

Developing an instrument to measure the influential factors on career choice among Iranian nursing students

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ABSTRACT

Background: Understanding why the graduates from the high schools choose nursing is essential for the health policy makers in each country and Iran is not an exception. The aim of this study was to develop an instrument measuring the influential factors on career choice among Iranian nursing students.

Materials and Methods: This methodological study employed both qualitative and quantitative approaches. In the first phase of the study, the items were generated for the instrument. These items were drawn from a relevant literature review along with taking a poll of experts' opinions. Then the psychometric properties of instrument were measured using content validity, face validity, and construct (exploratory factor analysis) validity as well as its reliability.

Results: Initially, a 35-item instrument was developed. In the second phase, a scale-level content validity index of 0.90 was obtained for the instrument. The factor structure of the inventory was identified by undertaking a principal component analysis in a sample of 139 nursing students. Three factors were extracted with a total variance account of 42.03%. Reliability was demonstrated with Cronbach's alpha coefficient of 0.77 for the entire scale. Consistency of the instrument was established with test — retest reliability with an interval of 2 weeks (intra-cluster correlation = 0.94, $P < 0.001$). Wilcoxon signed-rank test demonstrated no significant differences between the test — retest scores ($P > 0.05$).

Conclusion: It seems a culturally sensitive instrument with a satisfactory level of validity and reliability has some implications for policy makers in nursing education.

Key words: Career choice, Iran, nursing, psychometrics, students

INTRODUCTION

There have been major changes in accepting medical sciences students, including nursing students, in the university entrance examinations around the world in recent years. Now it is widely accepted that university students should not only fit their future profession in all aspects but also have enough knowledge and insight about their selected major.^[1]

Career choice is one of the most important decisions that one has to make throughout his/her life. To choose a job, one has to spend a lot of time and money. On the other hand, shifting to another profession after graduation requires too much time and budget, which emphasizes

the importance of accurate selection of a major at university level.^[1] Career choice is affected by one's motives which are not of equal importance to everyone. It is based on a number of personal, situational, and organizational factors.

Previous studies^[2-10] have shown that the reasons for choosing nursing as a major or a career included: Desire to help and care for others, an opportunity to work with people in a variety of work settings, job opportunities and security, income potential, impact of family and friends in the nursing profession, positive images of nurses, and quality of work environment. Other reasons include the experience of nursing a sick relative or friend,^[2,6,11] having relatives or friends involved in health care professions, or observing family members being cared for by nurses in hospital.^[2,6] Although career choice has been studied over several decades, further research may examine the changes and differences in different social environments.^[12,13]

Revolution in medical education system is one of the major policies of the Ministry of Health in the Islamic Republic of Iran. In recent years, influential steps have been undertaken to improve academic knowledge

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in the society and train efficient human resources. Understanding the issues that influence the selection of nursing as a career is now of vital importance in health system, as one of the most important concerns of the officials at the Ministry of Health is to improve the quality of health services.^[4,13]

To the best of our knowledge, few studies in Iran have investigated the characteristics of those who have selected nursing as a career and most of them were on job satisfaction in Iranian nurses and nursing students. One study showed that from the Iranian nursing students' point of view, the main reasons for attrition were: Poor social setting, discrepancy between pre-entry perceptions of nursing and its reality, staff and health care team's negative attitudes toward nurses, inappropriate clinical environment, social gap between physicians and nurses, and low salary of the graduates or financial factors.^[14] Another study conducted among 82 freshman Iranian nursing students has shown although more than 50% of the participants evaluated their information of nursing profession average, it is suggested to plan and make more efforts to recognize personal characteristics and personality.^[15] Thus, it is important to conduct more researches on career choice to promote more effective programs in nursing education.

In order to carry out research on the above aspects, valid and reliable instruments for measuring influential factors on career choice in Iranian nursing students are needed. Now it is accepted that instruments should be culturally sensitive and in accordance with each country's culture.^[16] So, an instrument, namely the Influential Factors on Career Choice Inventory (IFCCI), was developed for the purpose of this study.

