Social Media Disorder and Its Association with Depression and Self-Esteem Among the Adolescents of Kathmandu Metropolitan City: A Cross-Sectional Analytical Study

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Abstract

Introduction: Many studies have addressed Social Media Disorder (SMD) as an emerging mental health problem that may lead to depression and low self-esteem. This study aims to determine the prevalence of SMD and describe its association with self-esteem and depression among adolescents in Kathmandu Metropolitan City.

Methodology: Cross-sectional analytical study was conducted among a sample size of 418 using probability sampling. Descriptive summary statistics were calculated, and the association between SMD and Depression, and SMD and Self-esteem were measured using the Chi-square test and Pearson's Coefficient of Correlation.

Results: The SMD prevalence of 35.4%, a moderate positive relationship between SMD and depression (r=0.310), and a low negative relationship between SMD and self-esteem (r=-0.099) were observed.

Conclusion: SMD is a growing mental health problem in Nepal. The respondents diagnosed with possible depression requires further investigation, and necessary interventions must be carried out.

Keywords: Social Media Disorder, Depression, Self-esteem, Adolescent, Nepal

Introduction

The term "social media" is composed of two words: "social," which refers to "interacting with other people by sharing information with them and receiving information from them," and "media," which refers to an instrument of communication, like the internet (while TV, radio, and newspapers being some traditional forms of media)" [1]. Social media is the internet and computer-based technology that gives users quick electronic communication of content such as personal information and documents: videos, and photos by building virtual networks [2]. A computer, tablet, or smartphone helps users connect to social media via web-based software or application [2].

The standard features of social media may be one or many of the following: personal user accounts, profile pages, friends, followers, groups, hashtags, newsfeeds, personalization, notifications, information updating, saving or posting, like button and comment sections, and review, rating or voting systems [1].

Popular forms of social media include blogs (e.g., WordPress, Twitter), microblogs, social networks (e.g., Facebook, LinkedIn), media-sharing sites (Instagram, Pininterest), social bookmarking and selection sites, analysis sites, forums, and compelling worlds [3]. Although social media has helped us connect to the world, its overuse can lead to serious health problems like depression, anxiety, mania,

eating disorders, sleep deprivation, insecurity, FEMO (Fear of missing out), internet addiction, and other anti-social behaviors. Among these problems, internet addiction can be considered a probable epidemic of this century [4]. Social media addiction is a subcategory of internet addiction. [5].

Social media addiction, also known as "social media disorder"[6], "excessive social media use" [7], "problematic social media use"[8,9], and "compulsive social media use" [10,11] is a proposed diagnosis related to problematic, compulsive or overuse of social media [12] that can result in significant impairment in an individual's performance in varied life domains over a prolonged amount of time.[6].

Many studies have addressed SMD or Social media addiction as an emerging issue in the field of public health [6,11,13-15] and even showed its association with depression [14] and self-esteem [14,15], especially among adolescents. Adolescents are rapidly adopting new technologies among all age groups and are most vulnerable to possible negative influences of these technologies [16]. Moreover, there is empirical evidence that compulsive social media use is a growing mental health problem among adolescent smartphone users [17]. Further, several studies have shown a positive correlation between social media use and depression [14,18] and a negative correlation with self-esteem [18].

Some fragmented research done in Nepal has also provided evidence that these problems are growing here [4]. Our study, thus, aims to determine the prevalence of SMD and its association with depression and self-esteem among late adolescents (15-19 years old) studying in secondary schools in Kathmandu Metropolitan City.

Materials and Methods

Study design and method

A cross-sectional analytical study was carried out using a quantitative method wherein all the variables were assessed simultaneously. The prevalence of SMD and its association with depression and self-esteem among the adolescents of the Kathmandu Metropolitan City were determined.

Study area

The study was conducted in ten secondary schools in Kathmandu Metropolitan City. The city is inside the Kathmandu district in Bagmati province, consisting of 32 wards.

Study population

Late adolescents (15 – 19 years old) studying in grades 9, 10, 11, and 12 in schools inside the Kathmandu Metropolitan City were taken in the study.

Study duration

This cross-sectional study was conducted between May 1, 2019, and January 31, 2020.

Inclusion and exclusion criteria

The students aged 15 - 19 (in completed years) were only included. Students who refused to participate in the study were not included in the study.

Sampling strategy

This study used the probability sampling method (simple random sampling) to select secondary schools within the Kathmandu Metropolitan City. Again, Probability Proportional to Size was conducted to determine students from each selected school.

