

DATA PRIVACY LITERACY AMONG SOCIAL MEDIA USERS: A COMPARATIVE STUDY OF TIKTOK, INSTAGRAM, AND SNAPCHAT

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Abstract

Students constitute one of the most active groups of social media users, particularly on platforms such as TikTok, Instagram, and Snapchat. As the use of these platforms continues to expand, concerns regarding the collection, storage, and utilization of personal data have become increasingly significant. Despite growing public attention to digital privacy issues, limited empirical research has examined university students' awareness of data privacy risks and their privacy-related behaviors in the context of social media use in developing countries. This study investigated data privacy literacy and risk awareness among users of TikTok, Instagram, and Snapchat at Air University Multan Campus (AUMC). A quantitative descriptive survey design was employed, and data were collected through a structured self-administered questionnaire comprising 30 Likert-scale items organized into five dimensions: awareness of data privacy risks, perceptions of data collection practices, privacy protection behaviors, trust in social media platforms, and challenges in maintaining data privacy. Using purposive convenience sampling, responses were obtained from 80 undergraduate students and analyzed through descriptive statistics in IBM SPSS Statistics (Version 26.0). The findings indicate that participants demonstrated a relatively high level of awareness regarding data collection practices and privacy risks associated with social media platforms. They also expressed strong support for enhanced digital privacy education and stronger regulatory protections. However, this awareness was not consistently reflected in their privacy-protective behaviors, revealing a notable awareness-behavior gap. Participants reported moderate levels of trust in social media platforms and identified several challenges related to managing and safeguarding their personal information online. The study contributes empirical evidence on digital privacy literacy among university students and offers practical implications for educators, policymakers, and social media platforms seeking to promote responsible data practices and informed digital citizenship in Pakistan.

1. INTRODUCTION

1.1 Background of the Study

In recent years, digital technology has significantly transformed communication and social interaction. " Social media platforms are one of the most powerful digital tools in today's society. These include Facebook, Instagram, TikTok and Snapchat which allow users to share information, communicate in real time and participate in online communities. This has resulted in social media being an important part of everyday life, especially for young people and university students. College students are some of the most prolific users of social media sites. They use these platforms for a variety of reasons, including communicating with peers, collaborating academically, entertainment, and sharing information. Also, social media gives students the opportunity to share their opinion, participate in discussion, and build social networks beyond physical barriers. These benefits cause the fast growth of social media use among students. But with the growing use of social media, there are also some concerns about privacy, data security and psychological well-being. Many social media platforms operate on data-driven models, collecting and analysing user data for targeted advertising and personalized content. This means collecting vast amounts of personal data, including location data, browsing behaviour, personal interests and online interactions. This information improves the user experience, but also increases the risk of privacy violations and misuse of personal data.

Recent research has indicated that many social media users do not have a complete understanding of how their personal information is gathered and utilized on digital platforms. Users may be exposed to cyber threats such as identity theft, data breaches and unauthorized access to personal information due to lack of knowledge of privacy policies and security settings. For university students who regularly post personal content online, these risks are even greater. College users of TikTok recognized the risks of data collection but continued to use the platform because they believed the benefits outweighed the costs to their privacy ^[19].

Furthermore, Kurniawan et al.^[11] found that computing students in Indonesia were still susceptible despite having some awareness of platform data practices. Elwadya and Salmani^[5] pointed out a significant disparity between the complexity of platform privacy policies and the extent of users' comprehension, as they often agree to data practices without complete awareness. Besides privacy risks, social media use has also been linked to psychological and emotional effects. Studies have found that excessive use of social media sites can lead to increased stress and anxiety and reduced self-esteem among young users. Woodward et al.^[23] found platform-specific associations between TikTok and Snapchat use and negative mental health outcomes, including depression and anxiety, among young adults. One of the main reasons is social comparison. Users are often exposed to curated online content that presents idealized images of lifestyle and appearance, potentially creating unrealistic standards that can adversely affect self-perception ^[21]. Brailovskaia et al.^[2] also reported that it was problematic use of social media, not the duration of use, that was a significant predictor of depression and lower self-esteem among university students.

There is also a recent discussion in the academic world about the importance of digital literacy and privacy awareness. In a Pakistani context, Khan et al.^[10] found that social media usage patterns among undergraduate students significantly predicted reduced psychological well-being. Teaching students how to protect their privacy and share data responsibly and safely online can help reduce potential risks in a meaningful way. As the use of social media is becoming more and more influential in students' lives, it is important to understand how such use affects privacy awareness and psychological well-being, so that researchers can help identify challenges and suggest strategies for safe and balanced digital behaviour. This study is based on the analysis of these relationships among Air University Multan students of BSCS.

1.2 Statement of the Problem

While social media platforms offer many benefits like communication, networking and access to information, their extensive use has led to serious concerns regarding data privacy and mental health. Many university students post personal information on social media without fully understanding the potential risks of data exposure and misuse. Likewise, continuous exposure to online content, social comparison, and digital interactions may impact students' emotional health and self-confidence. However, there is a dearth of empirical evidence that explores the joint effect of social media use on privacy awareness and psychological well-being of university students. These dimensions have often been explored in isolation in the existing literature, and even more so, in the context of the Pakistani higher education. This study therefore aims to investigate how social media usage simultaneously affects students' privacy awareness and psychological experiences, addressing this dual gap in the empirical literature.

1.3 Research Questions

The following research questions guided the investigation:

- How frequently do BSCS students use social media platforms, and which platforms dominate their usage patterns?
- What is the relationship between social media usage frequency and students' awareness of data privacy risks?
- In what ways does social media usage influence the psychological well-being of university students?

1.4 Significance of the Study

This study contributes to the existing body of knowledge in several important ways. It presents empirical evidence of the awareness-behaviour gap of technically educated university students, showing that technical literacy alone is not sufficient to ensure privacy-protective conduct. This finding has immediate implications for the design and delivery of digital literacy programmes within computing education curricula. The research employs and extends Privacy Calculus

Theory and Social Comparison Theory in a non-Western, developing country context, adding to the ongoing globalization of these theories. In practical terms, the results give tangible guidance to educational institutions, technology developers and policymakers. The findings can be used by universities to develop contextually relevant digital well-being and privacy education programmes. Technology platforms may use these insights to develop more transparent and user-friendly privacy management tools. At the policy level, the study provides empirical grounding for discussions regarding data governance frameworks and regulatory protections for student users in Pakistan. As one of the few survey based studies to simultaneously examine privacy awareness and psychological well-being among BSCS students in this context, this research fills an important gap in the regional literature and lays a foundation for future longitudinal and comparative investigations.

2. Review of the Related Literature

2.1 Theoretical Foundations

2.1.1 Privacy Calculus Theory

Dinev and Hart^[4] were the first to propose the Privacy Calculus Theory, claiming that individuals make rational calculations of costs and benefits when deciding whether or not to release personal information on digital media. The theory does not treat privacy as an absolute concern but rather as a matter of users deciding on the perceived rewards of disclosure (social recognition, personalized content and entertainment) versus the perceived risks of data exposure, surveillance and misuse. This calculus is particularly salient in social media contexts, where users routinely trade personal information for access to and engagement with platforms. Content on Snapchat is temporary, which creates a false sense of less risk and encourages users to share information without full knowledge of how long it is retained. As Elwadya and Salmani^[5] elaborate, there is a considerable difference between what platform privacy policies specify and what users really understand or expect, further reinforcing the imbalance of the calculus

that favors the perception of benefit over informed risk assessment.

