COMPARING IMAGE- AND TEXT-BASED SOCIAL MEDIA PLATFORMS AND THEIR EFFECTS ON MENTAL HEALTH

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Abstract

Social media has become a part of daily modern life. The use of social media has been researched to have both positive and negative influences on individual mental health. Most mental health research focuses on image-based social media (IBSM) platforms like Instagram that encourage passive usage. While text-based social media (TBSM) forums like Reddit are utilised more as data sources rather than studied as platforms that encourage active usage with the potential to influence mental health. The present research utilises a secondary dataset investigating the general relationship between these two social media platforms and mental health. A principal component analysis identified two factors: Social Comparison & External Validation (SCES) and Cognitive & Emotional Struggles (CES). Reddit and Instagram users were compared using t-tests across these two dimensions and overall mental health scores. Only SCES saw a significant difference between the two social media platforms with Reddit users reportedly have better mental health scores on this dimension. No significant difference was present for the other two dimensions. These findings suggest that text-based forums that encourage more active usage may be more beneficial for mental health than image-based platforms that encourage more passive usage, particularly within this dimension. These findings emphasise the importance of exploring the mental health impact of less researched social media platforms rather than solely using them as data sources.

Introduction

Since its conception, social media has become a part of modern daily life. Social media is an umbrella term for online platforms that facilitate the creation and exchange of user-generated content and interactions between users (Kaplan & Haenlein, 2010). A prominent field of research concerns the effect of social media on its users' mental health (Sadagheyani & Tatari, 2020). Subsequent findings reveal the nuanced nature of this topic, where mental health, being a complex construct, elicits both positive and negative mental health outcomes depending on what facet of social media is being explored (e.g., Umegaki and Higuchi, 2022).

The medium of social media can have varying negative impacts on mental health. For example, Gupta et al. (2023) found a significant positive association between self-reported body dysmorphic symptoms and image-based social media (IBSM) (e.g., Instagram, TikTok) but not with text-based social media (TBSM) (e.g., Twitter). This inverse relationship between mental health and IBSM usage has also been supported by Jarman et al. (2021), who found similar results with Instagram and Snapchat. However, this finding could be due to the general nature of social media platforms, where users tend to engage in a more optimised manner of self-presentation, sharing more positive content about their lives (Faelens et al., 2021). Thus, these findings present the uncertainty around the exact impact of platform medium (e.g., image vs text) on mental health.

Moreover, it is important to note that the medium of social media encourages different usages of the platform: passive (i.e., no engagement in social interactions) versus active usage (i.e., interacting with content/users) can influence mental health outcomes (Meier & Krause, 2023). For example, passive usage increases the risk of upward social comparison where users compare themselves with someone they believe is 'better' (e.g., see an Instagram post of someone with a thinner body) (Verduyn et al., 2017). This social comparison is more common on IBSM than TBSM, as the former regularly prioritises users seeing curated content of idealistic body images and lifestyles that often encourage users to

compare themselves to unattainable standards (Choukas-Bradley et al., 2024). Upward social comparison can lead to negative mental health outcomes like body image issues and eating disorder (e.g., Bonfanti et al., 2024; So and Kwon, 2022. However, some research argues that social comparison is an evolved aspect human cognition (Baldwin & Mussweiler, 2018), whereby helping individuals navigate social groups by providing information on their relative ranking (Blease, 2015; Meier and Johnson, 2022). However, upward social comparison can be maladaptive especially on social media where content is constantly be generated and posted for large followings. It poses a greater risk to mental health when users feel they fall short of unrealistic standards, leading to negative self-evaluations (Chou & Edge, 2012).

Furthermore, both active and passive social media usage can have positive impacts on mental health through mood regulation. For example, Li et al. (2024) found both active and passive usage improved participants induced sad mood, with no significant difference between the two usage groups. Although surprising for the passive group –usage is typically associated with declining mental health (Verduyn et al., 2017) – the authors suggest this positive mental health outcome may be a short-term effect. They propose that prolonged passive use would likely align with that previous research (i.e., resulting negative mental health outcomes; Honda and Togo, 2023). Alternatively, the active usage group was evidenced to be promote functional emotional regulation strategies associated with positive mental health (Li et al., 2024). These mixed results in the cognitive facet of mental health outcomes highlight the growing need to focus on distinct social media usage when exploring the relationship between social media and mental health.

