The mediating role of social network addiction in the relationship between body image dissatisfaction and depression

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Abstract

Aim: The present study was conducted with the aim of investigating the mediating role of addiction to social networks in the relationship between body image dissatisfaction and depression.

Method: The current research was a correlational and structural equation type. The statistical population of the research included all male and female undergraduate, master's and doctoral students of Gilan University who were studying in 1400-1401. 304 people were selected by random sampling method and answered questionnaires of addiction to mobile based social networks (AMQBSN), dissatisfaction with body image (BICI) and depression (BDI-II). Data were analyzed using structural equation modeling with SPSS-27 and SMART-PLS-3 statistical software.

Finding: The results of structural equations showed that body dissatisfaction has a direct and significant effect on depression. Also, addiction to social networks has a direct effect on depression. Addiction to social networks plays a mediating role in the relationship between body image dissatisfaction and depression.

Result: As a result, the value of the goodness of fit (GOF) is equal to 0/24 which, by comparing it with acceptable values for GOF, shows the average fit of the model. According to the results of the present study, the expansion of the use of social networks, especially among students, has provided a platform for addiction, which increases dissatisfaction with body image, which leads to depression.

Keywords: Addiction to social netwoks, Depression, Dissatisfaction with body image.

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Introduction

Students are a unique group of people who experience many stressful events during the most sensitive period of their lives. As the level of education increases, students face more stressful events (Asef et al., 2020). Student life is considered a stressful time because students have to dedicate themselves to a different environment and face many psychological pressures (Asma et al., 2022). Students play an important role in the future of the country and constitute a large part of the population that is increasing rapidly. Therefore, the importance of health in students is essential (Khodadadi et al., 2018). Mental health is one of the basic components of psychological well-being. Depression is one of the most common mental illnesses worldwide. Depression is common among students and leads to poor academic performance, unhealthy interpersonal relationships, and low quality of life (Lim et al., 2022). Currently, depression is the leading cause of disability worldwide, and more than 300 million people worldwide of all ages suffer from this disorder (Sawhney et al., 2020). One out of six people (16.6%) suffers from depression at some point in their life, and it is more common in women than men (Nucci et al., 2020). Depression symptoms include feelings of sadness, loss of interest, feelings of guilt or inferiority, sleep or appetite disturbances, fatigue, and low concentration. Depression in its most severe state leads to suicide and increases the risk of mortality (Lim et al., 2018). According to the reports of two global meta-analysis studies, more than 1 out of 4 students have symptoms of depression, and 1 out of 10 have suicidal thoughts (Ramadianto et al., 2022). Moreover, the evidence indicates a two-way relationship between depression and body image, which means that either depression may worsen the perception of body image or that distorted body image aggravates the symptoms of depression (Moradi et al., 2021).

Body image means a person's personal assessment of the weight, shape, size, and appearance of his body and that of others (Fischetti et al., 2020), and a person's negative perception of his appearance is called body dissatisfaction (Barnes et al., 2020). According to Frederick et al., 20-40% of women are dissatisfied with their bodies. However, body dissatisfaction has also been observed in men, and its rate has been reported as 10-30%. Even in Frederick et al.'s report, 90% of American male students were dissatisfied with being muscular (Quittkat et al., 2019). Research results have shown that body dissatisfaction can predict some psychological conditions, such as low self-esteem, depressive symptoms, and suicidal thoughts (Bornioli et al., 2021). In fact, it seems that anxiety and depression aggravate the negative consequences of body dissatisfaction. Research in the field of body dissatisfaction has mainly focused on women and has provided strong evidence that there is a relationship between body dissatisfaction, anxiety, and depression in women. In contrast, the relationship between body dissatisfaction, anxiety, and depression in men is less acknowledged (Barnes et al., 2020). Body satisfaction is negatively related to youth use of social networks (Tamarit et al., 2021). Social network websites (SNS) or virtual social networks are among the most widespread virtual social media, which are considered one of the most common forms of human social communication today (Gramlich, 2019, quoted by Bland, 2020). In recent

