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Development and Validation of The Social Media Interaction Scale for Youth

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ABSTRACT

This study investigates the development and validation of the Social Media Interaction Scale (SMIS) using a cross-sectional correlation research design. Participants were selected using probability random sampling methods with sample size calculated on the basis of Yamane Formula. Social media usage was defined as various internet tools emphasizing social communication and creative expression. Informed consent was taken and confidentiality was maintained. Data were analyzed using exploratory and confirmatory factor analyses in SPSS version 24 and AMOS version 24 respectively. Phase I focused on interviews with the experts and developed item pool. Phase II carried out content validity. Phase III comprised a try-out. In Phase IV, the sample sufficiency was assessed using KMO and Bartlett's Test of Sphericity on a probability sample of 306 students (19 to 25 years). Principal Component Analysis with Varimax rotation and Kaiser Normalization identified three distinct components: Cognitive Engagement (CE), Behavioral Engagement (BE), and Affective Engagement (AE). Another probability sample of 257 students yielded the values of CMIN/DF ratio were 3.2. The goodness of fit index (GFI), as well as the comparative fit index (CFI), were estimated to be equal to .912 and .914 respectively. Phase V analyzed the concurrent validity and Cronbach's Alpha reliability coefficients were 0.22 ($p < 0.01$) and 0.86 respectively on a sample of 257 students. Conclusively, SMIS is a valid and reliable instrument developed to measure the phenomenon of social media engagement among youth. The SMIS is useful for screening youth with overindulgence tendencies in social media and to provide guidance and counselling in this aspect.

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1. Introduction

Social media has become the main way people talk to each other, keep in touch with friends and family, and get their news. Many youngsters spend more time on their phones than they'd like to admit (Haque, Eyemoon, & Rahaman, 2021; Rahaman et al., 2022). The proliferation of social media platforms in recent years has changed how teenagers engage with their environment. Young people's lives are significantly influenced by these digital systems, and it is impossible to overstate this fact. However, this rapid integration of social media into the fabric of everyday life has raised concerns about its impact on teenagers' mental and physical well-being. This is often worsened by seeing certain images that have been intentionally chosen from social media. It is important to study how social media affects the emotional and psychological health of young individuals. In this digital age, the aim is to explore the intricacies that exist between social media and their effects on mental well-being of teens. Communication is an important part of the social media world. By sharing information, commenting, messaging privately or even video-calling each other; users can form bonds with others. How people interact or communicate via these platforms may shed light on their psychology (Kim & Lee, 2019). It implied that youth is a time of significant physical, socio-emotional, and cognitive transformation that is essential to identity formation. Adult mental health issues such as increased anxiety,

sadness, and self-harm practices, as well as poorer socio-emotional well-being, reduced self-esteem, and a obscure body persona, are linked to social media interaction use. In this context, the study investigates how to measure psychological suffering impacted by social media interaction in youth. There are a few instruments available to measure this phenomenon. However, in Pakistan, there are no such scales and there is a need for the development of the one (see (Saleem, Ali, & Hanan, 2014; Shahid, Bashir, & Fatima, 2024).

Instagram lets users share pictures and numbers, like how many accounts they follow how many posts they've made, and how many likes and comments each post gets. Some studies show that posting photos can make people feel better, while others say it can have a negative effect (Maclean, Al-Saggaf, & Hogg, 2020). The need to get lots of likes and comments can push some people to develop harmful habits such as eating disorders mental health issues, and body image problems (Rahaman et al., 2022). Social media is described as computer-mediated communication channels that enable social engagement with large and small audiences in real-time. This includes posting actively on the relevant media and getting passively involved by browsing across one or more options available in social media simultaneously (Kuru et al., 2023). Social media interactions encompass a wide range of activities that users engage in on various platforms. These interactions can be broadly categorized into several types. Posts and stories often involve curating an idealized version of oneself, leading to self-objectification and psychological distress (Grabe, Ward, & Hyde, 2008; Meier & Gray, 2014). The pursuit of likes and positive reactions can cause users to focus on external approval, leading to self-objectification and distress when expectations are not met. Comments, both positive and negative, can reinforce self-objectification and cause significant psychological distress. Shares and retweets of appearance-focused content can amplify self-objectification and lead to feelings of inadequacy and distress (Casale & Fioravanti, 2018).

