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# The Validity and Reliability of the Persian Version of Nomophobia Questionnaire

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**Original Article**

## Abstract

**Background:** Nomophobia is the fear of being disconnected from one's mobile phone, prevailing in modern area. To the best of our knowledge, no Persian psychometric scales are available for investigating nomophobia among Iranians. Therefore, we here aimed to translate and validate the Nomophobia Questionnaire (NMP-Q) for being used in Iran.

**Methods:** The NMP-Q was translated from English to Persian using a classical "backward and forward" procedure. Exploratory factor analysis (EFA) was carried out to explore the underlying factor structure of the translated questionnaire. A principal component analysis (PCA) approach with varimax rotation was further performed.

**Findings:** 425 volunteer students were included. Among them, 80.2% were 20-30 years old. Men and women constituted 187 (44.0%) and 238 (56.0%) of the participants, respectively. 100 (23.5%) of the subjects were medicine graduates. Using mobile phones for more than 5 years was noted in 215 (50.6%) subjects. Also, 422 (99.3%) subjects connected to the Internet via their cellphones. Regarding cellphone usage, 301 (70.8%) subjects used them less than 5 hours a day, 158 (37.2%) subjects checked their cellphones less than 10 times a day, and 92 (21.6%) subjects checked their cellphones every 20 minutes. Eigenvalues and the scree-plot supported a 3-factorial nature of the translated questionnaire. NMP-Q showed an overall Cronbach's alpha coefficient of 0.93 (the coefficients of 0.90, 0.77, and 0.71 for the three factors, respectively). The first, second, and third factors explained 26.30%, 20.84%, and 17.60% of the variance, respectively. The total score of NMP-Q correlated with the hours spent with mobile phones, the years of using them, and the age.

**Conclusion:** Our findings showed that the Persian version of the NMP-Q was a valid and reliable tool for evaluating nomophobia among Iranians.

**Keywords:** Cell phone use; Questionnaire; Psychometrics; Factor analysis

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## Introduction

Technologies such as mobile smartphones and the Internet are rapidly growing. Mobile cellphones constitute the greatest inventions in modern world. Because of their convenience and ease of use, most people in developed and developing countries use cellphones. Although primary mobile phones were intended for interpersonal communications, new cell phones provide a wide range of applications such as high-resolution cameras, music players, and GPS. Despite the advancements of the mobile phone technology since its advent in 1983, improper mobile phones usage can be harmful for human's physical and psychological health.[1] In fact, behavioral problems regarding mobile phone usage have led to the implementation of some constraining social and legal measures. There have been positive relationships between improper mobile phone usage and aggression, smoking, tendency to commit suicide, and low confidence among both genders and at various age groups. Pseudo-addictive behaviors regarding mobile phones are considered as serious threats for people's work and social life. The addicts to mobile phones feel depressed, lonely, and failed when they are away from their phones. Sometimes, job and life are both disturbed by frequent calls, text messages, web-surfing, and online chatting.[1] Addiction to mobile phones is defined as excessive using of them and may be considered as a form of Internet Addiction. Few studies have been conducted on this field. Evidence indicated that excessive usage of mobile phones followed a similar pattern to other mind-engaged behavioral problems such as staying up late at night, being excessively engaged in exchanging text messages, and emotional dependence. In fact, these individuals believe that they cannot live without their phones. Excessive usage of mobile phones also negatively affects students' physical and psychological health.[2]

Nomophobia is the fear of being far from mobile phone and therefore losing phone calls. Nomophobia is the abbreviated form of no-mobile-phone phobia. Nomophobia was first described in a study carried out in 2008 assessing anxiety in mobile phone users.[3] The nomophobe and nomophobic are two additional entities related to nomophobia. Nomophobe is referred to individuals with nomophobia. The term nomophobic is an adjective used to describe the characteristics of nomophobes and/or behaviors influenced by nomophobia. In a study in 2013, King et al. defined nomophobia as a modern world disorder justifying the inconvenience and/or anxiety caused by the lack of access to mobile phones, personal computers, and other communicative devices.[4] Although the primary definition referred to the inaccessibility to computers, these have been now replaced by mobile phones and smart phones as well as tablets as the modern mass media technologies.[3]

The frequency of nomophobia has been reported as 68.92% among mobile phone users in India, according to a study performed in 2016. This community based on a cross-sectional exploratory study has revealed higher frequencies of mobile-dependency in men than women with 82.91% and 31.25%, respectively.[5] Furthermore, the recent study showed that young adults aged between 18-24 years were more susceptible to nomophobia (77%) in comparison with those aged 25-34 years (68%).[3] Long-term complications of excessive mobile phone usage have been behavioral and life style changes, visual disturbance, anxiety, musculoskeletal disorders (MSDs), low concentration as well as increased risk of parotid cancer and brain tumors, infertility, genetic mutations, and other biological side effects.[4]

