

Digital Challenges in the Social Media Era: Addressing Misinformation and its Associated Risks

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Abstract: In the present era, social media has become an integral part of our lives. However, its growing influence has also given rise to various challenges including misinformation, information overload, lack of educational value and risk of addiction. Furthermore, the inadequate skills of users are amplifying these issues as they find it extremely challenging to navigate through the current information landscape. The purpose of this was to investigate these issues thoroughly and examine how they are interrelated and their overall impact on user experience. The statistical tests revealed misinformation as the major challenge affecting social media. The tests also found information overload and the potential of addiction having a moderate effect on the users. Additionally, a Kruskal-Wallis test was performed for further insight and the results suggested no significant differences between these concerns, suggesting their interconnectedness. The findings emphasize upon the need for collective efforts from users, social media platforms and policymakers to address these issues through digital literacy, targeted outreach programs and strong regulations. This study provides valuable insights that lay a framework for future research and address the complex issues of social media's influence on individuals and society as a whole.

Keywords: Addiction, Digital Literacy, Information Overload, Misinformation, Social Media.

1 Introduction

Social media has revolutionized how we communicate with each other, access information and engage with anyone across the globe. Social media platforms have become an integral part of our everyday lives. They have a huge influence on present day communication, information delivery, knowledge sharing, business, academics and other aspects of life [1,2]. Despite the numerous advantages that it offers, social media also presents significant challenges, particularly in the spread of misinformation. In fact, social media is regarded as the main contributor to the widespread occurrence of misinformation in modern culture [3]. Through decentralized and distributed networks that social media offers, individuals create and quickly disseminate false information to a large audience in a short time [4]. This has led to information degradation and has been a key factor in the spread of fake stories or false narratives on social media [5]. Major global events, such as the 2016 presidential election and the COVID-19 infodemic have drawn more attention on how social media structures and presents information, making it harder for the users to distinguish between reliable facts and wrong or misleading information [6,7]. Therefore, it has become a challenging task to stop the spread of false information legally and technologically because every social media user can act as a node for false information on several networks [8]. While misinformation continues to be a major challenge on social media, its associated risks are further contributing to the growing complexities. Together, all these issues are capable of creating a fertile ground for digital wildfires [9]. Issues like information overload, lack of educational value, risk of addiction, and inadequate skills of users further hinder the effectiveness of these platforms. All these issues are interconnected and influence each other. For example, information overload has been found to be further exacerbated by misinformation. Moreover, large volumes of information present online make it challenging for the users to find useful information [10]. Also, social media has no control over the accuracy or sources of content that are posted online. This further amplifies uncertainty amongst the users regarding the credibility and content accuracy in online posts [11]. To make matters worse, individuals lack adequate skills to navigate through loads of information available on social media. As a result, they tend to avoid using social media as an information source as they consider it unreliable [12]. However, that does not stop them from using these platforms. They become busy chatting, tweeting, posting, commenting and watching funny videos [13]. The consumption of entertaining content increases with time and results in habitual use and increased dependence on social media [14]. Nti et al. linked the heavy

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usage of social media for entertainment to poor performance of students [15]. The increased usage is also seen as a coping mechanism or distraction used by users when there is information overload [16]. Subsequently, when the academic performance of users gets affected, staying focused becomes extremely challenging for them [17]. Additionally, unchecked social media usage reduces sleep time as well as sleep quality, increases academic stress and procrastination amongst users, more specifically students [18]. This leads to increased psychological stress, anxiety, and sometimes depression [19,20]. This study examines how issues like social media addiction, misinformation, information overload, etc. are interrelated and impact user experience online.

Given the pervasive use of social media, understanding the darker side becomes crucial. Although there is research on misinformation which keeps growing but understanding the other challenges is equally important as they are having serious consequences on various aspects of our lives. A thorough study like this that delves deeper into these challenges is important as most of them go unnoticed due to focus on misinformation only. This will also help in finding practical solutions to these challenges and reduce the harm that they are causing to the whole society. Furthermore, such studies can also help in maximizing the benefits that these platforms provide. In conclusion, social media is not all bad. If used correctly, it can be used as a powerful tool and provide numerous benefits.

