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The Journal of Community Health Management

Journal homepage: https://www.jchm.in/

Original Research Article

Attitudes towards selfie-taking and its relation to body dysmorphic disorder among pre-clinical medical students

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ARTICLE INFO

Article history:
Received 24-04-2022
Accepted 22-05-2022
Available online 12-07-2022

Keywords:
Body dysmorphic disorder
Likert scale
Psychometric scale
Correlation
Selfie addiction

ABSTRACT

Background: Selfies are self-taken images of people that can reflect human feelings and can disseminate different messages. It is thought that technology has played a big part in the evolution of what is termed nowadays "selfie addiction". The goal of this study is to examine the prevalence and correlation of Selfie Addiction and Body Dysmorphic Disorder (BDD) using two scales – the Psychometric scale for selfie addiction and the Body Dysmorphic Disorder Questionnaire (BDDQ). This study examines these two phenomena amongst preclinical medical students of King Abdulaziz University (KAU), Jeddah, Saudi Arabia.

Materials and Methods: This was a cross-sectional research, which involved 317 preclinical medical students from King Abdulaziz University (KAU), Jeddah, Saudi Arabia. The psychometric scale for selfie addiction is a Likert Scale with ten statements, while the BDDQ constitutes of four statements. The data was collected between 16/2/2021 and 31/10/2021. Ethical approval and informed consent were obtained at the beginning of the study.

Results: There were a total of 317 responses. The overall prevalence of selfie addiction was 13.88% with females having higher rates than males (22.5% versus 11.4%), and more senior students having a higher prevalence than their junior colleagues (19.5% versus 7.8%). Also, being single was associated with higher scores of (14.0%) compared to the married group (0%). The average score for selfie addiction was 18.66 which is below the cutoff score of 30. The prevalence of BDD was (5.67%), and the average score of BDDQ was 1.03 with a range of 0-4 and standard deviation of 1.3. There was no significant correlation between BDD and demographic variables. There was a very weak correlation between BDD and selfie addiction; the Pearson Correlation value was (r = 0.144, p= 0.01). However, a Chi square comparing those who were addicted to selfies versus not (based on the cutoff score) showed a significant difference in BDD scores. (p=0.044) indicating possible correlation.

Conclusion: Results show that the prevalence of selfie addiction was 13.88% which seems significant. BDD had a lower prevalence of 5.67%. Factors related to higher rates of selfie addiction included being a more senior student, being single and female. In contrast, these demographic factors did not seem to be related to BDD. Finally, there was a weak correlation between BDD and selfie addiction. More research is needed to study the correlation between the two domains in different populations.

1. Introduction

In a study by Senft in 2015,[1] Selfie was defined as a photographic object that radiates human feeling by connecting the photographer to the photographed, and the

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https://doi.org/10.18231/j.jchm.2022.013

observer to the participant, among social media users. It can also transmit diverse understandings of information to different kinds of people, markets, and audiences. Technology has played a big role in the rise of this phenomenon that can be considered a cultural artifact and social practice.[1] The acts of taking selfies and uploading them on social media has become a trend amongst young individuals which has been described as the "Selfie habit".[2]

Selfies portray images of people at their best, which is associated with edited and photoshopped photos often posted by "influencers" who are continuously posting selfies on their social media platforms.[3] With the use of selfies, these marketers indicate that one is youthful, cool, trendy, and connected. These ideals may have a negative effect on young populations, particularly adolescents trying to achieve unrealistic and unattainable images like the "influencers" they follow on certain platforms.[4] This also may lead to narcissistic behavior, as they try to make modifications to their physical appearance by changing their looks to appear more attractive, to the extent that some people actually undergo plastic surgery.[5] This particular habit can be linked to harmful mental states such as narcissism or Body Dysmorphic Disorder (BDD).[5]

Narcissism is defined as a personality trait characterized by overly positive self-view, specifically in terms of one's social popularity and physical appearance.[6] One research mentioned that narcissistic people may have a tendency to be highly active in social media.[7] Narcissism is also found to be linked with posting selfies more frequently.[2] Possibly taking advantage of others through likes on social media, and enhancing their self-worth through posting selfies.[6] One study that assessed selfie behavior among nursing students found that the prevalence of selfie addiction among college students was (14.5%) and it was significantly associated with male gender.

