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Original Article

Psychiatry/Mental Health Section

A Cross-sectional Study on Patterns of Social Media Chat Usage and its Association with Psychiatric Morbidity among Nursing Students

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ABSTRACT

Introduction: The nursing students are particularly vulnerable group based on amount of the time they spend on the internet especially with social media. There are numerous social media chatting system available and the most commonly used in our region is whatsapp therefore the present study has been carried out on WhatsApp usage.

Aim: To study the patterns of WhatsApp usage and its association with Psychiatric morbidity among the nursing students.

Materials and Methods: A cross-sectional study was conducted on 500 nursing students who met the inclusion criteria. Levels of usage of Social Media and associated psychiatric morbidity were assessed for WhatsApp usage which was measured using Bergen's Facebook Addiction Scale modified for WhatsApp usage. Life-satisfaction was assessed using Satisfaction with Life Scale and Self-Esteem was assessed using Rosenberg Self-Esteem Scale. Negative emotional states like Depression, Anxiety and Stress was assessed using Depression Anxiety Stress Scales (DASSs). Loneliness was assessed using Differential Loneliness Scale. The results obtained were tabulated and statistically analysed using Pearson's association Chi Square test and Spearman's correlation test.

Results: The nursing students belonging to middle socio-economic status, from nuclear families were less lonely, having high satisfaction with life and self esteem, were more addicted to WhatsApp usage. Almost 2/3rd of the students having average academic performance interested in more creative hobbies than physical activity suffered from depression, anxiety and stress due to WhatsApp addiction.

Conclusion: WhatsApp dependence was most commonly seen among nursing students and had highly significant correlation with the associated psychiatric morbidity.

Keywords: Anxiety, Depression, Loneliness, Satisfaction with life, Self esteem

INTRODUCTION

Social Media (SM) can be defined as "a group of internet based applications that allow the creation and exchange of user generated content". This includes formation of online communities and sharing of information, ideas, opinions, messages, images and videos [1]. The social network sites are web-based services that allow people worldwide to create their profile within a bounded system in which they share personal information, connect with other friends, and view, react with those made by others within the bounded system [2]. Smartphone's addiction/abuse/misuse is trending globally especially among adolescents as a new type of health disorder, challenging the health care policy makers now-a-days as an emergency situation [3]. The concept of social networking site is that each one is linked with everyone else via six degrees of separation [4]. WhatsApp is an instant messaging application which was founded in 2009 by Brian Acton and Jan Koum. In April 2015, WhatsApp reached 800 million active users. It was acquired by Facebook in February 2014 for 19 billion US dollars. WhatsApp continues to remain as a very popular phone application available across multiple platforms. It has recently overtaken Facebook in terms of number of active monthly users [5].

The nursing students are a particularly vulnerable group based on amount of the time they spend on the internet especially with WhatsApp. The novelty of this study is, that this is the first of its kind being conducted to study the patterns of WhatsApp usage and its association with Psychiatric morbidity among the nursing students of Indian ethnicity. Hence, the aim of the present study was to know the association of socio-demographic and academic variables along with psychiatric morbidity such as depression, anxiety, stress, loneliness, satisfaction with life and self esteem for WhatsApp usage among nursing students.

MATERIALS AND METHODS

The present observational cross-sectional study was conducted from May 2018 to November 2018 on 500 nursing students at Dr. Vidyasagar Institute of Mental Health, Amristar, Punjab. The sample size was determined by simple random sampling technique using standard formula considered allowable error 0.05 and prevalence from previous study [6].

The Ethical Clearance Number 4736 was taken to conduct the present study obtained from the Regional Ethical Committee body. A written informed consent form which explained the nature of the study was obtained from all the students prior to the study.

Inclusion Criteria:

- The students who gave written informed consent to participate in the present study.
- The students who had completed 18 years at the time of data collection and not older than 25 years of age were selected as this age group spends more time on social media compared to other age groups and have highest prevalence of any mental illness.

Exclusion Criteria:

- The students with Co-morbid substance abuse or dependence.
- The students with organic or neurological disorder.

These conditions may act as confounders that in turn affect the evaluation of the present study.

