

# An exploratory study of selfie-taking and big five personality among general population

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## Abstract

**Background:** Selfie taking is an upcoming trend especially among millennials. With the advent of ever growing Smartphone technology this has become a prestigious affair. Recent studies have concentrated on exploring the idea that selfie taking is an addictive behaviour. In this study we made an attempt to see the personality traits seen in selfie taking. **Aims:** Association between the 'selfie' taking behaviour and big five personality. **Settings and Design:** Cross-sectional online. **Materials and Methodology:** Selfies behaviour scale (SBS) and Big five inventory (BFI). **Statistical analysis used:** mean, percentages, standard deviation, chi-square, t-test, analysis of variance and correlation. The data was analysed using R programming language. **Results:** Sample included 197 questionnaires. Female participants have significant association with overall SBS scores ( $P$  0.015), environment enhancement ( $P$  0.000), mood modification ( $P$  0.005) and self confidence ( $P$  0.005). Lower education is significantly associated with mood modification ( $P$  0.015). Currently studying is significantly associated with environment enhancement ( $P$  0.012). Those with higher SBS scores on comparing with general population, scored low in openness ( $P$  0.000), conscientiousness ( $P$  0.000) and agreeableness ( $P$  0.000). Total SBS is negatively correlated with openness ( $r$  -0.265,  $P$  0.000) and agreeableness ( $r$  -0.238,  $P$  0.000). **Conclusions:** Females, lower education and currently studying have more propensity to take selfies. Those with higher propensity to take selfie have low openness, conscientiousness and agreeableness. Study does not prove that selfie taking is a addictive behaviour, but gives a stimulus for future research in this direction.

**Keywords:** smartphone trends, addictive behaviour and big five personality.

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## INTRODUCTION

Selfie taking is a new phenomenon which is gaining a lot of importance among the millennials. This is clearly evident from the rising trend of mobile manufacturing companies to competitively release smartphones with

attractive selfie taking cameras, social media platforms which create a special niche for selfies and availability of applications for making the selfie taking experience a pleasant and a memorable one. Traditionally, addiction has been the term exclusively used to describe; excessive and harmful use of the drugs, but things have been changing and since few years there is growing evidence to suggest that like drugs, behaviours can also lead to addiction. Various behaviours have been postulated to cause addiction, to name a few gambling, exercise, internet gaming etc. While there is good evidence for some of these behaviours to be included as causing addiction, but for others the evidence is lacking or accumulating. In the recent version of diagnostic and statistical manual 5 (DSM 5) of American psychiatric association (APA), in chapter 'Substance related and addictive disorders' under section II<sup>1</sup> includes disorders

related to substance use and gambling. The research suggests that gambling also activates reward system similar to the drugs of abuse and causes symptoms similar to that seen in substance use disorders. Further it is clearly mentioned that other so called behavioural syndromes do not have adequate evidence to include in this category. Under heading “Conditions for further study” of Section III, DSM 5; “Internet gaming disorder” has been included with the proposed criteria. The recent publication on development of the ‘Selfitis behaviour scale’ by Balakrishnan and Griffiths<sup>2</sup> triggered a lot of arguments on behavioural addictions. There were a series of arguments published both for and against the inclusion of selfie taking as a behavioural addiction.<sup>3-5</sup> The arguments in both the directions appear valid and to an extent convey that; it is not fair to label all behaviours as addictive or classify them as mental disorder/ illness. If the trend of labelling behaviours as addictive continues, we may have to fear that many of our behaviours will be termed as addictive. So in the current study we have not presumed that selfie taking is an addictive behaviour and considered it just like any other behaviour. But have included few questions to see if it has any addictive properties related to behavioural addiction. We are curious to explore the personality traits that go in line with selfie taking behaviour. Selfie taking behaviour can be considered to be a part of narcissism, where love for own is expressed by taking photos of self. Previously the technology was not conducive to take selfies, but with the advances in technology; this has become very easy. By our study we want to identify the big five personality traits who indulge in selfie taking. The field of behavioural addiction is ever evolving, we expect that this research will add more to our understanding.

### **Subjects and Methods:**

#### **Aims of the study:**

To study association between the selfie taking behaviour and big five personality.