2.1.2 Social Comparison Theory

Social Comparison Theory was first proposed by Festinger^[6]. It suggests that people determine their own opinions, abilities and social worth by comparing themselves to others. This theory has found new explanatory power in the context of social media platforms like Instagram, TikTok and Snapchat, which offer constant streams of curated, idealised self-presentations. . Users engage in upward social comparison with others they perceive as more attractive, successful, or popular; and research repeatedly shows that such comparisons are associated with lower self-esteem, greater anxiety, and depressive symptoms. Taylor and Arnes^[21] found that upward comparison on Instagram has a negative effect on

both self-esteem and body image among adult users. Rahayu Ahmad et al.^[17] found that passive use of Instagram, which facilitates constant exposure to such comparisons, is a significant predictor of depression. The effects are particularly pronounced among student populations: Jiang and Ngien^[9] found a causal chain in which the utilization of Instagram spurs social comparison, leading to an increase in social anxiety. In TikTok, the short-form video format amplifies this dynamic by normalizing idealized lifestyle content, while in Snapchat, social reciprocity features create pressure to maintain curated self-presentations. The conceptual framework for this research to analyze the influence of platform use among BSCS students on the observable changes in the psychological well-being is Social Comparison Theory.

2.2 Review of Empirical Studies

Author	Year	Sample	Focus	Findings
Sandoval et al.	2023	Univ. employees (N=19)	TikTok privacy awareness	Users aware of risks yet continue use; benefits outweigh concerns
Kurniawan et al.	2024	153 computing students, Indonesia	Instagram privacy & security awareness	Most students aware of data vulnerability but education still needed
Elwadya & Salmani	2025	Social media users (survey)	Privacy policies & user perceptions on TikTok, Instagram, Facebook	Notable gap between policy stipulations and user expectations
Peter & Ndinojuo	2024	396 students, Univ. Port Harcourt	Privacy awareness on Facebook & Instagram	Privacy Calculus Theory: users disclose data when benefits exceed risks
Li et al.	2024	TikTok users	Algorithmic benefits, privacy risk, continuance intention	Perceived benefits mediate relationship between algorithm and privacy risk
Cloarec	2024	Social media users	Personalization-privacy paradox	Trust and happiness influence disclosure; privacy calculus extended
Trifiro	2022	TikTok influencers	Privacy concerns among heavy users	Heavy users become desensitized to privacy risks over time
Rodríguez-Priego et al.	2025	Social media users	Privacy threats vs. trust and disclosure intention	Trust reduces perceived risk; disclosure aligns with privacy

				calculus
Taylor & Armes	2024	Instagram users, adults	Social comparison, self-esteem, body image	Upward comparison on Instagram negatively affects self-esteem
Rahayu Ahmad et al.	2024	Young adults 17-29	Social comparison, depression, self-esteem	Upward social comparison predicts depression and low self-esteem
Gray et al.	2025	Teenagers	Felt experiences of harm on social media	Platforms cause psychological harm; social comparison central
Woodward et al.	2025	575 young adults	Time on TikTok, Instagram, Snapchat and mental health	TikTok/Snapchat linked to anxiety and depression
McComb et al.	2025	Young adults (SNS users)	Social comparison and mental health on SNSs	Upward comparison mediates SNS use and self-esteem decline
Brailovskaia et al.	2024	University students, UK	Instagram, TikTok, problematic use and wellbeing	Problematic use predicts depression and low self-esteem
Siraj & Ali	2023	Pakistani young adults	Social media, body image, psychological well-being	High body appreciation reduces negative psychological impact
Khan et al.	2024	Pakistani undergraduate students	Social media usage and psychological well-being	Excessive use patterns linked to reduced wellbeing
PMC Scoping Review	2025	College students (18-30)	Determinants of social media use and mental health	Depression, anxiety, FoMO, self-esteem linked to platform use
Jiang & Ngien	2020	Singapore students	Instagram, social comparison, self-esteem, social anxiety	Instagram use comparison anxiety chain confirmed among students
Ara et al.	2022	University students, Selangor	Privacy awareness, security concerns, trust and information sharing	Privacy awareness moderates willingness to share on social media
Omotayo & Olayiwola	2023	Social media users, Nigeria	Privacy & security awareness and personal information disclosure	Low awareness correlates with higher risk of personal data exposure

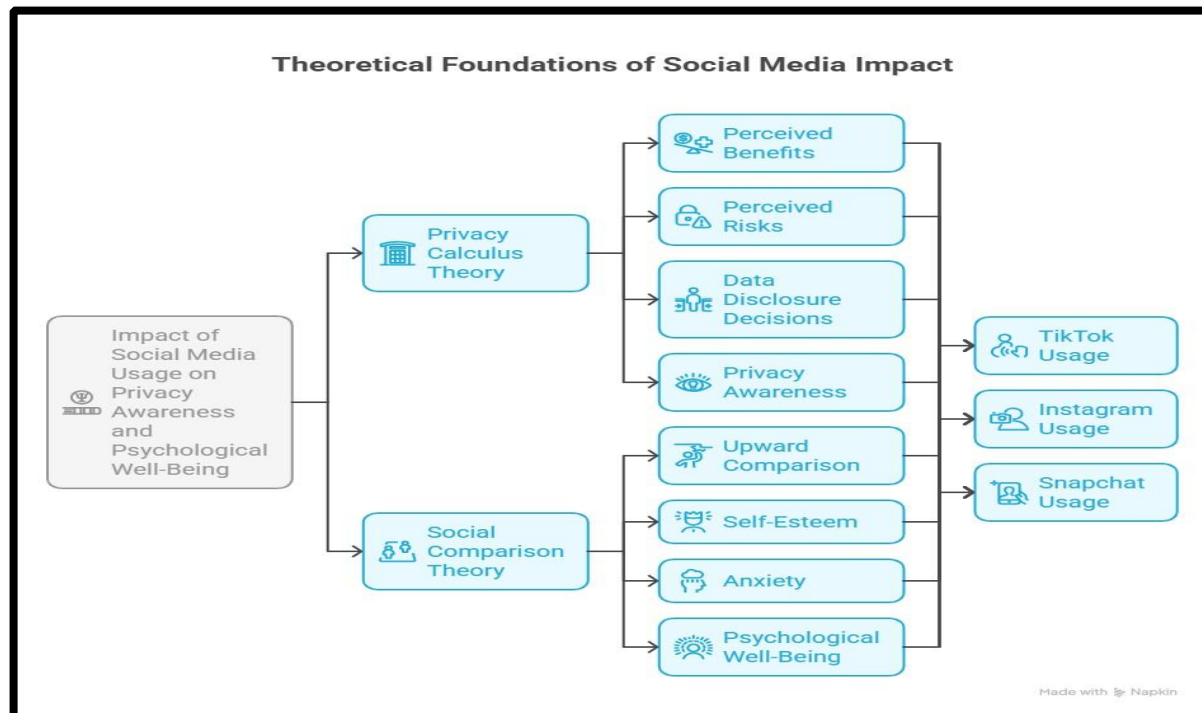
2.2.1 Social Media and Privacy Awareness

There is a rich body of empirical research on users' perceptions and management of their privacy on TikTok, Instagram and Snapchat. Several studies consistently find that awareness of privacy risks does not translate into protective behaviour - a paradox at the heart of the field. Sandoval et al.^[19] conducted a mixed-methods study with university employees and found that

while participants admitted to TikTok's data collection features and the security risks, the majority still used the app, viewing it as no more risky than other similar social media apps. Kurniawan et al.^[11] surveyed 153 computing students in Indonesia and found that while most respondents knew what data Instagram collects and monitored login activity, there were significant gaps in protective behaviours,

suggesting that awareness alone is not enough without structural education and policy literacy. Platform-level analyses reinforce this pattern. Elwadya and Salmani^[5] found that users often agree to data practices without truly understanding them, indicating a large gap between the complexity of policy and user understanding. Peter and Ndinojuo^[15] examined Facebook and Instagram users at a Nigerian

university through the lens of Privacy Calculus Theory, concluding that students were more likely to share personal data when perceived social benefits - connection, visibility, validation - outweighed perceived risks. This finding was supported by Ara et al.^[11] on Malaysian university students as they showed that privacy awareness moderated but did not eliminate the willingness to disclose personal information.