All the students were given a self designed performa for socio-demographic variables and specific scales for WhatsApp usage. Depression Anxiety Stress Scales (DASS), Differential Loneliness Scale (DLS), Satisfaction With Life Scale (SWLS) and Rosenberg Self-Esteem Scale (RSES) were used. The content validity and face validity was assessed. The validity and reliability scores were found to be satisfactory with CVI score of 0.82 and reliability of 0.88. The results obtained were tabulated, scored on individual scales.

Description of Tools

1. **Socio-demographic and academic data form:** This form was designed to collect personal details like age, sex, religion, residential address, marital status, type of family setting, combined total monthly income of all the family members, attendance, and scores in final exam and hobbies of the study subjects.
2. **Bergen facebook addiction scale:** (Modified for WhatsApp Usage): This scale has 6-items rated on five point Likert scale which has been adapted from the Bergen Facebook Addiction Scale with the modification that the respondents would answer the questions with regard to their usage of WhatsApp, a mobile phone messaging application. It is scored from very rarely to very often. Higher scores indicate higher levels of dependence on WhatsApp, as with the Bergen Facebook Addiction Scale. This scale has acceptable psychometric properties in terms of internal consistency, factor structure, and reliability, as well as in relation to content, convergent and discriminative validity [7].
3. **Depression Anxiety Stress Scales (DASS):** This is a set of three categorical scales of depression, anxiety and stress incorporating forty two items in it (fourteen items in each of the three scales) that is designed to measure the emotional state. The DASS was developed by researchers at the University of New South Wales. Subjects were asked to use 4-point severity/frequency Likert scales to rate the extent to which they have experienced each state over the past week. Scores for Depression, Anxiety and Stress were calculated by summing the scores for the relevant items. The reliability scores of DASS rate depression at 0.91, anxiety at 0.84 and stress at 0.90 respectively in a normative sample according to Cronbach's alpha score [8].

Depression domain: Scores between 0 and 9 are normal, scores between 10 and 13 indicate mild depression, scores between 14 and 20 indicate moderate depression, scores between 21 and 27 indicate severe depression and scores of 28 or more indicate extremely severe depression.

Anxiety domain: Scores between 0 and 7 are normal, scores between 8 and 9 indicate mild anxiety, scores between 10 and 14 indicate moderate anxiety, scores between 15 and 19 indicate severe anxiety and scores of 20 and above indicate extremely severe anxiety.

Stress domain: Scores between 0 and 14 are normal, scores between 15 and 18 indicate mild stress, scores between 19 and 25 indicate moderate stress, scores between 26 and 33 indicate severe stress and scores of 34 and above indicate extremely severe stress [8].

4. **Differential loneliness scale:** Short Student Version (DLS): The DLS measures loneliness in four types of relationships namely romantic/sexual relationships, friendships, relationships with family and relationships with larger groups or the community. The DLS is a 20 item scale with true or false questions. The DLS authors claim that the instrument has substantive and structural validity with reliability of the scale is high ranging from 0.90-0.92 [9].
5. **Satisfaction with Life Scale (SWLS):** The SWLS scale assess satisfaction with the respondent's life but does not assess satisfaction in relation to health and financial aspects. By using the respondent's own criteria, the scale assess individual conscious judgement of evaluation in his or her life

The 1-7 scale comprises five statements which are answered from strongly agree to strongly disagree. Higher scores indicate greater life satisfaction. Scores between 5 and 9 indicate extreme dissatisfaction, scores between 10 and 14 indicate dissatisfaction, scores between 15 and 19 indicate slightly below average life satisfaction, scores between 20 and 24 indicate an average score implying that there is general satisfaction but some areas has very much merit improvement, scores between 25 and 29 indicate a high score implying that the lives of respondents with this score may not be perfect but things are mostly good, scores between 30 and 35 indicate a very high score and high levels of satisfaction [10].

6. **Rosenberg Self-Esteem Scale (RSES):** The scale is ten item Likert scales with items answered on a four point scale answered from strongly agree to strongly disagree. The scale measures self-esteem by asking the respondents to reflect on their current feelings. The scores 3, 2, 1 and 0 for the ten items were added. The higher the score, higher the self esteem. The RSES presented high ratings in reliability areas, internal consistency was 0.77, minimum coefficient of reproducibility was at least 0.90 [11].

