Addiction & Health

Design and Validation of an Addiction Potential Questionnaire for Iranian Children Aged 12 to 18 Using Exploratory Factor Analysis

Aboubakr Jafarnezhad, Haleh Ghaem Maralani, Ali Sahraian, Jafar Hassanzadeh*

Please cite this article as: Jafarnezhad A, Ghaem Maralani H, Sahraian A, Hassanzadeh J .Design and Validation of an Addiction Potential Questionnaire for Iranian Children Aged 12 to 18 Using Exploratory Factor Analysis. Addict & Health. 2025; x(x):x–x.

PubMed | PubMed Central | Sherpa Romeo
Islamic World Science Citation (ISC)
Google Scholar | Index Copernicus

Print ISSN : 2008-4633
Online ISSN : 2008-8469

Abstract

Introduction: Drug addiction is one of the social and health problems of the world. Children are the most vulnerable social stratum in the problem of addiction. The study aimed to design a questionnaire for children's addiction tendencies and to study the psychometric characteristics of Iranian children.

Materials and Methods: It was a cross-sectional study that was conducted in 2023 among 400 students of Shiraz city (Iran) with multi-stage sampling (stratified-cluster-simple random). Inclusion criteria were students, residents of Shiraz city, studying in the first or second year of high school, and exclusion criteria were non-cooperation and unwillingness to participate in the study. Validity was determined through face, content, and construct with exploratory factor analysis (EFA) and reliability through Cronbach's alpha and Intraclass correlation coefficient(ICC). Moreover, *SPSSv.26* was applied for further analysis.

Findings: The average age of the participants was 15.39±1.94. The face and content validity of the scale was quantitatively and qualitatively assessed and confirmed and showed the construct validity through EFA; the scale has 30 items with four factors that explain 40% of the total extracted variance. Cronbach's alpha and ICC of the factors indicated strong to excellent reliability of the scale.

Conclusion: The results showed that the current questionnaire has good validity and reliability, so it may apply with confidence to study the addiction tendency and screening of Iranian children aged 12 to 18 years.

Keywords: Addiction Potential Questionnaire, Validation Studies, Child, Factor Analysis, Iran.

Introduction

Today, the drug crisis is one of the major global crises that spread the most significant contemporary social problem, which is, addiction[1]. However, addiction is a behavioral-psychological syndrome with a strong desire for drugs, constant use, and a strong desire to use again after stopping the drug[2-5]. Accordingly, the United Nations (UN) has defined addiction as acute or chronic poisoning that is harmful to a person or society and is caused by using natural or industrial drugs[2, 6-8]. Iran's special position in the Golden Crescent region has been

effective in increasing the consumption of these substances [9, 10]. According to United Nations statistics, about 90% of drug addicts and drug addicts are detected in the Golden Crescent region[10]. Furthermore, addiction is the cause of the disintegration of individual personality, and family institution and an effective factor in the destruction of social life and the destruction of society. Therefore, the most vulnerable social stratum in the occurrence of the problem of addiction are children who are either addicted themselves or live in a family where one of the adult members is an addict [11, 12]. The lowering of the age of addiction in the country is a warning sign that shows the vulnerability of the young Iranian society to drugs [13-16]. According to the report (2022) of *the United Nations Office on Drugs and Crime* (UNODC), approx. 284 million individuals aged 15 to 64 around the world used drugs by 2020, which is equivalent to a 26% increase in the last decade [17].

According to experts, the instrumentalization of the content related to each instrument should be directly from the individuals who are the reference of the instrument [18]. To examine the available instruments in the field of addiction tendency (children 12-18 years old), an extensive review of texts was conducted in databases such as *PubMed*, *Magiran*, *Google Scholar*, and *SID*, and additionally, researchers [19] did systematic research. However, it was found that despite the high priority of children's addiction, none of the studies have used a single and specific instrument for the target group [20-61].

Among the major limitations of the existing instruments, the following is likely to be mentioned: failure to examine the sample size according to scientific principles [24, 32, 35, 40, 42, 44, 49, 52, 62], not belonging to a specific group (children, imprisoned women, addicted men, students...) [22, 27, 33, 34, 41, 46, 55, 60, 63, 64],failure to report validation indicators in several studies [23, 26, 29, 32, 33, 41, 43-45, 47, 48, 51, 54, 58, 61, 62]; the uncertainty of the number of questions in some studies [32, 33, 48, 58, 61, 62]; failure to updating some instruments[1, 23, 27, 29, 31, 33-36, 38, 41-47, 49, 51, 52, 54, 56, 58, 61, 62]; lacking a standard questionnaire that has examined children's tendency to addiction[32, 37, 43, 51, 58, 61]. However, some instruments are not valid and only lists were applied to test addiction tendency [26, 51].

Considering the significance of reducing the unwanted consequences of children's addiction, the need to design and psychometrically assess a standard questionnaire was raised for children's addiction tendencies in Iran. Accordingly, several shortcomings were observed in previous research, which necessitates the need to improve research methods and use more up-to-date and appropriate instruments. Furthermore, the necessity of designing and psychometric instrument for children's addiction tendency is discussed according to the needs and priorities of the society according to the notification of the " Anti-Narcotics

Headquarters"[65] on children's addiction and the special cultural and social context of the country. Therefore, the output of the research is a standard questionnaire that may be applied to measure the degree of tendency to addiction in children, to screen and identify children prone to addiction, and to introduce them to the authorities, if necessary.

Materials and Methods

This cross-sectional study was conducted in 2023 and consists of two phases: in the first phase, the preliminary stages of questionnaire questions were compiled. First, by reviewing the texts in Persian and Latin databases and scientific sites such as *PubMed, Magiran, Google Scholar, SID*, and *Qolbank* [66], highlighted keywords, namely, "Addiction Tendency Questionnaire", Tendency Questionnaire on Iranian Population", "Validation of Addiction Questionnaire" was searched by using Medical Subject Headings (MeSH Terms) and combining synonyms of words with “AND”, “OR”, “NOT” condition operators. Following collecting articles, and questionnaires, conducting systematic research [19], and making sure of the mentioned limitations, the initial collection of questions was conducted according to the opinion of experts, the review of texts, the supervisor, the review of the questionnaire with these concepts, and the pool of items was formed. Subsequently, the relevant questions were designed and written first. Following the finalization of the questions, face validity was measured quantitatively by 32 participants and qualitative validity by 32 participants and 15 experts. Next, content validity was performed qualitatively and quantitatively by 15 experts from all over the country, of which 10 individuals had the rank of professor and 9 had expertise in instrument making from different fields: epidemiology, clinical psychology, psychiatrist, sociologist, social doctor, health education, nursing education. Following designing the questionnaire and measuring face validity, with a pilot study, reliability was evaluated through Cronbach's alpha test in the participants.