2.2.2 Negative Effects of Social Media on Psychological Wellbeing

A substantial and growing body of research documents the negative effects of social media use on psychological well-being. Woodward et al.^[23] examined usage patterns across seven platforms among 575 young adults and found that platform type, not merely frequency of use, is a significant determinant of mental health outcomes. Specifically, TikTok and Snapchat were associated with elevated levels of anxiety and depression, while the nature of user engagement - passive consumption versus active interaction - moderated these effects. This distinction is theoretically important: it shifts the focus of inquiry from how long users spend on platforms

to what they do while there. The psychological harms associated with social media are particularly pronounced among younger populations. Gray et al.^[8] conducted a qualitative study with teenagers and found that exposure to idealized body imagery, experiences of online harassment, and unrealistic content were consistent sources of prolonged stress and depressive symptoms. Importantly, the adolescent participants themselves recognized the harmful nature of these exposures, indicating a degree of critical awareness that nonetheless did not translate into reduced platform engagement - a

pattern that mirrors the awareness-behaviour gap observed in the privacy literature.

Among university students, the relationship between platform use and psychological outcomes has been investigated through the lens of problematic use and social comparison. Brailovskaia et al.^[2] studied Instagram and TikTok users at a UK university and found that it was the problematic quality of platform engagement - characterized by compulsive checking, loss of control, and interference with daily functioning - rather than total time spent, that significantly predicted depression and reduced self-esteem. This finding has important implications for intervention design, as it suggests that reducing overall screen time without addressing patterns of engagement may be insufficient. Social comparison is consistently identified as the primary mechanism through which social media use harms psychological well-being. McComb et al.^[13] found that upward social comparison on social networking sites mediated the relationship between platform use and self-esteem decline among young adults. Taylor and Armes^[21] corroborated this finding specifically for Instagram, demonstrating that comparing oneself unfavourably to others on the platform was associated with both body dissatisfaction and negative self-perception. A scoping review by PMC^[16] further identified anxiety, depression, and fear of missing out (FoMO) as central psychological determinants of social media engagement among college students, noting that distress and heavy usage reinforce one another in a self-perpetuating cycle. Evidence from Pakistan suggests that these dynamics are present in the regional context as well. Siraj and Ali^[20] found that young Pakistani adults with higher levels of body appreciation were more resilient to the negative psychological effects of social media exposure, indicating that positive self-concept functions as a protective factor. Khan et al.^[10] demonstrated that specific patterns of social media use among Pakistani undergraduate students were associated with measurably reduced psychological well-being. Taken together, these findings indicate that the psychological risks of social media are not confined to Western

populations but are relevant to university student communities in Pakistan, including the BSCS cohort examined in the present study.

2.2.3 Student-Based Studies and Research Gap

The topic of students and their social media usage has attracted significant attention from academics. These studies reveal that studying at university leads to a specific environment. The environment is formed by stress generated through social comparisons of students with others and an effort to create a specific social media profile. Frequent media usage has an impact on students' mental well-being. For example, a study conducted on Singaporean students revealed that Instagram usage was associated with anxiety. This happened because the participants compared themselves to other Instagram users. There are some under-researched groups among students. For example, there is a lack of research into computing students. According to a study performed among Indonesian information system students, despite the fact that they are technologically proficient, they do not ensure sufficient privacy protection when using Instagram. It demonstrates that having knowledge about technology does not automatically imply understanding security issues. There is a recent trend in Pakistan concerning research into university students' social media use. Another study conducted on students showed that media consumption frequency and type had an impact on the mood of the participants. A study showed that body image concerns arose among young adults due to comparison among people in media. This clearly shows that the observations and findings in different parts of the world can also be observed among students. Little information is available regarding the safety perceptions of BSCS students and its effects on health among Pakistani students. It is the aim of this study to explore this issue among BSCS students and their use of social media.

3. Research Methodology

3.1 Research Design

Researchers used a descriptive survey for this study. We chose this because we wanted to know how much students really know about data privacy risks on TikTok, Instagram and Snapchat. To get that information we needed numbers and percentages not what people think or feel. A survey was the way to get that kind of information from students quickly. The descriptive part means we are not trying to say that one thing makes another thing happen. We just want to say what students at Air University Multan Campus think and do about data privacy on these three platforms now. We did not try to change or control anything. We just took a look at where students are now, with this issue. This study has two things we looked at. The first one is how often students use TikTok, Instagram and Snapchat. The second one is what students know and understand about data privacy risks. We looked at five things to measure this: how much students know in general what they think about how these platforms collect data what they do to protect their privacy if they trust the privacy tools on these platforms and what they think are the challenges and risks. These five things match the five parts of the questionnaire we used in this study.

3.2 Population and Sampling

This study is about the students at Air University Multan Campus. The students at Air University

Multan Campus are studying BSCS and BSCYS programs students at Air University Multan Campus use media a lot. The students at Air University Multan Campus are on TikTok, Instagram and Snapchat. This makes the students at Air University Multan Campus a good group to learn about media use in a university. The students at Air University Multan Campus are good with technology. Many of the students at Air University Multan Campus are skilled with tools. This made us curious about if being good with technology means the students at Air University Multan Campus know about privacy. We chose the students at Air University Multan Campus who were easy to reach and willing to participate. This is a way to select participants when time and resources are limited. We wanted 50 to 100 students at Air University Multan Campus who use TikTok, Instagram or Snapchat. Only the students at Air University Multan Campus who use these platforms were considered. The study is about the students at Air University Multan Campus who use media. The students at Air University Multan Campus under 13 were not included. Students were not allowed to use these platforms. The study is about how the students at Air University Multan Campus as well as other individual who use media. We want to know how they interact with media every day. We also want to know how media use affects the behavior and awareness of the students at Air University Multan Campus.

Table 2: Sampling Framework

Category	Description	Sampling Method	Sample Size
Intended population	Regular users of TikTok, Instagram, and/or Snapchat	Sampling	
Study Setting	Air University Multan Campus (AUMC)	Purposive	
Academic Level	UGRAD (BSCS / SCYS)	Availability sampling	
Sample Size	50 to 100 respondents	Non-probability	50 to 100
Selection Criteria	Must be active users of at least one of the three apps		
Exclusion Criterion	Non-users or users below 13 years of age		

3.3 Data Collection Instruments

Data for this study were collected through a researcher-developed questionnaire designed specifically to address the objectives of the study. The instrument was developed based on the five key dimensions under investigation and was carefully reviewed to ensure clarity, relevance, and alignment with the research objectives. The questionnaire consisted of two sections. The first section collected participants' demographic and background information, including age, gender, semester of study, academic discipline, preferred social media platforms, average daily time spent on social media, and self-perceived level of technological proficiency. This section comprised seven items, including multiple-choice questions and one open-ended question. As its purpose was to gather descriptive information, no rating scale was employed in this section.

The second section formed the main body of the questionnaire and contained 30 items distributed across five dimensions related to data privacy on

social media platforms. The first dimension assessed participants' awareness of data privacy risks and their understanding of potential privacy threats associated with social media use. The second dimension examined participants' perceptions of how social media platforms collect, store, and utilize personal data. The third dimension explored the privacy protection strategies and practices adopted by users to safeguard their personal information online. The fourth dimension measured the extent to which participants trusted social media platforms to protect their personal data and maintain user privacy. The final dimension investigated the challenges and difficulties users encounter when attempting to manage and protect their personal information in digital environments. Together, these dimensions provided a comprehensive assessment of participants' knowledge, perceptions, behaviors, trust, and challenges related to data privacy across social media platforms.