In order to scrutinize nomophobia dimensions in American students, Yildirim and Correia[6] recruited the self-reported nomophobia questionnaire (NMP-Q). They further assessed the structure and reliability of the questionnaire. This was a two-phased study aimed to develop a self-report tool to show the intensity of nomophobia among American students. The first qualitative phase included describing nomophobia by focusing on semi-structured interviews. Then, the findings of the qualitative phase were used to expand the items in NMP-Q. In the second quantitative phase, the reliability of the questionnaire was also evaluated. Nomophobia dimensions obtained in the first phase included: 1) communication failure, 2) losing connectivity, 3) inaccessibility to information, and 4) inconvenience. Overall, Yildirim and Correia showed an internal consistency coefficient of 0.954 for all the NMP-Q items representing appropriate internal consistency. The Cronbach's alpha coefficient for the four dimensions was obtained

as 0.939, 0.874, 0.827, and 0.814, respectively, indicating suitable validity. The four dimensions of NMP-Q (i.e., communication failure, losing connectivity, inaccessibility to information, and inconvenience) retrieved by exploratory factor analysis (EFA) were in accordance with the theoretical structure of nomophobia and showed the construct validity of the NMP-Q.[6]

Gutierrez-Puertas et al. conducted a study in 2016 to investigate the reliability of the Spanish version of NMP-Q. The Cronbach alpha coefficient of the questionnaire was 0.928 showing an appropriate internal reliability. The Cronbach alpha values for each factor were 0.744, 0.874, and 0.840, respectively.[7] The Addiction to Mobile Phone Questionnaire showed an appropriate reliability with the Cronbach's alpha of 0.930 in Iran.[8] This study was conducted to determine the reliability and validity of the Persian version of NMP-Q among Iranians.

## Methods

The present cross-sectional study was conducted to assess nomophobia on 467 students of Mazandaran University of Medical Sciences, Sari, Iran, in 2016-2017. We used the Persian version of the NMP-Q validated by Yildirim and Correia.[6] Considering the withdrawal rate of 10% and design effect of 5.1, the total sample size was calculated as 467. A total number of 425 students completely responded to the questionnaire.

The exchanged students transferred from other universities, those who had participated in other psychological studies, and the students who had no mobile phones were excluded from the study. The rule of 10 (at least 10 samples for each item) and support vector regression (SVR) approach were recruited. The self-report NMP-Q consisted of 14 demographic questions and 28 items. In order to increase the generalizability and external reliability of the study, the proportional stratified sampling was used. The number of samples in each category was proportionate to the number of students at individual schools (i.e., medicine, dentistry, pharmacy, allied sciences, nursing and midwifery, health and management, and finally the Pardis campus). The fields of study and grades were further used to assign specific weights for calculating sample size for each school. After explaining the content of the questionnaire, the questionnaires were distributed among the students. The score of self-reported nomophobia was then calculated as the primary goal of the study. Other covariates included demographic variables (gender, educational year, age, field of study, and school) and the variables related to smart phone usage (i.e., the duration of usage and being online, the number of installed applications, the number of calls and messages, the number of received and sent emails, and the terms of using mobile phones). The tools for data gathering included the demographic questionnaire, the Mobile Phone Addiction Inventory (MPAI), and the Persian version of NMP-Q.

MPAI is a two-part scale consisting of 20 questions. The demographic information and the quality of using mobile phones are addressed in the first part. The second part includes questions about mobile phone addiction categorized into three conditions as tolerating the deprivation, life impairment, and compulsion-insistence. The students were assigned as phone addicts (the score of ≥ 70), frequent users (the score of 63-69), and moderate users (the score of ≤ 63) according to the obtained results.[9]

***NMP-Q:*** Yildirim and Correia[6] validated the reliability of the self-reported NMP-Q. The focused semi-structured interviews were held for designing the questions and describing nomophobia. All the students who used mobile phones were included in the study. The NMP-Q was translated and conceptually edited into fluent Persian by an expert translator with an excellent command on English language. Modifications were made to avoid cultural controversies. Afterwards, the Persian text was independently retranslated to English by two English experts. Then, the two English versions of the questionnaire were compared. The face validity was used to check the validity of the test. Two psychiatrists were asked to independently comment on the questionnaire items. Finally, the required corrections were made on the translated text. The final questionnaire included 20 questions in a 7 point Likert scale ranging from total disagreement (the score of 1) to total agreement (the score of 7). The final scores ranged from 20 to 140 where lower scores indicated lower dependence on smart phones.