The selectivity paradigm posits that people can only process a limited number of media messages based on personal dispositions, needs, and desires. Two communication theories uses and gratifications theory and selective exposure theory emphasize different aspects of selective media use, with the former viewing users as rational and conscious in their selections, while the latter suggests users may not always be fully aware of their motives (Zillmann & Bryant, 2013). Transactional media effects theories integrate selectivity into a broader process where the media user, rather than the media itself, initiates selective use leading to potential changes. These theories argue for a reciprocal relationship between media use and effects, influenced by various dispositional, developmental, and social-context factors (Slater, 2003). Conditional media effects theories propose that media influence is not equally implemented on all users and may be influenced by dispositional, developmental, and social-context factors. The Differential Susceptibility to Media Effects Model highlights the double role of these factors in predicting media use and influencing media processing and outcomes (Rideout & Fox, 2018). The communication theories posited that the media effects that act as a base for studies on how social media affects teenagers via analysis of selectivity, trans actionality, and conditionality. The computer-mediation concepts started in the 1970s explained the mental, emotional, and behavioral results of using social media. The transactional affordance theory of social media use explains self-effects theory about what social media can do (Bronfenbrenner, 2005; Sameroff, 2009). To wrap up grasping how social media affects young people needs a deep look at choice, back-and-forth action, and how specific conditions in media effect ideas. To get the full picture of how social media use links with thinking, feeling, and doing, one must think about personality, growth, and social surroundings (Gerbner et al., 1980). Therefore, the affective, cognitive, and behavioral components play crucial role in the comprehension of the social media interaction phenomenon. Affective engagement highlights the good and bad sentimental arousal in the individuals while using social media. The behavioral and cognitive engagements focus on unconscious and biased involvement respectively, with the contents presented in the social media (Ni et al., 2020). According to the gratification theory, the needs of curiosity and affiliation are fulfilled by seeking information, entertainment, and relational connectedness via cognitive, affective, and behavioral engagement of individuals with the social media (Dolan et al., 2016).

1.1. Rationale of the Study

Social media have already become an essential commodity, and even more so for the young. They spend hours on the internet, which can affect their self-concept and they compare themselves to youth seen online (in terms of beauty/image) which contributes to low self-esteem. Our goal is to develop and validate the SMIS that could underpin initiatives for healthier social

media use in young people, a key challenge given the meteoric rise of digital developments affecting mental health today.

2. Literature Review

Buehler (2017) looked into how Facebook was developed to foster interpersonal connections, but statistics show that frequent use has both beneficial and detrimental effects on wellbeing. A total of 1,104 college students gave their consent for research participation by answering questionnaires about their use of Facebook in terms of minutes, passive use, and active use as well as their well-being. Structural equation modeling was employed to analyze the collected data, evaluating several models for men and women. Analysis of models for both genders revealed that they fit the data. For both of the genders, more social comparison and self-objectification were observed in individuals using more Facebook. The increased self-comparison and self-objectification lead to low self-esteem and result in bad psychological well-being and body shaming. According to Keles, McCrae and Grealish (2020), regardless of being a vital part of our everyday routines, internet social media has been linked to an increase in psychological disorders in young people. This systematic review collated research on the influence of youth social media consumption on psychological disorders. Psyc INFO, Medline, Embase, CINAHL, and SSCI databases were sought, yielding 13 papers that fulfilled the specifications, 12 of which were cross-sectional investigations. Social media usage was associated with anxiety, mental health problems, and depression. However, major constraints exist due to problems in the research design, sampling, and measurement methods. Research using qualitative inquiry and long-term cohort studies can give better results. Garcia et al. (2022) conducted research and discovered that, while visual social media networks such as Instagram (IG) are progressively influencing young lady's daily activities, the mental health implications of these platforms have yet to be properly investigated. This research closely examines the impact of daily Instagram usage on self-objectification and psychological well-being in young females. Following an initial examination (N = 45), respondents (N= 481) completed a daily diary for a minimum of 13 nights, recording their Instagram consumption, everyday emotions, daily mental health, and self-centered thoughts and feelings. The multilevel model findings revealed that more Instagram consumption is linked to greater state self-objectification on that specific day. It has also been linked to a drop in happiness in life. The results posited that self-objectifying cognition was connected to IG consumption and mood swings. Thus, the study indicated that regular exposure to social media posts on IG have negative impact on the mental health. Future studies will investigate these impacts in groups with higher heterogeneity focusing on gender and ethnicity.