In the second phase, however after the corrections were made by the participants and experts, the secondary formulation of the questionnaire was done, then the validity of the structure was evaluated by using the maximum likelihood of the exploratory analysis factor and Varimax rotation. At this point, the final questionnaire (containing 30 questions) was given to the participants, and the secondary collection of questions was performed accordingly. According to scientific principles, the sample size must consist of at least 5 and a maximum of 10 participants for each item[31, 67-76]; therefore, after determining the number of questions (final 30 questions), considering the possible loss of participants, the sample size was 400 individuals. Moreover, the study population consisted of children aged 12 to 18 years old in

Shiraz city, and the research sample was among the students aged 12 to 18 years old in schools in Shiraz city, who were selected by multi-stage sampling method (stratified-cluster-simple random). Accordingly, Shiraz was first divided into 4 classes based on the 4 education districts. Based on the total required volume, however, the sample size in each class was calculated and then the required number of schools was selected randomly within each floor as a cluster sampling from the list of schools in the last class. Subsequently, in each school, the required number of students was selected by simple random. Upon constructing the validity, reliability was evaluated by Cronbach's alpha and intraclass correlation coefficient.

The variables of the research included age, gender, education, tendency to addiction, course of study, level of education, and educational district. The inclusion criteria were: students, residents of Shiraz, studying in the first or second year of high school, students who were willing to cooperate in the study; and the exclusion criteria were: non-cooperation and unwillingness to participate in the study. To keep the information confidential, however, no names and addresses were recorded on the questionnaires, and each questionnaire was given a unique code to avoid mistakes in data collection and analysis. Statistical methods for analysis were descriptive and analytical indices, Pearson correlation coefficient, exploratory analysis factor, Cronbach's alpha, and intraclass correlation coefficient. Moreover, SPSS v.26 was utilized as a Statistical Package for the Social Sciences analyses.

Findings

Descriptive Findings

In this study, 400 students participated, whose average age was 15.39±1.94 years. Moreover, the minimum age of the students was 12 years and the maximum age was 18 years. 50% (n=200) of the participants were boys. Besides, the number of students in each district was n=100 (25 percent) and 50 percent (n=200) of the students were studying in the first year of high school (Table 1).

Table 1. Description of the individual characteristics of the participants

Quantitative variable	Mean± SD	Min	Max
Age	15.39 ± 1.94	12	18
Qualitative variables	Category	Frequency (n=400)	percentage (%)
Gender	Girls	200	50
	Boys	200	50
Education District	1	100	25
	2	100	25
	3	100	25
	4	100	25

Study Course	1st	200	50
	2nd	200	50
Father's education	High school	116	29
	diploma	132	33
	A university's degree	152	38
Mother's education	High school	104	26
	diploma	158	39.5
	A university's degree	138	34.5

Items Generation

First, the texts were tested in Persian and Latin databases and scientific sites. After collecting the articles, and questionnaires, we created a pool of addiction tendency questions (628 items). Next, semantic items were discarded through theory and hypotheses, review of texts, review of existing questionnaires, and the panel of experts; Repeated, unrelated, similar, ambiguous, unclear, and negative sentences. Upon compiling and designing, 30 final items were approved.

Face Validity

Quantitative face validity results, which were performed by calculating the item impact index among 32 participants (students), showed that all items had an acceptable score (above 1.5) in terms of "significance" [67-75, 77]. Furthermore, to qualitatively measure face validity, the items were given to 15 experts and 32 participants, and the level of the questions was tested in terms of "difficulty of expressions", "appropriateness", "ambiguity" and "insufficiency". Consequently, 6 items required to be clarified, and their examples were mentioned according to the answers of the participants and experts. Following measuring face validity, as a pilot, the reliability of Solat was measured through Cronbach's alpha in 32 participants, which was acceptable (0.87).

Content Validity

For qualitative content validity, the items were given to 15 experts to test their opinions on the questionnaire terms in terms of *grammar*, *wording*, *item allocation,* and *scaling*. However, the results showed that 27 items needed to be modified; 10 items were mentioned, 4 items were merged, 6 items were replaced with more appropriate words, and 7 items were changed from yes/no to 5-option Likert scale. Additionally, the comparative content validity ratio (CVR) and the content validity index (CVI) were employed to quantitatively measure the validity of the content. In calculating CVR, experts were asked to test each item based on the three-part scale of "necessary", "useful but not necessary" and "not necessary".

Ultimately, the judgment about CVR was based on the Lawshe Table. As the Table shows, however, the acceptable CVR value for 15 evaluators was 0.49. The results showed that all items hold an acceptable boundary (above 0.49). Furthermore, to test CVI, the Waltz and Basel content validity index was applied. The experts determined the questions according to the following criteria: "Relevance", "Clearness" and "Simplicity". According to a 4-point Likert scale, each item is "relevant", "relevant to some extent", "relevant", and "completely relevant". The acceptable CVI, however, is 0.79[67-69, 71-75, 77-80]. The results showed that all items had acceptable values of CVI (higher than 0.79).

Construct Validity

Construct validity was evaluated using maximum likelihood factor analysis and varimax rotation. To perform EFA, however, the following assumptions were first examined: sample size (5 to 10 subjects per item), data normality, outliers, missing data, correlation between items (min. 0.3, and max. 0.9), collinearity, factorability, and sampling adequacy[31, 67-73, 75, 76, 79, 81-83]; which all the assumptions were in place. Table 2 displays the factorability and sampling adequacy. Moreover, the Keyser-Meyer-Olkin (KMO) statistic was 0.88. Furthermore, as Cereny & Kaiser stated, the value of KMO should be more than 0.6 to perform EFA [31, 67-76, 79, 83]. The results showed that the questions were actionable. Additionally, Bartlett's sphericity test was significant (P<0.001)[31, 67-73, 75-79, 81-83], which indicates that it is important that the answer of the participants for factor analysis is sufficient to extract and explore the factors.