MATERIALS AND METHODS

This was a mixed method study using both qualitative and quantitative approaches. It was performed in two stages. Mixed methods research is a combination of both qualitative and quantitative research methods. It is usually done in a number of ways wherein each approach contributes to the description of a phenomenon. It is deemed that is the best method since it offers a better understanding of research.^[17,18]

At first, a comprehensive literature review on the existing surveys measuring the influential factors on career choice in nursing and the opinions of experts was conducted to develop a pool of items for the instrument. In this step, 15 faculty members of Mazandaran University of Medical Sciences (MUMS) in the area of nursing, medical

education, and instrument development were selected based on purposeful sampling method. Face-to-face semi-structured interviews were employed. This allowed the researcher to explain clearly the aims of the study and the expectations of the experts. They were encouraged to provide comments and recommendations concerning any aspect of the IFCCI.

Once the design of the items was completed, the instrument was assessed in terms of content validity. First, a content validity rating form was prepared and given to 10 faculty members to evaluate the instrument. The assessment was based on Waltz and Bausell content validity index (CVI). The experts scored the relevancy, clarity, and simplicity of each statement in IFCCI using a Likert-type scale ranging from 1 to 4.^[19] The score for CVI for each statement was calculated by dividing the number of agreed experts (who scored 3 and 4 in the Likert scale) by the total number of experts. The statement was accepted if the CVI was ≥ 0.79 .^[20]

To assess face validity, the experts and 10 nursing students were asked to assess the statements in IFCCI for clarity and fluency. They were asked to evaluate item wording, response format, and instrument length. Changes made in the original version included adoption of age-appropriate words and development of a format more appealing to the nursing students.

Construct validity of IFCCI was assessed using exploratory factor analysis method to explore the categories of statements (as the variables) with the highest relativity. The required number of respondents for factor analysis was 3-10 for each statement.^[21] In this step, 139 nursing students (70 female and 69 male) were recruited from first-grade nursing students studying at three nursing schools in Mazandaran province in the north of Iran. The questionnaire was distributed among all the freshmen in the three nursing schools from October 2011 to March 2012, and 139 questionnaires were returned. The Kaiser — Meyer — Olkin test was used to assess the sampling adequacy.

Internal consistency and test — retest reliability methods were used to assess the reliability of IFCCI. Internal consistency reflecting the extent to which each item measures the same construct by creating an average of all possible inter-item correlations was investigated using Cronbach's alpha coefficient. An acceptable coefficient for internal consistency should be between 0.70 and 0.80 and more.^[22] Cronbach's alpha of IFCCI was calculated in a sample of 20 nursing students using convenience sampling method. It was measured for each factor and also for the whole of the questionnaire. Stability of a

tool shows the reliability of obtained scores following a test — retest administration.^[23] In this step, stability of IFCCI was assessed using test — retest reliability measurement method. Twenty nursing students filled out the IFCCI forms twice with a 2-week interval.^[24] Intra-cluster correlation index was used to compare the scores obtained from the test — retest administration of IFCCI.

Finally, the collected data were fed into the Statistical Package for Social Sciences for Windows version 13.0 (SPSS Inc., Chicago, IL, USA) for further analysis.

The study was approved by ethical committee of MUMS. All the participants were informed of the purpose and the design of the study. They were told that they could withdraw the study whenever they wanted and were assured about the confidentiality and anonymity of the information.

RESULTS

Extensive literature reviews on the influential factors of career choice in nursing students and the opinions of experts were used to make the preliminary tool with 35 statements. Then, parallel statements were omitted or combined by the researchers. Subsequently, a questionnaire was developed with 30 statements in a five-level Likert-type scale (not important, less important, moderately important, very important, and extremely important). Likert-type scale is a psychometric scale commonly used in questionnaires and is the most widely used scale in survey research. It is a method of ascribing quantitative value to qualitative data to make it amenable to statistical analysis.^[25]

Statements with CVI of less than 0.79 were omitted, reducing the number of items from 30 to 19. A scale-level CVI of 0.90 for the instrument was obtained. Besides, researchers attempted to make a correct, reasonable, and clear writing of statements based on experts' and nursing students' opinions to meet the face validity of the instrument.

With regard to exploratory factor analysis, an acceptable level of Kaiser — Meyer — Olkin (0.70) was obtained.^[26]

Correlation matrix was evaluated using the Bartlett's test of sphericity giving a value of 624.01 ($P < 0.001$).