years, the popularity of the Internet has led to an increase in the use of virtual networks by 7.8% of users. So that this number reached 3.81 billion people in 2020, and according to estimates, this number will reach 4.41 billion people by 2025 (Yeshioglu et al., 2021). The spread of digital and social media Determining the impact of social networking sites (SNS) such as Facebook and Instagram on body image concerns seems critical (Nicholson, 2020). A study identified frequent use of social networking sites as a risk factor in developing body deformity disorder (Riding & Kos, 2020). Also, there is a positive relationship between the use of social networks and dissatisfaction with body image (Hugo & Mills, 2019), and with the increase in the use of social networks, dissatisfaction with body image increases (Alavi, 2019). In addition, according to the conducted research, addiction to the Internet and social networks has increased significantly. It has led to the creation of a range of problems (Ning et al., 2018), and as it was said depression is one of them, which increases with the increase in the use of virtual networks and its addiction (Saroudi et al., 2019). Moreover, in research, it was found that students who are more exposed to using social networks are more exposed to depression (Shehbazirad, 2014).

The number of Internet users in Iran has increased significantly in recent years. According to the published statistics, the number of Internet users in Iran was more than 62 million people until 2019. Therefore, recent research in Iran indicates that most of these users are young (Labani et al., 2020). Even though social networks have provided a new way of communication for young people to maintain old relationships, Some studies have shown that its harmful use may harm people's adjustment (Zhou et al., 2020). Some studies have shown that its harmful use may harm people's adjustment (Zhou et al., 2020). On the other hand, evidence shows that the use of social networks can have a negative impact on the mental health of its users, especially the young generation (Glasard and Stones, 2016, cited in Hind and Schwan, 2020). There is evidence that frequent use of social networks (more than two hours a day) can be associated with poor mental health, greater psychological distress, depression, and suicidal thoughts (Sampasa et al., 2015, cited by Hossein and Griffiths, 2019). Moreover, the higher the addiction to social networks, the higher the scores in depression (Karli et al., 2014). Concerning the material presented, it seems that conducting research in the field of student depression is one of the important issues because depression can affect academic performance or in other words lead to academic failure. That is, people who had more severe depression experienced low academic performance to the same extent, and as much as the depression has improved, the individual's academic performance has also increased (Hisenbagasi et al., 2005). However, such research results can provide useful solutions to improve students' academic performance. Therefore, investigating the relationship between depression and body dissatisfaction is an important issue considering the increasing use of social networks by young people Because a person's dissatisfaction with their body can lead to mental problems and unhealthy actions (Moradi et al., 2021). According to the above, the current research seeks to answer the question of whether the modeling of depression based on body dissatisfaction with the mediating role of addiction to social networks in Gilan University students has a good fit.

Research Method:

The current research was descriptive and correlational of the type of structural equations. The analysis method of this research was modeling, which was used to examine the causal relationships of research variables. In this model, body dissatisfaction is an independent variable, addiction to social networks is a mediating variable, and depression is a dependent variable. Data were analyzed with SPSS and AMOS software version 24. The statistical population of this research was all male and female undergraduate, graduate, and doctoral students of Gilan University who were studying in the academic year of 1400, of which 304 were randomly selected as a sample. The criteria for entering the sample into the current research were: being a student of Gilan University and being in the process of studying; also, in all stages of the research, ethical principles were tried to be taken into account, and no student was forced to study.

Research Instrument:

1. Addiction Questionnaire to Mobile-Based Social Networks (AMQBSN): created by Khawaja Ahmadi in 2015 (Khawaja Ahmadi et al., 2015). This tool has 23 questions, which measure 4 subscales of individual performance (questions 1 to 9), time management (questions 10 to 15), self-control (questions 16 to 19), and social relations (questions 20 to 23) in a 5-factor Likert scale from completely agree = 5 to completely disagree = 1. The minimum score in this test is 23 and the maximum score is 115, and higher scores indicate a higher addiction of the respondent to social networks (Khwaje Ahmadi et al., 2015). In the Iranian sample, the validity of this tool was confirmed by the exploratory factor analysis method, CVI = 0.95; also, the reliability of this tool was confirmed by Cronbach's alpha method of 0.927 in Bushehr medical students (Khwajeh Ahmadi et al., 2015). In the present study, Cronbach's alpha coefficient was 0.98.

