

# Research Paper: Designing and Determining the Psychometrics Properties of a Scale Consequences of Virtual So- cial Networks in Users



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## ABSTRACT

**Background & Aims of the Study:** Virtual Social Networks (VSNs), as a major communication tool, affect different aspects of life in society members. Due to the lack of an appropriate questionnaire to assess the consequences of using these VSNs, this study aimed to design and determine the psychometric properties of a questionnaire using consequences of VSNs in users.

**Materials and Methods:** This methodological research was conducted on 320 active users of VSNs in Qom Province, Iran, in 2018. Based on the purposeful literature review, 97 items related to various consequences of using VSNs were prepared. By assessing the face and content validity of the questionnaire, using the opinion of an 8-member expert panel, the items were quantitatively and qualitatively reviewed and reduced to 32 items. Furthermore, the reliability of the questionnaire was determined by examining the internal correlation of items by calculating the Cronbach's alpha coefficient and the validity of the questionnaire was examined by a test-retest method using SPSS v. 20. Finally, to evaluate the tool's structural validity, exploratory factor analysis was performed using LISREL 10.3.

**Results:** After determining the validity and reliability, a 7-factor questionnaire with 22 items was obtained. The content validity ratio and index values of all items were obtained to be more than 0.75 and 0.79, respectively. In the assessment of structural validity, the factor load values of all items, i.e., appropriate values, were measured to be more than 0.5. The reliability of the questionnaire was confirmed by Cronbach's alpha coefficient to range between 0.65 and 0.85 and a correlation coefficient index of 0.66-0.87.

**Conclusion:** The present study data suggested that the developed questionnaire, using consequences of VSNs, had proper validity and reliability and can be used in future studies.

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## 1. Introduction

Individuals' lives are characterized in a world surrounded by computer and internet communications. Network society has led to the penetration of comprehensiveness, complexity, and technological networking into various areas of life [1]. According to the Ministry of Communications and the International Telecommunication Union, the internet penetration rate in Iran has reached more than 46.9%, equivalent to 36.5 million subjects. Most internet users use virtual social networks; thus, these networks present major effects on Iranian public opinion [2, 3].

One of the possibilities of information and communication technology based on Web 2 tools in Virtual Social Networks (VSNs). By definition, social media has been introduced as internet networks that quickly and easily provide an online connection for users to interact [1]. The concept of internet social networks was first introduced in 1960 at the University of Illinois at Urbana-Champaign. Since then, numerous similar websites have been created worldwide; they have been so popular among users that are considered among the most important and effective communication tools [4-6].

Among these virtual social networks, Facebook, with the highest number of users, followed by YouTube and Instagram, are the most popular social networks globally [7]. However, in a study conducted in Iran, Telegram with 88.6%, Instagram (63.8%), WhatsApp (38.6%), and YouTube (13.6%) were among the social networks most applied in the country. Besides, Soroush with 12.4%, was among the most popular VSNs [8].

VSNs, with their unique features, can meet the wide range of needs of users; they include a set of tools to communicate with others and share content, such as social networking sites (e.g., Facebook & Twitter), sites to provide photo sharing (e.g., Flickr), and video sharing sites (e.g., YouTube & Vimeo). Social networks are unique, as facilitate two-way communication and allow subjects to personalize their content and interact with others [4, 5, 9, 10].

Numerous studies highlighted the positive and negative consequences of VSNs on various aspects of individuals' lives [11-13]. Among their adverse effects, we can mention the creation and increase of anxiety and stress in users [14]. However, VSNs also present favorable consequences and can be used for educational

purposes, maintaining current friendships, reviving old friendships, dating, self-expression, escaping loneliness and related problems, emotional discharge, happiness, entertainment, and fun, spending time, information, mobilization, and organization, social and political oversight, and so on [15, 16].

In several studies, various tools and questionnaires have been designed and psychoanalyzed with sometimes different goals for VSNs. Accordingly, they can be used as tools for measuring social network addiction in students [17-19]; tools for attitude towards using social networks and relationship with students' academic performance [20]; the psychometric evaluation of tools for the intensity of activity in social networks [21]; a tool for health education experts [9]; a questionnaire measuring the impact of social networking sites on students [22, 23]; a questionnaire on the psychosocial aspects of the Facebook social network [24], and so on.