Objectives were: to identify if selfie taking behaviour has any addictive properties; to find association between socio demographic variables and selfie taking behaviour and to identify if any, a pattern of big five personality traits in selfie taking individuals.

#### **Study details:**

Study was started after getting approval from the ethical committee. Questions were uploaded into google online forms. Forms explained the study details, objectives and included the consent form. Once uploaded online, a sharable link was generated which was then forwarded on social media networking sites, whatsapp and facebook. The flow of the forms was made in such a way that only when the participant consented to the study, he/she was directed to fill the questionnaire. Questionnaire

included, socio demographic details, selfitis behaviour scale (SBS) and big five inventory- 44 (BFI). Snowballing technique was used to reach to other participants, once a participant have filled the form they were requested to further share the link with their contacts. Data collection took place between August to September 2020.

#### **Questionnaire:**

Socio-demographic details were collected using a self-structured proforma. We also included questions related to the pattern of smart phone use like; frequency and reason for changing smart phone, social networking sites used, number of selfies taken in a day and questions related to addictive behaviour.

Selfitis behaviour scale (SBS)<sup>2</sup>: This was developed by Balakrishnan J and Griffiths MD. It is a 20 item questionnaire and the items are scored on a 5-point likert scale with score for each item ranging from 1 as strongly agree to 5 as strongly disagree. The total score of the scale ranges from 20 to 100 and no cut off values have been deduced. The scale was developed and validated in Indian population. The original article was distributed under the terms of creative commons attribution 4.0 international license and permits unrestricted use.

SBS has six subscales, namely environment enhancement, social competition, attention seeking, mood modification, self-confidence and subjective conformity. Environment enhancement refers to making memorable memories of the situation in which selfie is taken. Social competition refers to the competitive feeling a person has while taking selfie; like sharing selfies, taking selfie in different poses, expecting likes for the selfies posted. Attention seeking is very much related to narcissism, it means trying to gain popularity by the medium of selfies. Mood modification is a subjective experience of making oneself feel better using selfies, it also acts as a reinforcing factor. Self confidence refers to indulging in a selfie taking behaviour to improve ones own confidence. Subjective conformity refers to the behavioural change which people are willing to make for social conformance.

Big five inventory-44 (BFI)<sup>6</sup>: It is a 44 item questionnaire based on big five personality theory. Each item is scored from 1 as disagree strongly to 5 as agree strongly. It has five subscales/ traits, they are openness, conscientiousness, extraversion, agreeableness and neuroticism. Some of the items have to be reverse scored. The score values are grouped to get a mean score for each trait. This is used for analysis. Author has provided a comparison sample values as per age for comparison with the study.

Openness refers to the presence of features like creativity, imagination and insight. Higher score

indicates the individual is curious about learning new things, involves in artistic jobs etc. Conscientiousness refers to person who has a good impulse control in order to facilitate a goal directed behaviour. Extraversion refers to sociably outgoing traits like sociability, networking, talkativeness etc. Agreeableness refers to traits like altruism, trust, kindness, affection and modesty. This trait is akin to prosocial behaviours. Neuroticism refers to more of aspects like anxious, nervousness, sadness etc.<sup>6,7</sup>

### Statistical analysis:

The online forms once filled by a participant would get automatically updated to the google drive. The data from the forms was downloaded as comma separated value (CSV) file. The data was analysed using R language version 4.0.2.<sup>8</sup> R language is an open source programming language designed to analyse data. In R, the following packages were used for analysis; dplyr,<sup>9</sup> summarytools<sup>10</sup> and ggplot2.<sup>11</sup> Data was subjected to analysis based on the study aims and objectives to obtain mean, standard deviation, chi square, student t-test, analysis of variance (ANOVA), and correlation where applicable. We have taken a sub group of the study data with high SBS score (total score more than 72), which is analysed using kruskal-wallis rank sum test. The p value was considered significant if  $p < 0.05$  at 95% confidence intervals. The data obtained was then tabulated and presented in the study.