2. Body Image Body Image Concern Inventor (BICI) Questionnaire: This tool was developed by Littleton (Littleton et al., 2005). This tool has 19 questions, which measure 2 dimensions of the person's dissatisfaction and embarrassment with their appearance, checking and hiding perceived defects (questions 1-3-5-8-9-14-15-16-17-18 and 19) and the degree of interference of concern about appearance in the individual's social performance (questions 2-4-6-7-10-11-12 and 13) in a 5-factor Likert scale from always = 5 to never = 1. The minimum score in this test is 19 and the maximum score is 95, and higher scores indicate a high level of body image dissatisfaction (Littleton et al., 2005). The findings of Littleton et al. (2005) on a group of university students indicate that the validity of this questionnaire is 0.93 by Cronbach's alpha method and the item-total correlation is between 0.32 and 0.73. Moreover, the validity coefficient of this questionnaire has been reported as 0.83 through correlation with the self-report scale of body dysmorphic disorder (Basaknejad and Ghaffari, 2008). Cronbach's alpha in the present study was 0.98.

3. Beck Depression Inventory-II Questionnaire (BDI-II):

This instrument was developed by Aaron Beck (Beck et al., 1961). This tool contains 21 groups of sentences and measures the severity of depression on a Likert scale of 4 from 0 to 3. The minimum score in this test is 0, and the maximum score is 63, and higher scores indicate more severe depression (Beck et al., 1961). In the Iranian sample, the MMPI-D scale was used for the convergent validity of this tool, and it was confirmed as 0.60. Moreover, the reliability of this tool was confirmed by Cronbach's alpha method of 0.87 in the male students of Shahid Chamran University of Ahvaz (Rajabi et al., 2008). Cronbach's alpha in the present study was 0.95.

Findings

Data analysis of this research was done on two levels of: descriptive findings and inferential findings. At the level of inferential findings, the relationship between the variables was tested with the Spearman correlation test, and the research model was tested with the structural equation modeling technique. The maximum alpha error level to test the hypotheses was determined as 0.05 ($p \geq 0.05$). Data analysis of the present research was done using statistical software SPSS version 27 and Smart PLS version 3.

Demographic Characteristics

In the statistical sample, 52.3% of the respondents were male and 47.7% were female. 49.3% of people were single, 45.7% were married and 4.9% were divorced. The age range of people was from 18 to 40 years old, and the average age of people was 26.78 years with a standard deviation of 4.65. In terms of education, most of the respondents (59.2%) were undergraduate students. Moreover, 23.7% were graduate students, 8.9% were graduate students, and 8.2% were doctoral students. 48% of the respondents had a permanent job, 35.2% had a part-time job and 16.8% had no job. The average monthly income of employees was 4.87 million Tomans with a standard deviation of 2.91.

Descriptive Statistics and Correlation between Variables

Table 1 shows the descriptive statistics, skewness, and kurtosis indices to check the questionnaire's normality, validity, and reliability tests. The Mahalanobis distance method identified multivariate outlier data, and there was no multivariate outlier data in the data. It should be noted that univariate normality was checked with skewness and kurtosis indices, and because the values of skewness and kurtosis of the dependent variable of depression were outside the range of -2 to +2, 2.27 and 4.67 were obtained, respectively. The distribution of the dependent variable was non-normal, so Spearman's non-parametric correlation test was used to investigate the relationship. Multivariate normality, which was the assumption of the structural equation modeling test, was checked with the Merdia coefficient, and the obtained coefficient was equal to 77.91. Furthermore, based on criterion 5 for the Merdia coefficient (Burn, 2010), it can be concluded that the multivariate normal distribution was violated, and based on this, the non-parametric partial least squares method, which is resistant to the multivariate non-normality assumption, was used to test the model. Most of the questions related to the

depression scale had inappropriate skewness and elongation, which caused the rejection of the assumption of multivariate normality.