Factor analysis and concurrent and convergent validities were used to calculate the reliability of the NMP-Q. EFA, principal component analysis (PCA), scree test, and the orthogonal varimax

rotation method were used to analyze the scale factors. The Persian version of mobile phone addiction scale was used to calculate the concurrent validity of the NMP-Q. The correlation coefficients between the nomophobia total score and the scale factors were used to calculate the convergent validity of NMP-Q. Split-half and internal consistency (Cronbach's alpha) methods were used to calculate the reliability of NMP-Q. Spearman-Brown correlation coefficient was used to split the halves and to determine their reliability coefficient for the whole scale. A Pearson's correlation coefficient of 0.4 or higher was considered as desirable. For conducting intra-rater reliability method, the questionnaire was completed again by 30 of the students after two weeks from the primary quest, and then the reliability coefficient was obtained for the whole and microDimensions comparisons. Cronbach's alpha coefficient was used to determine the internal consistencies of the micro-dimensions of the questionnaire. The simple correlation coefficients were further calculated for the total score and every test item. The validity of the NMP-Q was also judged seeking compatibilities of NMP-Q scale with each other and with the whole scale. The internal consistency of the questionnaire dimensions was determined using Cronbach's alpha method. The coefficients equal to or higher than 0.7 were considered as desirable. EFA was used to extract nomophobia factors. The extraction criteria for slope factors included scree plot and eigenvalue which were evaluated using varimax rotation. In order to determine the confirmatory factor analysis (CFA) and the validity of the extracted factor, the fitness of the obtained model was estimated applying LISEREL and first order confirmatory factor. Goodness of fit index (GFI), root mean square error of approximation (RMSEA), incremental fit index (IFI), and comparative fit index (CFI) were also calculated. According to Hu and Bentler,[10] if the values of GFI, CFI, and IFI were lower than 0.8, the model value was considered to be appropriate and adequate.

The present study was confirmed by the Ethical Committee of Mazandaran University of Medical Sciences (Ethical code: IR.MAZUMS.REC.1396.2113). Informed consent was obtained from the participants. The data were represented without any reference to the participants' names and their responses were kept confidential by the research team.

## Results

The sample population included 425 students of Mazandaran University of Medical Sciences. 56.0% of the respondents were men. Most of the respondents (80.2%) were 20-30 years old. The field of study in the majority of the respondents (23.5%) was medicine. Around half of the students (50.6%) have been using smart phones for more than 5 years. In addition, 3.99% of the respondents used Internet with 8.70% of them being online less than 5 hours a day. Moreover, 2.37% of the respondents checked their phones less than 10 times a day and 6.21% checked their phones every 20 minutes (Table 1).

**Table 1.** Demographic features of the university students

| Variables | | n (%) |
|---|---|---|
| Sex | Female | 238 (56.0) |
| | Male | 187(44) |
| Age (year) | < 20 | 84 (19.8) |
| | 20-30 | 341 (80.2) |
| Study fields | Medicine | 100 (23.5) |
| | Dentistry | 55 (12.9) |
| | Pharmacy | 81 (19.1) |
| | Health sciences | 56 (13.5) |
| | Nursing | 58 (13.6) |
| | Midwifery | 41 (9.6) |
| | Paramedical sciences | 34 (8.0) |
| Smartphone use duration (year) | < 1 | 7 (1.6) |
| | 1-2 | 10 (2.4) |
| | 2-3 | 28 (6.6) |
| | 3-4 | 73 (17.2) |
| | 4-5 | 92 (21.6) |
| | > 5 | 215 (50.6) |
| Internet usage | Yes | 422 (99.3) |
| | No | 3 (0.7) |
| Smartphone usage (hours per day) | < 5 | 301 (70.8) |
| | 5-10 | 103 (24.2) |
| | 10-15 | 11 (2.6) |
| | 15-20 | 9 (2.1) |
| | > 20 | 1 (0.2) |
| Frequency of checking phones (times per day) | < 10 | 158 (37.2) |
| | 10-20 | 113 (26.6) |
| | 20-30 | 64 (15.1) |
| | 30-40 | 11 (2.6) |
| | 40-50 | 40 (9.4) |
| | > 50 | 39 (9.2) |
| Intervals between checking phone episodes (minutes/hours) | 5 minutes | 38 (8.9) |
| | 10 minutes | 58 (13.6) |
| | 20 minutes | 92 (21.6) |
| | 30 minutes | 89 (20.9) |
| | 1 hour | 74 (17.4) |
| | 2 hours | 38 (8.9) |
| | 3 hours | 14 (3.3) |
| | Longer than 3 hours | 22 (5.2) |

**Table 2.** Bartlett test and sampling adequacy index for first and second-order test

| Sampling adequacy index | | 0.930 |
|---|---|---|
| First-order Bartlett's test of sphericity | Chi-square approximation | 5478.151 |
| | df | 190 |
| | P | < 0.001 |
| | | 0.931 |
| Second-order Bartlett's test of sphericity | Chi-square approximation | 5455.965 |
| | df | 171 |
| | P | < 0.001 |

df: Degree of freedom

The Kaiser-Meyer-Olkin (KMO) index was obtained as 0.931 indicating an adequate sample size for the factor analysis (the values > 0.6 were considered as desirable). Furthermore, the significance level of the Bartlett's test was < 0.05 indicating appropriate EFA for retrieving the factor model structure and rejecting the identity hypothesis in the correlation matrix. Based on these observations, research factors were identified (Table 2).