Table 2. The result of the KMO statistic and Bartlett's sphericity test

Indicators	Amount
KMO statistic and Bartlett's sphericity test	0.88
Chi-square statistics	2846.484
Degrees of freedom	435
P-value	P<0.001

Table 3 shows the CVI and CVR indices, Factor Loadings, Communality, the percentage of variance, the Eigenvalues, and the Total Variance Explained of the instrument with the Maximum Likelihood method and Varimax rotation among 30 items. Consequently, four factors, namely "*physical-mental problems*," "*family-personality*", "*social factors*," and " *other*

items," were extracted, which allocated 6.68, 1.81, 1.70, and 1.45, respectively. Moreover, the first factor accounted for 22.25% of the variance, the second for 6.02% of the variance, the third for 5.64%, and the fourth for 5.12%, The percentage of the total variance explained was 40%(Table 3), Furthermore, according to the Scree plot, four factors have an eigenvalue higher than one (Figure 1).

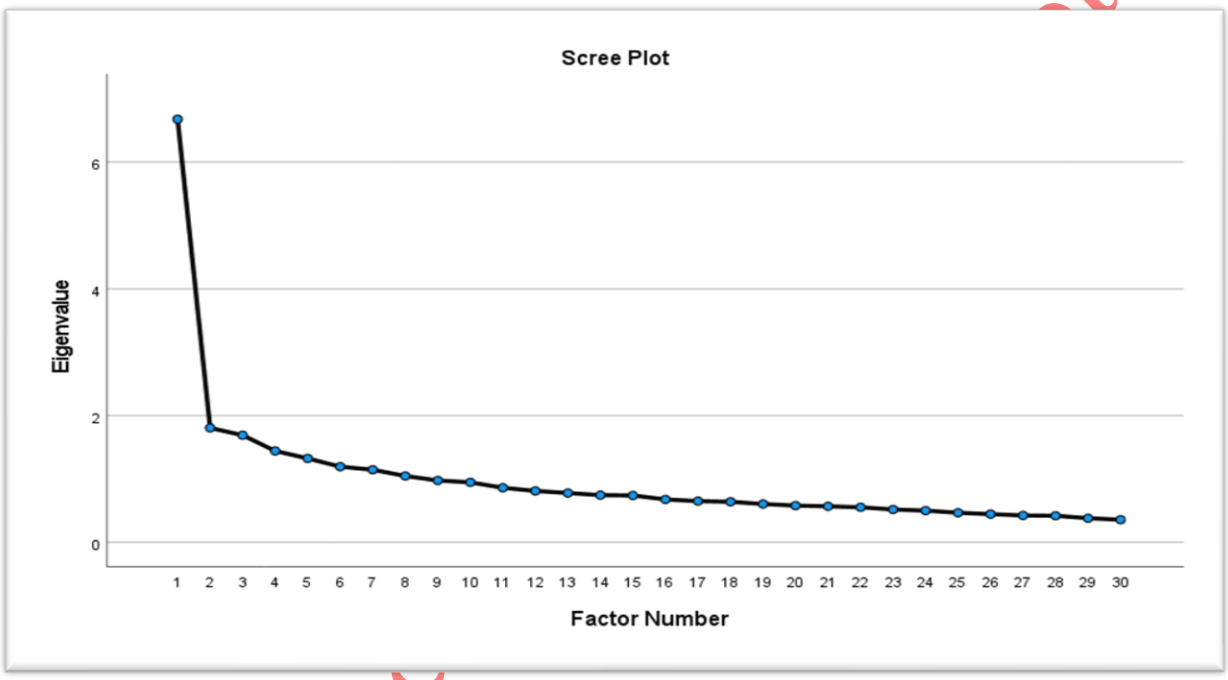

Figure 1. Scree plot

Table 3. CVI, CVR indices & Total Variance Explained of children's addiction Tendency scale

Factor	Item	Item Description	CVI	CVR	Extracted Factors			
					factor loading	Communality	% of Variance	Eigenvalues
1st Factor: Physical & mental problems	12	Do you feel bored, sad, or upset for no reason?	0.86	0.88	0.67	0.54	22.25	6.68
	19	How many negative thoughts come to your mind that cannot be recounted?	1	1	0.64	0.47		
	6	Have you ever had sleep problems? (Irregularity in waking up and sleeping)	0.73	0.93	0.62	0.44		
	18	How often have you experienced chronic (long-term) fatigue, digestive problems, or bone and muscle pains in your life?	0.86	0.86	0.61	0.44		
	23	Have you ever felt like hurting yourself or hurting others?	1	1	0.52	0.42		
	24	Have you ever thought of going to a doctor or a psychologist to relieve physical pain or mental-psychological problems?	0.86	0.86	0.42	0.25		
	11	Do you become irrational or aggressive when angry?	0.73	1	0.47	0.40		
	25	Have you ever decided to live independently from your family? (Living independently from parents and family)	0.86	1	0.49	0.43		
2nd Factor: Family-personality	9	Have you ever argued/disputed with your family members?	0.73	0.93	0.60	0.52	6.02	1.81
	10	Have you ever been disliked or rejected by people around you?	0.86	0.86	0.62	0.51		
	20	How much do parents trust you?	0.86	0.93	0.50	0.43		
	21	Are your parents strict or scolding you?	0.86	0.86	0.50	0.41		
	27	How often has divorce occurred in your family or close relatives?	1	1	0.49	0.35		
	28	Is anyone in your family (father, mother, brother, sister) an addict?	1	1	0.60	0.38		
3rd Factor: Social	16	To what extent can you resist your inappropriate desires and desires (e.g., the desire to party or have fun during exams, etc.)?	1	1	0.54	0.33	5.64	1.70
	17	To what extent are you influenced by the suggestions of your friends and family?	1	1	0.35	0.25		
	7	How much "power to say no" do you have in front of suggestions from friends and people around you?	1	0.93	0.34	0.25		
	15	How interested are you in doing things that require long-term persistence and concentration, such as studying for a long time or doing difficult homework?	0.86	0.93	0.61	0.45		
	22	Have you ever had to take money from your parents without their permission?	0.86	0.93	0.47	0.32		
	1	How much do you enjoy your life?	0.86	0.86	0.54	0.49		
	2	How many sports activities do you do daily?	0.86	0.86	0.63	0.41		
	3	In your free time, how often do you engage in social activities (e.g.reading books, scientific olympiads, sports activities, singing group, theater, etc.)?	0.86	0.93	0.62	0.40		
	4	How much do you ask God for help with the problems in your life?	0.73	0.86	0.39	0.20		
	29	Are there any addicts among your relatives?	0.86	0.93	0.52	0.36		
	30	Is anyone among your friends addicted?	1	1	0.49	0.43		
4th Factor: Other items	13	How much do you believe in this sentence: "Anything enjoyable should be experienced, even if it involves risks"?	1	1	0.36	0.25	5.12	1.45
	14	Do you enjoy doing exciting things with danger or taking risks (such as violent martial arts, dangerous motorcycle riding, driving at high speed, jumping from a great height, etc.)?	0.86	0.93	0.43	0.27		
	26	Have you ever failed or collapsed in your studies?	0.86	1	0.47	0.45		
	5	Have you ever experienced poverty (impoverished) in your life?	0.73	0.93	0.39	0.37		
	8	To what extent do you adhere to the norms and values of the society (e.g., respect for others, respecting the rights of others, the way you dress, cleanliness of the environment, etc.)?	0.73	0.93	0.41	0.20		