BDD is an uncommon yet severe psychiatric illness.[5] It is important to properly diagnose patients with BDD in order to manage illness and protect them from possible harm.[5] In a study by Weingarden, et al,[8] BDD was described as developing apprehensions to non-existent or slight defects in physical appearance in such a way that patients tend to believe and think they are abnormal, unattractive, ugly, or deformed when in reality they appear normal. Therefore, this preoccupation leads to repetitive behaviors like checking oneself in the mirror and later becomes difficult to control.[9] In a brief review of the literature on selfie-taking and mental health, Kaur and Vig[10] concluded that selfie addiction was associated with low self-esteem, narcissism, loneliness and depression.

The DSM-5 outlines 4 criteria for the diagnosis of BDD. First, detecting one or more perceived imperfections or blemishes on oneself that other people would not even be able to recognize. Second, repetitive actions such as skin-picking, excessive grooming, mirror-checking and seeking reassurance or comparing oneself to others, as a consequence of these personal insecurities. Third, these preoccupations and thoughts bring about notable distress and negative changes to the afflicted person's social functioning and other important areas of life. Last, the fixation on physical appearance cannot be explained by problems with body fat or weight in an individual whose symptoms meet diagnostic criteria for an eating disorder.[9]

To our knowledge, there have not been studies in Saudi Arabia about the possible correlation of selfie-taking and BDD. This study aimed to identify the relationship between taking selfies in social media and its association with body dysmorphic disorder. Its secondary objectives were to determine the prevalence of Body Dysmorphic Disorder and selfie addiction among preclinical medical students in King Abdulaziz University Jeddah, Saudi Arabia in 2021. Finally, it aimed to explore other risk factors for both BDD and Selfie addictions such as gender, age, and marital status.

2. Materials and Methods

The study was conducted from February to October 2021. This was a cross-sectional study which involved 317 pre-clinical medical students enrolled in the Faculty of Medicine in King Abdulaziz University, Jeddah, Saudi Arabia. Consent was obtained from participants. Exclusion criteria included those with actual conditions that could affect appearance such as congenital defects or acquired deformities caused by trauma or burns. In order to recruit participants for this study, an electronic questionnaire to obtain consent was distributed at the beginning of this study. Then, an online survey was sent to the leader of each group of students through e-mail and/or WhatsApp (a widely used application amongst students). The cohort leaders were acknowledged as data collectors.

In terms of the questionnaire content, it contained demographic questions as well as the items of the body dysmorphic disorder questionnaire (BDDQ) and the Psychometric scale for selfie addiction. Written permission was obtained to use both scales. The scoring of the Body Dysmorphic Disorder Questionnaire (BDDQ) ranges from 0-4 and a score of 4 was considered positive for BDD-screening. It has been shown to have a sensitivity of 94% and specificity of 90%.[11]

The psychometric scale on selfie addiction is a Likert Scale which has ten statements. The score can range from 10 to 50 and the cut off score is 30, meaning a score more than 30 would indicate selfie addiction and a score equal or less than 30 indicates a normal result. All the items had a discrimination index value of >0.75 indicating that each item is effective with Cronbach's alpha more than 0.7.[7]

2.1. Statistical methodology

This study was interpreted by a statistical software called IBM SPSS version 23 (IBM Corp., Armonk, N.Y., USA) and visually presented by using GraphPad Prism version 8 (GraphPad Software, Inc., San Diego, CA, USA). Simple descriptive statistics were used to define the characteristics of the study variables by number and percentages for the categorical variables. Continuous variables were presented by means and standard deviations. They were "Psychometric scale for selfie-addiction score" and "Body Dysmorphic Disorder Score".

To compute the total score for "Psychometric scale for selfie-addiction score", the response for the questions were represented as follows:

Strongly Agree – 5, Agree -4, Neutral - 3, Disagree -2, Strongly Disagree -1

The questions involved in the calculation are shown in Table 1.