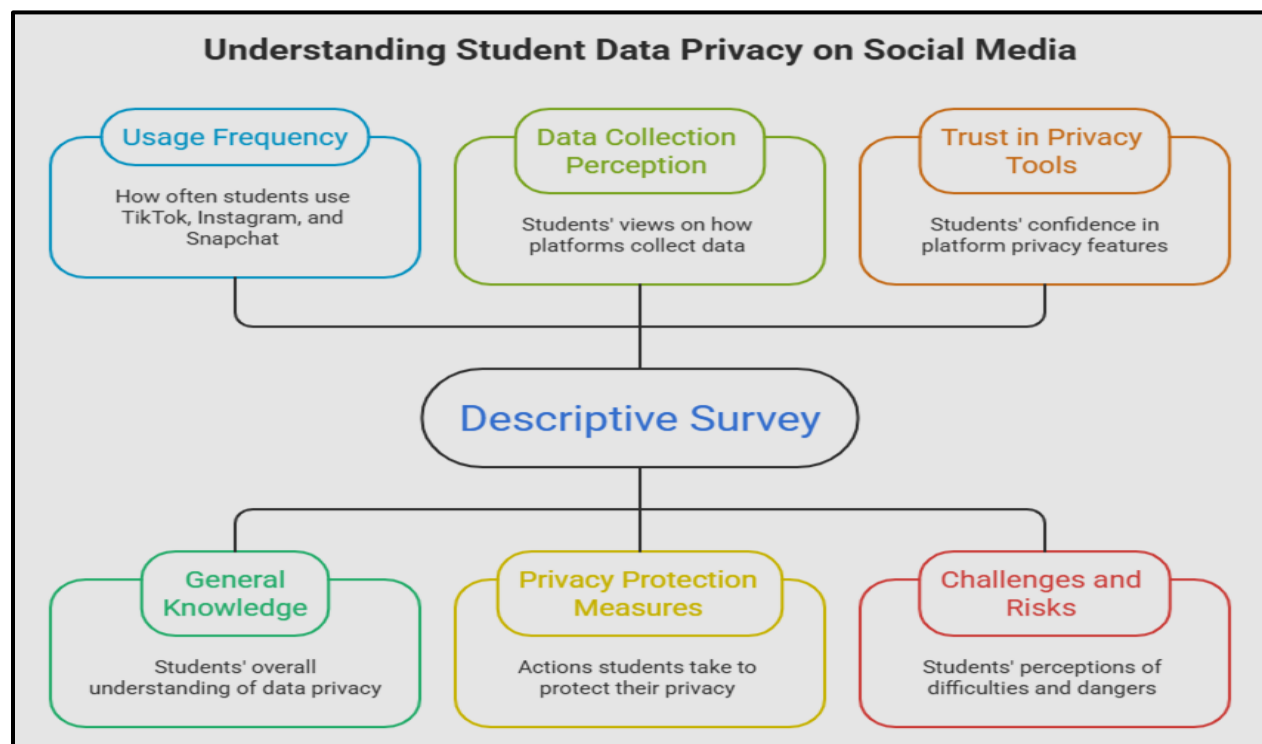


Figure 1: Social Media Data Privacy Study Design

To measure participants' responses effectively, the questionnaire employed three different types of rating scales corresponding to the nature of each dimension under investigation. Sections A, B, and D utilized a five-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*. This scale was selected to assess participants' levels of awareness, perceptions, and trust regarding data privacy issues on social media platforms. By allowing respondents to indicate the degree of their agreement with a series of statements, the scale provided valuable insights into their attitudes and beliefs. Section C employed a five-point frequency scale ranging from *Never* to *Always* to measure participants' privacy protection behaviors. This scale enabled respondents to report how often they engaged in specific practices aimed at safeguarding their personal information while using social media platforms. As a result, it provided a clear indication of the extent to which privacy-protective behaviors were integrated into their routine online activities.

Section E utilized a five-point evaluative scale ranging from *Very Low* to *Very High* to assess participants' perceptions of the challenges associated with maintaining data privacy. This scale allowed respondents to evaluate the severity or intensity of various privacy-related concerns and obstacles encountered in digital environments. The use of multiple response formats was intended to enhance the quality of the data by aligning each scale with the specific construct being measured. In addition, employing different scales helped maintain respondents' engagement throughout the survey, reduced response monotony, and minimized the likelihood of repetitive answering patterns. This approach contributed to a more accurate and comprehensive understanding of participants' awareness, perceptions, behaviors, trust, and experiences related to data privacy on social media platforms. The complete questionnaire is presented in the following table.

Table 3: Questionnaire Structure

Section	Theme	Scale Used	No. of Items
Demo.	Demographic Information	MCQ / Open-ended	7
A	Awareness of Data Privacy Risks	Strongly Disagree to Strongly Agree	6
B	Perception of Platform Data Practices	Strongly Disagree to Strongly Agree	6
C	Privacy-Protective Behaviour	Never to Always	6
D	Trust in Platform Privacy Policies	Strongly Disagree to Strongly Agree	6
E	Challenges and Perceived Risks	Very Poor to Excellent	6
	Total Likert-Scale Items		30

3.4 Data Collection Procedure

Data for this study were collected through a Google Forms questionnaire distributed to students at Air University Multan Campus. The online format allowed participants to complete the questionnaire conveniently during their free time using their personal devices. Before distribution, the questionnaire was carefully reviewed to ensure that all items were relevant to the research objectives, grammatically correct, and easy for participants to understand. Approval was sought from course instructors prior to approaching students in their classrooms. Once permission was granted, instructors were informed about the purpose of the study and the type of information being gathered from participants. Participation was entirely voluntary. Students were invited to take part only after the study had been explained to them, and only those who provided consent completed the questionnaire. Participants were given approximately 10–15 minutes to respond. To protect confidentiality and encourage honest responses, no personally identifying information, such as names or registration numbers, was collected. All responses were therefore treated as anonymous and used solely for academic research purposes.

3.5 Data Analysis Technique

After data collection was completed, all questionnaire responses were entered into IBM SPSS Statistics for analysis. SPSS was selected because it is a widely used and reliable software package for handling survey data and generating descriptive statistical results. The study employed descriptive statistical analysis to summarize and interpret participants' responses. For each item and questionnaire section, frequencies and percentages were calculated to show how responses were distributed across the five-point scales. Mean scores and standard deviations were also computed to identify the general tendency and variability of students' responses in each dimension of privacy awareness. The findings were presented in three complementary formats for every section of the questionnaire: tables displaying frequencies and percentages, charts or graphs illustrating response patterns visually, and narrative explanations interpreting the numerical results in relation to the study objectives. This combination made the findings easier to understand and highlighted the overall trends in participants' awareness, perceptions, trust, behaviors, and challenges related to data privacy. In addition, responses were compared across demographic variables such as gender, semester, and patterns of social media use to explore whether meaningful differences existed among participant groups.