Reliability

Table 4 shows that the internal consistency of the entire questionnaire was 0.87, which indicates the strong correlation of the entire instrument. Furthermore, the internal consistency of each factor was in the range of 0.46 to 0.80, which indicates a moderate to strong correlation between each factor and the corresponding items. To calculate the intraclass correlation coefficient, the questionnaire was given to 150 participants, and two weeks later, the said questionnaire was completed again by the same ones. The intraclass correlation of the whole instrument was 0.88, which indicates a good to excellent agreement between domains and items. Additionally, the ICC between each factor and the corresponding items was in the range of 0.69 to 0.84, which indicates a moderate to strong ICC between each factor and its items.

Table 4. Internal consistency (Cronbach's alpha coefficient) and intraclass correlation of test-retest scores of subscales and the questionnaire

Factor	Sub-scale	Items (number of items)	Cronbach's alpha	ICC	CI (ICC)	p-value
1	Physical & mental problems	8 (12,19,6,18,23,24,11,25)	0.80	0.84	0.78 - 0.88	<0.001
2	Family	6 (9,10,20,21,27,28)	0.70	0.72	0.61 - 0.79	<0.001
3	Environmental-social-spiritual	11(16,17,7,15,22,1,3,2,4,29,30)	0.61	0.69	0.58 - 0.78	<0.001
4	Other items	5 (26,5,8,13,14)	0.46	0.74	0.64 - 0.81	<0.001
Total		30	0.87	0.88	0.83 - 0.91	<0.001

Discussion

The purpose was to compile and validate the addiction tendency questionnaire of Iranian children aged 12 to 18. According to the results, all items had an acceptable impact factor index (above 1.5) in terms of quantitative face validity. Furthermore, the qualitative formal validity index was modified with the proposed suggestions. Subsequently, qualitative content validity was evaluated by a group of experts. Quantitative content validity reported in CVR and CVI were above 0.49 and 0.79, respectively. However, the results showed that the sampling adequacy index was 0.88 and Bartlett's test had a significant level (P<0.001). Moreover, four factors were achieved through the children's addiction tendency scale, and the percentage of the total explained variance was 40%. In terms of reliability, Cronbach's alpha value and intraclass correlation coefficient for the entire designed instrument were 0.87 and 0.88, respectively, which indicated moderate to strong reliability of the measuring instrument.

In a research entitled “Life skills training Impact on self-mastery and attitude towards drug use in high school students” by Kaleybar et al. (2019) studied a sample size of 30 girls in

Tabriz, who applied the questionnaire of Wade and Butcher (1990) for validation. However, Cronbach's alpha was utilized to measure reliability, nevertheless, they did not mention any validity measurement. The results showed that the addiction tendency questionnaire does not have construct validity. The open test criterion is 0.60, which is likely to separate non-addicted and addicted teenagers from each other. It similarly has a high Cronbach's alpha [62]. Cronbach's alpha report may not be satisfied with being optimal or bad and its value must highlighted, accordingly. However, in the present study, the reliability index of the measurement and its value was reported as 0.87. Furthermore, the open-ended test criterion reported (0.6) does not have an optimal influence to confirm the reliability, although our results showed that ICC holds a value of 0.88. Correspondingly, quantitative, and qualitative measurement of formal and content validity was performed. On construct validity, four factors were extracted through EFA, all items had high factor loadings, and the extracted factors justified 40% of the items' variance. In the present study, unlike the other study, the instrument was validated in both genders.

Accordingly, Azarmehr and Ahmadi conducted a study on the tendency of youngsters to become addicted to male and female students in East Azerbaijan (2017), and surveyed 150 individuals were tested with a questionnaire taken from the work of Narimani et al [45]; which contained 41 questions. Moreover, the results showed that 49% of the total variance of addiction tendency could be explained by the factors [24]. The total amount of explained variance in our research was calculated as 40%, which shows that the studies are aligned with each other. The sample size in the aforementioned study was considered to be n=150, however, in our research, we evaluated n=400. According to experts, however, it is beneficial to include 5 to 10 subjects in the study for each item [31, 67-76, 79, 80], and with this account, the minimum sample size of the mentioned study must be n=200. In the present study, due to the appropriate sample size (n=400), appropriate factor loadings were achieved.

In their study, Naderiasar et al (2015) studied the effectiveness of group training in spiritual intelligence on the degree of addiction tendency among Qazvin high school students. Accordingly, 53 students were included in the study as a multi-stage sampling. In this study, Cronbach's alpha was reported as 0.82. However, they did not mention the validity of the questionnaire. Another point is the age group of the studied students, which was unclear in the study. Moreover, it is expected that a sample size of at least n=80 will be included in the study. However, according to experts, a sample size of less than 100 individuals gives weak and unreliable results [31, 67-76, 79, 80]. In the present study, despite the similarity of Cronbach's alpha (0.87), the intraclass correlation index (0.88) was applied to report reliability, which

contributed to the richness of the work. Additionally, the age group was 12 to 18 years and the sample size was n=400. Another point is the reliability of the questionnaire items, which were not mentioned in the study. The authors of the present study mentioned Cronbach's alpha and the intraclass correlation coefficient of the entire questionnaire and its subclasses by separating the relevant factors and items[44].