However, given the growing use of these networks, especially Telegram and WhatsApp, and the greater focus of the literature on internet addiction and social networking, the design of questionnaires to specific target groups, such as youth and students, and the lack of appropriate questionnaires to assess the consequences due to the use of virtual social networks, it is necessary to design a valid and reliable questionnaire to measure these effects and consequences in users. Therefore, the present study aimed to design a questionnaire to assess the consequences of using VSNs on users and evaluate its validity and reliability.

## 2. Materials and Methods

This methodological study was conducted in 2018. The study population included all active users of VSNs living in Qom Province, Iran. In this study, researchers first designed an initial questionnaire. After designing the questionnaire, to evaluate the validity and reliability, face, content, and construct validity methods were used by Exploratory Factor Analysis (EFA). To determine the reliability, Cronbach's alpha coefficient and Intra-Class Correlation Coefficient (ICC) was used, as follows:

Initially, to design the items of the first draft of the questionnaire, an extensive review of sources and texts, and a review of experts' opinions were employed. Accordingly, a bank of questionnaire items related to the dimensions concerning the consequences of using VSNs was formed and similar items were merged or deleted. Finally, the remaining items were categorized into 138 items.

To determine the face validity of the questionnaire, the qualitative method was used. Therefore, the designed questions were provided to 8 specialists in health education, epidemiology, statistics, psychology, and sociology and familiar with the psychometrics of the questionnaire. They were requested to provide the necessary review and feedback concerning the appropriateness and relevancy of the phrases with the dimensions and structures of the questionnaire and the existence of words reflecting the desired concept. To evaluate face validity, the question was answered: "Is the tool properly designed to evaluate the intended purpose?" Finally, after sending and receiving the questionnaire twice and analyzing the views, a consensus was reached. Then, using the formula of the item effect method, face validity was calculated according to the following Equation:

$$(\text{Impact Score} = \text{Frequency (\%)} \times \text{Importance})$$

Frequency reflects the percentage of individuals who gave a score of 4 or 5, and what is meant by the importance of the average total score of subjects to importance based on the Likert-type scale. If the impact score exceeds 1.5, the item will be considered suitable for further analysis [25]; based on which, 97 items were extracted.

The Content Validity Ratio (CVR) was used to quantitatively evaluate the content validity of the tool. CVR was also applied to ensure that the main correct content was selected. Furthermore, the Content Validity Index (CVI) was used to ensure that the questionnaire questions were best designed to measure the content. To determine the CVR, experts were first requested to comment on each item of the questionnaire based on grammar criteria, the use of appropriate words, importance, necessity, and the proper placement of phrases. Individual items were examined using 3 spectrums, as follows: "the item is necessary", "the item is useful but not necessary", and "the item is not necessary". The responses were then calculated based on the following formula [26, 27]. Finally, the opinions and views of experts were applied to correct and improve the questionnaire items. According to the Lowshe table, items with a CVR of higher than 0.75 (based on the judgment of 8 experts) were significant ( $P < 0.05$ ) and retained [28].

$$\text{CVR} = \frac{(\text{Number of essential responses per item}) - (\text{Number of participants}/2)}{(\text{Number of participants}/2)}$$

The questionnaire was re-provided to the experts to calculate the CVI; they were requested to separately determine the relevance, clarity, and simplicity of each item of the questionnaire, based on the CVI of Waltz

and Bausell, on a Likert-type scale, ranging from 1 to 5 [29]. Thus, in this study, the CVI was calculated for each item by dividing the number of experts agreeing to rank 3 and 4 for each item by the total number of experts [30] (according to the following formula). In this method, items with a score higher than 0.79 are suitable, those between 0.70 and 0.79 need to be corrected, and items with a score less than 0.70 are unacceptable. Then, based on the mean CVI scores of all items of the questionnaire, the average CVI of the questionnaire was calculated. A score of 0.90 or higher is recommended for the average CVI (S-CVI/Ave) of the questionnaire [30]. Finally, the content validity of the questionnaire was established and the number of items was reduced from 97 to 32.

$$\text{CVI} = \frac{\text{Number of experts who rated the item 3 or 4}}{\text{Total number of experts}}$$

After applying the necessary changes, to determine the validity of the structure, EFA, using principal component analysis and varimax rotation was used to identify the main components and summarize and classify the data into correlated groups. The purpose of EFA is to reduce a series of data to be easily described and used, i.e., usually the case with questionnaires [31]. In this study, the following assumptions were also observed before performing factor analysis [32]:

1. Kaiser-Meyer-Olkin sampling adequacy index should be at least 0.6.
2. The result of Bartlett's Sphericity test is statistically significant.
3. The factor load of each question in the factor matrix and the rotating matrix is at least 0.3 and it is better to be higher than that.
4. Each of the factors belongs to more than one question.
5. The factors have sufficient credibility.