Sample size

The sample size was calculated using the following formula:

$$n = \frac{z^2 pq}{d^2}$$

where,

n = the desired sample size

z = 1.96 (at CI 95%)

p = prevalence of the problem = 0.5 (since prevalence is taken as 50 per cent)

q = 0.5

d = allowable error = 5% = 0.05

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2}$$

Hence, $n = 384.16$

Metropolitan City, which falls under the country's capital, consists of 32 wards, and lies in the northwest part of the Kathmandu Valley.

The city is ahead in adapting to new technologies, including social media and the internet. Moreover, the city is an educational hub for students from all over Nepal, which enabled us to reach a diverse group of participants.

non-response rate = 10% of n = 10% of 384.16 = 38.416 Hence, the total sample size = 384.16+38.416 = 422.16 ≈ 423

However, after deducting the non-responders, the study size was reduced to 418.

Sampling techniques

Multi-stage sampling was done. Ten secondary schools were selected through simple random sampling (Lottery Method). Then Probability Proportional to Size sampling method was applied to determine the number of samples to be taken from each school. PPS is a sampling technique in which the probability of a unit being selected is proportional to the size of the ultimate team. Thus, the list of the total number of students was taken from each selected school.

Here, the total number of students in ten schools was 53, 50, 300, 30, 1000, 200, 250, 100, 600, and 120; the sum was 2703. Thus,

The percentage of samples from the first school was $= \frac{53}{2703} \times 100 = 1.96\%$

The sample size taken from first school was = 2 % of 422 = 8

After determining the sample size, a simple random sampling technique (table of random numbers) was used to select the samples.

Data collection techniques and tools

Data collection technique: Respondent's self-administration technique was used. The study respondents were adequately informed and explained the purpose of the study.

Data collection tools: Semi-structured questionnaire was used. The questionnaire consisted of four parts which included- questions on sociodemographic variables, independent variables, a 9-item social media disorder scale [6], a 6-item Kutcher Adolescent Depression Scale [19], and a 10-item Rosenberg self-esteem scale [20]. The first section consisted of the sociodemographic or background variables. The second section consisted of questions on independent variables such as social media use (Yes/No question), type of social media use(Multiple-choice question), and frequency of social media use (closed-ended question). Internet availability in residence (Yes/No question), first social media used (closed-ended inquiry), age when created first social media account or used first social media (open-ended), and purpose for social media usage (closed-ended question). The third section consisted of an SMD scale with a rating of two(Yes/No). A person is said to have SMD if s/he meets 5 out of 9 criteria (preoccupation, tolerance, withdrawal, persistence, displacement, interpersonal problems, deception, escape, and conflict) of the SMD scale.

The fourth section consisted of 6-item KADS. Zero to-three systems with "hardly ever," "much of the time," "most of the time," and "all of the time" scored as zero, one, two, and three, respectively. If the total score was at or above six, we said that the individual might have a major depressive disorder, and if the score was below six, then the individual probably was not depressed.

The fifth section consisted of a 10-item Rosenberg self-esteem scale which contained five positively and five negatively worded items (reverse coded); higher scores indicated higher self-esteem. It was a zero to three system with "strongly disagree," "disagree," "agree," and "strongly agree" scored as zero, one, two, and three, respectively, for items 1, 3, 4, 7, and 10 and scored in reverse order for items 2, 5, 6, 8, 9. The scores were summed and kept on a continuous scale. Higher scores indicated higher self-esteem.

Independent Variables

The independent variables in our study included sociodemographic variables (age, sex, educational level, faculty, ethnic group, and religion) and variables such as social media use, frequency of social media use, type of social media users, and Internet connection availability.

Dependent Variables

The dependent variables in our study included SMD, depression, and self-esteem.

Pretesting the tools

The pretesting was done in 10 % of the total sample size calculated (n=423), i.e., 43 individuals. The individuals were selected from outside of the study area, i.e., outside of Kathmandu Metropolitan City. The pretesting was done in United Academy, Lalitpur metropolitan city.

Validity and reliability

Validity: The content validity of the instrument for its completeness and clarity was established by consultation with the research supervisor, subject experts, and statistician, and needed modification was done as per the suggestion. A multi-stage sampling technique was used to select secondary students in Kathmandu Metropolitan City to reduce random error. Respondents were informed about the research topic and content to minimize information bias.

Reliability: The instrument's reliability was established by pretesting it among 43 students outside Kathmandu Metropolitan City. Based on the feedback from the respondent, instruments were modified.