Table 1: Selfie addiction score items

	Please answer the following questions by indicating your agreement or disagreement with each statement according to the Likert scale
1.	I often spend time taking selfies.
2.	I often take selfies regardless of my workload.
3.	I feel disconnected from my surrounding when I am taking selfies.
4.	I find it hard to stop taking selfies once I start.
5.	I use more than one electronic device to take selfies simultaneously.
6.	I take selfies even during sad situations.
7.	I feel frustrated when I am unable to take a good selfie
8.	I try to cut down the amount of selfies I take, but I fail.
9.	I need counseling to reduce my sulfide addiction.
10.	I cannot survive without taking selfies.

By a simple additive method, scores ranging from 10-50 with a cut-off point of 30 were categorized as follows:

1. Normal if less or equal 30
2. Selfie addiction if more than 30

For the BDDQ, a simple additive method was applied to get the score. The range is 0-4 with cumulative scorning. 4 points is considered a positive screen for BDD. The items of this scale are shown in Table 2.

Each of the domains underwent a reliability analysis using Cronbach's alpha coefficient to study the properties of the measurement scales and items that composed the scales, and their average inter-item correlation. These domains were studied in relation to demographical data using Chi-square test for categorical variables and t-test were used to compare between groups. To identify relationships between continuous variables represented by means, a Pearson's correlation coefficient was used. A conventional p-value <0.05 was the criteria to reject the null hypothesis.

Table 2: Questionnaires for determination of body dysmorphic disorder score

1.	Are you very concerned about the appearance of some part(s) of your body that you consider especially unattractive? = Yes (1 point)
2.	Do these concerns preoccupy you? That is, do you think about them a lot and wish you could think about them less? Yes (1 point
3.	Yes at least once (1 point) • Has your defect(s) caused you a lot of distress, torment, or pain? • Has your defect(s) significantly interfered with your social life? • Has your defect(s) significantly interfered with your schoolwork, your job or your ability to function in your role? • Are there things you avoid because of you defect(s)?
4.	How much time do you spend thinking about your defect(s) per day on average? = More or equal 1 hour (1 points)
5.	Is your main concern with your appearance that you aren't thin enough or that you might become fat? Yes = excluded

2.2. Ethical consideration

Approval from King Abdulaziz University Research Ethical Committee and informed written consent with assurance of confidentiality from participants were obtained for this study.

3. Results

This online cross-sectional study included 317 pre-clinical medical students, ranging from 18-29 years of age, with a mean age of 20.7. It can be inferred that the population mainly involved young adults with a standard deviation of 1.4%. Demographics show that there were 246 male (77.6%) and 71 female (22.4%) participants. The population was almost divided equally across educational levels as 48.3% or 153 students were in their 2nd year while 51.7% or 164 students were in their 3rd year. The majority of participants or 99.1% were single, while 0.3% were married and 0.6% were separated. Table 3 displays the characteristics of the study samples.

The mean score of the BDDQ was 1.03 with a range of 0-4 and standard deviation of 1.3. Many students (178 or 56.2%) scored 0, 35 participants or 11.0% scored 1. There are 37 or 11.7% of the population that scored 2 and 49 or 15.5% of the total got a score of 3. Lastly, 18 or 5.7% scored 4 in BDDQ.

The computed Cronbach's alpha of Body Dysmorphic Disorder was 0.523 for the 4-item questionnaire. There were no differences in terms of the BDDQ in relation to demographics as shown in Table 4.