For factor analysis, the recommended sample size equals 5-10 subjects per item of the questionnaire. Some experts consider even 3 samples per item of the questionnaire to be sufficient if the percentage of variance expressed is more than 0.80 [33]. In this study, 10 samples were considered for each of the 32 items of the questionnaire. Finally, 320 samples were selected using the multistage sampling method. For this purpose, among the postal areas of Qom Province (as a cluster), some public places, such as healthcare centers, offices, mosques, shrines, and parks were randomly selected, and

according to the sample size, questionnaires from eligible individuals who referred to these places was completed.

This questionnaire was collected from 320 active users of eligible VSNs (individuals aged  $\geq 18$  years [34], who have used VSNs for at least 6 months and keep using them during the study). Subjects that gave incomplete answers to the questionnaire were excluded from the study and replaced with other samples.

Eventually, after analyzing the construct validity of the questionnaire, 7 factors, and 22 items were obtained; according to their content, they were named as physical, psychological, cultural, social, identification and belonging, general, and political, with a range of Likert-type options (completely agree, agree, no opinion, disagree, & strongly disagree), rated from one to 5. A 5-point Likert-type scale falls in the form of “strongly disagree” (1 point), “disagree” (2 points), “have no opinion” (3 points), “agree” (4 points), and “strongly agree” (5 points).

In the present study, to determine the reliability of the questionnaire, internal consistency methods, by Cronbach’s alpha coefficient and external stability using test-retest were used. Cronbach’s alpha coefficient of 0.70 or higher also indicates an acceptable level of reliability [30]. To determine the reliability of the questionnaire using test-retest, considering  $r=0.50$  (the estimation of correlation between before and two weeks after the questionnaire questions) was calculated using the formula below: 38 subjects, which according to the probability of samples dropout, 40 individuals were chosen. For this purpose, Cronbach’s alpha coefficient was calculated to measure the internal consistency of the questionnaire. To assess the stability of the test-retest data, the questionnaire was completed by 40 individuals in the target group in two stages with a two-week interval. Then, for the scores obtained in these two stages, the Intra-Class Coefficient (ICC) was calculated. If the ICC is higher than 0.80, the degree of internal stability is desirable [35].

$$n = \left[ \frac{za/2 + z1 - \beta}{0.5 \ln\left(\frac{1+r}{1-r}\right)} \right]^2 + 3 \quad r=0.5 \quad a=0.05$$

To observe ethical considerations, individuals voluntarily entered the study with complete knowledge of the objectives of the study. Furthermore, the questionnaires were completed without the need to enter personal details. This study was also reviewed and approved by the Ethics Committee of Qom University of Medical Sciences. In the present study, after reviewing the raw data, the obtained data were analyzed using SPSS v. 20 and

LISREL 10.3. To determine the content validity of CVI and CVR, to determine the construct validity of EFA, to determine the reliability of internal consistency, Cronbach’s alpha coefficient was used for each factor and the whole questionnaire. Moreover, to determine the test-retest reliability, the ICC test was used.

### 3. Results

The Mean $\pm$ SD age of the users was 28 $\pm$ 9.08 years. In terms of gender, 192(60%) and 128(40%) subjects were female and male, in sequence. Furthermore, 153(47.8%) individuals were single, 164(51.3%) were married, and 3(0.9%) samples were divorced. Additionally, the majority of users (216; 67.5%) had a university degree, 81(25.4%) subjects had a diploma, 19(5.9%) had secondary school education, and 4(1.2%) had primary education. Concerning internet familiarity, 138(43.2%) individuals reported high familiarity, 153(47.8%) identified moderate level, 26(8.1%) participants reported low, and 3(0.9%) individuals were without internet knowledge. The Mean $\pm$ SD daily internet use was measured as 3.5 $\pm$ 1.8 hours in the study participants.

