Original Article

Access this article online

Quick Response Code:

Website: www.jehp.net

DOI: 10.4103/jehp.jehp_530_20

Development and validation of a scale to measure attitude of people toward men in nursing profession

Sharma K. Sharma[1], Shiv Kumar Mudgal[2]

Abstract:

BACKGROUND: Ancient history mentions the dominance of men in nursing; however, now nursing has a feminine image, and globally more than 90% of nursing workforce is females. Recently, more number of males are attracted to nursing, but there is a paucity of literature on the attitude of people about men in nursing may be because of a lack of measurement scales available for this purpose. The aim of this study was to develop and validate a new scale measuring attitude of people toward men in nursing.

MATERIALS AND METHODS: The present study was conducted at a tertiary care hospital and used an exploratory sequential design with an instrument development model. A total of 400 participants were selected using the simple random sampling technique. The reliability, content validity, face validity, and construct validity of this newly developed scale were computed. For data analyses SPSS AMOS version 23 was used for performing exploratory and confirmatory factor analyses.

RESULTS: The new scale "AMnQ" consists of 15 items under three factors: (I) nursing is feministic and professionally low, (II) higher suitability of male nurses in technical and challenging situations, and (III) synonymy of empathy and care with a female. The final model with 15 items of AMnQ scale was validated by confirmatory factor analysis and showed a good fit to data. The Cronbach's α for the overall scale was 0.87, and for Factors I, II, and III, it was 0.80, 0.88, and 0.89, respectively.

CONCLUSIONS: The "AMnQ" is a valid, reliable scale to assess the attitude of patients, nurses, physicians, and nursing students toward men in nursing. There is an assumption that nursing is a feminine profession; therefore, a valid and reliable scale to measure the attitude of people toward men in nursing will help to generate pieces of evidence on this subject, so that policymakers can make unbiased decisions on liberalizing entry of men in nursing.

Keywords:

Attitude scale, men in nursing, reliability and validity

Introduction

Nursing is an oldest art and a youngest science of caring. It is a vital component of health-care delivery system; however, this discipline has an inherent feminine image in society.[1] A female is believed to have an innate nature of care, compassion, sensitivity, sympathy, and attention in providing care to sick that has symbolized nursing as a profession of females.[2]

However, males are believed to be more suitable for some of the clinical areas such as psychiatry, emergency, trauma, operation theater , and intensive care units. Nonetheless, since the last two decades, more number of males have started moving into nursing profession probably because of increasing job opportunities and handsome salary or wages. This growing trend of men entering in nursing profession reflects changing attitude of society toward men in nursing.[3,4] However, there are limited studies conducted to assess society's attitude

[1]College of Nursing, AIIMS, Jodhpur, Rajasthan, India, [2]Akal College of Nursing, Eternal University, Baru Sahib, Himachal Pradesh, India

Address for correspondence:
Prof. Suresh K. Sharma, College of Nursing, AIIMS, Jodhpur - 342 005, Rajasthan, India.
E-mail: sk.aiims17@gmail.com

Received: 18-05-2020
Accepted: 18-08-2020
Published: 27-02-2021

How to cite this article: Sharma SK, Mudgal SK. Development and validation of a scale to measure attitude of people toward men in nursing profession. J Edu Health Promot 2021;10:54.

towards men in nursing as well as the perception of health-care professionals, nursing students, and students from different fields on this trend.[5-12] Furthermore, there is a lack of valid and reliable objective scales to assess the attitude of people toward men in nursing; we could find only single 6-item scales developed for this purpose, which has limited scope to measure all the dimensions of this phenomenon.[13]

Therefore, a valid and reliable scale is essential to precisely assess the attitude of people toward men in nursing, so that empirical evidences can be generated on this subject, which can help policymakers to take unbiased decisions on liberalizing entry of men in nursing.[14,15] Men in nursing is a resurging phenomenon, however, there is a paucity of data on attitude of people toward men in nursing may be due to lack of valid and reliable scales to measure this attribute, especially in the South Asian countries. Though, there are few studies which attempted to measure the attitude of people toward men in nursing using self-structured scales, and evidences generated through these studies cannot be generalized due to not utilization of standard scales.[16] Therefore, the authors decided to develop a comprehensive, valid, and reliable scale to measure attitude of people toward men in nursing profession.

Objective of the study

- To develop a comprehensive scale to measure the attitude of people toward men in nursing and evaluate its validity and reliability.