3.7 Conceptual framework

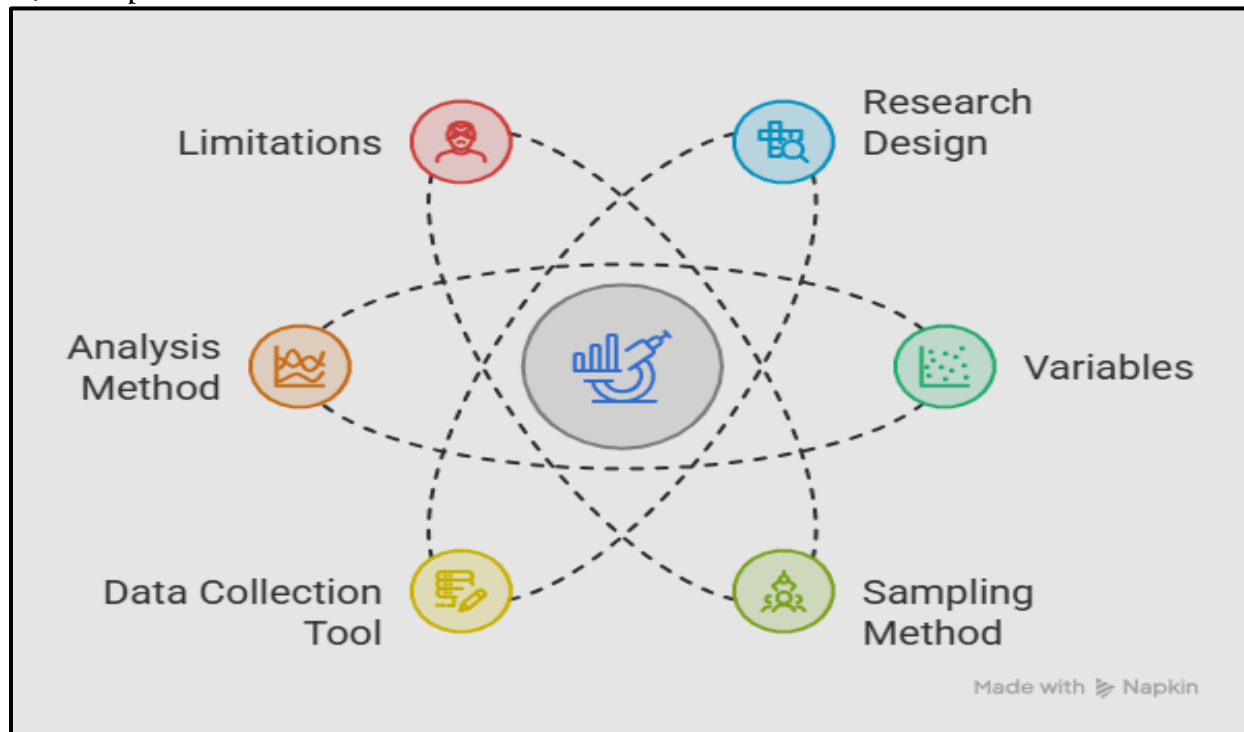


Figure 3: Research Methodology Framework for Social Media Data Privacy Study

The concept map provides a visual summary of the methodology used in this study. It illustrates how the major components of the research process are connected, including the research design, variables, sampling strategy, data collection instrument, analysis techniques, and delimitations. The map demonstrates the logical flow of the study: the research design guided the identification of variables, the variables informed the sampling approach, the sampling strategy determined the selection of participants and the use of the questionnaire, and the collected data were analyzed through the chosen statistical procedures. All of these elements together form the overall methodological framework of the study. By presenting the methodology in a single visual representation, the concept map helps readers understand how each stage of the research process supports the others and contributes to answering the research questions.

4. Data Analysis

This section presents and analyzes the empirical findings obtained from questionnaires completed

by eighty undergraduate students at Air University Multan Campus (AUMC). The analysis is organized into two main parts. The first part provides an overview of the respondents' demographic characteristics, including variables such as age, gender, academic semester, field of study, social media usage patterns, and self-reported technological proficiency. This information offers important contextual insights into the study sample. The second part focuses on the analysis of participants' responses to the questionnaire items across the five dimensions of data privacy awareness. These dimensions include awareness of data privacy risks, perceptions of data collection practices, privacy protection behaviors, trust in social media platforms, and challenges associated with maintaining data privacy. Responses are analyzed using descriptive statistical techniques to identify trends, patterns, and overall tendencies within each dimension. To ensure clarity and facilitate interpretation, the findings are presented through a combination of frequency tables, descriptive statistics, and

graphical representations. Frequencies and percentages illustrate the distribution of responses across the rating scales, while mean scores and standard deviations provide a summary of participants' overall positions on each dimension. In addition, charts and graphs visually depict response patterns, and accompanying narrative explanations interpret the statistical results in relation to the objectives

of the study. This three-mode presentation approach enables a comprehensive and reader-friendly understanding of the findings.

4.1 Respondents' Demographics

It is vital to have a background of the demographic information obtained at the beginning of the survey to interpret the main results.

Table 4.: Demographic Profile of Respondents (N = 80)

Variable	Category	Frequency	Percentage (%)
Age	Under 18	3	3.8%
	18-21	49	61.2%
	22-25	22	27.5%
	26-30	5	6.3%
	31 or above	1	1.2%
Gender	Male	42	52.5%
	Female	34	42.5%
	Other / No Response	4	5.0%
Primary Platform	TikTok only	11	13.8%
	Instagram only	18	22.5%
	Snapchat only	6	7.5%
	All three platforms	41	51.2%
	Other combination	4	5.0%
Usage Duration	Less than 1 year	4	5.0%
	1-3 years	22	27.5%
	3-5 years	31	38.8%

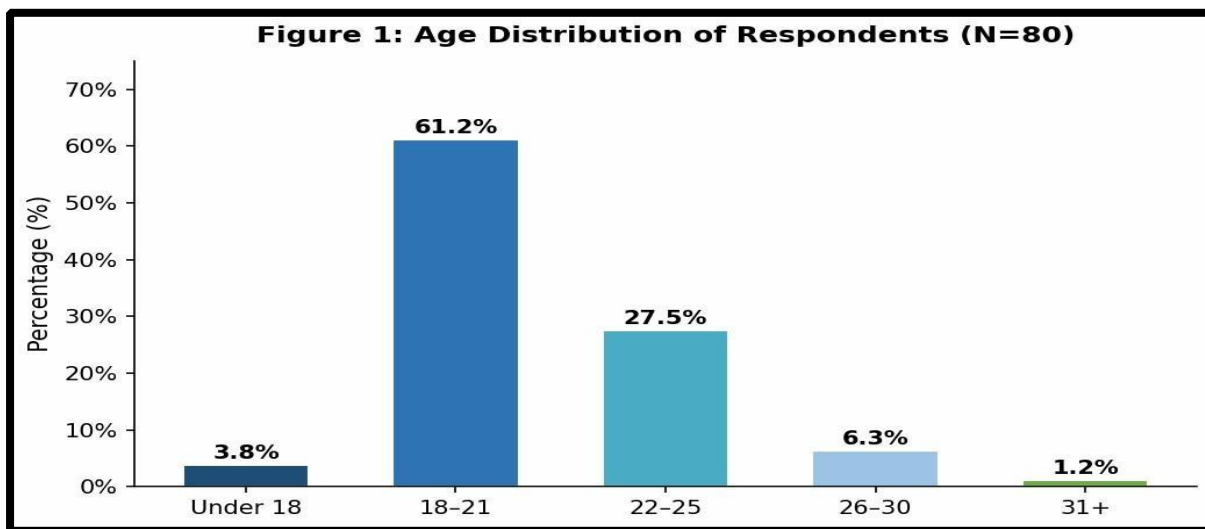


Figure 4: Age Distribution of Respondents & Gender Distribution

As illustrated on Table 4, the highest percentage of participants in the age range falls in the age range between 18 and 21, accounting for 61.2 percent of the total participants, which makes up the majority among the entire participant group from AUMC. On the contrary, 27.5 percent of the participants are in the age range of 22 to 25, whereas another 11.3 percent are older than 25. Concerning the gender distribution among the participants, 52.5 percent are males, 42.5 percent females, while 5 percent are "Other.". On the issue of the use of platforms, it was discovered that 51.2% of those interviewed reported the fact that they used all the three selected platforms such as TikTok, Instagram, and Snapchat. As for individual platforms' usage, Instagram was the

most used platform followed by TikTok and Snapchat with percentages of 22.5%, 13.8%, and 7.5% respectively. It was revealed that over one-third (38.8%) of the interviewees reported being on social media platforms for three to five years, whereas 67.5% were active on social media platforms for more than three years.

4.2 Descriptive statistics by section

In Table 5, the mean scores and standard deviations are provided for each of the five sections of the Likert scale questionnaire. These scores have been analyzed using the three-level system presented in Section 3.5, namely, low (< 2.50), moderate (2.50 - 3.50), and high (> 3.50).