After calculating the score of effect index, 41 items presented a score lower than 1.5, i.e., removed and the number of items was reduced from 138 to 97. Additionally, the CVR and CVI of the items were calculated per the opinion of 8 experts. Subsequently, the CVR results indicated that according to the Lowshe table, the items with a CVR less than the values provided for 8 subjects (0.75) were excluded. Thus, from 97 items, 60 were removed and the number of items was reduced to 37. Moreover, the results of CVI revealed that 5 items had CVI values lower than 0.79, i.e., removed and the remaining items were kept; at this stage, the number of items was reduced from 37 to 32.

The results of EFA with varimax rotation suggested that the calculated sample adequacy value (KMO) was equal to 0.785. Additionally, Bartlett’s test for Sphericity was significant at 0.001. At this stage, 10 items whose variance explained by each factor was less than 0.5 were removed. Finally, the number of variables was classified into 7 factors and 22 items according to. Out of these 22 items, 4 concerned the physical dimension, 3 items were related to the psychological dimension, 4 items respected the social dimension, 3 items addressed the cultural dimension, 3 items were related to the general dimension, 2 items concerned the identity and belonging dimension, and 3 items respected the political dimension. Therefore, the range of achievable scores in the physical dimension (5-20), psychological dimension (5-15), social dimen-

**Table 1.** The eigenvalue and corresponding variance of extraction factors without and with rotation

Number	Factors	before Varimax Rotation			After Varimax Rotation		
		Eigenvalue	Variance (%)	Cumulative Variance (%)	Eigenvalue	Variance (%)	Cumulative Variance (%)
1	Physical dimension	4.252	19.329	19.329	2.757	12.532	12.532
2	Psychological dimension	1.741	7.913	43.429	2.448	11.128	35.613
3	Social dimension	3.561	16.187	35.516	2.630	11.953	24.485
4	Cultural dimension	1.651	7.503	50.932	2.218	10.081	45.694
5	General dimension	1.237	5.621	56.553	1.930	8.772	54.466
6	Dimensions of Identification and Belonging	1.113	5.057	61.610	1.321	6.004	60.471
7	Political dimension	1.031	4.687	66.297	1.282	5.826	66.297

sion (5-20), cultural dimension (5-15), general dimension (5-15), identity and belonging dimension (5-10) and the political dimension (5-15) were identified.

To achieve that the present questionnaire, i.e., saturated with several factors, the eigenvalues, the ratio of variance explained by each factor, the eigenvalues or sloping scheme, and the number of assumed factors were considered. Table 1 on the left of the first 3 columns presents a description of the eigenvalue and the corresponding variance of the factor and identifies the factors whose eigenvalues are greater than one and remain in the analysis, and the factors with eigenvalues less than one and the factors, i.e., explained only by an obvious variable were excluded from the analysis. These eigenvalues were non-rotating extraction factors that include the factor loads (factor scores) of each of the variables in the remaining 7 factors. To interpret factor loads without rotation, the factors are rotated to increase their interpretability. The 3 columns on the right represent the eigenvalues of the extraction factors with varimax rotation and the corresponding variance of the factor (Table 1).

Table 2 illustrates the number of factors extracted by the EFA method along with the observable variables and the factor load associated with each factor. The higher the absolute value of the coefficients of the observed variables, the greater the relevant factor in the total variance of the variable. Observational variables are called factors based on their correlation and Varimax rotation around 7 latent variables. Besides, all these dimensions explain the consequences of using VSNs on users. These 7 variable factors explained 66.297% of the variance; it

includes the highest share of the first factor with 19.32% and the lowest share of the seventh factor with 4.68%.

Furthermore, in the physical dimension, the highest factor load was related to the third item (G3) and the lowest factor load was related to the first item (G1). Psychologically, the highest factor load was related to the first item (R1) and the lowest factor load was related to the third item (R3). In the social dimension, the highest factor load was related to the second item (E2) and the lowest factor load was related to the third item (E3). In the cultural dimension, the highest factor load was related to the second item (F2) and the lowest factor load was related to the third item (F3). In the general dimension, the highest load was related to the second item (P2) and the lowest factor load was related to the first item (P1). In the dimension of identification and belonging, the highest factor load was related to the first item (H1) and the lowest factor load was related to the second item (H2). Finally, in the political dimension, the highest factor load was related to the first item (S1) and the lowest factor load was related to the third item (S3) (Table 2).

To determine the internal reliability of the questionnaire, Cronbach's alpha coefficient was used per dimension, ranging from 0.85 to 0.65 among 40 active users of VSNs and eligible for the research. Additionally, to determine the external reliability of the questionnaire, the test-retest method was used. The questionnaire was completed by 40 users of VSNs in two stages two weeks apart and the results indicated that the mentioned dimensions of the optimal correlation coefficient equaled 0.66-0.87 (Table 3).