Furthermore, research exploring social media and mental health has been concentrated on specific platforms like Instagram and Facebook, with other platforms that provide similar affordances to the conventional platforms being used as data collection tools instead of being investigated for their effects on mental health (e.g., Reddit as a data collection tool – Boettcher, 2021). This lack of diversity within the research field is

concerning, given that individuals are more likely to have a social media diet where they engage in multiple types/platforms rather than just one (Ellison & Vitak, 2015). Hence, this research aims to bridge the gap by exploring how mental health outcomes differ across social media platforms that foster active engagement, such as the lesser-researched TBSM Reddit, compared to those that encourage passive consumption, like the more widely studied IBSM Instagram.

Due to their distinct affordances, Reddit and Instagram were selected as the social media platforms of interest. Reddit, a predominantly text-based forum platform, encourages active participation through user-generated discussions. In contrast, Instagram, a predominantly image-based platform, promotes passive engagement by providing users with a curated feed of their followers' posts. Thus, it is hypothesised that participants who are Instagram and not Reddit users should have poorer mental health scores and vice versa for Reddit users.

Methods & Analysis

Data Source

The data source utilised for this report is the 2022 Social Media and Mental Health dataset obtained from Kaggle (SouvikAhmed071 & Muhesena, 2022). This data was obtained from survey research to investigate the relationship between time on social media and its subsequent impact on mental health. The dataset includes responses from 12 questions exploring different facets of mental health rated on a five-point Likert scale alongside demographic data and general social media usage.

Participants

The dataset includes responses from 481 participants. Ages ranged from 13 to 91 years. For ethical issues, given that no information on data collection and parental consent for minors' participation was provided, participants under 18 years old were removed from the dataset. Therefore, the final dataset consisted of 462 participants from the original 481 participants. The final mean age was 26.6 years ($SD = 9.87$). Most participants were students (university/school) (69.7%), followed by salaried workers (28.6%) and retired individuals (1.7%).

Data Analysis

Principal Component Analysis (PCA). Even though all questions asked were related to mental health, a PCA was conducted to identify the potential grouping of the questions. Two components were identified to explain approximately 40% of the variance, with additional components only contributing to the fractional variance explained. Hence, two potential components: Cognitive & Emotional Struggles (CES) and Social Comparison & External Validation (SCEV) were used to distinguish the responses. The component categorisation is shown in Appendix A. Therefore, for the rest of the report, these two components alongside overall mental health will be referenced when discussing results.

Results

Descriptive Statistics

Social Media Usage

All participants reported to use at least one social media platform. The total number of platforms used by participants varied from one to nine platforms. Approximately 57% of participants used between one and four apps, and the majority had accounts on four different platforms (Figure 1). The three most popular social media platforms were Facebook (20.2%), YouTube (20.1%) and Instagram (17.3%). Additionally, most participants spent more than five hours using social media daily (Figure 2).

Figure 1

Bar plot showing the percentage distribution of users based on total number of social media platforms they use.