Results for the psychometric scale for selfie-addiction were also determined. The mean score for psychometric

Table 3: Demographics of study samples

Variables	N	Min	Max	Mean	SD
Age (years)	317	18	29	20.71	1.4
		Count		%	
Total		317		100.0	
Gender	Male	246		77.6	
	Female	71		22.4	
Education level	2nd year	153		48.3	
	3rd year	164		51.7	
Marital status	Single	314		99.1	
	Married	1		0.3	
	Separated	2		0.6	

Table 4: Body dysmorphic disorder and psychometric scale for selfie-addiction score across demographics

Demographics			Psychometric scale for selfie-addiction score		Body Dysmorphic Disorder Score	
Age (years)	r		0.012		-0.089	
	p-value		0.829		0.112	
	N		317		317	
		Total	Mean ± SD	p-value	Mean ± SD	p-value
Gender	Male	246	17.61 ± 8.6	<0.001[a]	0.97 ± 1.3	0.122
	Female	71	22.32 ± 8.5		1.27 ± 1.5	
Education level	2nd year	153	17.11 ± 7.4	0.002[b]	1.00 ± 1.3	0.658
	3rd year	164	20.11 ± 9.7		1.07 ± 1.4	
Marital status	Single	314	18.65 ± 8.8	0.741	1.04 ± 1.3	0.181
	Married at least once	3	20.33 ± 8.1		0.00 ± 0.0	

[a]-significant using Independent t-test at <0.05 level.
[b]-significant using Welch's t-test at <0.05 level.

scale for selfie addiction was 18.66 with a minimum possible value of 10.00 and a maximum value of 50.00, while the computed standard deviation was 8.8. Majority 86.1% or 273 students were normal and 13.9% or 44 students had selfie addiction according to the psychometric scale for selfie addiction.

The Cronbach's alpha for psychometric scale for selfie addiction was 0.898 for the 10-item questionnaire. Differences across demographic variables was also determined as shown in Table 4. Females and seniors had higher scores on selfie addiction (m=22.32 ± 8.5, p <0.001) and (m=20.11 ± 9.7, p 0.002), respectively.

The Pearson correlation coefficient between Body dysmorphic disorder score and psychometric scale of selfie addiction score (whether normal or addicted to selfie) was low, (r = 0.144, p= 0.01) indicating very low correlation. However, a Chi square comparing those who were addicted to selfies versus not (based on the cutoff score) showed a significant difference in BDD scores. (p=0.044) as shown in Table 5.

Most respondents' response to the Psychometric scale for selfie-addiction statements were leaning towards the Disagree region as most of the statements had a mean score of 1.58-2.25. Standard deviation obtained from the scores were ranging from 1.1-1.3. From Figure 1, it can be shown that the lowest score was from the statements "I cannot survive without taking selfies" and "I need counseling to reduce my selfie addiction"; and these are oriented towards Strongly Disagree. On the other hand, the highest score (inclined to strongly agree) were from the statement "I often spend time taking selfies "and "I take selfies even during sad situations".

With regards to the Body Dysmorphic Disorder Questionnaire. For the question "Are you very concerned about the appearance of some part(s) of your body that you consider especially unattractive?", 56.2% or 178 participants answered No, while 139 or 43.8% agreed. The body part that most participants were insecure about was their face -indicated by 54 respondents or 38.8%, followed by "the whole body" indicated by 28 respondents or 20.1%, then the upper body (36 respondents or 25.9%) and finally, the lower body (19 respondents or 13.7%).

About 65 (46.76%) said that these physical concerns did not preoccupy them and that they did not think of it often nor wish to think less about them, while 74 (53.24%) said otherwise. The defects have caused 46 participants (33.1%) a lot of distress, torment, or pain, while 93 or 66.9% did not experience that. These concerns had not significantly interfered with the social life of 87 people (62.59%), while 52 (37.41%) were affected by them. Sixty-six or (47.48%)

Table 5: Pearson correlation between the BDDQ score and psychometric scale for selfie addiction score

Variables		Total	Psychometric scale for selfie-addiction score		p-value
			Normal	Addicted to Selfie	
Total		317	273(86.1%)	44(13.9%)	-
Body Dysmorphic Disorder Score	0	178	155(87.1%)	23(12.9%)	0.044[a]
	1	35	33(94.3%)	2(5.7%)	
	2	37	34(91.9%)	3(8.1%)	
	3	49	36(73.5%)	13(26.5%)	
	4	18	15(83.3%)	3(16.7%)	
	Pearson Correlation	317	r = 0.144		0.010[b]

[a]-significant using Chi-Square Test at <0.05 level.
[b]-significant using Pearson Correlation at <0.05 level.

