

## Assessing the Predictors of Intention and Behavior in Using Virtual Social Networks Among Students of the Yazd University of Medical Sciences Based on the Theory of Planned Behavior

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### ABSTRACT

**Introduction:** There has been a recent spike in the use of virtual social networks. However, only a few studies have explored factors that influence the use of social networks by using theories of health education among students. The present study aims to determine the predictive factors of virtual social networks among students of the Yazd University of Medical Sciences based on the constructs of the theory of planned behavior.

**Methods:** In 2016 this cross-sectional study was conducted on 300 students who were selected by the stratified random sampling method. Data was collected from a questionnaire based on the constructs of the theory of planned behavior including attitudes, subjective norms, perceived behavioral control, and behavioral intentions and behaviors. The data collected was then analyzed via the SPSS V.16 software using descriptive statistics, Pearson product-moment correlation test, one-way analysis of variance, and regression.

**Results:** The mean age of the students was  $22.28 \pm 3.69$  years. The results also suggested that 98.3% of them were using virtual social networks. Moreover, the findings of the regression analysis indicated that attitudes, subjective norms, and perceived behavioral control were predictors of intention to use social networks, while attitudes had the highest predictive power for the intention to use social networks ( $\beta = 0.38$ ). Furthermore, the results of the regression analysis demonstrated that behavioral intention, attitudes, and subjective norms among the constructs of the theory of planned behavior could predict the behavior to use virtual space.

**Conclusion:** The use of virtual social networks by university students displayed a rising trend. Measures ought to be taken to create a right attitude about the extent and efficient use of virtual networks to ensure that they do not interfere with the students' educational activities and real relationships.

**Keywords:** Virtual social networks, university students, theory of planned Behavior

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## Introduction

The Internet-based social networks have drawn a lot of attention to themselves these days because they have quickly gained global popularity <sup>(1)</sup>. Such networks are databases that provide their users with facilities to share their favorites, thoughts, and activities with others and receive the same thoughts and activities from them. Online social networks such as Facebook, Twitter, and MySpace have gained great popularity and have become an integral part of everyday life <sup>(2)</sup>. In recent years, these networks have revolutionized communications <sup>(3)</sup>, information, and knowledge-sharing <sup>(4)</sup>. Such networks have especially attracted the attention of younger generations including university students <sup>(5)</sup>. Adolescents in Iran enroll themselves higher education courses often away from their home and families, and they are admitted to universities they clear the university entrance exam after high school—this is a critical period of their growth <sup>(6)</sup>. Therefore, the impact of such networks can be detected during university years <sup>(7)</sup>. For example, a study in the UK showed that more than 95% of undergraduate students regularly use virtual social networks <sup>(8)</sup>. Moreover, the results of another investigation revealed that current social networks could be considered as an integral part of the lives of many university students who spend a substantial portion of their time on such networks. It was concluded that the use of these networks by these students is only for entertainment purposes and the role of social networks in educational activities is rather negligible <sup>(9)</sup>. The use of the Internet causes many problems such as frustration, loneliness, anxiety, and a general deterioration of mental health <sup>(10)</sup>. Just like other technologies, the Internet causes physical laziness, promotes inactivity, and reduces attempts to communicate with others in the real world, thus leading to social seclusion <sup>(11)</sup>. In this regard, it is argued that virtual relationships in social networks can gradually fade face-to-face relationships among individuals—this can lead to social isolation and lack of socialization <sup>(12)</sup>. Virtual environments can decrease human relationships with the outside world by providing

newer information and weakening the role of humans in society. The addiction to use of online social networks has become a challenge for families around the world <sup>(13)</sup>. Therefore, the increasing use of social networks among users requires an examination of their individual and social behaviors <sup>(14)</sup>. By checking a personal page, the study updates various habits of social networking such as checking one's own and friends' pages as well as writing comments below others' photos and videos; these habits influence the focus of people on their own lives or occupational activities in a short term <sup>(15)</sup>. The results of other studies have also shown that the level of self-esteem in addicted online users was significantly lower than those who do not use the Internet or make use of it at a normal level <sup>(16)</sup>. A major problem in today's world of information is also related to personal data. In this respect, a large amount of information is collected by public agencies, search engines, social networking systems, financial institutions, and other organizations and then stored in their databases. Although such information is vital to many people, they may be misused in the virtual space. Problems like theft, fraud, and defamation of character in the real world can also be observed in the virtual environment <sup>(17)</sup>.