Materials and Methods

The present study was conducted using exploratory sequential design with an instrument development model. The study design consisted of two sequential phases: (I) First phase – instrument development phase where items were developed through literature search, brainstorming, and content and face validity was computed on feedbacks provided by a penal of 11 validators. The developed scale to measure attitude toward men in nursing was termed as "AMnQ." Second phase – developed scale was field tested and psychometric analysis for contract validity and reliability testing was carried out using appropriate statistical methods.

Phase I: Instrument development

Item generation

The first step in the way of developing the AMnQ was a thorough review of the available literature to know how the concept of attitude toward men in nursing had been used in current scales. We mainly searched PubMed, EMBASE, OVID databases, bibliographies, and related references for collecting information to generate a list of statements corresponding to AMnQ.

MeSH terms and free-text term such as " "Person" OR "Patients" AND "Nurses, Male" AND "Attitude", "Attitude" AND "Nurses, Male" AND "Health Personnel" were used for the purpose. Articles published in English language and studies assessed the attitude of people, health-care professionals, and students toward men in nursing were included. We excluded the editorial, review, and opinion articles.

All selected studies analyzed and 47 statements regarding the attitude toward men in nursing were identified. After consulting with experts and discussion among research team members, items were discarded, revised, and mixed. A scale with 28 items was included in this study. We followed the PRISMA guideline to search and select the related items [Figure 1].

Therefore, the first draft constituted of 28 items evaluating the attitude. This initial five-point Likert scale has both positive (23) and negative (5) items. Each item was rated as 1, 2, 3, 4, and 5 for strongly disagree, disagree, neutral, agree, and strongly agree, respectively, for positive phrasing statements, while for negative phrasing statements, scoring was done in a reverse manner. The total score is the sum of all item scores and higher scores suggested a positive attitude toward men in nursing.

Face validity

The face validity of this draft was then assessed by obtaining feedback from three nurses, two doctoral nursing students, two physicians, and four patients. For qualitative assessment, all validators were requested to evaluate the relevant wording, difficulty, and suitability of the items. In quantitative approach, they were asked to answer the item "to what level each item is necessary for assessing people' attitude toward men in nursing?" A five-point Likert scale was used for each item, and the score ranged between 1 = completely unnecessary and 5 = completely necessary. The following formula (impact

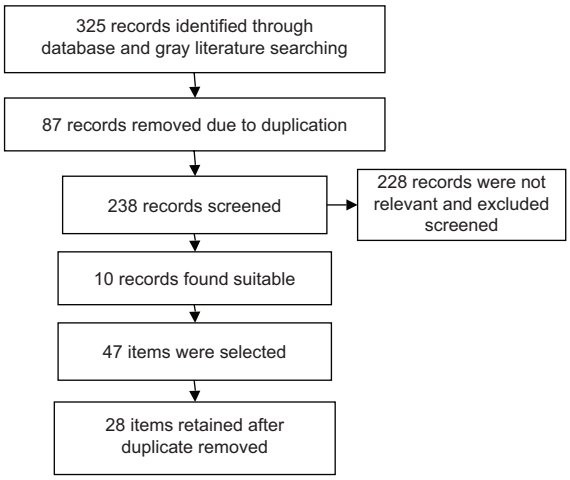

Figure 1: Flow diagram for item selection based on PRISMA guidelines

score = frequency (%) × necessary) was used to determine the effect of each item. The items which had a score ≥1.5 were retained for further process.[17]

Desired modifications were done as per the feedback from experts and the opinion and impact score of the people who did face validity.

Content validity

To establish the validity of this scale, we carried out the following steps. First, content validity was assessed using both qualitative and quantitative methods. For qualitative assessment, validators were requested to evaluate the items in terms of wording, grammar, and word placement in the items. Then, for assessment of quantitative values of content validity, we used content validity ratio (CVR), content validity index (CVI) criteria, and kappa statistic. CVR evaluates the need of an item for the participants, while CVI investigates the items' appropriateness, representativeness, and explicitness, and the initial draft of the scale was submitted to seven experts and four common people. This panel of experts comprised three nursing experts, two physicians, two sociologists, and four common people. The experts were requested to select among three options "necessary," "useful but not necessary," and "unnecessary." We used "Lawshe table" to determine CVR value. As we sent it to eleven experts, therefore, items which had > 0.571 were retained in the study.[18] For assess CVI, All seven experts and four common people (total eleven validators) were asked to evaluate each item of AMnQ and rate for its relevance on a five-point Likert scale (1 = not relevant and should be removed, 2 = somewhat relevant and needs major changes, 3 = relevant and requires small revisions, 4 = relevant but require modification in wording, and 5 = highly relevant).[19] The items with a CVI of ≥0.78 were retained.[20]