With principal component analysis, six factors with an eigenvalue of greater than 1 were determined. They could explain 73.13% of the variance. To make the instrument simpler and more explainable, exploratory factor analysis was performed again with a limitation in factors' extraction to three factors, and varimax rotation method was run. Varimax rotation is an orthogonal rotation method usually used for making the construct factors simple and explainable.^[18] At this stage, a minimum point of 0.35 was considered as the acceptable minimum factor loading for keeping a statement in an extracted factor following factor analysis. Two statements were deleted because they were not able to achieve the minimum factor load of 0.35. Finally, 17 statements remained in three constructs, which could explain 42.03% of variance [Table 1]. These constructs were named as social factors (statements 1-6), personality factors (statements 7-11), and professional factors (statements 12-17) [Table 2]. As the results demonstrated, there were two statements that could be included in more than one construct. These statements were considered for a construct, based on their factor load and meaning. Therefore, statement 9 was considered for construct 2 (personality factors) and statement 17 was considered for construct 3 (professional factors).

To compare the mean score of different influential factors on career choice held by nursing students, a multivariate analysis was conducted. In this analysis, the means of the items in the three scales were taken as the multiple dependent variables. The results are summarized in Table 3. The findings of this study did not show any differences in the mean scores of the extracted subscales between female and male nursing students.

Cronbach's alpha coefficient was obtained to be 0.77 for the whole IFCCI, and for the subscales of the instrument, the figures were: Social factors (0.73), personality factors (0.69), and professional factors (0.70). The intra-cluster correlation coefficient calculated to assess the stability of

Table 1: Results of principal components analysis — factors and variance explained

Component	Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
	1	3.94	21.09	21.90	2.91	16.21
2	2.03	11.28	33.18	2.36	13.13	29.34
3	1.59	8.84	42.03	2.28	12.68	42.03

Extraction method: Principal component analysis

Table 2: Rotated matrix of an instrument to measure the influential factors on career choice in Iranian nursing students based on principal component analysis and varimax rotation

Statements	1	2	3
1 Mass media encouragement	0.821		
2 School counselors' encouragement	0.809		
3 Peers' encouragement	0.798		
4 Parents' encouragement	0.595		
5 Having a relative involved in nursing profession	0.377		
6 Experience of nursing a sick relative or friend	0.372		
7 A chance to job opportunity		0.760	
8 A chance to income potential		0.760	
9 A chance to get higher degrees		0.570	0.367
10 Based on score in university entrance exam		0.560	
11 Not affording the expenses of studying in other majors/cities		0.376	
12 Interest in nursing		0.354	
13 Quality of work environment			0.774
14 Scientific content of nursing major			0.664
15 Desire to help and care for others			0.575
16 Positive images of nurses			0.501
17 Social credibility of nursing major	0.445		0.468

Table 3: Multivariate analysis of influential factors on career choice

Subscale	N	Mean	Std. deviation	95% CI*	F	Sig
Social factors	139	2.07	0.51	1.98-2.16	3.08	0.02
Personality factors	139	2.21	0.41	1.98-2.16		
Professional factors	139	2.19	0.46	1.98-2.16		
Total	417	2.16	0.46	2.11-2.20		

*CI=Confidence interval

IFCCI was 0.984 ($P < 0.001$). Moreover, the Wilcoxon signed-rank test demonstrated no significant differences between the scores of test-retest administration ($P = 0.32$).

DISCUSSION

This study was undertaken to develop an instrument measuring the influential factors on career choice among Iranian nursing students and to evaluate its psychometric properties. The authors engaged in the process described herein because of the scarcity of critical analysis and research on the influential factors on career choice instrument for nursing students that is culturally relevant and psychometrically robust in the Iranian context. It seems that knowing the factors that can influence one to choose a

major can help solve the problems with major job changes and save time and money. We recognize that there is not one single perfect scale; however, the objective was to find the one which most closely matched the research objectives, all the while being structurally acceptable, appropriate, suitable, and applicable to the target group. Although all the work leading to the development of this instrument was conducted in Sari, north of Iran, it is worth mentioning that the nursing students, who participated in this study, were from different cities and ethnicities from all around Iran, as a result of nationwide student selection in university entrance examination system.