The latent factors of the test were extracted by the PCA and varimax rotation. Regarding the values > 1 and scree plot, 3 factors were identified in this model (Table 3 and Figure 1). The three identified factors retrieved the values of 4.997, 3.961, and 3.345 constituting 61.823% and 64.755% of the total variances of the test variables before and after eliminating the question number 20, respectively. The common value for the question 20 was not acceptable in the initial survey necessitating the removal of this item. After the elimination of this question, exploratory analysis was repeated. The repetition of exploratory analysis revealed values above 0.5 for all the variables (questions) representing optimal values (Table 3).

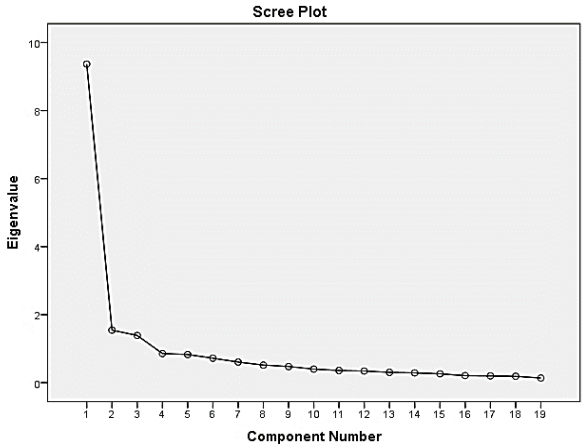


**Figure 1.** Domain slope diagram of test variables

**Table 3.** Extracted common values of research variables (questions)

| First time | | Second time | |
|---|---|---|---|
| Variables (questions) | Common values | Variables (questions) | Common values |
| Question 1 | 0.578 | Question 1 | 0.580 |
| Question 2 | 0.722 | Question 2 | 0.725 |
| Question 3 | 0.531 | Question 3 | 0.527 |
| Question 4 | 0.687 | Question 4 | 0.686 |
| Question 5 | 0.534 | Question 5 | 0.534 |
| Question 6 | 0.578 | Question 6 | 0.582 |
| Question 7 | 0.554 | Question 7 | 0.544 |
| Question 8 | 0.558 | Question 8 | 0.553 |
| Question 9 | 0.499 | Question 9 | 0.503 |
| Question 10 | 0.764 | Question 10 | 0.763 |
| Question 11 | 0.742 | Question 11 | 0.745 |
| Question 12 | 0.767 | Question 12 | 0.769 |
| Question 13 | 0.781 | Question 13 | 0.777 |
| Question 14 | 0.727 | Question 14 | 0.729 |
| Question 15 | 0.418 | Question 15 | 0.521 |
| Question 16 | 0.733 | Question 16 | 0.735 |
| Question 17 | 0.764 | Question 17 | 0.762 |
| Question 18 | 0.755 | Question 18 | 0.751 |
| Question 19 | 0.608 | Question 19 | 0.617 |
| Question 20 | 0.065 | Question 20 | Deleted |

**Table 4.** Special values of > 1 for three extracted factors

| Factor | Special value | The variance explanation (%) | The cumulative variance (%) |
|---|---|---|---|
| 1 | 4.997 | 26.301 | 26.301 |
| 2 | 3.961 | 20.847 | 47.148 |
| 3 | 3.345 | 17.608 | 64.755 |

The latent factors in the test were extracted by PCA and varimax rotation. Regarding the values > 1 and scree plot, 3 factors were obtained in this model (Table 4 and Figure 1). The three identified factors retrieved the values of 4.997, 3.961, and 3.345 constituting 61.823% and 64.755% of the total variances of the test variables in the rotation method before and after eliminating the question number 20, respectively.

The questions related to each of the extracted factors in the rotation matrix have been presented in table 5. In exploratory analysis, 3 factors were identified which were assigned to their corresponding questions considering the highest correlation values. The means and standard deviations (SDs) of the 3 factors were 3.98 ± 1.21, 4.05 ± 1.64, and 3.21 ± 1.50, respectively. Furthermore, Cronbach's alpha coefficients of these factors were obtained as 0.90, 0.77, and 0.71, respectively, indicating high (i.e., > 0.7) reliability for all the three factors.

Afterwards, the model fitness was examined using LISEREL and first order factor analysis (Figures 2 and 3).

First order factor analysis in standard estimation mode demonstrated the factorial load above 0.6 for all the items indicating strong relationships between research factors and their corresponding items.