We also calculated kappa statistic, which is a consensus index of inter-rater agreement that adjusts for chance agreement. Kappa coefficient acts as a supplement to CVI because it provides information about degree of agreement beyond chance. After getting I-CVI value for all items of the scale, kappa statistic was calculated. The kappa coefficient values more than 0.74, between 0.74 and 0.60, and between 0.59 and 0.40 are categorized as excellent, good, and fair, respectively.[21,22]

After this, a second draft of items was developed. A pilot study was done with this draft to collect data and measure the construct validity of the AMnQ using exploratory and confirmatory factor analyses.

Phase II: Testing the validity and reliability of AMnQ

Construct validity

Exploratory factor analysis

The data collected from the participants were used for factor analysis. Before performing factor analysis, we carried out the Kaiser-Meyer-Olkin (KMO) test to determine the adequate number of samples and Bartlett's test to confirm that the sample was adequate to carry out an acceptable factor analysis. A KMO value >0.7 suggests the adequacy of sample size, and a significant value ($P < 0.05$) of Bartlett's test of sphericity suggests the valuable correlation among the items as per the correlations matrix.[23] Researchers attain the correct number of factors using eigenvalues (more than 1) and scree plot. To determine the loading of each item in the extracted factors, researchers used an oblique (promax) rotation, and the items with factor loadings of ≥0.5 were retained.[24]

Confirmatory factor analysis

We performed confirmatory factor analysis (CFA) using IBM SPSS AMOS (Analysis of Moment Structures) 23.0 to validate the results of the factor structure obtained from the exploratory factor analysis (EFA). We used a structural equation model to determine the factor structure. The fit of model was determined on the following criteria:[25]

- Chi-square value <0.05 suggests evidence of poor model fit to the data
- Goodness of fit index (GFI) value 0.95 or greater suggests the good model fit
- Root mean square error of approximation (RMSEA) values 0.06 are acceptable. These smaller values indicate better model fit.

To attain a good model fit, we evaluated whether items met the desired standards and we discarded those items that could not meet the desired parameters. We revised the model until the final or better fit model was attained.

Reliability

We calculated the internal consistency of the items to assess the reliability of the scale. We measured the Cronbach's α coefficient for the items in each factor of the model and a value of 0.7 or greater indicates an acceptable internal consistency of the scale. We also measured the correlation between the factors to determine the overlapping factors. The item-total correlation (>0.3) and Cronbach's α value (0.7) should not drop significantly with the item elimination, and internal consistency was reassessed when an item with the lowest internal correlation was deleted.[26]

We also assessed the test–retest reliability to determine the stability of the scale. In the present study, we distributed the same questionnaire to the participants after 2 weeks. Based on the allotted code of each participant, the same participant's questionnaire could be identified and matched with their first one. Then, with the use of correlation coefficient, we measured test–retest reliability of the questionnaire.[2,26]

Participants' recruitment

This study was conducted in a tertiary care hospital and nursing college from January 2019 to April 2020. The population of the present study was composed of nurses and physicians working at a tertiary care hospital, the patients admitted to the same hospital, and nursing students of nursing college. A simple random sampling technique was used, and 140 registered nurses, 100 physicians, 160 patients, and 80 nursing students were selected as per prescribed inclusion and exclusion criteria.

Inclusion criteria

- Patients who received care from both male and female nurses, no psychiatric history, able to understand and communicate in Hindi or English, and were of more than 18 years of age
- Physician and nurses who have working experience with male nurse.

We selected 16 areas (medical-surgical wards, emergency department, intensive care units, and operation theaters) to collect data. The AMnQ was mailed to nurses, physicians, and nursing students while patients were contacted in-person in their respective ward and scale was handed over to them for their response. The response rate from nurses, physicians, and nursing students was 79.4% (254), while from patients, it was 97.5% (156). Total 410 participants returned the completed questionnaires; however, 10 questionnaires were dropped because of incomplete responses, and finally, total 400 participants' questionnaires were considered for final analyses.

Ethical consideration

The research project was approved by the institutional ethical committee of All India Institute of Medical Sciences, Rishikesh vide letter no. AIIMS/IEC/19/1142. Informed written consent for voluntary participation was obtained from each study participant, and they were assured for the confidentiality of information and anonymity of informants.