To understand factors influencing behavior, it is necessary to employ models and theories of behavioral sciences. In this respect, theoretical models are considered as a guide to understand and perceive behaviors and to represent the social, biological, cognitive, behavioral, psychological, and environmental determinants of health-related behaviors <sup>(18)</sup>. The theory of planned behavior (TPB) is one of the important theories proposed in terms of the use of virtual social networks <sup>(19)</sup>. This theory assumes an individual as a reasonable actor in such a way that a person processes information before showing a behavior. During this process, an individual's basic ideas and his/ her behavior may entail changes <sup>(20)</sup>. According to the TPB, the primary determinant of behavior is behavioral intention, which, by itself, is the outcome of

individual attitude to behavior, individual perception of surrounding social norms and those within the living environment, and eventually individual perception of the degree of control to show or not to show a behavior. The contribution of each of these factors in predicting behavior is not constant and varies according to the types of behaviors and study populations examined<sup>(21)</sup>. It should be noted that the predictive power of the given theory has been confirmed by numerous studies in the field of behavioral change and thus it is recognized as one of the most important theories associated with online networks<sup>(22)</sup>. In this regard, research studies conducted in Iran have mostly examined the relationship between online social networks and the crisis of identity and lifestyles among young adults<sup>(23, 24)</sup>. To our knowledge, no studies have been carried out so far on the predictors of the use of virtual social networks based on existing theories in behavioral sciences; in fact, only a handful of investigations across the world have assessed the predictors of using virtual social networks based on the constructs of the TPB<sup>(22, 25)</sup>. Therefore, owing to the lack of resources to pinpoint the determinants of the level of the use of virtual social networks among university students, the present study investigated the use trend among students enrolled in the Yazd Shahid Sadoughi University of Medical Sciences as well as its predictors based on the constructs of the TPB.

## Methods

This cross-sectional study was conducted on 300 students enrolled in the Yazd Shahid Sadoughi University of Medical Sciences in 2016. Before conducting the study, a permit was obtained from the university to distribute and complete the questionnaires. Next, the students were assured of confidentiality of information. The sample size was determined using the same study<sup>(25)</sup> and considering  $SD = 1.23$ ,  $\alpha = 0.05$ , and  $d$  (amount of error) = 0.14. Finally, it was determined to be equal to 300 students. The inclusion criteria were being a student in the Yazd Shahid Sadoughi University of Medical Sciences and signing consent forms to participate in the study. The

exclusion criteria included the unwillingness to participate in the study and incomplete filling up of questionnaires. The stratified random sampling method was also used in this study. The data collection instrument was a researcher-designed questionnaire. The given questionnaire consisted of three parts: the first part was associated with demographic characteristics such as age, gender, field of study, level of education, father's occupation, mother's occupation, father's level of education, mother's level of education (eight items); the second part was related to the use of virtual social networks including the name of social networks and membership, duration of using virtual networks (in terms of months and years), and daily levels of using these networks (in hours) (four items); the third part of the questionnaire was about researcher-designed items on attitudes (12 items related to the following statement: the use of virtual social networks is useful for me), subjective norms (11 items related to the following statement: my friends think that I must use virtual social networks), perceived behavioral control (three items related to the following statement: the use of virtual social networks is entirely in my control), and behavioral intention (three items related to the following statement: I will continue the use of virtual social networks in the future; one item associated with the behavior related to the following question: how many times do you use virtual social networks in a week?). To determine the content validity of the questionnaire, it was submitted to 10 experts and scholars in the field of health education and sociology. After this, its content validity index (CVI) and content validity ratio (CVR) were measured to be 0.82 and 0.86 respectively. The reliability of the questionnaire using Cronbach's coefficient alpha for each part was separately determined: attitudes ( $\alpha = 0.94$ ), subjective norms ( $\alpha = 0.71$ ), perceived behavioral control ( $\alpha = 0.75$ ), and behavioral intention ( $\alpha = 0.70$ ). In this respect, the items of attitudes, perceived behavioral control, behavioral intention, and the first four items of subjective norms were measured through a five-point Likert-type scale including completely agree (5 points), agree

(4 points), neutral (3 points), disagree (2 points), and completely disagree (1 point). The other seven items were related to subjective norms and measured by a five-point Likert-type scale including never (1 point), a little (2 points), neutral (3 points), a lot (4 points), and very much (5 points). In this respect, the items associated with behavior in using virtual social networks during the week were measured based on a four-point Likert-type scale comprising never (1 point), sometimes (2 points), often (3 points), and always (4 points). After collecting and entering the given data into the SPSS V.16 software, descriptive statistical methods (mean and standard deviation) and inferential statistical methods such as analysis of variance (ANOVA), independent t-test, Pearson product-moment correlation coefficient, and regression tests were used for data analysis.