1.1 Literature Review:

In the present era, social media has become an integral part of our lives. Individuals mostly use it for entertainment, convenience, social interaction, seeking and sharing information and escaping from daily life [21]. In the past few years, it has also been used extensively to communicate excessive amounts of information every day across the globe. This may be attributed to the fact that users are not only consuming but also creating and sharing information on social media platforms. At the same time, there is a lack of gatekeeping on these platforms that allows users to post anything they want online, and it has resulted in a decline in information quality and proliferation of misinformation on these platforms on a wider scale. These issues are combinedly proving destructive and affecting vast number of people [22]. The current design of social media platforms is further aiding the amplification of these issues by focusing on engagement of users over accuracy of content [23]. Consequently, users have been found mindlessly scrolling online without gaining any meaningful knowledge. The findings of the study done by Alfari et al. found only a small percentage of users using social media for academic purposes [24].

The vast amount of unregulated content has resulted in information overload as well as misinformation. As a matter of fact, misinformation is considered as a global threat now [25]. The reason behind its amplification might be that it seamlessly blends with truthful information, making it hard for users to differentiate between credible information and falsity [26]. The current methods for combatting misinformation and its associated issues are inadequate in protecting the users from the threats. [27]. Therefore, literary interventions are needed to help users to be inoculated against such harmful effects of social media [28].

Misinformation alone is not doing all the damage. Other reasons like addictive use, lack of educational value, cyberbullying, trolling, fake news, and privacy violations are also affecting social media usage of individuals [29]. Social media has amplified these issues to unprecedented levels and hence makes them much bigger challenges than ever before. Bhandarkar et al. found social media having a negative impact on the academic performance of youngsters and called social media addiction a major problem amongst them [30]. Besides that, research has shown it affects the rational decision-making abilities of users and makes them more vulnerable to misinformation [31]. There is also a lack of awareness, skills, lack of time, interest, confidence, privacy issues, as well as fear of uncivil interactions on social media that stop these youngsters from using social media for learning or benefits [32]. So, they start using social media more for entertainment purposes and social interaction. Once individuals start using it for these activities, it starts becoming habitual and addictive to them [33]. Subsequently, addictive usage results in poorer sleep quality, lower self-esteem, and higher levels of anxiety and depression [34].

As we continue enjoying the benefits of social media, it is important to have awareness about its negative side which affects every aspect of our life including academics, health, politics, climate change, economic issues and so on. Given these challenges of social media, users need to be mindful of using these platforms responsibly and not get distracted by the humongous amounts of information available online [35]. Also, they need to be digitally literate enough to take informed decisions and be able to tackle social media pressure and curb the impulsive and habitual use [36]. There is a need to stay vigilant and be mindful of the pitfalls in order to maximize the benefits that social media offers.

2 Methodology

A questionnaire was used to explore the various effects of social media usage on users. Misinformation, information overload, lack of educational value, risk of addiction, and inadequate skills are among the parameters examined. The

questionnaire was distributed electronically amongst the respondents. This ensured user-friendliness and efficient data collection. A non-probability convenience sampling method was used to recruit participants from Lovely Professional University. A total of 121 complete responses were collected during a two-week period. This helped the participants in indicating how much they agreed or disagreed with a range of statements. To ensure clarity and better applicability, pre-testing of the questionnaire was done. Descriptive statistics were used to calculate the mean, median, standard deviation, minimum, maximum, etc. This helped us to have a thorough understanding of how the data was distributed. Additionally, central tendencies were also computed for each parameter. Subsequently, statistical tests as well as visual inspection were done to determine normality for each factor. We also employed the Anderson-Darling test to evaluate the distribution of responses for each factor. Furthermore, Kruskal-Wallis test was also employed to explore the statistical differences between these parameters [37]. The Kruskal-Wallis test is a non-parametric test and is used when the data distribution is not normal, and the dependent variable is continuous or ordinal. In this study, it helped in comparing the median ranks across multiple groups.