Results

Content and face validity

The scale with initial 28 items was sent for face validation, and all items had an impact score more than 1.5. Only minor modifications in the wording were done as per expert's qualitative suggestions. This procedure ended up with a draft of 28 items in the scale. This draft with 28 items was validated by the expert panel, and nine items were deleted as they had a CVI and CVR value <0.78 and 0.571, respectively. While kappa coefficient for all items in the scale ranged from 0.83 to 1.

Reliability

We measured the Cronbach's α using the statistical computer program IBM-SPSS statistics. The measured value of Cronbach's α was 0.87, which suggested that the scale has a good internal consistency. Karl's Pearson's correlation of the AMnQ's items ranged from 0.23 to 0.94. Therefore, three items were dropped from AMnQ scale and a final draft of 16 items was prepared.

We mailed the scale after 2 weeks, and each participant was requested to complete it the second time. One hundred and fifteen study participants completed and sent back the scale. The test–retest reliability of 16 items AMnQ scale was measured, and the measured reliability was 0.93.

We measured the internal consistency of all three factors with 15 items scale. All of the correlations between each item ranged from 0.49 to 0.89, suggesting that the items in the final model had the ability to discriminate participants with positive attitude from those with negative attitude. The Cronbach's alpha coefficient for Factor I (nursing is feministic and professionally low), Factor II (higher suitability of male nurses in technical and challenging situations), and Factor III (synonymy of empathy and care with female) was 0.80, 0.88 and 0.89, respectively. These values indicated good internal consistency of scale items.

Construct validity

Exploratory factor analysis

The KMO value was 0.883, and the values of the Bartlett's test was significant ($\chi 2 = 3564.88$; $P < 0.001$). The results of both tests suggested that the sample was adequate to carry out an acceptable factor analysis and the sample size adequacy for a 16-item scale's psychometric testing. After that, all 16 items were tested using principal component analysis. Table 1 shows that three factors were extracted which have an eigenvalue >1. The values of rotational variances of Factor I, Factor II, and Factor III were 21.51%, 20.84%, and 19.89%, respectively. The cumulative value of postrotational variances was 61.89%, which suggested that all three factors cumulatively explained 61.89% of variances.

After the factor analysis, we assigned the names to all three factors and these factors with their items presented in Table 2:

- Factor I: Nursing is feministic and professionally low
- Factor II: Higher suitability of male nurses in technical and challenging situations

Table 1: The principal component factor analysis for attitude scale for men in nursing (*n*=400)

Number	Eigenvalue	Postrotational variance (%)	Cumulative (%)
Factor I	3.227	21.512	21.512
Factor II	3.073	20.484	41.996
Factor III	2.983	19.889	61.885

- Factor III: Synonymy of empathy and care with female.

Confirmatory factor analysis

- Model 1: The results of EFA were cross-validated through CFA, and this three-factor model did not have a good fit, as shown in results with value of Chi-square = 2111.015 (df-87; *P* = 0.001), GFI = 0.89, and RMSEA = 0.07. It was assessed that item 8 in Factor I had a high value (3.65) of residual covariance with item 2 in Factor II. Therefore, item 8 removed and we tested the model again
- Model 2: Three-factor model with 15 items were retested, and this showed a better model fit according to the predefined standards as all fits shown that this model had a better goodness of fit (χ^2 = 2048.57, df – 72; *P* = 0.12, GFI = 0.95, and RMSEA = 0.06). Therefore, this model was accepted as a satisfactory model [Figure 2].

Discussion

The aim of this study was to develop and evaluate the psychometric properties of a new scale for assessing the attitude of patients, nurses, physicians, nursing students, and people toward men in nursing profession. Content validity was assessed using a panel of experts and face validity by administering the scale to nurses, physicians, nursing students, and patients while construct validity was determined by EFA and CFA. The internal consistency and stability of the scale were measured to determine the reliability of the scale.