## RESULTS

3.1. Socio demographic details (Table 1 and 2): A total of 197 questionnaires are analysed in the study. Participants belong to the age ranging from 20 to 50 years, among them 56% belong to 20 to 25 years. Males constitute 58% of the sample. Majority of the sample belong to Hindu religion (86%) followed by Christian (12%). Around two thirds of the sample are doing graduation in various fields. One third of the sample are married. The study constitute 57% of the sample who are currently studying and 53% hail from a urban background. We have asked participants some questions related to their smartphone usage. Twenty eight percent the participants have the habit of frequently (at least once in a year) changing smartphone and outdated software (7%) is the common reason quoted, followed by broken phone (6%). Twenty percent of the participants consider selfie taking a problem, 12% report of being preoccupied about taking a selfie. But upto 32% of the participants take at least 5 selfie in a day. Seven percent feel anxious or irritable when they avoid taking selfie, 44% report of taking selfie repeatedly or spending more time in order to achieve satisfaction, 15% report of failing to stop taking a selfie, around 10% report of taking selfie in a risky or a

hazardous situation, 24% report trying to cover up selfie taking from family members or friends, 12% report of showing their feelings by the medium of selfies and only 5% feel that they have lost important relationship due to their selfie taking behaviour. A majority report of spending less time on other hobbies because of selfie taking. Among the different social media platforms usage, most commonly used one are Whatsapp 99%, followed by Instagram- 71%, Facebook- 67%, Snapchat- 28% and Twitter- 23%. 3.2. Selfitis behaviour scale (SBS) (Table 1, 2, 3a and 3b): We have compared the various socio demographic details with the overall SBS score. The gender and the SBS follow significant association, the rest of the variables do not give significant association. In the gender, females report higher SBS score than males. On comparing various questions related to selfie taking with overall SBS score, there is significant association with the following questions; taking selfie repeatedly or spending more time in order to achieve satisfaction ( $P 0.000$ ), failing to stop taking selfie ( $P 0.000$ ), trying to cover up selfie taking behaviour from friends or family members ( $P 0.000$ ), expressing feelings in social media by taking selfie ( $P 0.001$ ) and losing important relationships because of selfie taking ( $P 0.002$ ). We have further compared to find any association between various sub scales of SBS with socio demographic variables. There is significant association between age and subjective conformity ( $P 0.020$ ), participants belonging to 35 to 40 years have higher score than other age groups. Significant association exists between gender and environment enhancement ( $P 0.000$ ), mood modification ( $P 0.005$ ) and self confidence ( $P 0.005$ ). In all the three subscales females score higher in comparison to males. Educational status is significantly associated with mood modification ( $P 0.015$ ) and among them graduate studying participants have higher score. The employment status and environment enhancement ( $P 0.012$ ) follow significant association, participants who are currently studying have reported higher score than the currently employed. 3.3. Big five inventory- 44 (BFI) (Table 4): As per objectives of the study, we selected a sub group of participants with higher SBS score and compared them with the individual personality traits. The authors of the original SBS have not worked on the cut off score values. Previous studies have taken arbitrary cut off values, which are not standardised and cannot be utilised. So we have used a commonly used method to obtain cut off values for SBS, that is maximum score minus minimum score divided by the number of levels. Taking the maximum value as 100, minimum value as 20 and levels as 3, we obtained a value of 26.67. Based on this we

considered those participants with SBS score above 72 as high score.

This BFI scores of this sub group is compared with the BFI score of general population. There is significant association in openness ( $P$  0.000), conscientiousness ( $P$  0.000) and agreeableness ( $P$  0.000) traits. The sub group of participants score low in openness, conscientiousness and agreeableness.

We then compared the various socio demographic variables of this sub group with the individual personality traits of BFI. As the the sample size is small ( $n = 31$ ), we used non parametric tests to find association between variables. There is significant association between gender and agreeableness ( $P$  0.046), the other variables do not show significant association. In the gender; females have higher mean and median scores when compared to males.

3.4. Comparison between the SBS and BFI (Table 5): We compared the six sub scales and the total score of SBS with the five personality traits of BFI.

3.4.1. Openness: It is significantly associated with social competition ( $P$  0.000,  $r = -0.342$ ), attention seeking ( $P$

0.000,  $r = -0.267$ ), mood modification ( $P$  0.000,  $r = -0.260$ ), subjective conformity ( $P$  0.000,  $r = -0.338$ ) and total score ( $P$  0.000,  $r = -0.265$ ). There is a weak negative linear correlation with all these sub scales of SBS.