Table 1: Descriptive statistics and evaluation of convergent validity and reliability

Variables	Mean	The standard deviation	skewness	kurtosis	Average variance extracted	Composite reliability	Cronbach's alpha
Dissatisfaction and embarrassment with appearance	22.59	8.50	1.07	0.70	0.75	0.97	0.96
Interference of worry in social functioning	15.93	6.27	1.06	0.70	0.77	0.96	0.96
body dissatisfaction	38.52	14.60	1.10	0.73	0.74	0.98	0.98
Individual performance	23.21	8.51	0.71	-0.27	0.61	0.93	0.92
Time Management	14.69	5.50	1.01	0.21	0.81	0.96	0.95
Self-control	10.03	3.69	0.93	0.12	0.85	0.96	0.94
Social Relations	10.28	3.62	0.71	-0.30	0.86	0.96	0.95
Addiction to social networks	58.20	20.18	1.00	0.05	0.69	0.98	0.98
Depression	26.88	8.20	2.27	4.6	0.53	0.96	0.95

According to the results, the average total body dissatisfaction was equal to 38.52, addiction to social networks was equal to 58.20, and depression was equal to 26.88. The validity of the questionnaire was evaluated with the confirmatory factor analysis technique, and the criterion of factor loading of 0.40 was included for the questions of the questionnaires, and the questions that had a factor loading of less than 0.40 were excluded from the analysis. Convergent validity was evaluated with the average variance extracted index (AVE), which was higher than 0.50 for all variables, confirming the scales' convergent validity. The reliability of the measurement tools was checked with combined reliability tests and Cronbach's alpha, and since all the obtained values were greater than 0.70, the reliability of the measurement tools was confirmed. Table 2 shows the results of

Spearman's correlation test. Also, divergent validity was evaluated by the Fornell and Larcker method based on Table 2.

Table 2: Spearman's correlation test between research variables and divergent validity

Variables	1	2	3	4	5	6	7	٨	٩
1. Dissatisfaction and embarrassment with appearance	0.92								
2. Interference in social functioning	0.92**	0.88							
3. Body dissatisfaction	0.98**	0.97**	0.81						
4. Individual performance	0.22**	0.20**	0.21**	0.82					
5. Time management	0.32**	0.33**	0.32**	0.71**	0.84				
6. Self-control	0.29**	0.29**	0.29**	0.71**	0.68**	0.77			
7. Social Relations	0.30**	0.33**	0.32**	0.66**	0.70**	00.61**	0.81		
8. Addiction to social networks	0.26**	0.26**	00.26**	0.92**	0.72**	0.74**	0.73**	0.78	
9. Depression	0.29**	0.25**	0.28**	0.18**	0.22**	0.14**	0.15**	0.18	0.73

Note: $p \leq 0.05$=* and p tto**

The results of the Spearman correlation test (Table 2) showed a significant relationship between body dissatisfaction and depression, which was positive, and the intensity of the relationship was equal to 0.28 ($p<0.05$). A positive relationship was observed between body dissatisfaction and addiction to social networks, and the intensity of the relationship was equal to 0.26. Moreover, a significant relationship was observed between addiction to social networks and depression; and the direction of the relationship was positive, and the intensity of the relationship was equal to 0.18. According to the findings, a positive relationship was observed between both components of body dissatisfaction and all four components of addiction to social networks with depression ($p<0.05$).

Examining the intensity of correlation between independent and mediating variables (body dissatisfaction and addiction to social networks) showed that the intensity of correlation between two variables was equal to 0.26, which was less than 0.70. which showed that there was no strong correlation and problematization between the variables affecting depression, and the hypothesis of non-multicollinearity was maintained.