STATISTICAL ANALYSIS

The statistical analysis was done using IBM SPSS Version 22 for windows. Pearson's association Chi-square test was applied to know the association between variables and Spearman's correlation was applied to know the relation between categorical variables.

RESULTS

In the present study all the participants' were female subjects and their mean age was 21.05±0.79. Around 318 (63.6%) participants were addicted to WhatsApp usage whereas only 18% of them were found to be normal with WhatsApp usage [Table/Fig-1]. Majority of the participants showed severe and extremely severe depression symptoms, 314 (98.7%) showed severe and extremely severe anxiety symptoms and 256 (80.5%) showed severe and extremely severe symptoms to stress [Table/Fig-2]. A statistically significant association was found between these categories to WhatsApp usage (p<0.001). About 114 (82.6%) of the participants showed low self esteem associated with WhatsApp dependence for Rosenberg Self esteem scale [Table/Fig-3] with statistically significant association (p<0.001) and about 123(87.9%) of the participants expressed low satisfaction with life and were also addicted to WhatsApp usage with statistically significant association (p<0.001) [Table/Fig-3].

		Frequency	Percentage
BFAS (Modified for whatsapp usage)	Normal	90	18.00
	Possible addict	92	18.40
	Addict	318	63.60

[Table/Fig-1]: Descriptive statistics of Bergen Facebook Addiction Scale (BFAS) modified for whatsapp usage.

A negative correlation (r=-0.026) was found between WhatsApp usage and romantic/sexual relationship, relationship with family, friends [Table/Fig-4] with statistically significant at p=0.05. A positive and moderate relationship (r=0.519) for symptoms related to stress

DASS		Normal	Mild	Moderate	Severe	Extremely severe	Chi-square (χ^2) value
Depression categories	1	0 (0%)	10 (83.3%)	26 (23.2%)	50 (23.4%)	4 (2.6%)	125.648**
	2	6 (100%)	0 (0%)	38 (33.9%)	20 (9.3%)	28 (17.9%)	
	3	0 (0%)	2 (16.7%)	48 (42.9%)	144 (67.3%)	124 (79.5%)	
Anxiety categories	1	0 (0%)	0 (0%)	10 (71.4%)	26 (14.4%)	54 (18%)	91.272**
	2	4 (100%)	2 (100%)	0 (0%)	57 (31.7%)	29 (9.7%)	
	3	0 (0%)	0 (0%)	4 (28.6%)	97 (53.9%)	217 (72.3%)	
Stress categories	1	10 (55.6%)	0 (0%)	66 (43.4%)	10 (7.0%)	4 (2.2%)	192.990**
	2	6 (33.3%)	7 (100%)	26 (17.1%)	38 (26.8%)	15 (8.3%)	
	3	2 (11.1%)	0 (0%)	60 (39.5%)	94 (66.2%)	162 (89.5%)	

[Table/Fig-2]: Comparison of Depression and Anxiety Stress Scale (DASS) with whatsapp usage.
**p-value: <0.001 highly significant
where 1, 2 & 3 indicate Normal, Possible addict and Addict respectively

RSES	Normal	Possible addict	Addict	Chi-Square (χ^2) value
1	0 (0%)	24 (17.4%)	114 (82.6%)	73.143**
2	67 (34.5%)	28 (14.4%)	99 (51%)	
3	23 (13.7%)	40 (23.8%)	105 (62.5%)	
SWLS	**Normal**	**Possible addict**	**Addict**	**Chi-Square (χ^2) value**
2	2 (1.4%)	15 (10.7%)	123 (87.9%)	98.521**
3	61 (27.2%)	41 (18.3%)	122 (54.5%)	
4	10 (14.5%)	14 (20.3%)	45 (65.2%)	
5	10 (16.7%)	22 (36.7%)	28 (46.7%)	
6	7 (100%)	0 (0%)	0 (0%)	