3.4.2. Conscientiousness: It is significantly associated with attention seeking ( $P$  0.000,  $r = -0.151$ ) and has no linear correlation.

3.4.3. Extraversion: It is not associated with any of the subscales nor the total score of SBS.

3.4.4. Agreeableness It is significantly associated with social competition ( $P$  0.000,  $r = -0.3030$ ), attention seeking ( $P$  0.000,  $r = -0.220$ ), mood modification ( $P$  0.000,  $r = -0.254$ ), self confidence ( $P$  0.000,  $r = -0.140$ ), subjective conformity ( $P$  0.000,  $r = -0.253$ ) and total score ( $P$  0.000,  $r = -0.238$ ). It has a weak negative linear correlation with social competition, mood modification, subjective conformity and no linear correlation with attention seeking, self confidence and total SBS score.

3.4.5. Neutoticism: It is significantly associated with self confidence ( $P$  0.000,  $r = 0.154$ ) and is positively correlated.

**Table 1:** Summary of socio demographic variables and comparison with selfitis behaviour scale (SBS)

Sl. No	Variables	Characters (n= 197)	Frequencies (Percentages)	SBS score mean (SD)	P value
1.	Age (years)	20 to 25	111 (56.4%)	57.63 (14.3)	0.053
		25 to 30	44 (22.3%)	47.95 (18.5)	
		30 to 35	25 (12.7%)	53.88 (16.7)	
		35 to 40	7 (3.5%)	66.71 (11.9)	
		40 to 45	7 (3.5%)	47.85 (18.8)	
		45 to 50	3 (1.5%)	50.00 (19.0)	
2.	Gender	Male	114 (57.9%)	51.56 (15.7)	0.015*
		Female	83 (42.1%)	57.24 (16.4)	
3.	Religion	Hindu	170 (86.3%)	55.31 (16.4)	0.655
		Christian	23 (11.7%)	52.65 (14.6)	
		Muslim	4 (2%)	48.00 (24.0)	
4.	Educational status	Intermediate	15 (7.6%)	55.64 (11.2)	0.134
		Graduation	137 (69.5%)	56.20 (16.7)	
		Post graduation	45 (22.8%)	50.58 (15.8)	
5.	Marital status	Married	61 (31%)	53.55 (17.6)	0.477
		Single/ Unmarried	136 (69%)	55.43 (15.7)	
6.	Employment status	Employed	84 (42.6%)	52.90 (16.8)	0.153
		Studying	113 (57.4%)	56.30 (15.8)	
7.	Place of stay	Rural	92 (46.7%)	55.13 (16.0)	0.815
		Urban	105 (53.3%)	54.59 (16.6)	

\*P value is significant <0.05, chi square, t test and Analysis of variance are used.

**Table 2:** Questions related to selfie and their comparison with Selfitis behaviour scale

Sl. No	Question (n= 197)	Responses	Frequency	Percentages	SBS score mean (SD)	P value
1.	Do you frequently change your Smartphone?	Yes	28	14.2%	51.83 (17.96)	0.206
		No	169	85.8%	55.69 (15.69)	
2.	Have you considered taking a 'Selfie' a problem?	Yes	41	20.8%	64.29 (15.81)	0.205
		No	154	78.2%	68.16 (17.96)	
3.		Yes	23	11.7%	60.48 (20.61)	0.144

	Do you always think or preoccupied about taking 'Selfie'?	No	172	87.3%	54.03 (15.52)	
4.	Do you feel anxious/ irritable when you avoid taking a 'Selfie'?	Yes	13	6.6%	53.71 (21.80)	0.839
		No	183	92.9%	54.93 (15.93)	
5.	Have you ever taken 'Selfie' repeatedly/ spend more time in order to achieve satisfaction	Yes	86	43.6%	61.59 (14.16)	0.000*
		No	110	55.8%	49.51 (16.01)	
6.	Have you ever failed in trying to stop taking 'Selfie'?	Yes	29	14.7%	64.30 (15.50)	0.000*
		No	167	84.8%	53.15 (15.94)	
7.	Do you spend less time on other hobbies because of 'Selfie' taking?	Yes	188	95.4%	60.11 (17.52)	0.380
		No	9	4.6%	54.60 (16.28)	
8.	Have you ever taken 'Selfie' in Hazardous/ risky situations?	Yes	19	9.6%	60.45 (12.97)	0.058
		No	177	89.8%	54.22 (16.58)	
9.	Have you ever tried to cover up 'Selfie' taking behavior from family members/ friends?	Yes	47	23.9%	63.64 (14.96)	0.000*
		No	149	75.6%	52.78 (15.78)	
10.	Have you ever showed your feelings by the way of 'Selfie' in social media?	Yes	24	12.2%	65.29 (15.37)	0.001*
		No	173	87.8%	53.40 (15.97)	
11.	Have you lost an important relationship because of 'Selfie' taking?	Yes	5	2.5%	74.20 (7.32)	0.002*
		No	192	97.5%	54.34 (16.20)	