**Table 2.** Consequences of using virtual social networks on users

Factors	Item Number	Contents	Factor Load	Subscriptions
Physical dimension	G1	Excessive use of virtual social networks has caused me to not have a good night's sleep.	0.608	0.520
	G2	I get a headache after using virtual social networks.	0.860	0.769
	G3	I burn my eyes after using virtual social networks.	0.844	0.761
	G4	After using VSNs, I get blurred vision.	0.828	0.727
Psychological dimension	R1	Using VSNs has made me depressed.	0.854	0.764
	R2	Using VSNs has made me anxious and stressed.	0.826	0.725
	R3	By joining VSNs, my self-confidence has decreased.	0.751	0.679
Social dimension	E1	In VSNs, it is possible to express ideas freely and get acquainted with the opinions and thoughts of others.	0.751	0.570
	E2	VSNs are media that provide equal opportunities for people to talk to each other.	0.761	0.673
	E3	Being in a VSN has strengthened my social relationships.	0.588	0.597
	E4	People have become much easier to communicate with each other through virtual social networks.	0.726	0.794
Cultural dimension	F1	Through VSNs, I become interested in the literature, poetry, and language of my nation.	0.808	0.781
	F2	I get to know my country's music through the use of VSNs.	0.852	0.693
	F3	By joining social networks, I will become more familiar with Iranian customs.	0.795	0.624
General dimension	P1	Life with VSNs is fascinating to me.	0.607	0.658
	P2	I feel emotionally supported by joining virtual groups.	0.726	0.550
	P3	By joining VSNs, people can easily express their emotions and feelings.	0.660	0.576
The dimension of identification and belonging	H1	Members of virtual social networks are satisfied with the feeling of belonging to the group and having a common interest and opinion.	0.839	0.726
	H2	In the space of VSNs, dating experience is possible in a style and context different from the real space.	0.588	0.576
Political dimension	S1	Using VSNs, I feel safe and secure in my country compared to other countries.	0.785	0.653
	S2	VSNs are needed to be aware of the country's political information and news.	0.764	0.632
	S3	Through the messages of VSNs, I have found a positive perception and view of the political situation in my country.	0.731	0.588

#### 4. Discussion

The current study designed and determined the psychometric properties of a questionnaire to assess the consequences of using VSNs on users. Designing and determining the psychometric properties of measuring instruments is a major challenge. This is because some designed instruments are used without validity and reliability establishment; the quality of a tool depends on its

validity and reliability [36]. In this study, face and content validity, construct validity (EFA), internal consistency (Cronbach's alpha coefficient), and questionnaire's reliability were confirmed by the test-retest approach. Since in each stage of this study, to validate the questionnaire, the opinions of experts were used; accordingly, the questionnaire provided good validity and reliability in a sample of Iranian users.

**Table 3.** Determining the reliability of the components of the questionnaire to measure the consequences of the use of VSNs on users

Numbers	Factors	Cronbach's Alpha Coefficient	ICC	P
1	Physical dimension	0.82	0.68	≤0.001
2	Psychological dimension	0.84	0.87	≤0.001
3	Social dimension	0.70	0.73	≤0.001
4	Cultural dimension	0.85	0.75	≤0.001
5	General dimension	0.65	0.71	≤0.001
6	Dimensions of identification and belonging	0.71	0.70	≤0.001
7	Political dimension	0.69	0.66	≤0.001

In the designing stage of the questionnaire, 138 items were set based on the review of texts. In the stage of determining face validity, items with an impact score less than 1.5 were removed and those with an impact score higher than 1.5 remained. Therefore, 41 items were removed and appropriate items (97 items) remained at this stage [37, 38]. Therefore, according to the sources of face validity, the questionnaire to measure the effects of using virtual social networks has good face validity.

In this study, to examine the content validity of the questionnaire, the CVR was used. Consequently, based on the judgment of 8 experts, items with a score less than 0.75 based on the table of Lowshe (60 items) were removed. Therefore, at this stage, more appropriate items remained [28]. Furthermore, the calculation of the CVI removed 5 items with a value of less than 0.79. Therefore, the remaining items were considered appropriate for the questionnaire [39]. As a result, the designed questionnaire had good content validity. Hejazi et al. [20] also used the content validity method in their research.