The tendency to use drugs among high school students in *Marivan City* was conducted by Valadbigi et al. In the study, however, the addiction tendency of 367 male and female students was measured with a questionnaire containing 32 questions. The results showed that the explanatory power of the four studied variables (commitment, involvement, attachment, and belief) was 53%[59]. Our findings reported the explanatory power of the items at 40%, which is consistent 40% which is consistent with this study; it may refer to the appropriate sample size, which is evident in both studies. Furthermore, the number of items in the current questionnaire was 30 questions, and the extracted factors were four factors, and in this study, the number of items was 32 questions. The studied factors are four factors, which may be the reason for the correlation coefficients and variance explanation.

Among other studies, the following studies may be mentioned: Ghaedamini et al., [29]; Haji Hasani et al., [32]; Zia al-Dini et al., [61]; Parsian et al., [43]; Mousavi et al., [55]; Sheikh and Kashi., [58]; Pour Mohammad et al., [48]; Narimani et al., [45]; Jalililan and Yazdanbakhsh., [38]; Sarban and Saeb., [53]; Mohammadi et al., [41]; Yekkehfallah et al., [60]; Baghiani Moghaddam et al., [25]; Mikaeili et al.[47] and Hajli et al., [33]. In all these studies, however, the instrument was either created by the researcher or another questionnaire was used, which was revalidated. Additionally, there were limitations in different validation steps that required clarification and reporting of the mentioned cases.

The present study was the first national comprehensive study in designing an instrument for addiction tendency in Iranian children; Up to now, a specific, standardized, and updated questionnaire regarding the degree of addiction tendency of Iranian children has not been compiled, designed, and validated, which represents an innovation and the creation of a new instrument according to the needs of the Iranian society. Another strong point of the study was the application of the quantitative-qualitative combined method in determining the formal and content validity of the instrument. Furthermore, in most studies, only one method was employed to determine the reliability of the instrument, while in the present study, two methods, Cronbach's alpha coefficient, and intraclass correlation coefficient, were applied for this purpose.

Moreover, unlike most studies, in this research, we examined the construct validity through EFA and identified the latent factors of the items, which was unprecedented in all the studies conducted in this field. Utilizing 15 experts with a well-known background in instrument making across the country, who have many publications of research validation, similarly greatly contributed to the study. However, despite all the strengths, like other studies, the present study had limitations; among them: the subject of the research and the target group under study; which are still considered as a social stigma, since the researchers faced difficulties in receiving the related permissions.

Conclusion

The addiction tendency questionnaire in Iranian children aged 12 to 18 years had adequate validity and reliability and may be applied by interested organizations; such as education, welfare, anti-narcotics headquarters, awareness police, and combating drug trafficking. Moreover, the country's researchers tend to children's addiction and their screening. However, the validity of the questionnaire was confirmed quantitatively and qualitatively following research conducted using face and content validity methods. Additionally, construct validity was applied through EFA, and the validity of the current instrument was confirmed using the above methods. Correspondingly, the examination of the reliability of the instrument from the dimension of internal homogeneity and intraclass correlation coefficient showed that all questions have the same role in the total score, and in case of deletion of each one, the reliability should not increase significantly, therefore the questions of the questionnaire had acceptable reliability. Therefore, to study the addiction tendency of Iranian children, as well as screening by relevant organizations, this valid and reliable instrument may be applied with confidence.

Acknowledgments

The authors would like to express their gratitude to the Vice-Department of Research and Technology of Shiraz University of Medical Sciences and Health Services, Fars Education, school administrators, professors, and all participants for their cooperation and participation in the study.

Authors' Contribution

Conceptualization: Jafar Hassanzadeh, Aboubakr Jafarnezhad.

Data curation: Aboubakr Jafarnezhad.

Formal analysis: Jafar Hassanzadeh, Haleh Ghaem Maralani, Aboubakr Jafarnezhad.

Investigation: Aboubakr Jafarnezhad.

Methodology: Jafar Hassanzadeh, Haleh Ghaem Maralani, Ali Sahraian, Aboubakr Jafarnezhad.

Project administration: Jafar Hassanzadeh, Haleh Ghaem Maralani.

Resources: Jafar Hassanzadeh, Aboubakr Jafarnezhad.

Software: Jafar Hassanzadeh, Haleh Ghaem Maralani, Aboubakr Jafarnezhad.

Supervision: Jafar Hassanzadeh,Haleh Ghaem Maralani, Ali Sahraian.

Validation: Jafar Hassanzadeh, Haleh Ghaem Maralani, Aboubakr Jafarnezhad.

Visualization: Jafar Hassanzadeh, Haleh Ghaem Maralani, Aboubakr Jafarnezhad.

Writing–original draft: Aboubakr Jafarnezhad.

Writing–review & editing: Jafar Hassanzadeh, Haleh Ghaem Maralani, Aboubakr Jafarnezhad.

Competing Interests

The authors have no conflict of interest.

Data Availability Statement

The datasets generated and/or analyzed during the current study are not publicly available. However, they can be obtained from the corresponding author upon reasonable request, with permission from the Ethical Committee of Shiraz University of Medical Sciences.

Ethical Approval

The study was a part of the thesis in the doctoral section of epidemiology, approved by the Ethics Committee of Shiraz University of Medical Sciences and Health Services in 2023 with the code of ethics *IR.SUMS.SCHEANUT.REC.1402.112*. Additionally, the approval of Iran's anti-narcotics headquarters, the approval of the scientific research committee of education of Fars Province, the approval of the officials and protection of education of Fars Province and the four education districts of Shiraz, as well as the approval of the officials of the schools under study. Verbal consent was achieved from each participant. Furthermore, the participants were assured that cooperation in the research is voluntary and the findings of the study will be reported and published anonymously.

Funding

This study was not funded by any public, commercial, or non-profit organizations.