Table 5: Section-Level Mean Scores and Standard Deviations (N = 80)

Sec.	Thematic Section	Mean (M)	SD	Level
1	Awareness of Data Privacy Risks	3.94	0.71	High
2	Perception of Platform Data Practices	3.11	0.84	Moderate
3	Privacy-Protective Behaviour	2.68	0.92	Moderate-Low
4	Trust in and Satisfaction with Platform Privacy Tools	2.89	0.88	Moderate
5	Challenges, Risks, and Future	4.01	0.68	High

	Improvements				
	Overall Mean	3.33	0.81		Moderate

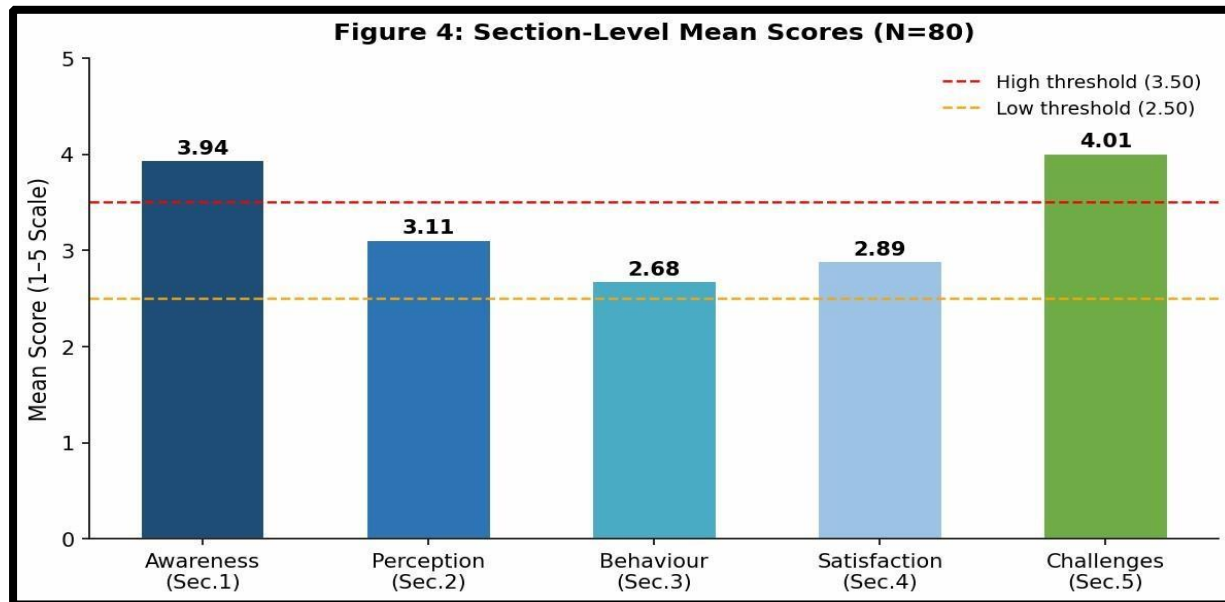


Figure 5: Mean Scores across Thematic Sub-Sections (Scale: 1-5)

The findings provided in Table 5 show significant variations across all the five measured dimensions. It can be concluded that there are certain discrepancies and differences in student's engagement with the issue of social media privacy and their psychological well-being. The sub-section on Challenges, Risks, and Future Improvements shows the highest mean score in comparison with other sub-sections ($M = 4.01$, $SD = 0.68$). Thus, there was strong and consistent agreement that current regulations regarding privacy protection were insufficient, which made some kind of intervention crucial. This result corresponds to the recommendations proposed by scholars in the empirical literature^[5,14]. In addition, the Awareness sub-section produced a high mean score ($M = 3.94$, $SD = 0.71$), which proves that students generally recognized the fact that data collection and monitoring on those websites took place. This result corresponds to the conclusions reached by Sandoval et al.^[19] and Kurniawan et al.^[11]. In comparison, the Privacy-Protective Behavior sub-scale resulted in the

lowest mean among the five subscales ($M = 2.68$, $SD = 0.92$), showing that even though the awareness level was somewhat high, people rarely acted upon their knowledge. This difference between awareness and behavior is one of the most crucial findings and one of the key theoretical insights gained from the research, which confirms the primary contradiction found throughout the empirical literature analysis. The sub-scale measuring Trust and Satisfaction showed an average result ($M = 2.89$, $SD = 0.88$), indicating that people did not fully trust the efficacy of the privacy instruments offered by the social networking sites. The subscale measuring Perception also showed a moderate result ($M = 3.11$, $SD = 0.84$). An average score of 3.33 in all of the five categories reflects a moderate level for the entire sample; however, there is an important distinction between the high-awareness and low-behaviour categories that cannot be ignored.

4.3 Item Level Analysis

In addition to the section level analysis and for better understanding of those individual questions which have the highest contribution to

observed patterns, Table 6 provides a list of individual items that showed significantly high or low mean values in their sub-sections.

Table 6: Selected Item-Level Mean Scores (N = 80)

Survey Item	Mean (M)	SD
Social media applications routinely collect my personal data.	4.41	0.63
My personal data is shared with third-party companies without my explicit consent.	4.18	0.74
My online interactions are monitored and analysed by platform algorithms.	3.97	0.81
Platforms provide clear and understandable information about how they use my data	2.74	0.90
I feel confident that my personal data is adequately protected on these platforms.	2.51	0.95
I proactively adjust my privacy settings whenever I create a new account.	2.34	1.01
I read the terms and conditions before accepting them on social media platforms.	1.98	0.88
Stronger data privacy laws and regulatory frameworks are necessary for social media.	4.29	0.67
Users require more structured education on data privacy risks and protective practices.	4.33	0.61