[Table/Fig-3]: Comparison of Rosenberg Self-Esteem Scale (RSES) and Satisfaction With Life Scale (SWLS) with WhatsApp Usage.
**p-value: <0.001 highly significant
RSES scores indicate level of self-esteem
SWLS scores indicate life satisfacttion score excluding extreme dissatisfaction

Domains	Mean	Standard deviation	Correlation coefficient (r)
Romantic/Sexual relationship	2.50	1.14	-0.026*
Friendship	1.60	0.92	
Relationship with family	1.22	0.73	
Relationship with larger group	1.63	1.01	
Total score	6.95	1.86	

[Table/Fig-4]: Comparison of Differential Loneliness Scale (DLS) with WhatsApp usage.
*Spearman's Correlation is significant at 0.05 level

		Depression	Anxiety	Stress
BFAS modified for whatsapp usage	Correlation coefficient (r)	0.334**	0.200**	0.519**

[Table/Fig-5]: Correlation of Bergen Facebook Addiction Scale (BFAS) modified for WhatsApp usage with Depression and Anxiety Stress Scale (DASS).
**p-value significant at 0.01 level

		DLS	SWLS	RSES
BFAS modified for whatsapp usage	Correlation coefficient (r)	-0.026	-0.282**	-0.146**

[Table/Fig-6]: Correlation of bergen facebook addiction scale modified for WhatsApp Usage with Differential Loneliness Scale (DLS), Satisfaction With Life Scale (SWLS) and Rosenberg Self-Esteem Scale (RSES).
**p-value significant at 0.01 level

BFAS (Modified for whatsapp usage)		Normal	Possible addict	Addict	Chi-square (χ^2) value
Family type	Joint	0 (0%)	4 (66.7%)	2 (33.3%)	9.657*
	Nuclear	90 (18.2%)	88 (17.8%)	316 (64%)	
Socio economic status	Low	2 (50%)	0	2 (50%)	17.821*
	Middle	72 (15.8%)	86 (18.9%)	298 (65.4%)	
	High	16 (40%)	6 (15%)	18 (45%)	
Academic performance	Below average	20 (12.8%)	20 (12.8%)	116 (74.4%)	35.473**
	Average	12 (8.6%)	28 (20.1%)	99 (71.2%)	
	Above average	10 (25%)	8 (20%)	22 (55%)	
	Good	48 (29.1%)	36 (21.8%)	81 (49.1%)	
Hobbies	With creative activity	8 (3.3%)	36 (14.9%)	197 (81.7%)	82.815**
	Both physical and creative activities	82 (31.7%)	56 (21.6%)	121 (46.7%)	

[Table/Fig-7]: Comparison of Bergen Facebook Addiction Scale (BFAS) modified for WhatsApp usage with family type, Socio Economic Status (SES), academic performance and hobbies.
*p<0.05; Significant
**p<0.001; Highly significant

and dependency for WhatsApp usage was found [Table/Fig-5] with statistically significant correlation at (p=0.01) whereas a low correlation was found between depression (r=0.334) and anxiety (r=0.200) symptoms respectively [Table/Fig-5] for WhatsApp dependency.

A low negative correlation was found [Table/Fig-6] with SWLS (r=-0.282) and RSES (r=-0.146) respectively for WhatsApp dependency. Most of the participants [Table/Fig-7] 316 (64%) belonged to nuclear family, 298 (65.4%) of them fall under middle socio-economic status, 116 (74.4%) were with below average academic performance and those 197 (81.7%) with creative activity were addicted to WhatsApp usage.

DISCUSSION

The Internet has become one of the most essential instruments of urban man for information, job opportunities, and education to entertainment, including social media sites and networking and is gradually becoming a structural part of our day to day life [12]. Today, the Internet is used by approximately 3.7 billion people all around the world (Internet World Stats, 2016). People are connected to Social Networking Sites (SNS) such as WhatsApp, Facebook, Instagram, and Twitter due to easy access and increasing use of smart phones especially in young adults [13,14]. Spending more time on these sites due to uncontrolled urge leads to SNS addiction affecting normal routine life of human [15,16]. Till date, WhatsApp addictions with its related psychiatric morbidity such as depression, anxiety, stress, loneliness, satisfaction with life and self esteem have never been studied on nursing students. Hence, the present cross sectional study is being conducted with the objective to assess the patterns of WhatsApp usage and its association with psychiatric morbidity among the Nursing students of Indian ethnicity.