Null hypothesis (H_0): There is no difference between the five categories of the independent variable in terms of the dependent variable.

Alternative hypothesis (H_a): There is a significant difference between the five categories of the independent variable in terms of the dependent variable.

The test was chosen because it can handle data that deviates from parametric test assumptions and is flexible enough to adjust to deviations from normality. Because it employs ranks rather than raw data, the Kruskal-Wallis test has greater power and reliability when working with skewed or non-normally distributed data.

3 Result and Analysis

3.1 Descriptive Statistics

In-depth analyses of the dataset are possible with descriptive statistics, which also reveal information about the shape, dispersion, and central tendencies of the distribution for a variety of factors. The variables' mean, median, standard deviation, lowest and maximum values, skewness, and kurtosis are displayed along with the descriptive statistics for these variables. These measures aid in understanding the general trends and deviations in the data. The descriptive statistics are shown in Table 1.

Table 1: Descriptive Statistics

	Information Overload	Misinformation	Lack of educational value	Risk of addiction	Inadequate Skills
Mean	3.07	3.24	3.17	3.17	3.1
Median	3	3.25	3	3.25	3
Std. Deviation	0.79	0.78	0.82	0.84	0.87
Minimum	1	1	1	1	1
Maximum	5	4.75	5	5	5
Skew	-0.09	-0.48	0.14	-0.21	0.06
Kurtosis	-0.17	-0.13	-0.21	-0.12	-0.17

The average respondents' perception of these issues is moderately significant, as indicated by the five factors' mean values, which range from 3.07 to 3.24. A generally symmetrical distribution of responses is suggested by the median values, which are near the means. With a standard deviation between 0.78 and 0.87, the data are moderately distributed around the mean. This suggests that there may be some variation in the ways that various respondents view these variables. Except for "Misinformation," which has a maximum value of 4.75, all dimensions have a minimum value of 1 and a maximum value of 5. This range indicated the diverse perceptions of respondents regarding the impact of social media on them. Skewness values reveal the distribution's asymmetry. The slightly negative skewness of the data for Information Overload, Addiction Risk, and Inadequate Skills indicates a slight tendency towards higher values. The negative skewness of misinformation is more noticeable, suggesting a stronger tendency for higher values. The small positive skewness of lack of educational value indicates a slight tendency toward lower values. Every factor has a negative kurtosis value, which suggests that the distribution is comparatively flat when compared to the normal distribution. This implies a more uniform distribution of responses and lighter tails in the data.

3.2 Normality

The Anderson-Darling (AD) test was used to determine if the data distribution for each factor was normal. This statistical test yields a p-value that indicates whether the data is normally distributed and is especially sensitive to deviations from

normality as shown in Table 2.

Table 2: The results of the Anderson-Darling test for normality

Groups	p-value
Information Overload	0.00127742
Misinformation	0.00369814
Lack of educational value	0.00003353
Risk of addiction	0.13666963
Inadequate Skills	0.00011300

According to the p-values derived from the Anderson-Darling test, the majority of factors' distributions significantly deviate from normality. Particularly, p-values less than 0.05 indicate significant departures from normalcy for Information Overload ($p = 0.00127742$), Misinformation ($p = 0.00369814$), Lack of Educational Value ($p = 0.00003353$), and Inadequate Skills ($p = 0.00011300$). However, the Risk of Addiction factor ($p = 0.13666963$) has a p-value larger than 0.05, meaning that its distribution is roughly normal and does not significantly deviate from it. For each factor, Q-Q (quantile-quantile) plots were created in order to further evaluate the data's normality, as seen in Figure 1.