**Table 5.** Questions regarding to each of factors derived from exploratory analysis

| Questions | Extracted factors of the research | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| I would feel uncomfortable without constant access to my smartphone. | 0.710 | | |
| I would be annoyed if I could not check on my smartphone when I wanted to do so. | 0.803 | | |
| Being unable to reach the news (e.g., happenings, weather, etc.) by my smartphone would make me nervous. | 0.581 | | |
| I would be annoyed if I could not use my smartphone and/or its capabilities when I wanted to do so. | 0.781 | | |
| Running out of the battery of my smartphone would scare me. | 0.615 | | |
| If I were to run out of credits or hit my monthly data limit, I would panic. | 0.515 | | |
| If I did not have a data signal or could not connect to Wi-Fi, then I would constantly check to see if I had a signal or could find a Wi-Fi network. | 0.645 | | |
| If I could not use my smartphone, I would be afraid of getting stranded somewhere. | 0.554 | | |
| If I could not check my smartphone for a while, I would feel a desire to check it. | 0.646 | | |
| If I did not have my smartphone with me: | | | |
| I would feel anxious because I could not instantly communicate with my family and/or friends. | | 0.723 | |
| I would be worried because my family and/or friends could not reach me. | | 0.768 | |
| I would feel nervous because I would not be able to receive text messages and calls. | | 0.704 | |
| I would be anxious because I could not keep in touch with my family and/or friends. | | 0.791 | |
| I would be nervous because I could not know if someone had tried to get a hold of me. | | 0.727 | |
| I would feel anxious because my constant connection to my family and friends would be broken. | | 0.537 | |
| I would be nervous because of being disconnected from my online identity. | | | 0.732 |
| I would be uncomfortable because I could not stay up-to-date with social media and online networks. | | | 0.786 |
| I would feel awkward because I could not check my notifications for updates from my connections and online networks. | | | 0.772 |
| I would feel anxious because I could not check my emails | | | 0.751 |
| I would feel weird because I would not know what to do. | | Deleted | |

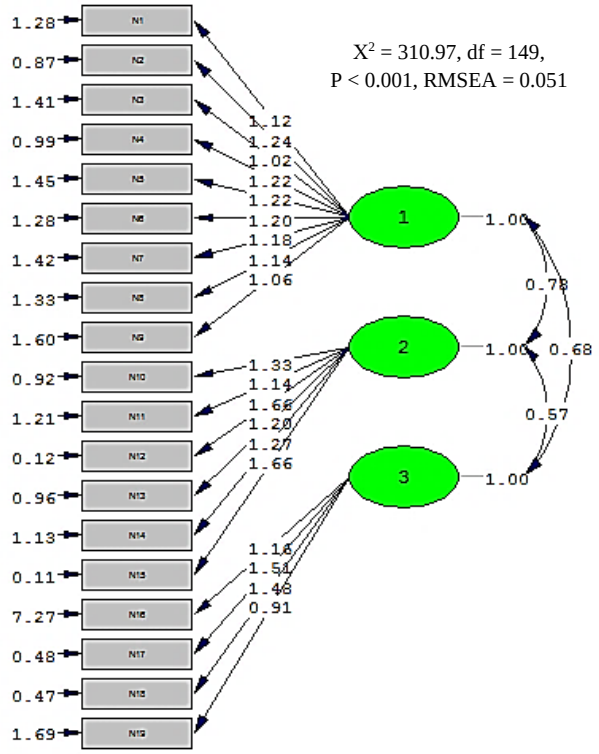


**Figure 2.** First factor analysis in standard estimation
df: Degree of freedom; RMSEA: Root mean square error of approximation

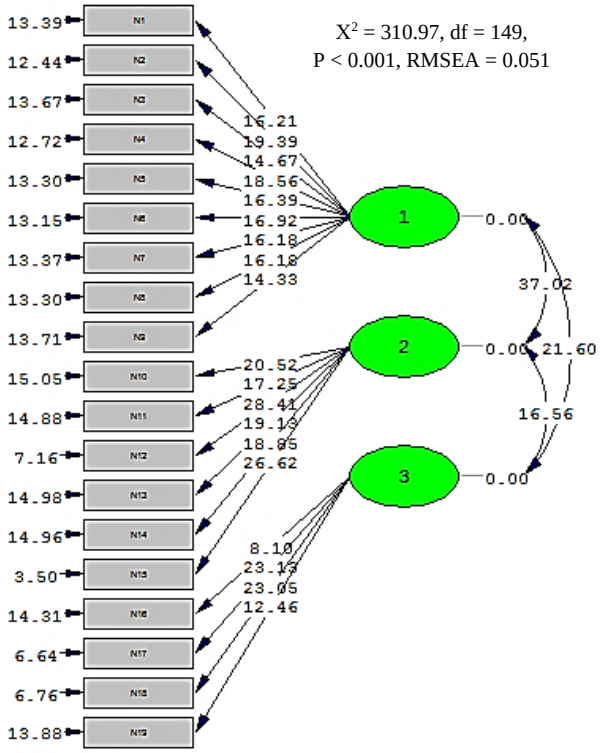


**Figure 3.** First factor analysis in significant numbers
df: Degree of freedom; RMSEA: Root mean square error of approximation

On the other hand, the first order factor analysis in significant value mode showed the significant value (T-value) > 1.96 for all the items. The fit indices of the model have been presented in table 6. In general, the model showed a good fitness. Overall, the 3 factors scale (model) with 19 items delivered an appropriate fitness for assessing nomophobia. The composite reliability (CR) has been presented in table 7. The obtained CR for the first, second, and third extracted factors were as 0.73, 0.87, and 0.78, respectively.