In the present study, about 18.4% were found to be possible addicts and 63.6% were found to be addicted to WhatsApp. The result of present study is very much higher when compared with previous study by Al-Menayes JJ, that showed 50% and by

Sharma KD et al., that showed 14.71% addiction to WhatsApp [17,18]. The results of study by Singh N et al., were in correlation with present study that showed strong associations of behavioral patterns among WhatsApp dependent population on shyness, moody behavior, loneliness and stress [19]. In the previous study by Montag C et al., young females used WhatsApp for longer duration of time than males [20]. The smart phone dominates the daily life and the most frequently used apps included WhatsApp (77.1%) which were in association with present study [21]. A previous study by Chauhan V et al., showed that more than half participants were using WhatsApp (71%) for the purposes of chatting (92%) [22].

Depression and Anxiety: Depression is the most common mental disorder to be associated with internet addiction among teenagers and university students [22]. SNS's such as WhatsApp, Twitter and Facebook were commonly used by students being 96.4% which was in correlation with present study [23]. Youngsters with net addiction suffer from pain, discomfort, anxiety and depression affecting their self-care and daily performance [24]. In the present study results on depression shows that 42.9% students were moderately depressed, 67.3% were severely depressed and 79.5% were extremely depressed. The results were higher when compared with previous study by Rabadi L et al., that showed 17.3% depression and results are lower when compared with previous studies by Goel D et al., and Upadhyay P et al., that shows maximum potential addicts [25-27].

In the present study results on anxiety shows that 54% students had severe anxiety and 72% had extremely severe anxiety. The results are higher when compared with previous study by Bhatia M et al., that showed overall anxiety of 37.7% and among them 29.41% of female subjects suffered from anxiety [28]. The correlation result for depression in the present study was r=0.334 for WhatsApp addiction was very less when compared with previous study by Rabadi L et al., that showed r=0.66 [25]. A previous study by Khali Al et al., revealed that 2/3rd (64.6%) experienced depression symptoms compared with normal (35.4%). A significant correlation exists between internet addiction, amount of time spent and symptoms of depression being (r=0.335 and r=0.205) respectively. These results were less when compared with present study that shows 67.3% with severe depression but the present results are in significant correlation for WhatsApp usage r=0.334 [24]. Another study by Rabadi L et al., for both depression and anxiety showed correlation of r=1 and r= 0.619 respectively which were not in correlation with present study for WhatsApp usage being r=0.334 for depression and r=0.2 for anxiety respectively [25].

Stress: Stress is a state or psychological process in which the individual finds his/her physical and psychological well-being as a threatening situation. In fact, creating stress depends on how the individual perceives the situations and events. A situation may be safe for someone and may be perceived as a threat for someone else. Those who suffer from anxiety and stress often have a great deal of trouble communicating and interacting with others in a healthy, positive, and meaningful way. These individuals may therefore use the internet as an escaping way, that is, when a person does not have access to the internet, becomes anxious and to reduce anxiety uses internet [29].

The present study result for stress shows significant correlation to WhatsApp usage r=0.519 was almost in correlation with previous study by Rabadi L et al., being r=0.647 [25]. Social media addiction in this study correlated positively and highly significantly with the depression, anxiety and stress domain scores. The subjects with WhatsApp usage were more addicted with depression (79.5%), anxiety (72.3%) and stress (89.5%) addiction levels. This shows greater degree of dependence on the social media for WhatsApp usage but WhatsApp addiction had much more mental illness with stress being main domain followed by depression and anxiety among the respondents.

Loneliness: Loneliness is an emotional distress situation associated with adverse physical and mental health and an unhealthy lifestyle along with unsatisfying social relations. Lonely individuals feel less healthy, less physically active have a high risk for heart diseases affected often by alcohol abuse [30]. Loneliness and negative affect emerged as the significant predictors of internet addiction which was negatively correlated for WhatsApp being r=-0.026 with present study [30].