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Research Model Test

The conceptual model of the research was tested using the structural equation modeling technique (SEM) in SmartPLS software. Figure 1 is the experimental model in the case of standardized coefficients.
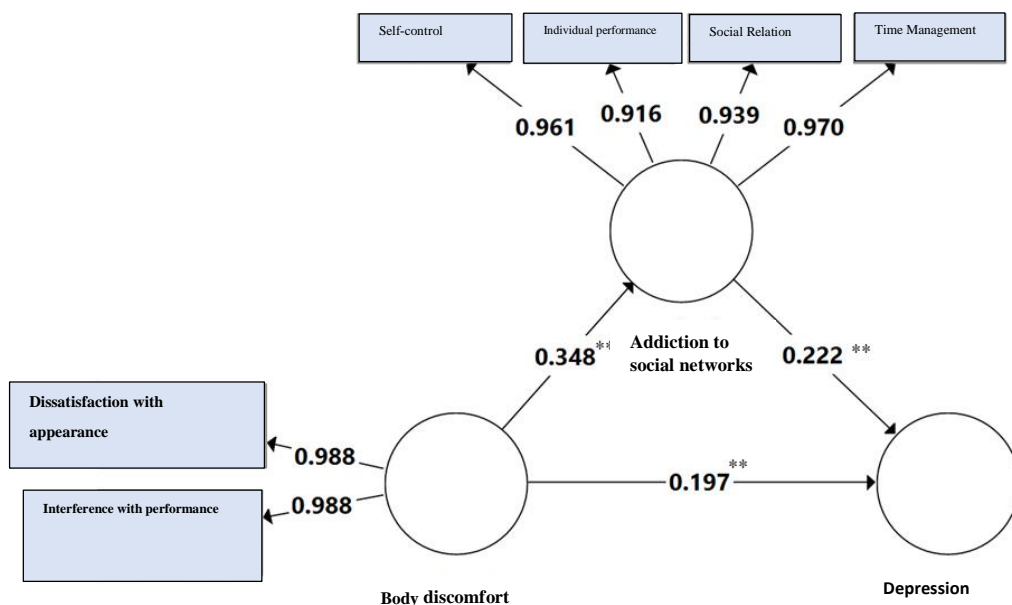

Figure 1- Experimental model in the case of standard path coefficients and significance level

Figure 1 is the model in standard mode. The significance of the main relationships is marked with an asterisk, and two stars mean confirming the relationship at the 99% confidence level (p<0.01). The results show that all three main relationships were confirmed in the model, and the strongest relationship was related to the effect of body dissatisfaction on addiction to social networks with a coefficient of 0.348.

The model's fit was checked using the coefficient of determination index (R2) and an overall index of fit (GOF). Chin (1988) describes the determination coefficient values of 0.67, 0.33, and 0.19 in the PLS path model as significant, moderate, and weak, respectively (Davari & Rezazadeh, 2012). If the overall fit index is greater than 0.36, it means that the research model has a good fit (Tenhaus et al., 2004). The findings showed

that the coefficient of determination obtained for the dependent variable of depression was equal to 0.12, which showed that the predictor variables of the model could predict 12% of the variance of depression. The value of the GOF index, which measures the model's overall fit, was found to be 0.24 for the research model, which is an average value. In general, the research model had an average fit. Table 3 shows the results of the direct relationship test of the model.

Table 3: Test results of structural relationships in the model (direct effects)

Relation	Standard Coefficient	standard error	T value	P value
Body dissatisfaction -> addiction to social networks	0.343	0.061	5.70	<0.001
Body dissatisfaction -> depression	0.197	0.071	2.77	0.006
Addiction to social networks -> depression	0.222	0.075	2.98	0.003

The results of direct effects showed that the direct effect of body dissatisfaction and addiction to social networks on the dependent variable of depression was confirmed (p<0.05). The direction of the effect of body dissatisfaction and addiction to social networks on depression was positive. Moreover, the effect of body dissatisfaction on addiction to social networks was confirmed, and the direction of the positive relationship and the intensity of the effect was equal to 0.348. Table 4 shows the results of the mediation role test. The mediator role was analyzed using the bootstrap method (standard error estimation).

Table 4: The results of the mediation test of addiction to social networks using the bootstrap method

Type of relationship	Indirect effect	Standard error	T value	P value
Body dissatisfaction --> addiction to social networks --> depression	0.077	0.029	2.63	0.009

According to Table 4, the mediating role of social network addiction in the relationship between body dissatisfaction and depression was confirmed (p<0.05). The VAF statistic was used to determine the intensity of the mediation effect. This statistic has a value between 0 and 1, and the closer it is to 1, the stronger the effect of the mediating variable (Davari & Rezadeh, 2013). The findings showed that the VAF statistic in the relationship between body dissatisfaction and depression was equal to 0.28, which showed that 28% of the total effect of body dissatisfaction on depression was indirectly through the mediating variable of addiction to social networks, which showed that the

type of mediation was partial. The effect of dissatisfaction on depression was both direct and indirect.