The reliability of the questionnaire was further assessed by split-half method. The reliability values of the first and second halves were 0.91 and 0.82, respectively, showing good reliabilities. The Guttmann coefficient of the questionnaire was obtained as 0.83 demonstrating an excellent total reliability (Table 8). The test-retest approach exhibited no significant differences between the results, verifying the reliability of the assessed nomophobia scale (Table 9).

According to the Cronbach's alpha coefficient, the total reliability of the nomophobia scale was estimated to be 0.93.

Considering the convergent validity, the Pearson's correlation coefficients between the total nomophobia scale score and either of the first, second, and third factors were 0.927, 0.894, and 0.759, respectively, disclosing significant and strong relationships between these parameters. Accordingly, the convergent validity condition was met. There was a strong significant correlation between the total nomophobia scale score and the mobile phone addiction score (Pearson's correlation coefficient of 0.805, P < 0.001). This indicated that divergent validity condition was held true.

**Table 6.** Goodness of fit index (GFI) of the model

| GFI | Value in current research | Desirable value | Status |
|---|---|---|---|
| $\chi^2$/df | 2.08 | 3 > | Very desirable |
| GFI | 0.95 | Close to 1 | Desirable |
| AGFI | 0.92 | Close to 1 | Desirable |
| RMR | 0.043 | 0.08 > | Relatively desirable |
| RMSEA | 0.051 | 0.08 > | Very desirable |

GFI: Goodness of fit index; df: Degree of freedom; AGFI: Adjusted goodness of fit index; RMR: Resting metabolic rate; RMSEA: Root mean square error of approximation

**Table 7.** Composite reliability (CR) of the nomophobia scale questions

| Variable | Question | $R^2$ | Factor loading | CR |
|---|---|---|---|---|
| 1 | 1 | 0.50 | 1.12 | 0.73 |
| | 2 | 0.64 | 1.24 | |
| | 3 | 0.43 | 1.02 | |
| | 4 | 0.60 | 1.22 | |
| | 5 | 0.50 | 1.22 | |
| | 6 | 0.53 | 1.20 | |
| | 7 | 0.49 | 1.18 | |
| | 8 | 0.50 | 1.14 | |
| | 9 | 0.41 | 1.06 | |
| 2 | 10 | 0.66 | 1.33 | 0.87 |
| | 11 | 0.52 | 1.14 | |
| | 12 | 0.96 | 1.66 | |
| | 13 | 0.60 | 1.20 | |
| | 14 | 0.59 | 1.27 | |
| | 15 | 0.96 | 1.66 | |
| 3 | 16 | 0.16 | 1.16 | 0.78 |
| | 17 | 0.83 | 1.58 | |
| | 18 | 0.82 | 1.48 | |
| | 19 | 0.33 | 0.91 | |

CR: Composite reliability

## Discussion

The present study was conducted to investigate the reliability and validity of the Persian version of the self-reported NMP-Q. The reliability values of the first and second halves were as 0.91 and 0.82, respectively, indicating good reliabilities. The final reliability values of the questionnaire were estimated as 0.83 and 0.93 by Guttmann's and Cronbach's alpha coefficients, respectively, showing excellent reliabilities. The study of Yildirim and Correia showed that the internal reliability coefficient of NMP-Q was 0.954 for all the items. Furthermore, the recent study revealed Cronbach's alpha coefficients of 0.939, 0.874, 0.827, and 0.814 for the four dimensions of the scale, respectively.[6] Collectively, the study of Yildirim and Correia as well as our study revealed acceptable internal consistency and validity for NMP-Q scale.[6] In the study of Bragazzi et al. in Italy, Cronbach's alpha coefficient of NMP-Q was obtained 0.95 (0.94, 0.89, and 0.88 values for the three factors), verifying good reliability of the Italian version of the questionnaire.[11] In the study of Gutierrez-Puertas et al., Cronbach's alpha value of the NMP-Q was obtained 0.928 (0.840, 0.874, 0.744, and 0.714 values for the four factors) which shows plausible internal reliability.[7] In another study by Gonzalez-Cabrera et al. in Spain, Cronbach's alpha coefficient for the questionnaire was reported as 0.950 (0.920, 0.850, 0.800, and 0.790 values for the three factors) which again demonstrated appropriate reliability of Spanish version of the scale.[12]

