younger age groups. This could be another factor that explains why levels of self-harm are relatively low among Instagram users. However, it is also worth considering that this data may be

influenced by other factors such as underreporting or self-selection bias, where users who are more susceptible to self-harm may not be active on the platform or choose not to publicly disclose their experiences.

This is different from several other studies which explain that accidentally finding content related to self-harm was caused by hashtags related to suicide (Arendt et al., 2019; Carlyle et al., 2018; Scherr, 2022). Carlyle et al. (2018) performed a content analysis on Instagram posts with themes related to suicide, including those that were labeled with #suicide and/or #suicidal. Analyses suggest that self-harm was prevalent in most of the posts. ones discussing thoughts of suicide received greater levels of interaction compared to ones that did not address this topic. In line with the research conducted by Arendt (2019), there was a notable lack of useful resources from authoritative figures in the field of public health. Nevertheless, the impact of the primarily visual content on Instagram is still largely uncharted. Qualitative research has provided limited evidence about the normalizing effects of photographs uploaded on the Tumblr platform among individuals aged 16 to 24 (Jacob et al., 2017). In addition to this, Moreno et al. (2016) have lately emphasized a new phenomenon, exclusive to certain platforms, which might be referred to as "accidental exposure." There is an overlap between non-suicide-related hashtags like #cat and suicide-related hashtags like #cutting. There may be a perceived correlation between cat-related behaviors like scratching or clawing and suicide-related behaviors like cutting among certain users. The potential reason for this overlap could be attributed to the similarity in the appearance of injuries caused by both cats and self-harm-related cutting, such as red lines. It is possible that persons who participate in self-harm may use cats as a plausible explanation for their wounds or scars, stating that their cat caused the injury ("My cat scratched me"). Moreno et al. (2016) highlighted the issue that individuals searching for photographs of adorable cats by purposefully perusing content labeled with #cat may unknowingly come across posts containing self-harm content connected to cutting. Therefore, in addition to deliberate exposure, certain users may inadvertently come across content related to self-harm.

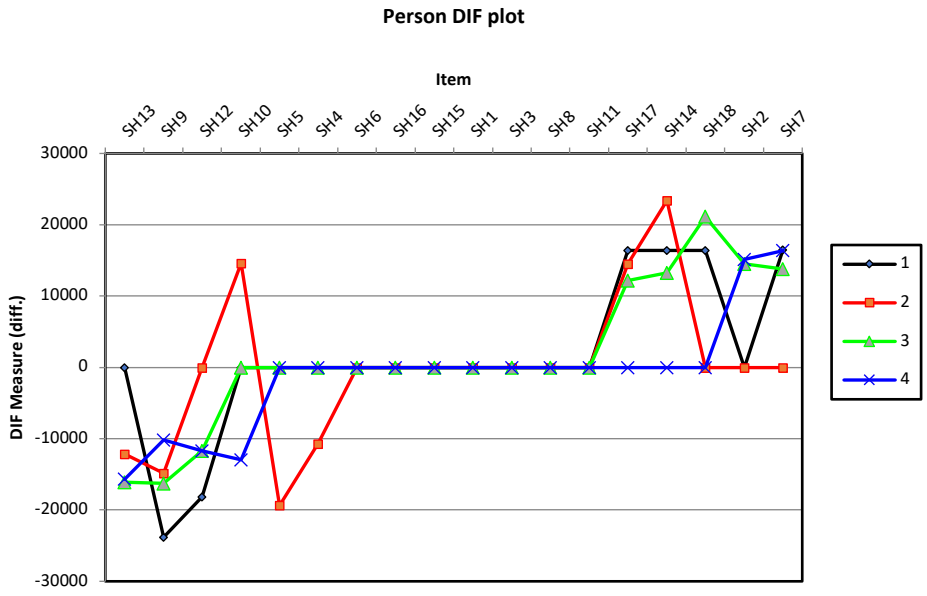

Figure 2. Quality of Person Answering the Self-Harm Instrument

Information: * = Total; 1 = Early teens (11 - 14 Years); 2 = Middle teens (15 - 17 Years); 3 = Late teens (18 - 20 Years); 4 = Early adulthood (21 - 40 Years)