Stronge et al. (2019) researched the rising demand for social media consumption that has produced conflicting findings, raising questions about its possible detrimental effects on mental health and suffering. It explores the link between the time invested on the conception of social media usage and psychiatric disorders in adults. Even after controlling for demographics and time spent on various activities, social media consumption was found to be positively related to psychological discomfort. Contrary to other regular behaviors, social media consumption had one of the greatest hourly unit connections with mental distress, but the relationship was rather minor. As a result, the only action likely to trigger anxiety is excessive social media consumption. The results presented provide strong evidence from a large-scale sample of people, suggesting that social media use is rarely a significant cause of psychological distress. Despite its primary objective of boosting individual interaction, Hanna discovered that engaging with Facebook has both good and detrimental impacts on a healthy lifestyle. To address these contrasting conclusions, social comparison as a mediator of the link between usage of Facebook and three measures pertaining to psychological health e.g., self-esteem, psychological wellness, and body shaming were used. This research included 1,104 college students. The structural equation modeling assessed unique models for both sexes, and all of them fit the data well. Higher utilization of Facebook was associated with social comparison and self-objectification which were in turn linked to worse self-worth, poorer psychological wellness, and increased feelings of body shame. Based on the review of the literature, it is found that a valid and reliable tool is missing in Pakistan to gauge these problems in the youth. Therefore, the present study aimed at the development of SMIS.

3. Research Methodology

The SMIS was developed by following the model of Ni et al. (2020) for social media engagement. The ethical permission to conduct this research was taken from Advanced Studies and Research Board (ASRB), University of Gujrat. The development of the scale was done in five different phases.

3.1. Phase I: Conceptualization and Item Generation

In the first phase, a cross-sectional study and semi-structured interviews were conducted with four professional psychologists and ten students studying at University of Gujrat. The interviews were transcribed for analysis, which led to the generation of items operated as a self-administered survey employing a 5-point Likert scale based on three domains of social media engagement: cognitive engagement, behavioral engagement, and affective engagement.

3.2. Phase II: Expert Evaluation for Validity

In the second phase, the 60 items formed in Urdu were evaluated for validity by a panel of experts, including three MPhil holders and two PhD holders. Based on the expert panel's evaluation, thirteen complex or inconsistent items were either removed or modified. The Content Validity Ratio (CVR) for forty-seven items was calculated using (Lawshe, 1975) formula: CVR = (ne - N/2) / (N/2). The CVR values are 0.99 to allow the inclusion of the items in the validation process which is recommended in Lawshe (1975).

3.3. Phase III: Tryout Study

The third phase was a tryout study to make changes to items based on thirty five participants, age 19 to 25 years from the University of Gujrat. This step was followed to make sure that items meet the population’s requirements while at the same time, they are easily understandable.

3.4. Phase IV: Pilot Study

The fourth phase was carried out as a pilot study in the University of Gujrat with the sample of the age group 19-25 years. Consent was sought from all the participants, and all the data collected from the individuals was kept anonymous. More detail about the scale was discovered in this pilot study and therefore added to its reliability and validity.

3.5. Phase V: Translation and Validity Testing

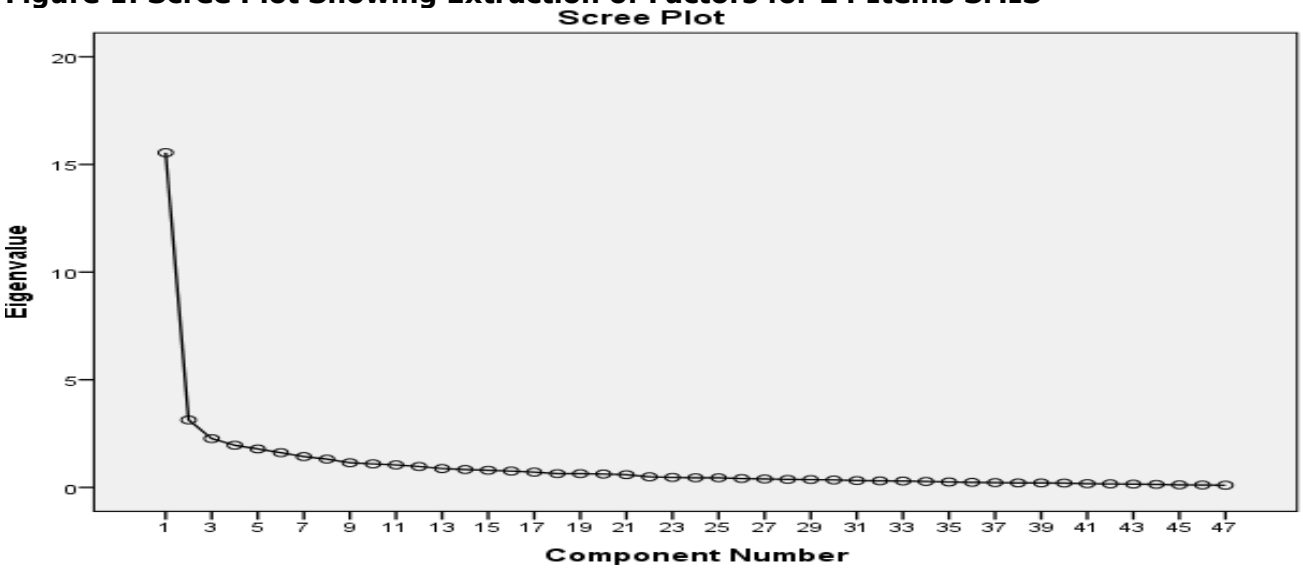
The fifth phase of the study comprised forward and backward translation (Brislin, 1970) of the social media engagement scale developed by Ni et al. (2020) for Urdu adaptation to match the culture and language. For the purpose of the present study, 267 participants were drawn from the University of Gujrat and for the purpose of data analysis Pearson product-moment correlation was used to determine the concurrent validity was carried out using the Statistical Package for the Social Sciences (SPSS) version 24. The above-outlined intensive process culminated to development of a culturally sensitive and very reliable Social Media Interaction Scale. The reliability analysis yielded 0.86 value.