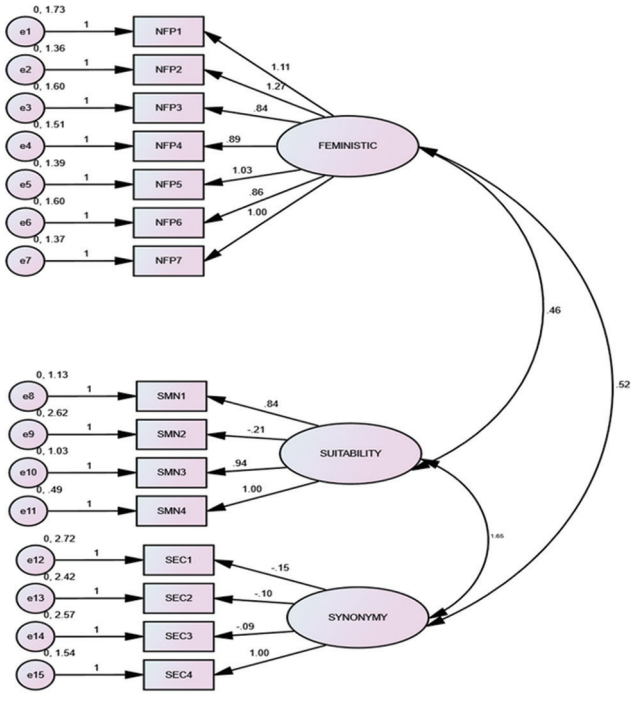

Figure 2: Confirmatory factor analysis of the 3 factors, 15 items model of AMnQ

One of the important prerequisites for the development of a scale is to measure the content validity. It is used to assess the degree of appropriateness and relevancy of the construct assessed by an instrument.[18] We measured the content validity of the first draft of the scale on the basis of feedback of eleven experts. This corresponds with the suggestions of a study, which recommended a minimum of three experts for assessment of the content validity.[27,28] Furthermore, it was also essential to determine the face validity of an instrument, so we administered it to the participants who had close attributes with the target population. Items were modified as per their suggestions.

We used EFA and CFA to test the factor structure of the scale. EFA is used to extract factors from a set of items, but it is not utilized to confirm factor structure as it is based on data instead of theory. Therefore, CFA was used to validate whether the hypothesized model developed from EFA fits for data because the basis of CFA is a theoretical and empirical foundation. In the present study, we identified a final model with 15 items and 3 factors such as Factor I is measured feministic characteristics and professional values of nursing, Factor II is related to the acceptance and suitability of male nurses in different situations and profession, and Factor III is concerned about the care preference with female nurses and their quality.

Another important issue during the development of an instrument was to determine the homogeneity or unidimensionality of the items. The Cronbach's α for the AMnQ overall scale was 0.87, and for each of the three subscales, it ranged from .80 to .89, which have shown good internal consistency for newly developed and validated AMnQ scale.

Based on this final scale, attitude toward men in nursing can be measured by summing the item scores and the minimum total possible score is 15 and maximum total possible score is 75. Higher total scores suggest a more favorable attitude toward men in nursing, while lower scores reflect negative attitude.

The present study verified the validity (content, face, and construct) and reliability (internal consistency and stability) of the AMnQ in the Indian context. Therefore, this AMnQ scale can be used to assess the attitude of patients, nurses, physicians, and nursing students toward men in nursing.

Limitations

The present study was limited to one particular geographical area, and patients visiting a single public tertiary care hospital may not be a true representation of people of the region. However, the present study recommended that further researches should be carried

Table 2: Rotated component matrix of the attitude scale for men in nursing

Factors	Component		
	1	2	3
Factor I: Nursing is feministic and professionally low			
People prefer to be cared by female nurses only	0.717		
Nursing is suitable only for the females	0.715		
Male patients also prefer to be cared by the female nurses only	0.702		
Nursing is considered as low-level occupation for the males	0.643		
Nursing is considered as purely a female profession	0.634		
Hospitals prefer to appoint female nurses	0.611		
Nursing is very challenging and frustrating occupation for males	0.573		
Factor II: Higher suitability of male nurses in technical and challenging situations			
Male nurses are more supportive and helpful in crisis		0.957	
Male nurses are more confident and technically sound than female nurses		0.944	
Male and female nurses both are equally required in nursing profession		0.940	
Male nurses are more suitable for some of the hospital units such as psychiatry, emergency, operation theater, and critical care units		0.522	
Factor III: Synonymy of empathy and care with female			
People do not prefer to send males for the nursing profession			0.874
Female patients do not prefer to be cared by male nurses			0.847
Female nurses are more caring and tender heart than male nurses			0.825
Female nurses are more polite and courteous in patient care			0.819

out on developing and validation of attitude toward men in nursing in different populations as there are differences in belief, culture, language, and health-care systems in the manner of attitude. We also recommended that other researchers use this scale to validate the model with other populations and settings.