\*P value is significant <0.05, chi square is used.

**Table 3a:** Comparison of socio demographic variables with subscales of Selfitis behaviour scale (SBS)

Sl. No	Variables	Characters (n= 197)	Environment enhancement		Social competition		Attention seeking	
			SBS score (SD)	P value	SBS score (SD)	P value	SBS score (SD)	P value
1.	Age (years)	20 to 25	13.39 (3.27)	0.082	10.95 (3.35)	0.117	7.91 (2.42)	0.054
		25 to 30	11.47 (4.70)		9.13 (3.55)		6.47 (2.34)	
		30 to 35	12.16 (3.51)		10.16 (3.77)		7.96 (2.63)	
		35 to 40	14.00 (1.63)		13.42 (4.07)		9.28 (2.05)	
		40 to 45	10.28 (3.86)		9.42 (3.73)		7.28 (2.75)	
		45 to 50	11.33 (3.05)		9.66 (4.93)		7.00 (3.46)	
2.	Gender	Male	11.67 (3.52)	0.000*	9.92 (3.30)	0.069	7.50 (2.64)	0.612
		Female	13.42 (3.72)		10.85 (3.76)		7.69 (2.42)	
3.	Religion	Hindu	12.73 (3.71)	0.867	10.59 (3.62)	0.431	7.71 (2.51)	0.448
		Christian	12.65 (3.52)		9.56 (3.20)		7.00 (2.35)	
		Muslim	11.00 (6.21)		10.00 (4.89)		7.00 (3.36)	
4.	Educational status	Intermediate	13.64 (2.43)	0.148	10.35 (3.60)	0.070	7.14 (2.10)	0.113
		Graduation	12.82 (3.90)		10.83 (3.59)		7.86 (2.56)	
		Post graduation	12.00 (3.47)		9.39 (3.45)		7.02 (2.40)	
5.	Marital status	Married	12.29 (4.04)	0.344	10.09 (3.83)	0.361	7.34 (2.56)	0.320
		Single/ Unmarried	12.86 (3.58)		10.62 (3.48)		7.73 (2.49)	
6.	Employment status	Employed	11.91 (3.81)	0.012*	10.17 (3.67)	0.344	7.52 (2.58)	0.666
		Studying	13.26 (3.58)		10.67 (3.54)		7.68 (2.46)	
7.	Place of stay	Rural	12.68 (3.61)	0.993	10.50 (3.67)	0.873	7.54 (2.52)	0.729
		Urban	12.69 (3.85)		10.42 (3.54)		7.67 (2.51)	

\*P value is significant <0.05, chi square, t test and Analysis of variance are used.

**Table 3b:** Comparison of socio demographic variables with subscales of Selfitis behaviour scale (SBS)

Sl. No	Variables	Characters (n= 197)	Mood modification		Self confidence		Subjective conformity	
			SBS score (SD)	P value	SBS score (SD)	P value	SBS score (SD)	P value
1.	Age (years)	20 to 25	8.59 (2.77)	0.080	9.19 (2.66)	0.062	7.56 (2.41)	0.020*
		25 to 30	6.95 (3.40)		7.90 (3.67)		6.00 (2.47)	
		30 to 35	7.76 (2.84)		8.40 (2.81)		7.44 (2.36)	
		35 to 40	10.00 (2.44)		10.57 (1.61)		9.42 (2.14)	
		40 to 45	6.42 (3.45)		7.00 (3.00)		7.42 (3.40)	
		45 to 50	6.66 (3.21)		7.00 (3.46)		8.33 (1.15)	
2.	Gender	Male	7.37 (2.81)	0.005*	8.07 (2.71)	0.005*	7.01 (2.59)	0.219
		Female	8.57 (3.10)		9.23 (3.10)		7.46 (2.48)	