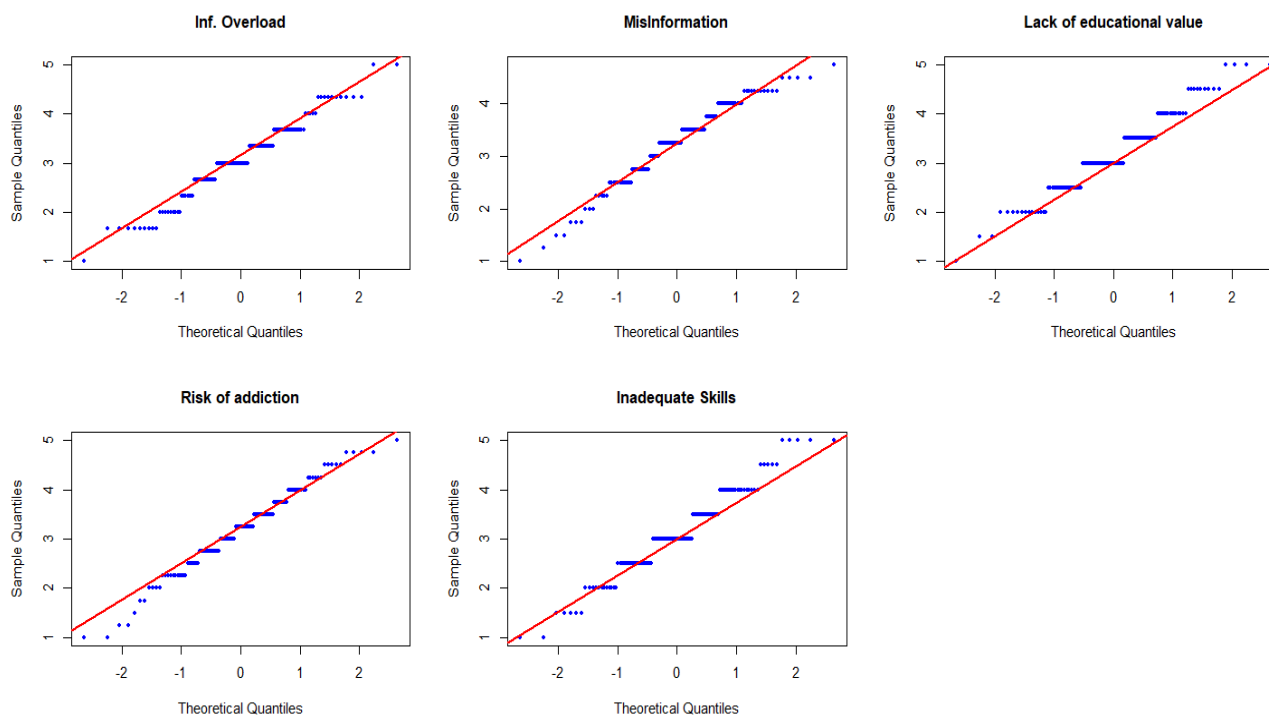


Fig. 1: Normality Plots (QQ Plots) for different groups

The results of the Anderson-Darling test are validated by the Q-Q plots as shown in Figure 1. The use of non-parametric techniques for further analysis is further supported by the significant deviations from normalcy shown by all other factors, with the exception of the Risk of Addiction. Because the Risk of Addiction data seems to follow a normal distribution, parametric methods can be applied to it. These visual aids offer a clear visual confirmation of the normalcy assessment and are crucial in helping select the most suitable statistical methods.

3.3 Kruskal Wallis Test

Use the Kruskal-Wallis test to see if there are statistically significant differences between the medians of the five groups (Information Overload, Misinformation, Lack of Educational Value, Risk of Addiction, and Inadequate Skills). The one-way ANOVA's assumptions are not satisfied when the data are not normally distributed, which is the case when this non-parametric test is employed. Set at $\alpha = 0.05$ as the significance threshold. Here are the AD test's null and hypothesis:

Null Hypothesis(H_0): There are no differences among the medians of the groups.