The convergent and divergent content validities of NMP-Q showed a significant relationship between the extracted factors and the total nomophobia scale score. Accordingly, the convergent validity condition was met. Furthermore, there was a significant relationship between the total nomophobia scale score and mobile phone addiction, fulfilling the divergent validity condition. Moreover, the questionnaire attained an appropriate content validity. Due to the similar divergent validity of the two questionnaires, they can be used interchangeably. Moreover, a strong and significant association was noted between the scores obtained from NMP-Q and Mobile Phone Involvement Questionnaire (MPIQ).[13] Our results showed good fitness of the 3-factor 19-item scales (i.e., models) for evaluating nomophobia. After performing rotation method, the special values of the three factors were obtained as 4.997, 3.961, and 3.345 constituting 64.75% of the total variance of the test. In the study of Bragazzi et al. who designed a three-factor questionnaire, the special values of the first, second, and third factors explained 23.32%, 23.91%, and 18.67% of the variance, respectively.[11]

**Table 8.** The reliability of questionnaire assessed by Split-half method

| | | | |
|---|---|---|---|
| Cronbach's alpha | First section | Alpha coefficient value | 0.911 |
| | | The number of questions | 10 |
| | Second section | Alpha coefficient value | 0.820 |
| | | The number of questions | 9 |
| | The total number of questions | 19 | |
| Correlation coefficient between the two halves | | 0.723 | |
| Spearman-Brown correlation coefficient | With equal length | 0.839 | |
| | With equal length | 0.839 | |
| Guttmann coefficient | | 0.839 | |

**Table 9.** The mean difference between test and retest of nomophobia scale and respective paired comparisons

| Variable | First time (mean ± SD) | Second time (mean ± SD) | Mean difference | t | df | P |
|---|---|---|---|---|---|---|
| 1 | 3.98 ± 1.21 | 3.66 ± 1.02 | -0.32 | 0.56 | 424 | 0.071 |
| 2 | 4.00 ± 1.44 | 4.01 ± 1.33 | 0.01 | 0.32 | 424 | 0.105 |
| 3 | 3.21 ± 1.50 | 3.18 ± 1.24 | -0.03 | 1.00 | 424 | 0.061 |
| Total | 11.19 ± 4.15 | 11.30 ± 3.59 | 0.11 | 0.27 | 424 | 0.055 |

df: Degree of freedom; SD: Standard deviation

On the other hand, Yildirim and Correia identified 4 factors for NMP-Q each constituting 49.89%, 8.26%, 6.31%, and 5.11% of test variance, respectively.[6] In the study of Gutierrez-Puertas et al., the NMP-Q was also comprised of 4 factors with respective variances of 22.38%, 16.82%, 11.87%, and 11.59%.[7] In another study, Gonzalez-Cabrera et al. also described 4 factors for the NMP-Q, representing appropriate special values.[12] Collectively, the Persian version of NMP-Q was identified with 3 factors delivering suitable special values for all the factors. Therefore, this questionnaire can be a reliable and valid tool for assessing nomophobia among Iranians.

In the test-retest reliability survey of the nomophobia scale, a significant association was observed between the results of test and retest steps. This indicated a good reliability for the nomophobia scale in present study. Similar to our findings, Gutierrez-Puertas et al. described no significant difference between the results of test and re-test steps highlighting appropriate reliability of the questionnaire.[7]

Overall, 50.6% of our respondents have been using smart phones for more than 5 years. In the study of Kalaskar, 34% of the respondents had used smart phones for 4-5 years.[14] In addition, a significant and reverse relationship was found between the number of years of using smart phones and nomophobia intensity in the recent study.[14] Additionally, we noted that 3.99% of our respondents used Internet with a significant and direct association between nomophobia score and the duration of being online. In the studies of Yahyazadeh et al.[15] and Kalaskar,[14] significant relationships were reported between the duration of using the Internet and mobile phone addiction ($P = 0.001$ and $P < 0.001$, respectively). These observations highlighted the Internet accessibility through smart phones as a major factor leading to mobile phone addiction. Moreover, 70.00% of our respondents used the Internet less than 5 hours a day. As well, 2.37% of them checked their phones less than 10 times a day; this is while 6.21% of the respondents checked their phones every 20 minutes. Therefore, nomophobia was significantly and inversely related to the hours of using mobile phones and the Internet per day. In the study of Bragazzi et al., 23.3% of the respondents checked their smart phones every 1-2 hours and a significant relationship was found between the duration of using smart phones and nomophobia.[11] In the study of Yahyazadeh et al., the subjects who used their smart phones for 21- hours a day had significantly higher nomophobia scores ($P = 0.001$).[15] Likewise, a significant relationship was found between the daily hours of using smart phones and nomophobia score in the study of Alosaimi et al. ($P = 0.001$).[16] Collectively, nomophobia intensity showed a direct correlation with the daily hours and the frequency of using smart phones.