3.	Religion	Hindu	8.14 (3.10)	0.660	8.75 (2.99)	0.651	7.37 (2.56)	0.381
		Christian	7.69 (2.42)		8.95 (2.88)		6.78 (2.27)	
		Muslim	7.00 (3.74)		7.00 (3.74)		6.00 (2.44)	
4.	Educational status	Intermediate	8.35 (2.23)	0.015*	9.64 (2.09)	0.106	6.50 (1.87)	0.244
		Graduation	8.40 (3.16)		8.86 (3.06)		7.41 (2.62)	
		Post graduation	6.97 (2.62)		8.10 (2.95)		7.08 (2.42)	
5.	Marital status	Married	7.96 (3.17)	0.766	8.59 (3.34)	0.647	7.26 (2.56)	0.965
		Single/ Unmarried	8.11 (2.98)		8.81 (2.83)		7.27 (2.52)	
6.	Employment status	Employed	7.60 (3.03)	0.067	8.44 (3.11)	0.222	7.23 (2.58)	0.864
		Studying	8.40 (3.01)		8.97 (2.89)		7.30 (2.50)	
7.	Place of stay	Rural	8.30 (3.06)	0.306	8.86 (3.00)	0.614	7.23 (2.48)	0.844
		Urban	7.85 (3.01)		8.64 (2.99)		7.30 (2.58)	

\*P value is significant <0.05, chi square, t test and Analysis of variance are used.

**Table 4:** Comparison of socio demographic details with Big Five Inventory 44 (BFI) among high score of Selfitis behaviour scale (SBS)

n= 31, P value	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
General population#	0.000*	0.000*	0.411	0.000*	0.065
Age	0.557	0.847	0.405	0.131	0.833
Gender	0.402	0.466	0.211	0.046*	0.351
Religion	0.896	0.431	0.746	0.541	0.237
Educational status	0.312	0.144	0.798	0.604	0.795
Marital status	0.650	0.412	0.945	0.856	0.716
Employment status	0.254	0.802	0.070	0.062	0.692
Place of stay	0.984	0.294	0.732	0.778	0.951

\*P value significant < 0.05, # Student t test, Kruskal-Wallis rank sum test used.

**Table 5:** Correlation between Selfitis behaviour scale (SBS) and big five inventory (BFI 44)

n= 197	Openness		Conscientiousness		Extraversion		Agreeableness		Neuroticism	
	r	Pvalue	r	Pvalue	r	Pvalue	r	Pvalue	r	Pvalue
Environment enhancement	-0.130	0.068	-0.010	0.882	0.115	0.107	-0.110	0.122	0.119	0.094
Social competition	-0.342	0.000*	-0.128	0.070	-0.035	0.623	-0.303	0.000*	0.137	0.054
Attention seeking	-0.267	0.000*	-0.151	0.033*	-0.018	0.796	-0.220	0.001*	0.057	0.422
Mood modification	-0.260	0.000*	-0.067	0.349	-0.045	0.528	-0.254	0.000*	0.100	0.159
Self confidence	-0.098	0.168	0.007	0.911	0.127	0.073	-0.140	0.049*	0.154	0.030*
Subjective conformity	-0.338	0.000*	-0.099	0.164	-0.089	0.213	-0.253	0.000*	0.102	0.150
Total SBS score	-0.265	0.000*	-0.080	0.261	0.033	0.638	-0.238	0.000*	0.129	0.070

\*P value significant <0.05, Pearson correlation test is used, r is correlation coefficient.

## DISCUSSION

Selfie taking has become a common practice among the millennials. In our daily life we come across people taking selfie as a part of their daily routine. Most of the times it may not be associated with the any special occasion. There may be many factors for this emerging behaviour. As mental health professionals and scientists, it is fascinating to study this emerging trend and gain a healthy understanding. In this study we aimed to explore the personality factors linked with the selfie taking behaviour. Previous studies have studied link between selfie taking behaviour with either narcissism or dark triad personality. Some studies have looked selfie taking as a mental illness or disease. There were some researchers who included selfie taking as a recognised behavioural addiction. But it has not been included as

behavioural addiction in any of the standard classificatory systems.