To evaluate the construct validity of the questionnaire, initially, factor analysis was performed on the remaining 32 items. The results of KMO measurement and Bartlett's test for Sphericity indicated its suitability. The results of the eigenvalue also indicated that the questionnaire was multifactorial (i.e., 7 factors). The minimum factor load required to include an item in a factor depends on the number of questionnaire expressions and considered eigenvalue [33]. Thus, the cut-off point of 0.5 is considered as the minimum factor load required by each item to maintain it. Then, based on which of the 7 factors had the highest factor load on each factor, it was considered as the item related to that factor.

Considering that the minimum factor load of some items of the questionnaire was higher than 0.5, 10 items were removed and the rest were retained. Therefore, according to the concordance of items in the factors obtained from factor analysis with the definition and dimensions of the concept of VSNs, the construct validity of the questionnaire was confirmed using EFA with 22 items in 7 factors. These items include 4 items were related to the physical dimension, 3 items concerned the psychological dimension, 4 items respected the social dimension, 3 items covered the cultural dimension, 3 items addressed the general dimension, 2 items were related to the dimension of identification and belonging, and 3 items concerned the political dimension.

In the study of Hejazi et al., after confirming the face validity, content validity, EFA by principal component method, and Varimax rotation, the final 30-item tool led to the extraction of two factors, as follows: attitude towards using social networks and the rate of using social networks [20]. Khajeahmadi et al. also performed the structural validity stages of their study using EFA; according to which the number of questionnaire items was reduced to 23 items and the dimensions of the questionnaire were classified into 4 factors, as follows: individual performance, time management, self-control, and social relations [18]. In the study of Alber et al., 6 dimensions of social network self-efficacy, social network experience, effort expectations, performance expectations, facilitation conditions, and social impact were obtained [9]. Bodroža and Jovanović also reached the final 5 dimensions of the psychosocial tools for using Facebook [24].

In the present study, to measure the different consequences of using VSNs on users, questionnaires including, 7 dimensions of physical, psychological, social, cultural,

general, identification and belonging, and political were obtained. The physical dimension addressed the negative consequences of using VSNs, physically, such as sleep problems, headaches, eye irritation, and blurred vision. Some studies indicated that using VSNs was positively correlated with health-related consequences [40]. Besides, users who overuse VSNs manifest further physical problems. These include sleep problems (e.g., irregular sleep patterns, insomnia, snoring, apnea, & nightmares), sedentary lifestyle, weight gain, obesity, decreased physical fitness, vision problems, and dry eyes, migraine headaches, and decreased personal health [41, 42].

In the psychological dimension of the developed questionnaire, the consequences of using VSNs included problems, such as depression, anxiety, stress, and decreased user confidence. Some studies have mentioned the benefits of using these networks to improve mental health [40, 43]; however, uncontrolled use of virtual social networks imposes various psychological harms on users, such as depression, anxiety, obsession, interpersonal sensitivity, hostility, morbid fear, paranoid thoughts, and psychosis [14, 41]. In the study of Bodroža and Jovanović, a dimension of the questionnaire was applied to examine the psychosocial aspects of using Facebook; the dimension of Facebook addiction, i.e., which has addressed problems, like sleep problems, but not separately [24].

The social dimension of the present questionnaire also included such aspects as being able to deliberately express ideas; getting acquainted with the opinions and thoughts of others; providing equal opportunities for individuals to talk to each other, as well as strengthening and facilitating social relations with their audiences in these networks. In the study of Khajeahmadi et al., a dimension of the questionnaire to measure addiction to mobile social networks as social relations [18]. In the study of Alber et al., one of the 6 dimensions of the questionnaire was the social impact [9]. In the case of the tool for examining the psychosocial aspects, employing Facebook, the factor of socialization, included active efforts to meet new friends [24]. Some studies also indicated that VSNs significantly impact the behavior and interpersonal communication of users, also increase their sense of social wellbeing [15, 40, 44].

In the cultural dimension of the generated questionnaire, issues, such as interest in literature, poetry, and mother language, more familiarity with Iranian customs, traditions, and music through using VSNs were addressed. In a study, the role of VSNs in creating an atmosphere of interethnic interaction and dialogue and

providing the possibility of mutual recognition and understanding of cultural differences was emphasized as the most important opportunities of VSNs [45]. Using VSNs in the cultural arena strengthens national identity symbols (language, literature, beliefs, national myths, etc.), strengthens national subcultures and soft cultural power in the international arena, forms cultural, and social campaigns to pursue issues and concerns, the odds of responding to doubts, criticisms, and deviations in various issues and the formation of a culture of dialogue and increase the tolerance of opposing ideas [45].