Refrences

1. Rouzbahani F, Akhlaghi Kouhpayeh H, *Relationship between attachment styles and initial maladaptation schemas with the social utility of leaving addicts %J Middle Eastern Journal of Disability Studies.* 2018. 8(0): p. 97-97. [Persian].
2. Mehdipoor Rabori R, Nematollahi M, Nouhi E. *The Family Role in Drug Addiction of Children from the Perspective of Addicted Children's Mothers in Kerman* %J Journal of Health and Hygiene, 2012. 3(2): p. 67-72. [Persian].

3. Nemati Sogolitappeh F, Khaledian M. *The Qualitative Study of Factors Affecting Relapse to Drug Abuse and Addiction with a Grounded Theory Approach.* Research on Addiction, 2022. 16(64): p. 279-307. [Persian].
4. Oujhand H, Azadfallah P, Rasoolzadeh Tabatabaie K. *The role of brain- behavioral systems with addiction relapse.* Pejouhesh dar Pezeshki (Research in Medicine), 2016. 40(2): p. 54-57. [Persian].
5. Amani F, Sadegie Ahari S, Mohammadi S, Azami A. *Trend of drug abuse patterns in drug addiction centers during 1999-2004.* Journal Ardabil of medical science, 2005. 3(5): p. 220-224. [Persian].
6. Soleimani R. *The role of non-governmental organizations in reducing drug use.* New ideas in science and technology, 2016. [Persian].
7. Habib A. *Family and Addiction* J Social Sciences, 1998. 6(10): p. 47-72.
8. Hosseini A. *Criminology and Crime troubleshooting theft.* Jahad University of Mashhad Press, 2002: p. 10-20. [Persian].
9. Zarkhani S. *Geopolitics of drugs and the security of the eastern borders*. in *National Congress on Border Cities and Security; Challenges and Strategies*. 2012. [Persian].
10. Honarjoo A, Mahkouii H, Momeni M, Gandomkar A. *An Analysis of the Status of International Land Boundaries in the Golden Crescent Region in the Fight against Drug Trafficking* %J Geography (Regional Planning), 2022. 12(48): p. 1055-1079. [Persian].
11. Jafarnejad A, Khanjani N, Tirgari B. *Factors Associated with Addiction in Children in Kerman city.* Journal of Community Health Research 2017. 6(3): p. 175-184. [Persian].
12. *Dehnavi M, Mirvahedzadeh B, Yavari M. Investigating the prevalence of drug abuse and evaluating knowledge, attitude and factors related to drugs in high school students of Yasouj city.* %J The Journal Of New Advances In Behavioral Sciences, 2021. 6(54): p. 197-210. [Persian].
13. Shokri K, Ranj Baran R, Rokhosh A. *Addiction approaches and models.* Social Health and Addiction, 2018. 18(5): p. 105 -138. [Persian].
14. Yahyazadeh H. *The effect of family factors on the tendency of people to abuse drugs.* Social research, 2010. 2(5): p. 123-142. [Persian].
15. Oviedo J, Eugenia M, Kirsten G, Daphne M, David CB, Suzanne K., et al., *History of reported sexual or physical abuse among long-term heroin users and their response to substitution treatment.* Addictive behaviors, 2011. 36(1-2): p. 55-60.
16. Kohei L. *Comparing Mental Status of Offspring of Addicted and Nonaddicted Fathers.* Social Welfare, 2003. 3(9): p. 295-306. [Persian].
17. Waly G. *UNODC World Drug Report 2022 highlights trends on cannabis post-legalization, environmental impacts of illicit drugs, and drug use among women and youth.* 2022; Available from: https://unis.unvienna.org/unis/en/pressrels/2022/unisnar1462.html.
18. Doward LC, Meads DM, Thorsen H. *Requirements for quality of life instruments in clinical research.* Value Health, 2004. 7 Suppl 1: p. S13-6.
19. Hassanzadeh J, Jafarnezha A. *The Process of Validating a Persian Version of Addiction Potential Scale for Children in the Iranian Population: A Systematic Review* J Addiction & Health, 2024. 16(2): p. 140-151. [Persian].
20. Aghjani S, Ahmadi sh, vahid F. *Causal Modeling of Tendency to Addiction Based on Anxiety Sensitivity Mediated by Mediation Difficult in Emotion Regulation in Male Adolescents* Journal of Sabzevar University of Medical Sciences, 2021. 28(4): p. 477-488. [Persian].

21. Akbari Chermahini S, Sajadinezhad MS, Shafieetabar M, Sepahvand T. *Cognitive control of two groups of adolescents with high and low tendency to addiction: a comparative study.* Advances in Cognitive Science, 2016. 20(1): p. 56-47. [Persian].
22. Ali Z. *Validation of Addiction Susceptibility Questionnaire in Iran Adolescents (ASQ-AV)* Journal of Clinical Psychology, 2014. 6(3): p. 81-93. [Persian].
23. Amini Z, Heidary BS. *What components of adolescents' responsibility are effective in preventing addiction?* Advanced Biomedical Research, 2020. 9. [Persian].
24. Azarmehr R, Ahmadi E. *The role of anxiety sensitivity and attentional control in predicting the tendency toward addiction in youth.* Iranian Journal of Health Psychology, 2019. 2(2): p. 45-50. [Persian].
25. Baghiani Moghaddam MH, Fazel Pour Sh, Zohreh R. *Comparison of the views of addicts and non-addicts about the causes of addiction.* Research Quarterly of Yazd School of Health, 2008. 7(3): p. 48-40. [Persian].
26. Faezeh BA. *Study of Knowledge of Kerman's High School for Boys Students about the Consequences of Psychoactive Substance Abuse* Avicenna Journal of Nursing and Midwifery Care, 2008. 16(1): p. 18-28. [Persian].
27. Fathi A, Zare A,Mousavifar B, Mursali H. *Examining the role of family function in preventing Tendency to addiction of teenagers and young people of Tabriz city.* East Azarbaijan Police Knowledge Quarterly, 2018. 27(11): p. 91-79. [Persian].
28. Feyzi H, Vaisi Raygani AA, Abdi A, Shakeri J, Mardokhian M. *The predisposing factors for drug abuse in viewpoints of referrers to Addiction Treatment Centers in Kermanshah.* Journal of rehabilitation research in nursing, 2016. 2(2): p. 47-56. [Persian].
29. Ghaedamini Harouni G, Bahreini Boroujeni M, Mirshah Jaafari SE, Sepehri Broujeni K. *Effectiveness of Four Preventive Methods on Attitudes toward Drug Abuse and Mental Health among High School Boys %J Research in Cognitive and Behavioral Sciences.* 2017. 7(1): p. 51-64. [Persian].
30. Gorbani Ensieh, Asadi J. *Comparison of Personality Traits, Mental Health, and Sensation Seeking between Adolescents with Substance-Dependent and Normal Parents*, in *Scientific Quarterly Journal of Addiction Research*. 2023. p. 137-160. [Persian].
31. Habibi A, Kolahi B. Modeling structural rates and factor analysis. *Structural equation modeling and factor analysis*. 1, ed. 1. 2017. [Persian].
32. Haji hasani M, Shafi Abadi A, Pirsaghi F, Kiyanipour O. *The relationship between aggression, self-expression and depression with readiness for addiction in female students of Allameh Tabatabai University.* Knowledge and research in applied psychology, 2012. 13(3): p. 65-74. [Persian].
33. Hajli A, Zakariaey MA, Sudeh H.K. *Iranians' Attitude towards Drug Abuse* Journal of Social Problems of Iran, 2010. 1(2): p. 81-111. [Persian].
34. Kambiz K, Shohreh S. *Scale standardization tendency to addiction (with emphasis on MMPI-ARF) secondary school students and pre-university.* Eur J Experiment Biol, 2012. 2(5): p. 1868-1879. [Persian].
35. Kazemi-Rezaei SV, Kazemi-Rezaei SA. *Prediction of tendency to addiction based on alexithymia and assertiveness in nursing students.* Feyz Journal of Kashan University of Medical Sciences, 2020. 24(2): p. 228-236. [Persian].
36. Khaliq Khah A, Misrkhani Na, Habiba N. *Predicting susceptibility to addiction based on psychological toughness and cognitive-emotional regulation.* Educational Psychology Skills Quarterly, 2020. 10(4): p. 40-50. [Persian].