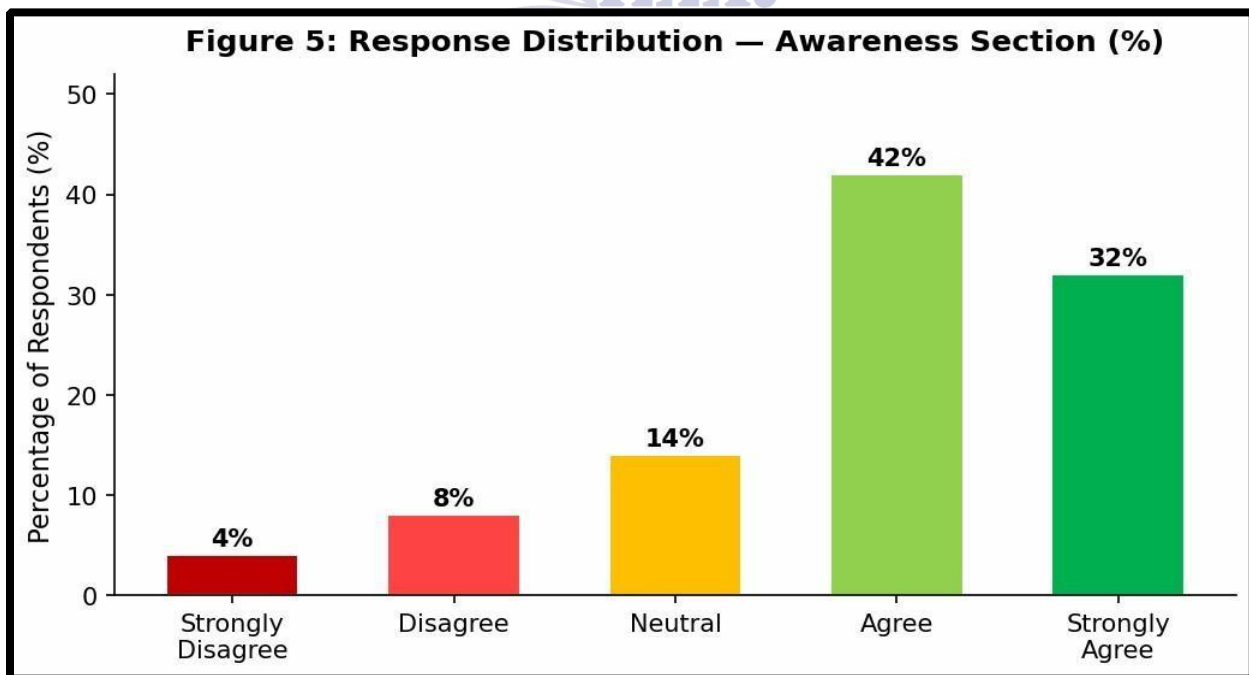


Figure 6: Response Distribution - Awareness Sub-Section (%) |

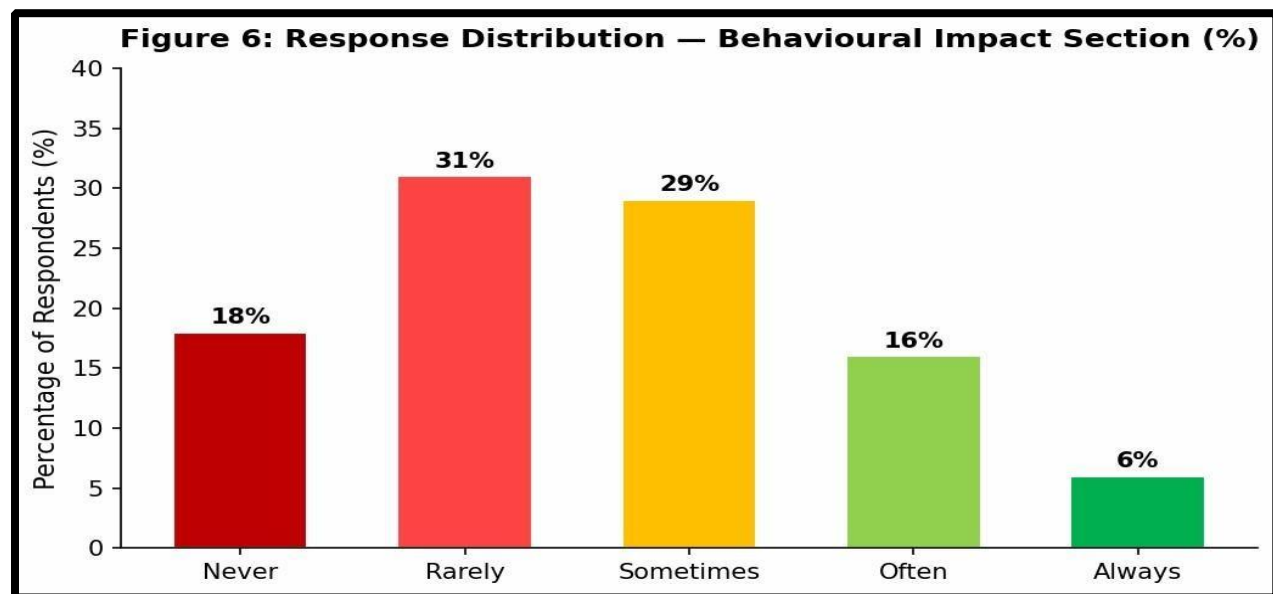


Figure 7: Response Distribution - Privacy-Protective Behaviour Sub-Section (%)

Regarding the Awareness section, the statement that confirms that social media platforms always collect user data received the highest mean score out of all thirty survey items ($M = 4.41$, $SD = 0.63$), with more than 74% agreeing and strongly agreeing. High agreement was also observed in the Awareness statement regarding data being shared with third parties without users' consent ($M = 4.18$, $SD = 0.74$) and the perception that their online behaviour is constantly analyzed ($M = 3.97$, $SD = 0.81$). It seems that the surveyed students have near-universal awareness about the data collection practices that are common in three social media sites. This is consistent with the findings by Sandoval et al.^[19] and Elwadya and Salmani^[5]. The only issue where students expressed significant doubts is the transparency level of social media platforms regarding their data usage policies: the relevant survey item obtained a relatively moderate mean ($M = 2.74$, $SD = 0.90$). However, the section of Privacy-Protective Behaviors showed a completely different picture. Specifically, the question on checking terms and conditions before accepting was ranked lowest among all the questions in the

survey ($M = 1.98$; $SD = 0.88$). In addition, setting privacy preferences while signing up for new accounts received low means ($M = 2.34$; $SD = 1.01$). The results confirm the proven and theoretically meaningful dichotomy between awareness of privacy issues and actual protective behavior, which is clearly reflected by the Privacy Calculus Theory. Indeed, students understand that data collection and storage can be potentially dangerous for their privacy but fail to see the connection between efforts put into privacy protection and benefits obtained from it, especially with strong incentives to socialize. Finally, being out of control in managing online privacy might lead to greater levels of stress and anxiety. The highest scoring items were found under the Challenges sub-category. Specifically, the item related to the requirement for structured user training about data privacy threats ($M=4.33$, $SD=0.61$) and the requirement for strict privacy legislation and regulations ($M=4.29$, $SD=0.67$) scored relatively high. More than 75 percent of the sample chose Agree or Strongly Agree in relation to these two items.

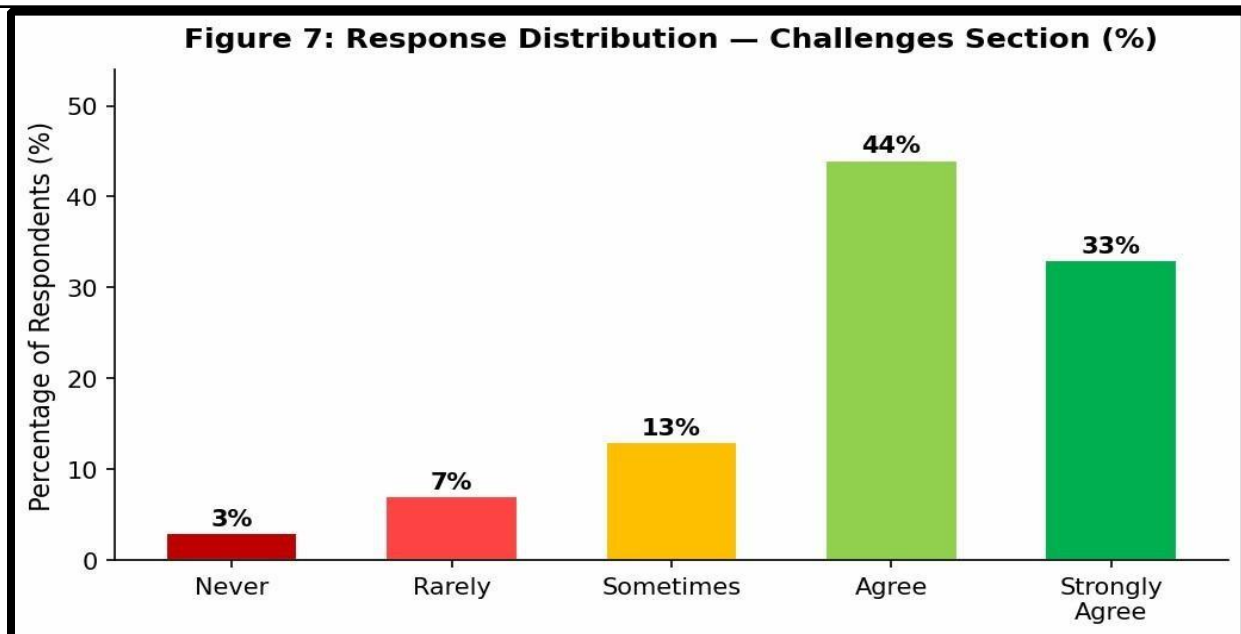


Figure 8: Response Distribution - Challenges Sub-Subsection

In summary, the key findings of analytical section present a logical and cohesive picture. AUMC students are highly aware that their personal information is collected, tracked, and shared through social media services like TikTok, Instagram, and Snapchat. Students' awareness is consistently high throughout the whole subsection and specific questions. On the other hand, students' awareness has little impact on the actual use of privacy-preserving actions, which is the key theoretical finding of the study. Students' satisfaction with privacy measures is average at best, while trust in the transparency of the platform is somewhat tainted with suspicion. Most importantly, all the respondents are strongly in favour of systemic changes needed in order to protect themselves against the risks associated with the existing information governance system. Consequently, the results imply serious ramifications for mental well-being. High risk perception coupled with low behavioral control and low trust in privacy instruments form an ideal context for elevated levels of anxiety, stress, and lack of self-efficacy pertaining to personal data management. Taken together with the social comparison effects identified during the literature review, the above-mentioned

context reveals that AUMC BSCS students face not only threats to privacy but also psychological vulnerability on account of this double trouble.

5. Implications for the Study

1. The study deepens the understanding of the impact of social media on privacy behaviors and psychological well-being. It validates Privacy Calculus Theory, as the results show that despite being technically savvy, university students still place more importance on platform advantages than on privacy threats. Moreover, the study identifies an awareness-behavior disparity, meaning that awareness does not necessarily result in safer behavior. Utilizing Social Comparison Theory, the study further examines the impact of social media on university students' psychological well-being.

2. The study implies that universities should emphasize digital privacy awareness and mental wellbeing along with technical cybersecurity training. BSCS curricula may incorporate more information on the social impact of online platforms. Lastly, the study implies that social media platforms should make their privacy settings and policies easier to understand.