4. Results and Discussion

Data analysis was performed using EFA (Exploratory Factor Analysis) to unravel the patterns of correlations between observed variables and uncover latent constructs within the dataset that underlie it. To this end, this statistical method began with checking if data is factorable, extracting initial factors, deciding on the number to retain and finally applying rotation procedures in order to come up with a more understandable solution. By facilitating the identification of core constructs that are measured by these instruments, EFA reduced data dimensionality. For instance, instrument used in this investigation was tested for its consistency using Hinkin, Tracey and Enz (1997) methodology. In the SPSS file, there were 306 Gujrat students selected by the probability simple random sampling technique and the use of Yamane Formula. The sample size determination formulae by Yamane (1973) was applied as follows: $n=N/(1+N(e)^2)$. Where “N” means a total population and “e” stands for the desired margin of error2 (Yamane, 1967). They consented to be a part of the study after being apprised about what it entailed; their responses were also kept anonymous and confidential so as to carry out ethical research practices. The Statistical Package for the Social Sciences (SPSS-24) is used for exploratory factor analysis (EFA). The sample sufficiency was assessed using KMO and Bartlett's Test of Sphericity. (Pallant et al., 2014) stated that a KMO value of 0.6 or higher is considered sufficient for sample adequacy. The significance value in the Test of Sphericity is less than 0.05.

This demonstrated that identity matrix is absent in the data. The current study's test results demonstrated great sample adequacy. For this research, KMO is .89 so the sample is adequate, Bartlett's test is significant.

Figure 1: Scree Plot Showing Extraction of Factors for 24 Items SMIS



The results of the Principal Component Analysis (PCA) uncover the underlying factor structure of the 24 items in the Social Media Interaction (SMIS) scale, indicating that a limited number of components explain a significant portion of the variance in the dataset. The first component alone accounts for 33.08% of the total variance, underscoring its importance in capturing the underlying structure of the data. The second component contributes an additional 6.67%, resulting in a cumulative variance of 39.74% when combined with the first component. Subsequent components add progressively smaller percentages of variance, with the cumulative total reaching approximately 55.97% after the sixth component. These findings imply that it would be beneficial to retain only the first few components specifically those with a variance contribution greater than 1 for further analysis, as they collectively account for a considerable amount of variance in the data.

Table 1: Exploratory Factor Analysis of SMI

		Factors		
Sr. No	**Item No.**	**CE**	**BE**	**AE**
1	25	.739		
2	24	.732		
3	23	.681		
4	22	.661		
5	26	.616		
6	31	.582		
7	33	.550		
8	44	.550		
9	28	.547		
10	21	.522		
11	12	.498		
12	32	.448		
13	29	.438		
14	30	.415		
15	35	.317		
16	27	.431		
17	41	.382		
18	36	.460		
19	13	.495		
20	15	.446		
21	11	.449		
22	14	.505		
23	17	.522		