Table 6: Prevalence of psychometric scale of selfie addiction among demographics

Demographics		Total	Psychometric scale for selfie-addiction score		p-value
			Normal	Selfie addict	
Total		317	273(86.1%)	44(13.9%)	-
Age (years)		317	20.71 ± 1.4	20.70 ± 1.1	0.978
Gender	Male	246	218(88.6%)	28(11.4%)	0.017[a]
	Female	71	55(77.5%)	16(22.5%)	
Education level	2nd year	153	141(92.2%)	12(7.8%)	0.003[a]
	3rd year	164	132(80.5%)	32(19.5%)	
Marital status	Single	314	270(86.0%)	44(14.0%)	0.485
	Married at least once	3	3(100.0%)	0(0.0%)	

[a]-significant using Chi-Square Test at <0.05 level.
[a]-significant using Chi-Square Test at <0.05 level. Summary of scores from the Psychometric scale for selfie-addiction statements rated using the Likert Scale.

said that they did not avoid anything because of his/her defect(s), while 73 or (52.52%) reportedly did. Regarding the time spent thinking about defects per day, 117 (majority or 84.17%) confessed they do it for less than 1 hour while 22 (15.83%) reported thinking for an hour or more. Lastly, 81 or 58.3% agreed that their initial worry was that they were not slim or that they might become fat, while 58 (41.7%) confirmed it did not really concern them.

Table 7 displays the data percentages on which body parts participants were most insecure about.

Table 7: Data on answers to body dysmorphic disorder questionnaire

Variables		Count	%
Total		317	100
Are you very concerned about the appearance of some part(s) of your body that you consider especially unattractive?	No	178	56.2
	Yes	139	43.8
		Count	**%**
Total		139	100
If the answer is yes, which body part?	Face	54	38.8
	Whole Body	28	20.1
	Upper Body	36	25.9
	Lower Body	19	13.7
	None	8	5.8

4. Discussion

This cross-sectional study involved 317 pre-clinical students of King Abdulaziz Univeristy in Jeddah, Saudi Arabia. Their attitude towards selfie-taking and its relation to body dysmorphic disorder was explored. The population involved had a mean age of 20.71 years old, with more male participants (77.6%) than female (22.4%), while their educational level is almost equally distributed. The young population involved in this survey may be informative to the literature, since there is still little information about age and gender diversity in relation to selfie behaviors according to a study by Dhir and his colleagues in 2016,[9] so this research may shed light on the extent of selfie-addiction to this age group, especially given the relatively new phenomenon of selfie-taking, and the lack of studies in Saudi Arabia. In this research, the relationship between age and BDD was not significant with a p value of 0.112, it might be that the whole population was young and close in age with SD=1.4 and so the age gap between participants may not have been wide enough to detect a difference in terms of BDD and age. It means that in this population, age does not play a significant role in identifying the prevalence of BDD in participants.

While another study conducted in Saudi Arabia year 2017, mentioned that BDD significantly decreases as age increases and highly observed on students aged between 15 to 25 years old.[12]

Females in our study had higher selfie addiction rates than males (22.5% versus 11.4%) which is similar to the findings of a study conducted by Dhir in Finland year 2015.[9] It should be noted however that there were much fewer female participants compared to male participants. This may be due to the larger male population of medical students at the institution surveyed, but a selection bias cannot be excluded. It is possible that female students were less likely to participate for various reasons. On the other hand, the correlation of gender with BDD verified insignificant difference among males and females. However another study mentioned that BDD was more prevalent in females (86.6%) than in males (13.4%).[12] Also, it was identified here that being single was associated with higher scores of selfie addiction with 14.0% prevalence compared to the married group with 0% prevalence. Compared to another study conducted in India which discovered that marital status has no association with selfie addiction.[13] In terms of BDD, our study determined that there was no significant difference between single and married participants in the prevalence of BDD, while another study determined that BDD was more common in married participants than those who were single.[12]