Well Being and Life Satisfaction: Well-being is defined by the individual himself/herself, or 'subjective well-being' [31]. The present study shows results for WhatsApp usage r=-0.282 that differ statistically. These results were in correlation with previous study by Błachnio A et al., for Facebook dependence statistically differ in self-esteem and satisfaction with life for both addicted and thorough users [32].

Self Esteem: Self-esteem is an individual's subjective evaluation of their own self worth which is essential to develop and maintain individual's mental health and quality of life [33]. When individual's fail to achieve self esteem, they are prone for various psychological problems. High self-esteem creates self-confidence in an individual helping him to get adapted to various difficult situations where as low self-esteem creates the sense of rejection, withdrawal or people apathy predicting addiction to Internet use [34].

In the present study low self esteem (82.6%) and high self esteem (62.5%) students were addicted to WhatsApp usage respectively showing statistically significant but negative correlation r=-0.146. These results were in correlation with previous study by Upadhyay P et al., that were not associated with self esteem and differ statistically [27]. The female subjects in the present study 18.4% were possibly addicted and 63.6% were addicted to WhatsApp.

The present study results is higher when compared with previous study by Ranganatha SC and Usha S that showed 45% addicts and the present study result were almost in correlation with previous study by Surwase K et al., that showed 61.9% addicts [6,35]. These results shows that females are equally as well as more prone for social networking sites compared with their male counterpart.

WhatsApp usage and Family Type: In the present study, overall students from nuclear family were 98.80% and students from joint family were only 1.2%. The students with nuclear family possibly addicted to WhatsApp were 17.8% and addicted were 64%. These results were in correlation for WhatsApp addiction with previous study where subjects from nuclear family (63.86%), nuclear extended family (33.14%) and joint family (3%) are addicted to internet or social media usage [18]. However, the present study results for joint family (1.2%) is less than half when compared with previous study with subjects from joint family was 3%. This shows that more nuclear families are present and very few joint families exist now-a-days [18].

WhatsApp usage and Socio Economic Status: In the present study overall students from middle class status about 65.4% were addicted to WhatsApp and around 50% of low and 45% of high class status subjects were addicted to WhatsApp usage. These results were almost nearer when compared with previous study for average status group showing 86.8% addiction and the result is higher when compared with previous study for middle class status showing 70% addiction [36,37].

WhatsApp usage and Academic Performance: The results of student's academic performance in the present study shows more than 70% of average and below average students were addicted to

WhatsApp and around 50% of above average and good students were possibly addicted to WhatsApp. The results of previous study found that average to high use of internet positively influenced the academic achievements while no use and extremely high usage had a negative impact on academic achievements of the students [38]. A previous study results on those who were depressed and scored marks less than 60% were addicted to internet having negative effects on their academic performance and mental health. Such students need to be identified and counseled [39].

WhatsApp usage and Hobbies: In the present study, students having hobbies with creative activity were mostly addicted to WhatsApp being 81.7% Similarly, the students having hobbies involving both physical and creative activities were too addicted to WhatsApp being 46.7%. It can be summarised that subjects involved in more physical activity will be less addicted and those involved with creative activity are more prone to social media/SNS sites.

More prospective studies need to be done to replicate the findings of this study by employing a control population and then study the psychiatric morbidity in the control population not using WhatsApp. These studies should also encompass multiple point assessments of the possible psychopathologies. Such future studies should consider a larger sample size from general population so that the findings can be generalised.

Limitation(s)

Attempting to study psychiatric morbidity among a control population not using social media like WhatsApp would have given a clearer picture. Only single point assessment of the possible females psychopathologies was carried out and the study was limited by a small sample size.

CONCLUSION(S)

In this study it was found that respondents who had greater degree of social media dependence on WhatsApp had more stress followed by depression and anxiety levels. Lesser life satisfaction was seen much more in WhatsApp dependence. Lower as well as higher self-esteem levels were seen with higher levels of WhatsApp dependence. All teachers, health care providers should pay closer attention to students who show addiction to social media and its related mental illness. For detecting high-risk students, it is important to regularly screen and to prevent transition to addiction, for which there is need to develop preventive interventions including counseling.

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