24	16	.462		
25	39		.655	
26	42		.651	
27	40		.631	
28	45		.620	
29	46		.593	
30	34		.571	
31	43		.543	
32	38		.516	
33	47		.419	
34	20		.408	
35	5		.397	
36	37		.302	
37	18		.409	
38	3			.693
39	4			.594
40	2			.588
41	8			.531
42	19			.525
43	10			.515
44	9			.478
45	1			.396
Eigen Values		15.54	3.13	2.26
Values of Variance		33%	6.66%	4.82%

Note: Factor loadings > .40

The EFA having Principal Component Analysis with Varimax rotation and Kaiser Normalization identified three distinct components: Cognitive Engagement (CE), Behavioral Engagement (BE), and Affective Engagement (AE). The Cognitive Engagement (CE) component showed high loadings for several items: SMI25 (.739), SMI24 (.732), SMI23 (.681), SMI22 (.661), SMI26 (.616), SMI31 (.582), and SMI33 (.550). Some items also exhibited secondary loadings on Behavioral Engagement (BE) and Affective Engagement (AE), indicating a shared variance across dimensions. The Behavioral Engagement (BE) component was characterized by significant loadings from items such as SMI39 (.655), SMI42 (.651), SMI40 (.631), and SMI45 (.620). Secondary loadings on CE were observed for items like SMI29 (.574) and SMI30 (.556), suggesting an overlap between cognitive and behavioral aspects of engagement. The Affective Engagement (AE) component included items such as SMI3 (.693), SMI13 (.633), SMI15 (.602), SMI4 (.594), SMI2 (.588), and SMI18 (.572). Some items loaded on CE and BE too, show the overlap between affective, cognitive and behavioral engagement. Each factor is represented by a set of items with high loadings, so the scale also measures different aspects of engagement. Item no 6 and 7 were excluded because these were not loaded into any factor.

Table 2: Confirmatory Factor Analysis of SMIS (N=256)

Model	CMIN/DF	GFI	CFI	IFI	RMSEA
SMI	3.2	0.912	0.914	0.915	0.09

Note: Structural equation modeling with GFI= Goodness of Fit Index, CFI=Comparative Fit Index, IFI=Incremental Fit Index, RMSEA= root-mean-square error of approximation

CFA was conducted on another sample of 256 participants selected by the probability simple random sampling technique and use of the Yamane Formula from the University of Gujrat. This model is significant (Hu & Bentler, 1999). The values of the CMIN/DF ratio were 3.2, and this implies a reasonable fit as the values closer to 3 is the signature of an acceptable model fit (Kline, 2023). The goodness of fit index (GFI), as well as the comparative fit index (CFI), were estimated to be equal to .912 and .914 respectively. These stands for the overall fit of the provided model in relation to an independent model and the figures closer to 1 are indicative of a better fit (Hu & Bentler, 1999; Jöreskog & Sörbom, 1996). However, RMSEA showed a moderate value for acceptance as it is above 0.08 and below 0.10 (Kang, Yang, & Zeng, 2019; Kenny, Kaniskan, & McCoach, 2015). Altogether, it is suggested from the results of the fit indices that the proposed model of the CFA can be considered to have sufficient good fit indices. These findings provide a foundational understanding of how well the proposed theoretical model aligns with the observed data. The SMIS is different from the rest of the scales developed so far for the assessment of the cognitive, behavioral, and affective involvement of individuals with social

media content. Previous instruments have focused on the association of people with social media in the context of their buying behaviors and marketing strategies used by the originations (Blazevic et al., 2014; Hall, 2018; Hollebeek, Glynn, & Brodie, 2014). Hence, the SMIS holds a sound utility for the assessment of the wellbeing of the youth in the context of their interaction with modern media techs.

Figure 2: CFA Model Confirming the Factor Structure of the Domains of Social Media Interaction Scale