Data Management and Analysis

Data were entered in EpiData. Data analysis was done in software called "Statistical Package for Social Sciences" IBM statistics version 16. For data consistency, the data entry was done on the evening of the day after completing data collection on that day.

Under descriptive summary statistics of data, frequency and percentage were calculated for those data which were categorical in nature. Additionally, mean, and standard deviation were calculated for numeric data. After collecting data from the field, data were checked to correct the possible errors.

Likewise, the chi-square test measured the association between two categorical variables, i.e., between SMD and Depression. For the samples more than or equal to fifty, a p-value of Pearson-Chi-square was used. For the 2*2 table of categorical data, a p-value of the continuity corrected test was used. Also, the degree of association between SMD and Depression and SMD and self-esteem was measured through correlation.

Ethical Considerations

The research approval was taken from the Department of Public Health, Nobel College. Ethical approval was taken from the Institutional Review Committee (IRC) of Nobel College. Formal permission was taken from secondary school sacting as guardians of the students to be included in the study. Informed consent was obtained from respondents by clarifying the purposes of the survey before the data collection. The respondent's dignity was maintained by allowing the option to discontinue the research study at any time without penalty. Confidentiality was maintained by not disclosing and anonymizing the respondent's information to others; collected information will be used only for the study purpose.

Results

Of the total respondents, i.e., 418, 56.94 % were male, and the remaining 43.06 % were female. The details of the sociodemographic characteristics of study participants are shown in **Table 1**.

Table 1: Distribution of socio-demographic characteristics of participants.

Characteristics	Number	Percentage
Sex		
Male	238	56.94
Female	180	43.06
Type of Family		
Nuclear family	268	64.11
Extended or Joint family	100	23.92
Single-parent family	40	9.57
Grandparent family	10	2.39
Resident of the participant		
Living with parents	326	77.99
Living with relatives	61	14.59
Living in a hostel	17	4.07
Other	14	3.35
Educational Level		
Grade 9	38	9.09
Grade 10	23	5.50
Grade 11	122	29.19
Grade 12	235	56.22
Age	Mean age 16.68±1.063 years	
15 years	64	15.31
16 years	114	27.27
17 years	150	35.89
18 years	72	17.22
19 years	18	4.31
Father's Occupation		
Homemaker	5	1.20
Agriculture	59	14.11
Business	193	46.17
Service	118	28.23
Labor	15	3.59
Foreign Employment	19	4.55
Other	9	2.15
Mother's Occupation		
Homemaker	239	57.18
Agriculture	32	7.66
Business	77	18.42
Service	56	13.40
Labor	5	1.20
Foreign Employment	4	0.96
Other	5	1.20

The sample size for the dataset was 418.

Out of the total respondents, 411 (98.3 %) used any of the given social media (Facebook, Facebook Messenger, WhatsApp, Viber, YouTube, Instagram, or Twitter), while the remaining 11 (1.7 %) did not use any of those media. Out of those who used social media (i.e., 411), the majority, i.e., 43.8 % spent one to three hours on those media daily, 38 % spent less than one hour daily, 10.7 % spent four to six hours daily, and remaining 7.5 % spent seven hours or more on these media daily. The majority, i.e., 91.73 % used smartphones to access social media, 40.15 % used laptops or computers, 13.14 % used tablets, and 0.24 % used other devices to access social media. Furthermore, 84.2 % owed a smartphone, while the remaining 15.8 % do not own a smartphone. In our study, 78.1 % of the total respondents used social media for

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getting updates and news, 69.6 % used them for messaging or chats or calls, 63.7 % used them for watching videos, 55.5 % used them for posting their pictures/videos/status, 50.9 % used them for managing their friends' posts, 31.1 % used them for following a celebrity or an influencer and the remaining 5.1 % used them for other purposes such as reading memes. The details of the distribution of characteristics related to social media use are as shown in **Table 2**.

Table 2. Distribution of characteristics related to social media use.

Characteristics	Number	Percentage
Average time spent on social media daily		
Less than 1 hour	156	38.0
1-3 hours	180	43.8
4-6 hours	44	10.7
7 hours or more	31	7.5
Social Media Used		
Facebook	348	84.67
Facebook Messenger	321	78.10
Instagram	218	53.04
Twitter	63	15.33
Viber	134	32.60
WhatsApp	79	19.22
YouTube	361	87.83
Wifi Availability		
Yes	361	87.8
No	50	12.2
Devices Used		
Smartphone	377	91.73
Laptop/Computer	165	40.15
Tablet	54	13.14
Others	1	0.24
Owe a Smartphone		
Yes	346	84.2
No	65	15.8
Purposes		
Post their pictures/videos/status	228	55.5
Get updates and news	321	78.1
Watch their friends' posts	209	50.9
Follow a celebrity or an influencer	128	31.1
Messaging or chats/calls	286	69.6
Watch videos	262	63.7
Others	21	5.1

The sample size for the dataset was 411 (the number of respondents who used any of the given social media: Facebook, Facebook Messenger, WhatsApp, Viber, YouTube, Instagram, or Twitter). In this study, the prevalence of SMD among the respondents (n=418) was found to be 35.4 % (i.e., 148 respondents).