Content validity of IFCCI was established by making a poll of experts' opinions to evaluate the instrument to the most appropriate item content. This method is one of the best ways to develop an evidence-based questionnaire with appropriate content.^[27] Li *et al.* conducted a study to design an instrument to measure college students' perspectives toward engineering in a sample of 73 engineering and 197 non-engineering students. They used content validity to confirm their developed instrument.^[28] Like this, in another study, Makhoul *et al.*, for development and validation of a scale in the area of youth mental health, in a sample of 288 students in fifth and sixth grades, used content validity assessment with the assistance of four local mental health specialists, two psychologists, and two psychiatrists.^[29]

Construct validity of the IFCCI using factor analysis showed social, personality, and professional factors shape Iranian nursing students' perspectives about career choice. Roberts^[30] in her study to identify the incoming college students who have the potential for success in a nursing career, in a sample of 300 college students, demonstrated that the developed instrument named Career Search Questionnaire had excellent psychometric properties with a reliability of 0.87. Exploratory factor analysis was used to identify and label all factors with an eigenvalue greater than 1, which led to the emergence of a distinct factor. She also assumed that this instrument appears capable of identifying beginners with an interest in or self-efficacy for nursing.

Students in this study agree that factors like family, peers, and school counselors' encouragement, a chance to job opportunity, income potential, and quality of work environment were the influential factors on their decision to select nursing, which is in accordance with other research studies.^[8-11] Our results showed that social factors were the most important factors on career choice, as it explained 16.21% of 42.03% of total variances. This finding may

reemphasize that parents, tutors, and career counselors have been identified as the influential factors in shaping high school pupils' career decisions.^[31]

Another finding revealed that the participants agreed that "not affording the expenses of studying in other majors/cities" (item number 11) was a factor that influenced their decisions to choose nursing as a major. This issue was stated in other studies which demonstrated nursing is not often the first choice for many student nurses^[9,32] and the majority of school students who had considered nursing as a career choice were those with low income and low socioeconomic background.^[33]

Other factors on career choice which have been less mentioned previously and with their roots in Iranian sociocultural context were "a chance to get higher degrees" and "scientific content of nursing major." Increased tendency to academic education has been found among Iranian young people, especially females, in recent years. The increased number of school graduates entering academic centers after the Islamic Revolution in Iran (1979),^[34] including nursing schools, proves this claim. It seems that women have attempted to gain more knowledge and occupy higher social positions, which has facilitated women's empowerment. But it is important that the educational policy makers should consider the above-mentioned findings more carefully. It means that if education, regardless of being formal or informal, is one of the Millennium Developmental Goals,^[35] choosing a major at the university, especially one related to medical sciences dealing with human health, must be carefully done since interest is one of the prerequisites of giving appropriate aid and service to the people seeking it.

Contrary to the findings of previous studies,^[36,37] parents' education was not demonstrated to have a significant influence on career choice in Iranian nursing students. May *et al.* showed that parents with high school education or less had significantly more positive attitudes toward nursing than the others. As the parents of most of the students who selected nursing in our study had a low educational background, it is speculated that this difference may be attributable to sample size and the data, which represent a profile of a homogenous sample.

This study had some limitations. First, the items generated in this instrument were based on the literature review and experts' opinions. If the nursing students who have chosen nursing as a career had been interviewed, perhaps other items would have emerged. So, the authors emphasize that this study would be considered as a pilot project that could be taken into account for further research in the field of instrument development. Second, this instrument was

not gender specific. It is speculated that a factor analysis with more samples in a multicenter research may lead to finding the other influential factors on career choice in Iranian nursing students.

CONCLUSION

This research is the first study to evaluate the psychometric properties of an inventory for career choice among Iranian nursing students. The results of this study may generate insightful information to nursing educators and policy makers in the Iranian context. It is hoped that using a locally sensitive instrument, more research can be conducted on this issue in nursing education and more targeted interventions can be developed and implemented for prevention of dropout rates in nursing schools. Also, it is anticipated that the results of our study may help the counseling centers at Iranian nursing schools to plan more carefully and give useful advice to students in order to help them succeed in education, choose more suitable occupations after graduation, and give better services to people in the society.

We suggest that policy makers in educational system working in other developing nations administer IFCCI in their own countries to find out if it matches their cultural features. If not, then we recommend that they engage in a similar process to develop and validate a career choice measure. It is also suggested to make a gender-specific questionnaire to study the influential factors on career choice separately in men and women. It will be of particular interest to find out how students in those countries perceive nursing and to explore the possible reasons causing the differences if there are any.

Finally, it is better to conduct a confirmatory factor analysis in order to provide a more stringent test of the factor structure of the instrument. After the proposed instrument model is deemed satisfactory through confirmatory factor analysis, it is suggested to be applied to measure the perspectives of different demographic groups by different characteristics in terms of different genders, ethnicities, family social economic statuses, or geographic locations.

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