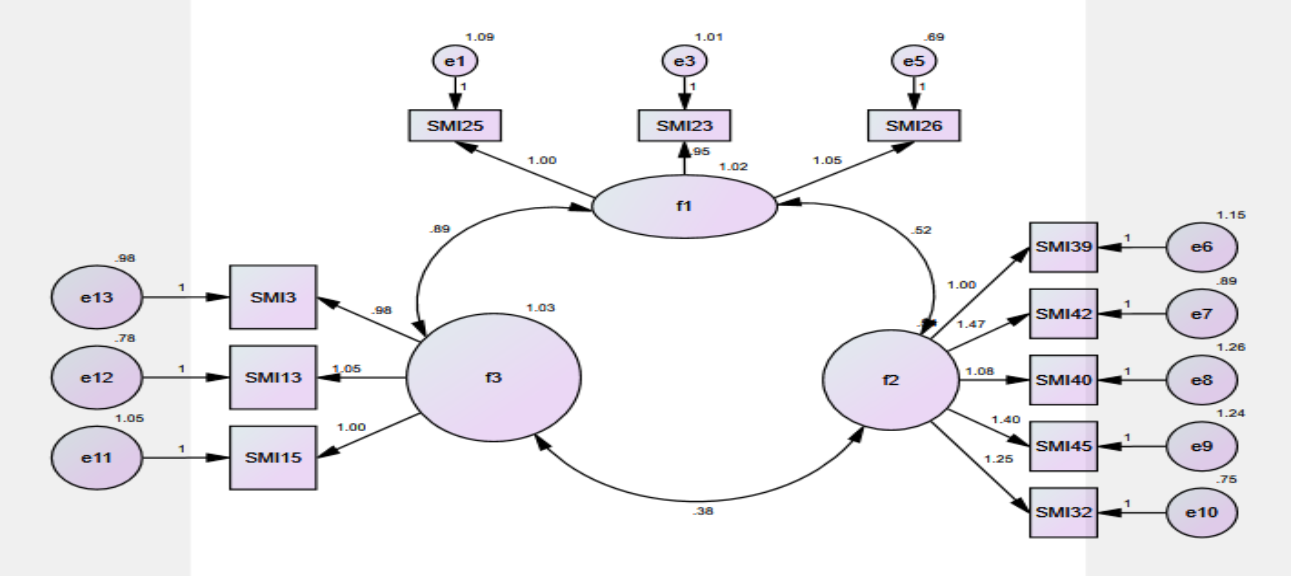


Table 3: Summary of Correlation for Validation(N=267)

Variable	*n*	1	2
1. Social Media Interaction	267	-	.22***
2. Social Media Engagement	267	-	-

This table provides the concurrent correlation values between the variables of Social Media Interaction and Social Media Engagement. Before correlation, 267 participants were taken from the University of Gujrat by applying the Yamane formula. The correlation between Social Media Engagement and Social Media Interaction is .22, indicating a statistically significant positive correlation at the $p < .01$ level. This suggests that higher social media engagement is associated with higher social media interaction among the sample of 267 participants.

Table 4: Summary of Cronbach's Alpha Correlation Coefficient (N=267)

Variable	*n*	α
1. Social Media Interaction Scale	11	.86
2. Social Media Engagement Scale-Urdu	11	.81

This table provides the reliability coefficient of Social Media Interaction and Social Media Engagement. Before correlation, 267 participants were taken from university of the Gujrat by applying the Yamane formula. The reliability of Social Media Engagement and Social Media Interaction scales are above 0.70 in the acceptable range of the reliability coefficient (Bajpai & Bajpai, 2014; Scholtes, Terwee, & Poolman, 2011).

5. Conclusion

In conclusion, the Social Media Interaction Scale (SMIS) is a valid and reliable tool to assess youth's engagement with social media. Awareness of those dynamics is essential for creating evidence-based interventions that would help to improve youth health-related digital literacy and increase their ability to use technologies safely and effectively.

5.1. Limitations and Suggestions

The study mainly included young people from cities with internet access. Therefore, the findings might not be generalized to rural or underdeveloped areas with limited access to internet facilities. The use of self-report inventories might yield response bias or social desirability effects

that would effect the study findings. Hence, a more indirect approach with qualitative methods can give a better understanding of the phenomenon.

5.2. Implications

The SMIS can be used in the clinical setting to screen out individuals having some problems with their media usage. Hence, the professionals can devise and implement counselling and therapeutic interventions according to the needs of the individuals. Moreover, the instrument is useful for educationists to create awareness among the students for the appropriate usage of social media. Implement educational initiatives targeting youth, parents, and educators to enhance critical media literacy skills and encourage healthy digital engagement. Advocate for policies that safeguard youth from harmful online content and promote ethical practices among social media platforms regarding body image and mental health.

5.3. Recommendations

Based on the present study, the following recommendations are to conduct longitudinal studies to explore the sustained effects of social media use on psychological well-being among youth. The study sample can be expanded to include diversity to encompass various socioeconomic backgrounds, geographical regions, and cultural contexts for broader applicability of findings. Future studies can use mixed methods approaches that integrate qualitative insights with quantitative data to deepen understanding of youth experiences with social media. In addition, therapeutic treatment aimed at boosting positive online behaviors and resilience against the negative influences of social media on physical appearance and mental health can be developed.

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