## Results

The mean age of the university students was  $22.28 \pm 3.69$  years with the age range of 18–49 years. In this respect, 64.3% of the university students were female and 35.7% male. In terms of their education, the students were categorized into three academic levels (bachelor's, master's, PhD and professional doctorate) in which the highest value in terms of frequency distribution was related to professional doctorate (49%). The most frequent level of parental education was university degree. The most frequent occupational status among mothers was housekeeping. Furthermore, 98.3% of these university students were using social networks. The most frequent uses of social networks were associated with applications such as Telegram (50%), WhatsApp (23%), and Instagram (21%) respectively. The results show that 50% of the students were using social networks for two to three hours a day, and 14% of them were using such networks more than four hours a day. The mean, standard deviation, and scores range of the planned behavior theory construct is demonstrated in Table 1.

The findings of the one-way ANOVA for attitudes, subjective norms, behavioral intention, and behavior among university students in different schools also revealed a significant difference. According to the results of Tukey's multiple comparison test, the differences in the attitudes were related to students of the paramedics and health ( $p = 0.03$ ) in terms of subjective norms. Such differences were observed in terms of behavioral intentions among health and medical students ( $p = 0.004$ ), behavior in students of nursing and dentistry ( $p = 0.04$ ), and nursing and pharmaceuticals ( $p = 0.04$ ).

In this respect, subjective norms and behavioral intentions relating to the use of social networks among students of different levels of education were also significantly different. According to Tukey's test, the mean scores of subjective norms among master's students ( $28.97 \pm 7.10$ ) and PhD students ( $32.90 \pm 5.94$ ) and the mean scores for behavioral intentions among master's students ( $10.64 \pm 1.94$ ) were significantly different from the mean scores obtained by PhD and professional doctorate students ( $11.72 \pm 2.48$ ) ( $p = 0.02$ ). Furthermore, the behavior in using social networks among students of different levels of education were significantly different ( $p = 0.04$ ). According to Tukey's multiple comparison test, such a difference was associated with bachelor's degree students ( $3.67 \pm 0.66$ ) and PhD and professional doctorate students ( $3.83 \pm 0.40$ ), respectively. In this regard, Table 2 illustrated the results of the one-way ANOVA for the constructs of the model based on levels of education. A significant model was obtained in terms of the regression analysis to predict the intention and behavior relating to the use of social networks based on the constructs of the TPB via the enter method. This model could justify 33% and 6% of the variance of intention and behavior respectively. Tables 3 and 4 provide information about the predictors of behavioral intention and behavior in the model.

**Table 1.** Means, standard deviation and score range of theory of planned behavior constructs in students

Constructs	Means	SD	Range of scores
Attitudes	45.23	6.45	5-60
Subjective norms	31.80	6.30	11-55
Perceived behavioral control	11.34	2.30	3-15
intention	11.37	2.39	3-15

**Table 2.** Results of one-way ANOVA for the constructs of the model based on levels of education

	bachelor's degree		master's degree		PhD and professional doctorate		F	P
	mean	standard deviation	mean	standard deviation	mean	standard deviation		
Attitudes	44.72	6.25	43.55	6.74	46.02	6.47	2.65	0.07
Subjective norms	31.22	6.22	28.97	7.10	32.90	5.9	6.40	0.002
Perceived behavioral control	11.23	2.18	11.79	2.05	11.33	2.45	0.81	0.44
Intention	11.13	2.38	1.64	1.94	11.72	2.48	3.58	0.02
Behavior	3.67	0.66	3.79	0.41	3.83	0.40	3.13	0.04

**Table 3.** Standardized and non-standardized regression coefficients for the variables entered into the behavioral intention model

	B	SEB	$\beta$	P
Constant coefficient	-0.49	0.97		0.60
Attitudes	0.14	0.01	0.38	0.000
Subjective norms	0.07	0.01	0.19	0.000
Perceived behavioral control	0.29	0.05	0.28	0.000

**Table 4.** Standardized and non-standardized regression coefficients for the variables entered into the behavior model

	B	SEB	$\beta$	P
Constant coefficient	2.81	0.25		0.00
Attitudes	0.19	0.005	0.237	0.00
Subjective norms	0.010	0.005	0.12	0.036
Perceived behavioral control	0.009	0.013	0.042	0.475