37. Noubakht L. *Students' attitude towards drug abuse and factors affecting it.* Social work research paper, 2015. 2(3): p. 156-188. [Persian].
38. Mansouri Jalilian A, kamran Y. *Predicting Tendency to Abuse Drugs by Using Differentiation and Metacognition among University Students* %J Research in Cognitive and Behavioral Sciences, 2016. 6(2): p. 43-52. [Persian].
39. Moghanloo M, Valivand Y. *Modeling the Tendency to Addiction Based the Five-Factor Personality Model Mediated by Resilience in Students.* Scientific Quarterly Journal of etiadpajohi, 2022. 16(63): p. 267-284. [Persian].
40. Mohammadi A, Pourghaz A, Raghib MS. *The Construction and Validation of Scale of Effective Factors in Drug Abuse Tendency among Youth (A Case Study in Khorasan Razavi).* Addiction and Substance Abuse Research Quarterly, 2013. 7(26): p. 73-94. [Persian].
41. Mohammadi N, Ghonouti FM, Movalat M. *The Study of Reasons in Relapsing of Addiction Patients Who Referred to Reference Center in Hamdan.* Avicenna Journal of Nursing and Midwifery Care, 2002. 15(1): p. 32-42. [Persian].
42. Mosayeb N. *Investigating the causes and related factors in the tendency of young people to use drugs (a case study of Jalga Chah Hashem region).* Journal of New Advances in Behavioral Sciences, 2019. 4(34): p. 46-58. [Persian].
43. Parsian M, Hashemian K, Abulmaali Kh, Mirhashmi M. *Predicting the attitude towards drug use in adolescents based on family educational risk factors for the mental health of adolescents in society: Designing a model for addiction prevention.* Journal of Ardabil University of Medical Sciences, 2015. 15(2): p. 198-206. [Persian].
44. Naderiasar MH, Ahadi H, Bahrami H, Hatami HR. *The effectiveness of spiritual intelligence group training on the level of addiction tendency in high school students.* Journal of Research in Educational Systems, 2018. 12(Special Issue): p. 163-173. [Persian].
45. Narimani M, Rajabpour M, Ahmadi A, Yaghooti Zarghar H, Rostamoghli Z. *Prevalence and factors associated with drug abuse among high school students in Semnan* %J Journal of School Psychology, 2017. 5(4): p. 132-145. [Persian].
46. Mohammad Nasl GH, Mahjoob B. *Social prevention of student addiction.* Scientific Quarterly Journal of Crime Prevention Approach, 2018. 1(3): p. 109-130. [Persian].
47. Nilofar M. *Comparison of Thought Control, Mindfulness and Attachment Styles in Students with High and Low Tendency to Addiction* %J Research on Addiction, 2017. 10(40): p. 65-86. [Persian].
48. Pour Mohammad Z, Yasini M, Ahmadi MH, Dehghani Kh. *Investigating the level of awareness of male students in rural high schools in Yazd province about drugs.* Scientific research journal of Shahid Sadougi University of Medical Sciences, Yazd, 2010. 18(3): p. 183-179. [Persian].
49. Pourhosein R, Morovati Z, Yosefi Afrashteh M. *Examining the role of family factors affecting drug trends (traditional-industrial) among youth of Lorestan province.* Journal of psychologicalscience, 2015. 14(54): p. 154-167. [Persian].
50. Rezaee A M, Delavar A, Najafi M. *The Construction and Validation of Opium Attitude Questionnaire among Guidance and High School Students.* Addiction and substance abuse research quarterly, 2016. 6(24): p. 54-37. [Persian].
51. Jamaloui H, Ariapouran S, Kajouie M, Moradi H, Taheri M. *Predicting the reduction of drug use in high school students based on attachment to God, religious attitude, social support and sensation seeking.* Psychology and religion, 2015. 8(8): p. 79-96. [Persian].
52. Salami F, Hatami H, Noori R. *The prediction of drug use tendency based on the psychological space of the family, the family history of addiction and the role of the*