Discussion

This research was conducted to model depression based on body dissatisfaction with the mediating role of addiction to social networks in Gilan University students. The result of this research showed that body dissatisfaction has a positive effect on depression; in other words, with the increase of body dissatisfaction, depression in students increases. The present result is in line with the studies of Bornioli et al. (2021) and Barnes et al. (2020). In explaining this hypothesis, it can be said that with the change of society's norms, fashionism, and also paying too much attention to thinness, mental preoccupation with the body has increased, and when people are not able to solve it and become more immersed in this issue over time, they will not be able to continue their lives as normal, and their moods may be affected by this flow and their daily activities may be disrupted. However, this constant preoccupation and worry causes symptoms of mental illnesses such as depression (Totunchi et al., 2012). Therefore, another result of the research showed that addiction to virtual networks has a direct effect on body dissatisfaction. In other words, with the increase in the use of virtual and social networks, body dissatisfaction increases. The present study's results align with the studies of Tamarit et al. (2021) and Hugo and Mills (2011). These studies believe that with the increase in the use of social networks, the fear of body image also increases. In explaining these results, it can be said that nowadays, people who use social networks share their best pictures, and other people compare these pictures with their own. A study by Cohen et al. (2017) found that concern about body image has a positive and meaningful relationship with publishing and viewing images on Instagram and Facebook. Moreover, Ku and Yen (2012) found in another study that activities related to publishing and viewing images on Facebook have a positive and significant relationship with fear of body image. Considering that most social networks like Instagram have defined sections for commenting and liking the images shared by people, The feedback that a person receives from others about his uploaded images affects the perception of his body image negatively or positively. Hummel and Smith's (2014) study showed that negative feedback from Facebook users increased their concerns about body image. Moreover, comparing your body image with others is one of the factors that can lead to fear and dissatisfaction with body image. The results of several studies have confirmed the relationship between body image comparisons in social networks and body image concerns (Holland & Tighman, 2016).

Another result of this research showed that addiction to social networks has a direct effect on depression. In other words, increasing the use of social networks causes depression in students. The results of the present study are consistent with the studies of Samyasa et al., quoted by Hossein and Griffith (2019) and Carli (2014). The current result of addictive behavior may deprive people of an enjoyable social life and increase negligence in their

personal lives (Karli, 2015). In general, people are trying to feel good. However, some people resort to excessive use of virtual networks as a shortcut to get such feelings (Vikel, 2015). As the present study showed, with the increase in the use of virtual networks, depression increases. Addiction to social and virtual networks can lead to many mental and psychological problems by creating a state of comparison between people; that is, a person does not consider their individual differences and social status. However, it cannot be concluded with certainty that social media addiction is a secondary disorder arising from a primary disorder such as depression because other authors argue that addiction to social networks is a specific disorder. Thus, although co-occurring with other psychiatric disorders, it is a distinct disorder in its own right (Montag et al., 2015).

Conclusion

Finally, the result showed that body dissatisfaction has a direct effect on depression with the mediation of addiction to social networks. In other words, with the increase in body dissatisfaction, depression in students increases, and students try to spend more of their time in cyberspace. With this description, it seems that due to the expansion of the use of virtual networks, especially among students, the bed for its addiction has also been provided. This can cause body dissatisfaction, which can lead to depression after such a problem. limitations of this study include: Sample size: Due to constraints on time and resources, the sample size of the study may be limited, which can affect the generalizability of the findings., Data collection methods: The limitations of the data collection methods used in the study, such as self-report surveys or interviews, may introduce bias or inaccuracies in the results., Time constraints: The timeframe of the study may be limited, preventing researchers from conducting a more in-depth analysis or collecting longitudinal data., Access to participants: Difficulty in accessing certain populations or individuals may limit the diversity of the sample and affect the representativeness of the findings. Considering that the general perspective of the research is quantitative and taking into account the previous perspectives to complete the previous research, the work done is a general and comparative one, and the findings of the research have been interpreted in the framework of the previous findings, and it has helped to expand the previous findings. Finally, considering the limitations of the research due to the specificity of the statistical population, generalization of the results should be done with caution. Therefore, it is suggested that this research be conducted on other social groups as well so that the power of generalization of the results can be increased.

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