## Discussion

The results of this study revealed that 98.3% of the university students were using virtual social networks at high levels. In this respect, the study by Khodayari et al. <sup>(26)</sup> on students enrolled in the Islamic Azad University of Mashhad showed such a level of use among to 55.3% students. Moreover, the results of a study by Mojaradi et al. <sup>(27)</sup>, which was conducted among university students of North Khorasan, revealed a 54% level of use of these networks that were almost in line with the findings of the present study. The most important point was

associated with the level of using these networks in which the results of the present study indicated that most university students (60%) were using virtual networks for two to three hours per day, which was consistent with the results of the study by Mojaradi et al. where 70% of university students were using virtual social networks for more than an hour a day. Furthermore, the results of the present study were consistent with the study of Soltani that reported daily three to five hours Internet use by the majority of students <sup>(28)</sup>. Given that these students used such networks for exchange of

scientific issues and improvement of their educational levels less than other purposes, this amount of use could bring about disorders in other tasks of university students such as acquisition of knowledge and other useful activities including sports, cultural activities, and social face-to-face interactions <sup>(29, 30)</sup>. Thus, it was made clear that these networks could play an important role in the daily lives of students. Checking the scores assigned to the construct of behavioral intention in the given model also suggested that the highest score was associated with the construct of attitudes (45.23) and the lowest score was related to the construct of behavioral control—this indicates that the attitudes of students toward the use of virtual networks were at a high level. According to the results, the mean scores of students' attitudes were correlated with variables like gender and levels of education in such a way that male students and also those with postgraduate degrees had more positive attitudes relating to the use of social networks. Regarding the effect of gender on attitude and behavior intention, the results of the present study were consistent with the studies of Plomp and Reinen <sup>(31)</sup> and Aliabadi and Moshtagh larghani <sup>(32)</sup>. However, the results were inconsistent with the results of the study of Yang. From here, it can be concluded that females had more positive attitude relating to the use of the Internet and virtual space due to differences in the cultural context and the point that female students felt more negative in terms of entering virtual networks in the present study <sup>(33)</sup>.

The results of the present study showed that the constructs of the model could predict behavioral intention at a moderate level so that such constructs could explain 33% of the variance for the intention to use virtual networks. Among the constructs of the model, attitudes had the highest predictive power for the intention to use virtual networks. Overall, previous studies have indicated a positive correlation between the attitudes and behavior intention of users. For example, in the theory of reason action, behavior is influenced by behavior intention. In fact, the attitude of the user is defined as the feeling of the user about a

particular behavior and this assessment is guided by the belief of the user <sup>(34)</sup>. In other words, the attitude of people is used to predict their behavior <sup>(35)</sup>. The results of the present study also indicated that behavioral intention and the constructs of the model, with the exception of perceived behavioral control, could predict the behavioral intention to use the virtual space. However, the amount of their predictive power for behavior was low in such a way that they could only predict 6% of the variance for behavior. The results of the present study about the impact of the construct of perceived control on behavior were in line with the findings obtained by Hamilton and White <sup>(36)</sup>. In this respect, it was assumed that the perceived power of behavior like individuals' involvement in social networks did not match the real power of such people in the use of virtual space and individuals may deal with obstacles in practice which can make a trouble in terms of the implementation of behavior. Overall, the results of this study suggested that attitudes, subjective norms, and perceived behavioral control were considered as significant predictors of the use of virtual social networks in such a way that students with more favorable attitudes toward the use of such networks and individuals who felt more pressure from others to use these networks and also had more control over the use of social networks were endowed with higher levels of intention to use these networks. Given the high level of use of the virtual networks, planning and intervention to manage the use of these networks are of utmost importance.

## Conclusion

Given the results of this study, attitude is one of the most important predictors of intention to get involved in social networks and there is a need to take measures to create the right attitudes about the extent and efficient use of virtual networks so that they do not interfere with the educational activities and real relationships of university students. Meanwhile, identifying key individuals influencing the behavior of this group of people in society can be one of the steps taken toward building optimal

subjective norms for the use of virtual networks with a correct behavior. Therefore, developing interventions based on the behavioral intention model can be considered as the first step to optimize this behavior. Considering the lack of proper culture-building and high use of social networks among university students, the Ministry of Youth Affairs and Sports and cultural centers at universities were suggested to implement educational activities for university students and to establish their familiarity with important people in their lives such as family members and friends in order to prevent damage by such networks. Furthermore, this study revealed that other factors could play a role in the occurrence of such behaviors in using virtual space. These factors can be identified and integrated with the TPB to reduce the improper use of such social networks and addiction to these networks.

#### Limitations and Further Research

This study, like other quantitative investigations, has some limitations and problems such as insufficient time and inaccurate attention in terms of completing questionnaires by university students. The study was also conducted on students

of the Yazd Shahid Sadoughi University of Medical Sciences and hence the findings could not be generalized to other universities. Therefore, it was recommended to do complementary studies within public and private universities and then compare their results. Moreover, the present study was conducted on the basis of the TPB. Future studies must employ other models and theories of behavioral sciences to analyze and compare the results. This study was only conducted on university students and therefore it is suggested to conduct further research on the use of such networks among other target groups such as school students.

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#### Conflict of Interest

No conflict of interest reported by authors

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