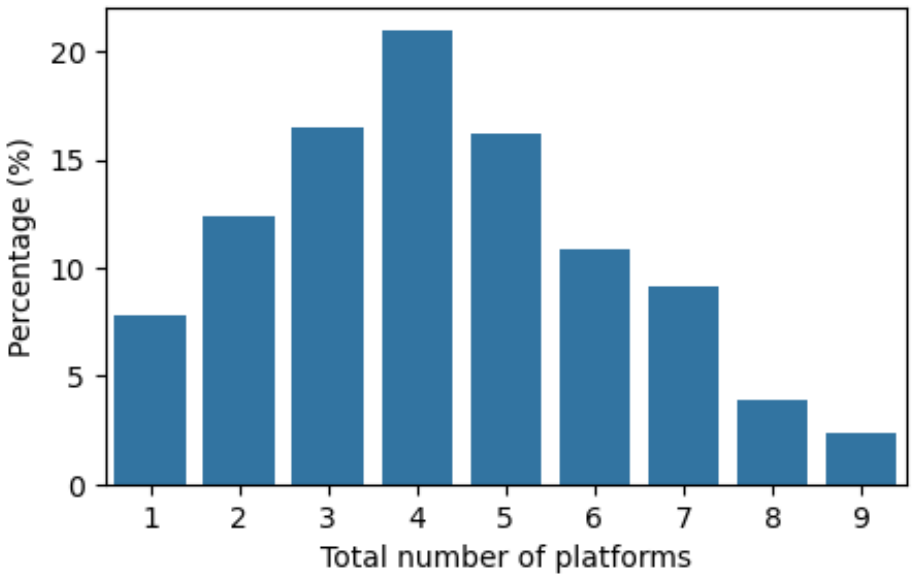
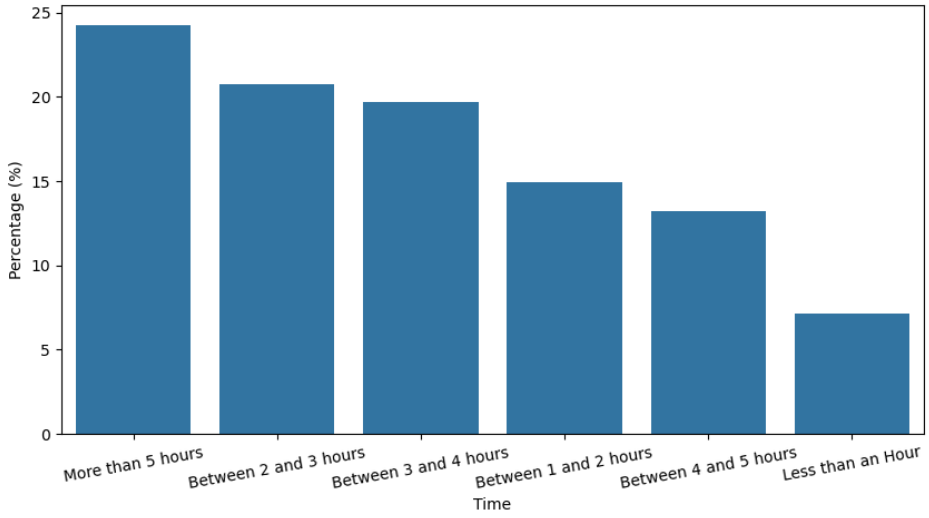


Figure 2

Bar plot showing the percentage distribution of users based on their time spent on social media.



Mental Health Questions (Overall)

The average mental health score was 37.39 (SD = 9.42) out of 60. The average SCEV score was 11.65 (SD = 2.97) out of 20. The average CES score was 25.74 (SD = 7.41) out of 40. Greater scores generally indicate a poorer mental health. This sample's mental health scores exhibit minimal deviation from the median, suggesting relatively good mental health among participants.

Mental Health Questions (Per Platform)

30 participants identified as Reddit and not Instagram users. However, 253 participants identified as Instagram users and not Reddit users. To avoid the increase in Type I error (false positive) from this 1:8 ratio of sample size, a random subsample of 30 Instagram users was selected for this analysis. Table 1 presents individual platforms' mean and standard deviation scores for mental health dimensions.

Table 1

Mean and Standard Deviation for Mental Health Dimensions for Reddit and Instagram.

Platform-Mental Health Dimension	Mean	Standard Deviation
Reddit-Total Mental Health Score	32.40	9.88
Instagram-Total Mental Health Score	36.83	8.85
Reddit-Social Comparison & External Validation	9.73	2.28
Instagram-Social Comparison & External Validation	11.40	2.30
Reddit-Cognitive & Emotional Struggles	22.67	8.63
Instagram-Cognitive & Emotional Struggles	25.43	7.01

Inferential Statistics

Levene's test was non-significant ($p > .05$) for all three-dimension groupings, adhering to the assumption of equal variances. With this passed assumption, three one-sample Student's t-tests were conducted to compare group mean scores between Reddit and Instagram for all three mental health dimensions.