The results of the Kruskal-Wallis test are summarized in Table 3 below:

Table 3: Kruskal Wallis Test

Groups	N	Median	Mean Rank
Inf Overload	121	3	286.93
Misinformation	121	3.25	327.39
Lack of educational value	121	3	302.8
Risk of addiction	121	3.25	309.08
Inadequate Skills	121	3	288.8
Total	605	3	

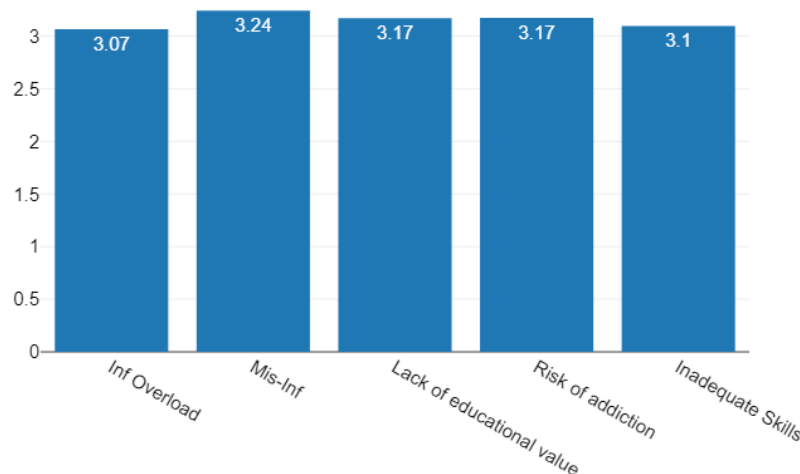
The test statistics are shown in Table 4.

Table 4: Result of Chi square

Statistic	Value
Chi-square (χ^2)	4.37
Degrees of freedom (df)	4
p-value	0.358

The results of the Kruskal-Wallis test show a p-value of 0.358 and a chi-square statistic of 4.37 with 4 degrees of freedom as shown in Table 4. The null hypothesis cannot be rejected because the p-value is higher than the alpha threshold of 0.05. The median rankings of the five groups do not differ in a way that is statistically significant, according to this.

The Kruskal-Wallis test mean ranks are represented graphically in Figure 2 by a bar chart. This chart makes it easier to understand how each group compares to the others based on mean ranks.

**Fig. 2: Kruskal-Wallis test mean ranks**

The mean ranks of each group as determined by the Kruskal-Wallis test are displayed in a clear and understandable bar chart. The findings of the Kruskal-Wallis test indicate that there is no statistically significant difference between the respondents' perceptions of information overload, misinformation, lack of educational value, risk of addiction, and inadequate skills.

4 Discussion

The study aimed to highlight key concerns related to social media, such as to misinformation, information overload, lack of educational value, risk of addiction, or inadequate skills and training, all perceived as moderately to highly significant by respondents. Descriptive statistics were used to evaluate their distributional characteristics using Q-Q plots and normality tests and investigate differences between them using non-parametric tests. The results of the descriptive statistics revealed that the mean ratings of all the challenges ranged from moderate to high. This shows that respondents consider these as important issues. However, when Q-Q plots and normality test were performed, they showed deviations from normal distributions for the majority of the factors. This indicates that the parametric assumptions might not be true. Additionally,

the Kruskal-Wallis test also revealed no significant variations statistically. Therefore, it can be concluded that majority of the respondents share similar views when it comes to these social media challenges.

Social media is a double-edged sword [38]. While it offers numerous benefits, it also comes with significant disadvantages and challenges as well [39]. The results of this study demonstrate the widespread concerns about social media among the respondents. The uniform rankings among the concerns highlight their deemed importance and significance. Although mean ratings differ, there are no statistically significant differences, indicating that concerns about various aspects of social media use are similar and interconnected. The respondents in this survey value these issues equally.