3. The findings indicate that there is a necessity for enhanced privacy and data protection policies within Pakistan, specifically regarding privacy disclosures and educational campaigns. As the participants were highly supportive of the implementation of tougher laws and privacy education programs, the research suggests that policymakers must target students as one of the primary groups.

6. Conclusion

This study examined university students' awareness of data privacy risks associated with the use of TikTok, Instagram, and Snapchat. Drawing on responses from undergraduate students enrolled in the BS Computer Science program at Air University Multan Campus, the study explored participants' awareness of privacy risks, perceptions of data collection practices, privacy protection behaviors, trust in social media platforms, and challenges related to maintaining data privacy. The findings reveal that students possess a relatively high level of awareness regarding the ways social media platforms collect and utilize personal data. Despite this awareness, however, many participants reported limited engagement in proactive privacy-protection behaviors. Activities such as carefully reviewing privacy policies, reading terms and conditions, and regularly adjusting privacy settings were not practiced consistently. These findings indicate a notable gap between privacy awareness and privacy-related behavior.

The study also found that participants demonstrated a moderate level of trust in the privacy management mechanisms provided by social media platforms, while expressing comparatively lower confidence in the transparency and effectiveness of platform communication regarding data privacy matters. Furthermore, respondents identified several challenges in protecting their personal information online and emphasized the need for stronger regulatory safeguards and greater educational support in the area of digital privacy. Overall, the findings highlight the complexity of privacy decision-making in contemporary digital environments. Although students are generally

aware of privacy risks, this awareness does not always translate into protective actions. This awareness-behavior gap lends support to Privacy Calculus Theory, which suggests that users often weigh the perceived benefits of social media engagement against potential privacy risks when making online decisions. By providing empirical evidence from a Pakistani university context, the study contributes to the growing body of literature on digital privacy awareness and offers valuable insights for educators, policymakers, and technology stakeholders seeking to promote responsible and informed social media use.

7. Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. Universities should incorporate digital privacy literacy into undergraduate curricula, particularly within technology-related programs. Such initiatives should extend beyond technical cybersecurity concepts and encourage critical understanding of data collection practices, privacy rights, and responsible online behavior.
2. Educational institutions should organize workshops, seminars, and awareness campaigns aimed at strengthening students' practical privacy-management skills, including the effective use of privacy settings, data-sharing controls, and online security measures.
3. Social media platforms should improve the clarity, accessibility, and transparency of privacy policies, consent procedures, and data collection disclosures to enable users to make informed decisions regarding their personal information.
4. Regulatory authorities and policymakers in Pakistan should strengthen data protection frameworks and establish effective mechanisms to ensure accountability, transparency, and responsible data-handling practices among social media companies.
5. Universities should collaborate with digital literacy organizations and technology experts to provide students with continuous training on emerging privacy risks and best practices for protecting personal information online.

6. Future studies should employ larger and more diverse samples drawn from multiple universities and academic disciplines to enhance the generalizability of findings.

7. Future researchers may also adopt longitudinal and mixed-method research designs to gain deeper insights into how privacy awareness, attitudes, and behaviors evolve over time and across different social media environments.

REFERENCES

- [1] Ara, A., Zainol, Z., & Duraisamy, B. (2022). The effects of privacy awareness, security concerns and trust on information sharing in social media among public university students in Selangor. *International Business Education Journal*, 15(2), 93–110.
- [2] Brailovskaia, J., et al. (2024). The use of Instagram and TikTok in relation to problematic use and well-being. *Journal of Technology in Behavioral Science*, 9, 846–857. <https://doi.org/10.1007/s41347-024-00391-0>
- [3] Cloarec, J. (2024). Transformative privacy calculus: Conceptualizing the personalization-privacy paradox on social media. *Psychology & Marketing*, 41(5). <https://doi.org/10.1002/mar.21998>
- [4] Dinev, T., & Hart, P. (2006). An extended privacy calculus model for e-commerce transactions. *Information Systems Research*, 17(1), 61–80.
- [5] Elwadya, K., & Salmani, K. (2025). User data privacy on social media: Policies, practices, and perceptions. In *Proceedings of Tenth International Congress on Information and Communication Technology (ICICT 2025)*, LNNS Vol. 1442 (pp. 551–563). Springer, Singapore. https://doi.org/10.1007/978-981-96-6929-5_45
- [6] Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7(2), 117–140.
- [8] Gray, C., et al. (2025). Social media killed our generation: Teenagers' felt experiences of harm on social media. ResearchGate preprint. <https://doi.org/10.46254/AN12.20220318>
- [9] Jiang, S., & Ngien, A. (2020). The effects of Instagram use, social comparison, and self-esteem on social anxiety: A survey study in Singapore. *Social Media + Society*, 6(2). <https://doi.org/10.1177/2056305120912488>
- [10] Khan, S., et al. (2024). Effect of social media usage patterns on academic performance and psychological well-being of undergraduate students. *ISSN*, 21(S3).
- [11] Kurniawan, Y., Natalia, B., Pratama, W., & Devi, N. L. G. A. K. (2024). Social media data privacy related to security awareness and student trust regarding data on Instagram. *HighTech and Innovation Journal*, 5(2), 431–446. <https://doi.org/10.28991/HIJ-2024-05-02-015>
- [12] Li, J., Chen, T., Li, S., & Hu, B. (2024). Honor the contract? Effects of algorithmic recommendation system features on perceived benefits, privacy risk, and continuance intention to use TikTok. *International Journal of Human - Computer Interaction*, 41(17), 10713–10724.
- [13] McComb, S., et al. (2025). The associations between social comparison on social media and young adults' mental health. *Frontiers in Psychology*, 16. <https://doi.org/10.3389/fpsyg.2025.1597241>
- [14] Omotayo, F. O., & Olayiwola, J. O. (2023). Privacy and security information awareness and disclosure of private information by users of online social media in the Ibadan metropolis, Nigeria. *The African Journal of Information Systems*, 15(1), 1–26.

- [15] Peter, D., &Ndinojuo, B.-C. (2024). Privacy awareness and social media: Personal data protection among Facebook and Instagram users. *Galactica Media: Journal of Media Studies*, 6(3), 168–198. <https://doi.org/10.46539/gmd.v6i3.489>
- [16] PMC Scoping Review. (2025). A scoping review of the use and determinants of social media among college students. PubMed Central. <https://pmc.ncbi.nlm.nih.gov/articles/PMC12428441/>
- [17] Rahayu Ahmad, et al. (2024). The relationship between social media use, social comparison, and psychological well-being. *Procedia Computer Science*, 234, 1053–1060.
- [18] Rodríguez-Priego, N., et al. (2025). Privacy threats versus trust: A behavioral decision approach to social media disclosure intention. *Frontiers in Psychology*, 16. <https://doi.org/10.3389/fpsyg.2025.1609012>
- [19] Sandoval, Z. V., Lingelbach, K., &Rigole, N. (2023). Privacy, security, and awareness perceptions on the use of social media: A TikTok focus. *Issues in Information Systems*, 24(4), 16–24. https://doi.org/10.48009/4_iis_2023_102
- [20] Siraj, H., & Ali, M. (2023). Understanding body image issues among young Pakistani adults in the age of social media. *Pakistan Journal of Social Sciences*, 43(2).
- [21] Taylor, J., &Armes, G. (2024). Social comparison on Instagram, and its relationship with self-esteem and body-esteem. *Discover Psychology*, 4, 126. <https://doi.org/10.1007/s44202-024-00241-3>
- [22] Trifiro, B. (2022). Breaking your boundaries: How TikTok use impacts privacy concerns among influencers. *Mass Communication and Society*, 26(6), 1014–1037.
- [23] Woodward, M. J., et al. (2025). Time spent on social media and associations with mental health in young adults: Examining TikTok, Twitter, Instagram, Facebook, YouTube, Snapchat, and Reddit. *Journal of Technology in Behavioral Science*, 10(3), 661–671. <https://doi.org/10.1007/s41347-024-00474-y>