In this study, the prevalence of selfie addiction was 13.88% from a sample size of 317, compared to another research conducted in India 2019, the prevalence was 14.5% from a sample size of 766,[14] indicating that selfie addiction showed a significant prevalence in both researches. On the other hand, among 317 participants involved in this study, 18 or 5.68% were found to have a BDD score of 4 (positive to BDD), showing significant prevalence. This was also true in another study in Saudi Arabia involving 365 sample size, with BDD prevalence of 4.4% at 95% confidence intervals.[15]

There was a very weak correlation between BDD and selfie addiction; the Pearson Correlation value was ($r = 0.144$, $p = 0.01$). However, an age comparing those who were addicted to selfies versus not (based on the cutoff score) showed a significant difference in BDD scores ($p=0.044$) indicating possible correlation. Also in another study conducted by Lina Abbas year 2021, showed that BDD scores were found to be significantly correlated to selfie addiction in a sample size of 504 Arab females.[16]

One can speculate on reasons for a weak correlation between Selfie-taking and BDD. Selfie taking may be a form of "checking" similar to mirror-checking; a compulsive behavior that reflects the obsession with image. On the other hand, some anxieties are managed with avoidance. It may be that those who have BDD try to avoid their own image sometimes.

This study may contribute to the BDD literature as there have not been enough studies that have been validated in general populations to assess BDD according to Brohede, et al in 2013.[11]

In terms of how the two scales performed in this population, reliability statistics provides the Cronbach's alpha coefficient, a main reliability index that comprises a number of variables or item in a questionnaire and its correlation in between those variables.[17] Here, this is used for psychometric scale for selfie addiction that obtained a value of 0.898 for a 10-item questionnaire. This indicates that the correlation of the test questionnaires is good and relatively consistent. Compared to another study conducted in India year 2017, where they used 6 items Questionnaire with a Cronbach's alpha score of 0.876.[18] For Body Dysmorphic Disorder questionnaire, the value of alpha coefficient was 0.523 for a 4-item set indicating less robust among the test's statements.[19] Another study showed that the internal consistency of BDDQ scores was good with an alpha coefficient value of 0.75, making it a reliable and valid instrument in measuring BDD.[20]

Lastly, this study has several limitations. The sample size is small and the population is homogeneous. There were more males than females. Survey-based cross-sectional studies have known limitations in terms of depth of enquiry, response rates and missing data. However, every effort was made to overcome these limitations.

5. Conclusion

This study determined attitudes towards selfie addiction via two tests, first was Psychometric scale for selfie addiction, and second was the Body Dysmorphic Disorder Questionnaire. Scores from these two domains were determined and relationship between taking selfies in social media and its association with body dysmorphic disorder was identified. This study helped provide more information as there have not been enough studies about correlation of selfie taking to BDD. Using statistics, scores from the tests were tabulated and analyzed. The 317 responses concluded that BDD and selfie addiction were found to have a prevalence of 5.67% and 13.88%, respectively among preclinical medical students of King Abdulaziz University. Participants in the study were mostly male, and selfie addiction was found to be more prevalent in females (11.4% versus 22.5%). Also, Educational level played a role with a higher prevalence of selfie addiction among the more senior students compared to their junior colleagues (19.5% versus 7.8%). Moreover, those who were single were more likely to have selfie addiction with a prevalence of (14.0%) compared to the married group (0%). There may be a weak correlation between BDD and selfie addiction. Areas for future study include replicating this study in larger more diverse populations, including qualitative analyses to delve deeper into questions related to body image and checking

behavior, and further exploring the possible relationship between selfie-taking and BDD, as well as other body image disorders.

6. Source of Funding

This research received no financial support from any institution or company.

7. Conflicts of Interest

None.

Acknowledgements

The authors acknowledges Abdullah Zuhairy, Murshid Almutairi, Maya Kheder and Raghad Shahbar for their help in data collection.

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Cite this article: Moumina HA, Altamimi LD, Alshawi SM, Kattan W. Attitudes towards selfie-taking and its relation to body dysmorphic disorder among pre-clinical medical students. *J Community Health Manag* 2022;9(2):60-66.