### Socio demographic variables:

In the study, female participants have high score on SBS. This is in line with previous studies,<sup>12-15</sup> which find that females are more tuned to taking selfies. The study also finds a link between selfie taking behaviour with environment enhancement, mood modification and self confidence among female participants. Previous studies,<sup>13</sup> have felt that excessive selfie taking behaviour in females could be due to their conscious feelings towards their physical appearance and to show off their photogenic beauty on social media platforms. Similarly Boursier *et al.*,<sup>16</sup> have done a study on participants of school going age and found that girls spend more time on

social media and share selfies frequently when compared to boys.

The present study finds that participants those who are studying give more attention to taking selfies as a way of remembering things than those who are employed. This may mean that free time available (assuming that participants who are studying have more flexible timings than employed), peer pressure could also act as contributing factors. This is to some extent in line with another finding of the study that is participants with lower education feel subjectively better by selfie taking. Selfie taking might act as a reinforcing factor in subjectively improving an individuals mood. This is in line with a previous study,<sup>13</sup> who found that lower education has higher number of selfie takers.

The study finds that Whatsapp is the most commonly (99%) used social networking platform followed by Instagram (71%). Facebook is reportedly been used by 67% of the participants. This is in line with a study done in India,<sup>17</sup> where Whatsapp followed by Facebook are the commonly used social networking sites. We also see that there is a trend to explore other upcoming social networking platforms like twitter and snapchat.

#### **Addiction related questions:**

Participants who have reported positively to some of the addiction related questions have scored high SBS score. These questions were framed based on the already existing criteria for behavioural addictions, namely gambling disorder and internet gaming disorder.<sup>1</sup> Criteria which have been taken from gambling disorder are; needing larger amounts of money to gamble in order to achieve desired excitement, lying to conceal extent of involvement in gambling and significant relationship being jeopardised due to gambling; which we reframed in the study as taking selfie repeatedly or spending more time in order to achieve satisfaction, trying to cover up selfie taking behaviour from family members or friends and losing an important relationship because of selfie taking. Criteria which have been taken from internet gaming disorder are unsuccessful attempts in stopping to participate in internet games and internet games as a way to escape from a negative mood, which we reframed as; failure to stop taking selfies and expression of the feelings by way of selfies in social media. Although other questions have been asked but the study did not find association. From these findings; we can probably say that participants are experiencing these problems due to higher involvement in selfie taking. We cannot extrapolate selfie taking as having non substance addiction properties, but it gives a direction to further research.

#### **Big five personality traits among those with high scores of SBS:**

Among those who scored higher in SBS, big five personality traits seen are openness, conscientiousness and agreeableness. The participants score low in all these three traits in comparison to general population. A study by Khoueury *et al.*<sup>13</sup> with similar objectives found an association between openness, conscientiousness and neuroticism with degree of selfie addiction, but did not find significant relationship between agreeableness and extraversion.

Lower pole in openness indicates having conservative attitude or approach towards things, being less imaginative or creative, less liking for the changes or monotonous in anything, less thoughtful etc. This is in line with the findings by Khoueury *et al.*,<sup>13</sup> who feel that people with low in openness would rather spend more time on taking selfies, than spending on new activities and experiences which would generate valuable feelings. Lower pole in conscientiousness indicates propensity for smoking, substance abuse, poor exercise habits, poor impulse control, less organised and mindful. This is in line with Khoueury *et al.*,<sup>13</sup> who feel that higher pole in conscientiousness acts as a protective factor against behavioural addictions. So lower pole would mean that people are less mindful about exposing their personal life via selfie taking, less organised about their work and deviating their resources from the future goals. This also indicates the possible presence of exposure to substances of abuse, which was not evaluated in the study.