Another finding of the study is that individuals tend to avoid information because of issues like information overload, misinformation, etc. This is consistent with the study conducted by Hwang and Jeong which identified information overload as a predictor of information anxiety, which subsequently led to information avoidance [40]. In the same way, Muhammed and Mathew stress that a significant public concern arises from the dissemination of false information on social media [41]. Soroya et al. also noted that social media exposure is the main cause of information overload and anxiety [42]. These results are consistent with the findings of the current study, which demonstrate that the avoidance of social media as a source of information is further exacerbated by a lack of critical thinking abilities, a lack of willingness to verify sources, and an excessive reliance on online platforms. This study is essential for social media platforms, policymakers and educators seeking to tackle these challenges of social media. It offers empirical proof where respondents have uniformity in their views regarding the issues. In order to gain deeper insights, future research can be done to examine the longitudinal shifts in the perceptions of users or explore demographic distinctions. Findings of this study also reveal negative influence of social media that affects the well-being of its users by weakening their cognitive capabilities and distracting them from doing productive work. This is consistent with the previous studies that have shown how social media affects the academics of users and impair their cognitive abilities [24]. Similarly, the conclusions drawn by this study regarding the risk of addiction is also in line with previous studies. For example, Hou et al. found social media addiction increasing the dependency of users on these platforms [43]. This continuous loop of using social media was found leading to mental health issues, poor academic performance, and low self-esteem. While social media can be a powerful tool for learning everyday life information or academic information, its value is reduced by its widespread use for pleasure, interaction or entertainment. These things result in information overload and misinformation. When non-educational content is prioritized, it leads to more distractions and makes it harder for the users, especially students to concentrate on academic goals [44]. There is also risk of addiction as the consumption of non-educational content becomes a habit. Therefore, it can be concluded that social media poses significant challenges and hence, there is a need to make the users digitally literate in order to reduce these adverse effects.

4.1 Limitation and Future Scope

Although this study offers insightful information about how people perceive concerns related to digital media, there are a few limitations that should be noted. This study relied on self-reported data of respondents and therefore, it can be prone to few biases like social desirability or recall bias. The study sample was selected based on a particular demographic or geographic area, which may have limited the findings' applicability to larger populations. Our ability to determine causal relationships or temporal trends among the variables under study is limited by the use of cross-sectional data. In order to better understand how people's perceptions of issues related to digital media change over time and in response to shifting media environments, longitudinal studies would be helpful. Finally, a predetermined set of factors was used to measure concerns related to digital media. Even though these factors are well known, future research may look into other aspects of newly identified problems with digital media consumption to offer a more complete picture.

This study establishes the foundation for multiple research directions despite its limitations. Analyzing how demographic variables (such as age and educational attainment) affect people's perceptions of issues related to social media could reveal important differences in the population. This would help in framing better policy recommendations and effective interventions. Furthermore, qualitative research methods like focus groups and interviews could benefit from the findings of this study. They might reveal details that the numbers may miss. Additionally, this study can also be beneficial for comparative research based on various nations, areas, cultures etc. That will contribute to better understanding of differences in issues related to social media across different groups. This will result in better understanding of how different societal norms, values and cultures can influence the ways and attitudes of users towards digital media.

5 Conclusions

Social media platforms are being widely used by people of all ages across the globe. However, issues like information overload, misinformation, lack of educational value and risk of addiction are rampant on social media and therefore hampering its effectiveness. On top of that, users lack adequate skills to navigate through the sea of information available on social media which further amplifies these challenges. This study focused on the perceptions of users towards these

challenges as the issues are interconnected and are often found influencing and amplifying one another. The findings of the study revealed that the majority of the respondents are affected by these issues. Their responses were found consistent, highlighting the pervasiveness of these issues on social media. Therefore, the study recommends digital literacy interventions and outreach programs for the users that will help them make informed decisions and engage responsibly online. For social media platforms, there is an urgent need to implement algorithms that prioritize accuracy over engagement. Gatekeeping information would be another great solution to stop issues like information overload and misinformation. At the same time, policymakers also have a responsibility to develop regulations for both users as well as the platforms so that the content that is posted is regularized. Right now, there is no single solution for all social media challenges. Therefore, the responsibility of tackling these issues cannot be placed on one stakeholder or one technology. From individual level to global level, everyone has a role to play in fighting these menaces. This study also emphasizes the need to advance research and take actions against all challenges in order to foster a community that is well-informed and healthier.

Conflicts of Interest Statement

The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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