There was a significant difference between Reddit and Instagram users regarding the social comparison and external validation dimension (t = -2.77, p = .007). Instagram users reported significantly poorer mental health (i.e., higher scores) than Reddit users, with a moderate effect size (d = -.465). There was no significant difference between Reddit and Instagram users for the Cognitive and Emotional Struggles dimension (t = -1.34, p = .186, d = -.346) and the overall mental health dimension (t = -1.80, p = .077, d = -.465). These findings partially support the hypothesis, as Instagram users' scores indicate poorer mental on one of the three dimensions, as the other two showed no significant differences.

Discussion

The study aimed to explore the difference in mental health effects between users of the IBSM Instagram and the TBSM Reddit. The initial hypothesis proposed that users of the IBSM Instagram would report poorer mental health than users of the TBSM Reddit. The results partially support the hypothesis, as Instagram users reported significantly poorer mental health in the Social Comparison and External Validation dimension but not in Cognitive and Emotional Struggles or overall mental health.

The partial support for the hypothesis aligns with prior research that suggests, when compared with TBSM, IBSM contributes more towards social comparison, which can have adverse mental health outcomes. The often-passive nature of these platforms can explain this finding; users are encouraged to browse through curated posts highlighting the positive aspects of others' lives, increasing the likelihood of upward social comparison (Chen et al., 2016; Choukas-Bradley et al., 2024). While the current study cannot determine whether this comparison is upward or downward, these findings also acknowledge the importance of social comparison and external validation on mental health, as it was the only mental health dimension that produced significant results between the two social media types. Thus, practical applications of these findings could involve adjusting the IBSM infrastructure, which discourages passive usage and/or encourages more active platform usage. An example could be a behavioural nudge encouraging interaction with the content and/or the content author when the user is browsing through the platform. This intervention could limit the risk of prolonged passive usage associated with decreased mental health outcomes (Honda & Togo, 2023).

The non-significant results can be understood through theoretical and experimental design perspectives. From a theoretical perspective, these findings differ from previous studies, suggesting that TBSM often-active usage nature is associated with better mental health outcomes (e.g., Li et al., 2024). However, the current findings suggest that despite the usage differences between IBSM and TBSM, they may share similarities in particular

mental health outcomes. For example, Li et al. (2024) found that both passive and active social media usage improved mood with no difference between the groups. Recent literature by Meier and Krause (2023) also suggests that this dichotomy faces conceptual challenges, one being that the dichotomy is "just screen time in disguise" (p.173). This presents an alternate explanation that the type of usage (at least in the short term as suggested by Li et al., 2024) is not distinct enough to influence specific mental health outcomes like CES. Therefore, additional research is needed to clarify this confusion among these constructs.

From the experimental design perspective, a key limitation of this analysis is the significant sample size discrepancy between the initially sampled Reddit and Instagram users. This initial sample had a ratio of eight Instagram users for every Reddit user. The significant disparity in group sizes may increase the risk of a Type I error (false positive), whereby a significant result is attributed to the number of data points rather than the effect's existence (Ruscio & Roche, 2012). Even standardised effect sizes (like Cohen's d) can be misleading when derived from samples with varying sizes (Alsalti et al., 2024). Hence, the current analysis randomly sampled 30 of the 253 Instagram users to match the sample size of Reddit users. While this reduced the risk of Type I error, it also lowered the statistical power of the analysis, given that fewer data points were used. Thus, it is unclear whether there is a significant difference between IBSM and TBSM within these dimensions or if this difference is not captured due to limited statistical power from tiny sample sizes. Therefore, a replication study using the same questions should be conducted with targeted recruitment of IBSM and TBSM users.

Ultimately, the relationship between social media and mental health is complex and multifaceted. This study highlights how different social media platforms encourage distinct usage patterns, which can lead to varying mental health outcomes. Future research should replicate this study with targeted recruitment from specific platforms, expanding beyond the most commonly studied ones.

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