Figure 2 reveals a bias towards respondents at different stages of development, specifically early adolescent, middle adolescence, late adolescence, and early adulthood, as indicated by six items. The items in question are SH13, SH9, SH12, SH10, SH17, and SH14. For instance, in the early

teenage condition (shown by the black line), it is evident that the line represents the lowest value on item SH9. This indicates that early adolescents are more likely to engage in the behavior described by the statement "Have you ever intentionally pulled out your hair?". Conversely, the red line representing middle adolescents in the development stage shows the lowest value for item SH5. This suggests that middle adolescents have a tendency to engage in behaviors that hinder the healing of wounds or intentionally cause bleeding in certain areas of their body, aligning with the statement in item SH5. This demonstrates the presence of notable disparities in self-harm conduct among various age cohorts, necessitating their consideration in endeavors to prevent and address self-harm in adolescents.

In another study conducted in Britain (Hawton et al., 2002), it was revealed that over 6.5% of 400 students aged 14-16 reported that they had self-inflicted injury within the past year. Although the onset of self-harm (SH) often occurs around the age of 13 among community teenagers, there has been less research on recent trends in adolescent SH, particularly about variations in the age of onset, within the general adolescent population. Prior research has indicated that starting self-harm at a younger age, usually 12 years old or younger, is linked to more frequent, varied, and severe types of self-harm (Ammerman et al., 2018; Muehlenkamp et al., 2019; O'Connor et al., 2018).

There may be beneficial effects, such as the reduction of social isolation by fostering a sense of community, the encouragement of recovery, and the reduction of deliberate self-harm impulses. Nevertheless, imitational behaviors may be triggered, which could result in detrimental effects (Brown et al., 2018). The detrimental consequences are typically emphasized by previous research, despite the fact that there are repeatedly expressed speculations about effects that can theoretically range from "contagion" to "caring" (Carlyle et al., 2018). For example, Scherr and Reinemann (2011) have documented the beneficial longitudinal effects of online health forums on suicidality but this is an exception. Combined, it has been hypothesized that exposure to self-harm on Instagram is associated with self-harm and suicidality-related outcomes, potentially eliciting a triggering effect that could result in an increase in imitative self-harm behaviors and heightened levels of suicidality (Arendt, 2019; Baker and Lewis, 2013; Brown et al., 2018).

The implications of this research are substantial, particularly when they are reconciled with the discovery that Instagram users exhibit lower rates of self-harm. This suggests that social media use, particularly on Instagram, has a positive impact on mental health outcomes (Efendi et al., 2023; Fatahya & Abidin, 2022). This information can be utilized by policymakers to create policies that are more attentive to the mental health requirements of social media users, particularly adolescents and young adults. Policymakers can develop interventions and programs that are more precisely targeted by comprehending the variation in self-harm behavior that is influenced by age and developmental stages. For instance, they may concentrate on educating users about healthy coping mechanisms, fostering positive online interactions, and offering access to mental health resources. This targeted approach is expected to be more effective in preventing and treating self-harm behavior among vulnerable demographics of social media users.

Additionally, this research has the potential to encourage collaboration among a variety of stakeholders, such as governments, educational institutions, healthcare providers, and social media platforms. Collectively, they can strive to create online environments that are more supportive and secure for adolescents and young adults. This collaboration may entail the implementation of policies to regulate detrimental content, the enhancement of access to mental health services through digital platforms, and the provision of training to educators, parents (Griffiths et al., 2019; Spirito et al., 2023), and health professionals on how to identify and address mental health issues in the digital age. Stakeholders can effectively address the mental health challenges that young people currently confront by integrating the capabilities of technology, education, and health. Ultimately, this comprehensive approach improves the mental health outcomes of social media consumers by acknowledging the positive potential of social media and addressing its risks.

Implications

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CONCLUSIONS

The results show that there is a significant difference between self-harm among Instagram users based on age, the age range of 18–20 years in late adolescent development is significantly more dominant in filling out the self-harm instrument compared to other age ranges. The study found that Instagram users showed relatively low rates of self-harm, indicating low rates of self-harm among the platform's users. This research suggests that policymakers and researchers should maintain a steadfast vigilance regarding the dynamics of mental health on social media platforms. Notwithstanding the relatively low incidence of self-harm, additional surveillance and investigation are warranted in order to comprehend evolving patterns and determinants that impact the psychological welfare of social media users. This will facilitate the development of policies that are suitable and attuned to the community's mental health requirements.

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