The chi-square test of independence conducted between SMD, and depression showed a statistically significant association between SMD and Depression at p = 0.000 (i.e., p < 0.05) as shown in **Table 3**. The correlation was measured between the total score of SMD and the total score of depression. The correlation was measured at p=0.000 which showed a moderate positive relationship (r=0.310).

Table 3. Cross tabulation showing the p-value of the chi-square test between SMD and Kutcher Adolescent Depression Scale.

Depression				p-value
	Not Depressed		**Possible Depression**	
SMD Doesn't have SMD		171	99	0.00
Has SMD		60	88	

The sample size for the dataset was 418 which included both the respondents who used social media and those who did not.

The chi-square test of independence between SMD and self-esteem showed no statistically significant association at p=0.761 as shown in

Table 4. The correlation was measured between the total score of SMD and the total score of RSES. The correlation was measured at p=0.044 which showed a low negative relationship (r=- 0.099).

Table 4. Cross tabulation showing the p-value of the chi-square test between SMD and Rosenberg Self-Esteem Scale.

			RSES Final Score		p-value
	Low Self-esteem		**Self-esteem within normal range**	**High Self-esteem**	
SMD Doesn't have SMD		52	201	17	
Has SMD		27	114	7	0.761

The sample size for the dataset was 418 which included both the respondents who used social media and those who did not.

Discussion and conclusion

SMD is an emerging mental health problem among adolescents. To our knowledge, this is the first study in Nepal to explore the association of SMD with depression and self-esteem.

One of the main goals of this study was to estimate the prevalence of SMD, which was found to be 35.4 % among the total sample of 418, which is comparatively higher than the other similar studies being conducted in other parts of the world. A study conducted among three models of adolescents aged 10-17 in the Netherlands in 2016 showed the prevalence of SMD to be 7.3 % (n=724), 11.6 % (n=873), and 10.3 % (n=601).

Though the results may have varied due to the geographical differences, it signifies the need to address this problem at the country level seriously.

When tested for gender differences, the chi-square test showed that the number of disordered girls (39.4 %) did not differ from the number of disordered boys (32.4 %).

This finding is in line with the previous two studies by Van den Eijnden but contradicts the result of the first sample in their study, which showed that disordered boys (10.2 %) were more than disordered girls (4.9 %) [6,13]. The correlation was measured at p=0.000 between the total score of SMD and the total score of depression which showed a moderate positive relationship (r=0.310). This means a higher score of SMD results in a higher score of depression. The finding coincides with the study by Van den Eijnden which showed a medium positive correlation (0.29) at p < 0.001 between SMD and Depression [6]. The findings of our study also

showed a low negative correlation (r= 0.099) between SMD, and self-esteem measured at p=0.044. This indicates that high levels of social media addiction are associated with low levels of self-esteem. This finding was in line with other studies conducted at Notre Dame University among students of median age 21.1, which showed a small, negative correlation, r ¼.23, N ¼ 364 at p < .001 [15], and a study by van den Eijnden conducted among three samples of adolescents aged 10-17 in the Netherlands in 2016, which showed a slight negative correlation (r=-0.19) at p < 0.001 [6].

Mental health conditions account for 16 % of the global burden of disease and injury among 10-19-year-old, depression being a leading cause of illness and disability amongst them [21]. These studies, including ours, show that adolescents are at a high risk of developing SMD along with depression and lower self-esteem. It is, therefore, fundamentally important to conduct further in-depth studies in this life course to detect the patterns of SMD, depression, and low self-esteem. These disorders are, however, the most treatable among the mental disorders [22], which can be intervened with early diagnosis, proper counseling, love, and support from friends and families.

A longitudinal approach could better describe the short- or long- term character of SMD, depression, and self-esteem in terms of study limitations. As the questionnaire length was limited, we had to make tough choices while selecting independent variables for our study. Also, of note missing from our data are the experiences of people who declined to take up any opportunity to participate.

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