The general dimension of the questionnaire included the attractiveness of life in the presence of VSNs, the feeling of receiving emotional support, and providing the ability to express emotions, and feelings in users of VSNs. Some studies found that individuals with membership and participation in these VSNs, to escape from loneliness and problems, emotional evacuation, receiving support and trust in others and groups [15, 34].

The identification and belonging dimension of the present questionnaire included users' satisfaction with the feeling of belonging to groups with common interests and beliefs, as well as the possibility of dating experience in a different way from the real space. A study suggested that the functions of VSNs concerning Iranian-Islamic identity included the optimal organization of virtual social groups, the development of social partnerships, sharing interests by members, and the ability to create content by members [46]. Furthermore, with the expansion of using VSNs, users can rely on these media to present their identity, personality traits, and other critical elements in social communication as they wish. VSN users have the opportunity to display a completely new and sometimes conflicting identity [47].

Finally, the political dimension of the questionnaire included such aspects as feeling more secure and calm in their country compared to other countries; deeming it necessary to know about the country's political news and gain insight and a positive view of the country's political situation using VSNs. Adlipour reported that using the Facebook social network to obtain news and information leads to strengthening trust and normal political participation among citizens [48]. Another study revealed a significant relationship between using VSNs and users' sense of security and comfort [49]. Using VSNs in the political field increases national affiliation helps to achieve the slogan of equality and justice and balanced development; promotes solidarity and strengthens it in social networks and recognizes the real needs of individ-



uals; it takes action to respond, control, and guide them on time [15, 45].

To evaluate the reliability of the present questionnaire, its internal consistency was determined by calculating Cronbach's alpha coefficient. The relevant results indicated the appropriate internal consistency of the items. Thus, the dimensions of the questionnaire provided acceptable and appropriate reliability. Khajeahmadi et al. [18] also confirmed the internal reliability of their questionnaire by calculating Cronbach's alpha coefficient of 0.92. Alber et al. [9], Al-Menayes [17], Hejazi et al. [20], and Li et al. [21] also used the internal consistency method to determine the reliability of their generated tools.

The reliability of the questionnaire was also tested through the test-retest method; the obtained results obtained from two tests at a 2-week interval highlighted the appropriate stability of the questionnaire. Jenkins-Guarneri et al. also used the test-retest method to determine the stability of their instrument [23]. Li et al. also used the retest method and ICC to evaluate the reliability of their instrument [21]. However, Khajeahmadi et al. [18] and Topaloglu et al. [22] did not use this method in their study and only calculated the Cronbach's alpha coefficient.

A strength of the present questionnaire was implementing the design process and determining its psychometric properties among all users aged over 18 years in the community. Due to not being assigned to only one specific age, education, or occupation, the questionnaire can be used in different groups.

The study had limitations such as the lack of cooperation or complete response of some users to the questionnaire questions, which led to the invitation of other subjects to participate in the study.

## 5. Conclusion

The present study results suggested that the designed questionnaire provided good validity and reliability. Additionally, the extent of the factor load of all items as appropriate. Considering that the consequences of VSNs are multidimensional and include comprehensive aspects, such as biopsychosocial, cultural, public, identification and belonging, and political, this questionnaire can be used in the outcome assessment studies of VSNs on various aspects of the lives of community users. Furthermore, this questionnaire is suitable for answering all sections of society; thus, it can help to identify existing deficiencies and help officials to address them.

## Ethical Considerations

### Compliance with ethical guidelines

The study was approved by the ethics committee of Qom University of Medical Sciences (Code: IR.MUQ.REC.1397.100).

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### Authors' contributions

Conceptualization and Supervision: Tahereh Ramezani and Zabihollah Gharlipour; Methodology: Zabihollah Gharlipour; Investigation, Writing – original draft, and Writing – review & editing: All authors; Data collection: Zahra Dashti, Fatemeh Kosari, and Maryam Malekzade; Data analysis: Zabihollah Gharlipour, Ahmad Rahbar and Tahereh Ramezani; Funding acquisition and Resources: Zabihollah Gharlipour and Tahereh Ramezani.

### Conflict of interest

The authors stated no conflicts of interest.

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