peer group in the tobacco-consuming adolescents. %J Applied Psychology, 2018. 12(2): p. 265-284. [Persian].
53. vakil heidari S, saeb S. *Investigating the factors affecting the reduction of rural youth tendency to drug use (Case Study: Ardabil County)* Journal of Studies of Human Settlements Planning, 2021. 1(16): p. 1-14. [Persian].
54. Satari B, Azam A, Mohammadi MA. *Examining the rate of tendency to addiction in people over ten years old in 2013 (Ardebil province).* Social Welfare Journal, 2004. 3(9): p. 263-282. [Persian].
55. Mousavi S, Roohafza H, Sadeghi M. *The relationship between the use of cigarettes and other drugs in students and their parents.* Research in medical sciences, 1999. 8(3): p. 57-59. [Persian].
56. Shamsi Maimandi M, Ziyadini SH, Alireza SY. *Effective factors in drug addiction from the perspective of high school students in Kerman 2014.* Scientific journal of Qazvin University of Medical Sciences, 2005. 12(3): p. 88-80. [Persian].
57. Sharifi S, Abbas HS. *Validation of the Persian version of the Vulnerable to Addiction Personality Questionnaire.* Addiction and Abuse Research Quarterly, 2006. 12(50): p. 277-290. [Persian].
58. Sheikh M, Kashi Ali. *Investigating the prevalence of drug use in Iranian students and demographic characteristics related to the pattern of drug use.* Quarterly magazine of the Center for Strategic Studies of the Ministry of Sports and Youth, 2016. 14(30): p. 145-160. [Persian].
59. valadbaigi E, lashkari A, *Tendency to drug use among high school students(Case Study: Marivan High Schools).* Refahj Quarterly, 2017. 17(64): p. 237-259. [Persian].
60. Yekkehfallah L, Momeni A, Torkashvand A, Jahani Hashemi H. *Factors Associated with Ecstasy Use in Students of Qazvin University of Medical Sciences.* Journal of Hayat 2009. 15(2): p. 80-73. [Persian].
61. Zia al-Dini H, Zarezade A, Farzad H. *Prevalence of substance abuse and addiction and some related factors in final year high school and pre-university students of Kerman city in 1379-80.* Journal of Kerman University of Medical Sciences, 2006. 13(2): p. 84-94. [Persian].
62. Habibi-Kaleybar R, Bahadorikhosroshahi J. *The Effectiveness of Teaching Life Skills (Critical Thinking) on Self-Control and Attitudes toward Drug Abuse among High-School Students.* J Thinking and Children, 2020. 11(1): p. 27-46. [Persian].
63. Mokkink LB, Terwee CB, Patrick DL, Alonso J, Stratford PW, Knol DL, et al. *The COSMIN study reached international consensus on taxonomy, terminology, and definitions of measurement properties for health-related patient-reported outcomes.* J Clin Epidemiol, 2010. 63(7): p. 737-45.
64. Ødbehr L, Kvigne K, Hauge S, Danbolt LJ. *Nurses' and care workers' experiences of spiritual needs in residents with dementia in nursing homes: a qualitative study.* BMC Nurs, 2014. 13: p. 12.
65. Raisi E. *Approved priorities for master's theses and doctoral theses*. 2024 [cited 2024 2024.07.31]; Available from: https://news.dchq.ir/3/?p=80550.
66. Qolbank. *Information bank of health and quality of life measurement tools*. 2024; Available from: http://www.qolbank.ir/Fa/Questionnaire/QuestionnaireList.aspx.
67. Abdulrahimi M , Ghiathundian Sh, Zakari Moghadam M, Ebadi A. *Instrumentation in medical sciences*. 1, ed. 1. 2022.
68. Pahlwan Sharif S, Sharifnia H. factor analysis and modeling of structural equations from zero to master with SPSS and AMOS software. 3nd ed.Tehran: Jame-e-Negar; 2022.

69. Sharifnia SH, Pahlwan Sharif S. *Factor analysis and modeling of structural equations from zero to master with SPSS and AMOS software, third edition*. 3, ed. 2. 2023.
70. Hajizadeh E, Asghari M. *Statistical methods and analyzes with a view to research methods in biological and health sciences (with SPSS guide)*. 2011: Academic Jihad Publishing Organization.
71. Khoshbakht Peishkhani M, Bandari R, Ebadi A, Sharifnia SH, Zareian A. *Measuring and Measuring Change - A Practical Guide to Instrumentation in the Medical Sciences*. 2, ed. 4. 2019.
72. Mohammadbeigi A, Mohammadsalehi N, Aligol M. *Validity and Reliability of the Instruments and Types of MeasurmentS in Health Applied Researches.* Scientific journal of Rafsanjan University of Medical Sciences, 2015. 13(12): p. 1153-1170. [Persian].
73. Nakhaei N. *Designing and analyzing a questionnaire with an emphasis on addiction research*. 74259, ed. 353. 2013: Kerman: Gera publishing house.
74. Chehrei A, Setayesh HR, Osyond S, Pak Mehr A, Haq Dost AA, Davoudi F, et al. *Principles of questionnaire design in medical science studies*. 2, ed. 2. 2018.
75. Pahlwan Sharif S, Sharif Nia SH. *Structural equation modeling with AMOS software*. 3, ed. 1. 2018.
76. Sadrasadat SJ, Minaei A. *An easy guide to factor analysis*. 4, ed. 1. 2015.
77. Lacasse Y, Godbout C, Sériès F. *Health-related quality of life in obstructive sleep apnoea.* Eur Respir J, 2002. 19(3): p. 499-503. [Persian].
78. Edwards Ch, Michael W, Wirth R J. *Measurement and the Study of Change.* Research in Human Development Research in Human Development, 2009. 6: p. 3-74.
79. Polit DF, Yang FM. *Measurement and the Measurement of Change: A Primer for the Health Professions*. 2014.
80. Sperber AD. *Translation and validation of study instruments for cross-cultural research.* Gastroenterology, 2004. 126(1 Suppl 1): p. S124-8.
81. Colin A, Andrew JS. *Critical Values for Lawshe's Content Validity Ratio:Revisiting the Original Methods of Calculation.* 2014. 47(1): p. 79-86.
82. Khorazian Akhwan M, Sobhani Fard Y. *Self-taught advanced statistical analysis with SPSS, LISREL, AMOS for compiling scientific articles, master theses, doctorate and organizational research*. 2016, tehran: Imam Sadiq University (AS).
83. Chehrei A, Haghdoost AA, Fershte Nejad SM, Bayat A. *Statistical analysis in medical science research using SPSS*. 4, ed. 4. 2022.