In the present study, women and men constituted 56% and 44% of the respondents, respectively. There was no significant relationship between nomophobia and gender ($P = 0.068$). In comparison, female and male participants comprised 60.3% and 39.7% of the subjects, respectively, in the study of Bragazzi et al.[11] However, a significant relationship was found between gender and nomophobia in the recent report.[11] Nevertheless, Yildirim and Correia[6] (55.1% women and 44.9% men) and Prasad et al.[17] (52.9% women and 47.1% men) also described no significant association between gender and nomophobia in their studies. Considering the fact that both genders frequently and equally used smart phones and also the gender-independent nature of nomophobia, both men and women are at risk of nomophobia.

Considering the people's needs to be welcomed by the society, a bias may have occurred while completing the questionnaires. Furthermore, our sample population was restricted to the medicine and allied sciences graduates and precautions should be considered

for generalizing our results to other social classes. Verifying the reliability of the Persian version of NMP-Q and determining nomophobia frequency are warranted in other populations. It is also recommended to assess potential relationships between nomophobia and behaviors such as gambling and/or addiction to online gaming, as well as other individual psychological features.

## Conclusion

We here verified the validity and reliability of the Persian version of the NMP-Q scale. So, this questionnaire can be used to investigate nomophobia among Iranians.

## Conflict of Interests

The Authors have no conflict of interest.

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# اعتبار و پایایی فرم فارسی پرسش‌نامه نوموفوبیا

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**مقاله پژوهشی**


## چکیده

**مقدمه:** نوموفوبیا، ترس شدید ناشی از دور شدن از گوشی موبایل و یک فوبیای موقعیتی مدرن می‌باشد. بر اساس اطلاعات موجود، هیچ مقیاس روان‌شناختی فارسی جهت سنجش این اختلال وجود ندارد. بنابراین، پژوهش حاضر با هدف ترجمه و اعتباریابی پرسش‌نامه نوموفوبیا طراحی گردید.

**روش‌ها:** پرسش‌نامه نوموفوبیا از انگلیسی به فارسی و سپس مجدد از فارسی به انگلیسی ترجمه شد. برای کشف عوامل نوموفوبیا، از روش تحلیلی عاملی استفاده گردید و در مرحله بعد تحلیل اکتشافی آزمون با شیوه تحلیل مؤلفه‌های اصلی و استفاده از چرخش واریماکس صورت گرفت.

**یافته‌ها:** ۴۲۵ داوطلب در تحقیق حاضر شرکت کردند. ۸۰/۲ درصد آنان سن بین ۲۰ تا ۳۰ سال داشتند. ۱۸۷ نفر مرد (۴۴/۰ درصد) و ۲۳۸ نفر زن (۵۶/۰ درصد) بودند. ۱۰۰ نفر (۲۳/۵ درصد) در رشته پزشکی مشغول به تحصیل بودند. ۲۱۵ نفر به مدت بیش از پنج سال از گوشی همراه استفاده می‌کردند (۵۰/۶ درصد). ۴۲۲ نفر (۹۹/۳ درصد) با تلفن همراه خود به اینترنت دسترسی داشتند و ۳۰۱ نفر (۷۰/۸ درصد) کمتر از پنج ساعت در روز را به استفاده از گوشی همراه اختصاص می‌دادند. ۱۵۸ نفر (۳۷/۲ درصد) کمتر از ۱۰ بار در روز گوشی همراه خود را چک می‌کردند و ۹۲ نفر هر ۲۰ دقیقه یک‌بار گوشی خود را چک می‌کردند (۲۱/۶ درصد). با توجه به تعداد ارزش‌های بالاتر از ۱ و نمودار Scree plot، سه عامل به دست آمد. پایایی پرسش‌نامه نوموفوبیا با استفاده از ضریب Cronbach's alpha، ۰/۹۵ (۰/۹۰، ۰/۷۷ و ۰/۷۰ برای سه عامل) گزارش گردید. واریانس سه عامل نیز به ترتیب ۲۶/۳۰۱، ۲۰/۸۴۷ و ۱۷/۶۰۸ درصد بود. نمره نهایی نوموفوبیا ارتباط معنی‌داری با با سن، رشته تحصیلی، تعداد سال‌های استفاده از گوشی همراه و مدت زمان استفاده از تلفن همراه داشت.

**نتیجه‌گیری:** تحلیل سایکومتریک پرسش‌نامه نوموفوبیا نشان داد که فرم فارسی این مقیاس ابزار معتبر و پایایی جهت سنجش نوموفوبیا می‌باشد.


**واژگان کلیدی:** استفاده از تلفن همراه، پرسش‌نامه، روان‌سنجی، تحلیل عاملی

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