Lower pole in agreeableness indicates more propensity for interpersonal problems, procrastinating about things, showing little interest in others, does not bother how others feel. This is in contrast with Khoueury *et al.*,<sup>13</sup> who did not find any significant link between agreeableness and selfie addiction. They felt that this was the limitation of their study as they did not specifically ask for type of selfie and note that agreeableness may be associated with group selfie posting. We feel that those with lower agreeableness are less equipped with handling situations in a healthy way and hence resort to selfie taking as a means to tide over the deficit. A study by Kircaburun and Griffiths,<sup>18</sup> on instagram addiction among university students found association between conscientiousness and agreeableness with instagram addiction. They felt that those with lower agreeableness and conscientiousness may be addicted to instagram because they like exploring interesting profiles, wasting of time, entertainment etc. Instead of taking selfie and posting, they spend time on social networking site to express their liking of others selfies.

#### **Relationship between BFI and SBS:**

The study finds a significant association between the subscales of SBS with personality traits, but in most instances it is either weak or no linear correlation.

Environment enhancement means that the person feels good by taking selfies and stores these for memories. Here selfies create beautiful memories of the enjoyable environment. In the study it is not associated with any of the personality traits. A epigenetic study<sup>19</sup> has found that environment acts as a contributory factor in acquiring and developing excessive behaviours.

Sutton and Keogh<sup>20</sup> have studied social competition in 9 to 12 years, they were looking for relation with personality; they felt that social competition is primarily based on personality. We feel that those with selfie taking have conservative attitude and are less creative. So they resort to taking more selfies but may not post or share them often in social media platforms. This is like a paradox, where they feel competitive but do not post the selfies in social media; so probably here selfie taking is for comparison with selfies of other and thus obtain self satisfaction. Being less creative, they might use ready-made or easy to use selfie enhancing applications to portray their selfie skills.

Attention seeking is self explanatory as in posting selfies to gain attention of others. This involves variety of behaviours and closely associated with narcissism and also has been linked to social media usage. Balakrishnan and Griffiths<sup>2</sup> believe that this component is specific to selfie taking. We looked at big five model of personality, hence no input on narcissism aspect. Attention seeking may explain the poor interpersonal relationships and propensity to addictive behaviours like smoking. Probably seeking attention of others might get in the way of maintaining relations with the close family members or friends. As a way of compensating, they may explore the addictive substances. If we consider selfie taking as a addictive behaviour, then this might explain as a way of ventilating the inner feelings. Mood modification, according to Griffiths<sup>21</sup> is an experience associated with an activity which makes a person subjectively feel better. This acts as an reinforcing factor increasing selfie taking behaviour. Balakrishnan and Griffiths<sup>2</sup> believe that mood modification is a key factor in addiction to selfie taking. Again as explained above, selfie taking might act as a channel to compensate interpersonal problems and thus improving the mood. Lower self confidence is linked with excessive behaviour and addiction. Self confidence can increase momentarily while a person is online, and return back to baseline when offline.<sup>2</sup> We believe that poor coping and probably experience of burnout could be the reason for resorting to self taking as a means to improve individuals confidence. Similar views are expressed by another study, that selfie taking improves the confidence of the individuals.<sup>22</sup> In the study, neuroticism is directly linked with the self confidence, so probably selfie improves individuals negative emotions

and at the same time increases self confidence. As a part of a society we are bound by certain social rules and norms. Each individual tries to abide by them so as to blend into the society and not become an outcast. We find that selfie takers have conservative attitude, lack prosocial and communal orientation. Probably they try to fill this gap by taking selfie and try to conform to the community. Previous literature had studied link between social conformity and excessive behaviour, they found that through social media platform an individual will try to attain social belongingness to gain acceptance of the community.<sup>23</sup>

**Concluding remarks:** Everyone would agree that the current views on selfie taking are varied extending to both the extremes. Some might view, selfie taking as a unnecessary thing or waste of time and resources, hence might attribute selfie taking as a addictive behaviour. Others might term selfie taking as new thing which is a part and parcel of normal life.

**Limitations:** A focussed sample would yield better results, while analysing the results we felt that a sample with higher score in SBS or those who take frequent selfies might have yielded better results. We also felt a need to explore the issue of selfie taking as a behavioural addiction, which was not the aim of the study. In this direction probably a qualitative study where the researcher has the liberty to question participants if needed might fill the much required understanding in the research on behavioural addiction.

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