Conclusions

The "AMnQ" is a comprehensive, valid, and reliable scale for assessing attitude toward men in nursing. The scale can be used to determine the attitude of people toward this issue, and this information can be used by administrators and policymakers to make unbiased decision on entry of men in nursing profession. Furthermore, they plan and implement strategies to mitigate gender bias in nursing discipline.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References

1. O'Lynn EC, Tranbarger RC. Men in Nursing: History, Challenges and Opportunities. New York: Springer Publishing Company LLC; 2007.
2. Publications A. Men in Nursing: Why it's okay for men to care-Australian College of Nursing. Australian College of Nursing; 2019. Available from: https://www.acn.edu.au/nurse click/men-in-nursing-why-its-okay-for-men-to-care. [Last accessed on 2019 Nov 21].
3. Kleinman CS. Understanding and Capitalizing on Men's Advantages In: JONA: The Journal of Nursing Administration. LWW; 2019. https://journals.lww.com/jonajournal/Abstract/2004/02000/Understanding_and_Capitalizing_on_Men. [Last accessed on 2019 Nov 14].
4. Eser I˙, Khorshid L, Denat Y. Perception of nursing profession. J Cinar 2004;10:31-9.
5. Adeyemi-Adelanwa O, Barton-Gooden A, Dawkins P, Lindo JL. Attitudes of patients towards being cared for by male nurses in a Jamaican hospital. Appl Nurs Res 2016;29:140-3.
6. Buyuk ET, Rizalar S, Korkmaz M. Male Nurses: The Perspectives of the Hospitalized Children and Mothers PDF Free Download. Docplayer.net; 2019. Available from: https://docplayer.net/14041205-Male-nurses-the-perspectives-of-thehospitalized-children-s-mothers.html. [Last accessed on 2019 Nov 14].
7. Koç Z, Sağlam Z. Determining the Attitudes of Inpatients Towards Male Nurses; 2019. Available from: https://www.researchgate.net/profile/Sebahat_Akbal_Ates. [Last accessed on 2020 Nov 14].
8. Fottler MD. Attitudes of female nurses toward the male nurse: A study of occupational segregation. J Health Soc Behav 1976;17:98-110.
9. Lo R, Brown R. Perceptions of nursing students on men entering nursing as a career. Aust J Adv Nurs 1999;17:36-41.
10. Abudari MO, Ibrahim AF, Aly AA. Men in nursing" as viewed by male students in secondary schools. Clin Nurs Stud 2016;4:41-7.
11. Damon N. The attitudes and opinions of women in turkey about the male nurses who worked at the maternity and childbirth service. Int J Bus Soc Sci 2012;3:2012.
12. Haigh M. Men in Nursing: A Quantitative Study from the Perspective of West Australian Nursing Students. Mater, The University of Western Australia, Faculty of Medicine; 2015.
13. Bartfay W, Bartfay E, Clow K, Wu T. Attitudes and perceptions towards Men in nursing education. Internet J Allied Health Sci Practice 2010;8:1-7.
14. Tortumluoglu G, Akyil R, Karanlik A, Aldaç R, Turaneri E, Yılmaz A. Individuals' opinions and expectations about nurses in Erzurum province. J Ataturk Univ Sch Nurs 2005;8:10-9.
15. Coban GI, Kasikci M. Development of the attitude Scale for nursing profession. Int J Nurs Pract 2011;17:518-24.
16. Loughrey M. Just how male are male nurses? J Clin Nurs 2008;17:1327-34.

17. Baghcheghi N, Koohestani HR, Karimy M. Design and psychometric properties of willingness to mobile learning scale for medical sciences students: A mixed-methods study. J Educ Health Promot 2020;9:141.
18. Lawshe CH. A quantitative approach to content validity 1. Pers Psychol 1975;28:563-75.
19. Mohd Suan MA, Tan WL, Soelar SA, Ali AM. The development and validation of the nurses' attitude towards conducting research questionnaire (NA2CRESQ). Ann Med Health Sci Res 2017;7:377-82.
20. Polit DF, Beck CT, Owen SV. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. Res Nurs Health 2007;30:459-67.
21. Zamanzadeh V, Ghahramanian A, Rassouli M, Abbaszadeh A, Alavi-Majd H, Nikanfar AR. Design and implementation content validity study: Development of an instrument for measuring patient-centered communication. J Caring Sci 2015;4:165-78.
22. Cicchetti DV, Sparrow SA. Developing criteria for establishing interrater reliability of specific items: Applications to assessment of adaptive behavior. Am J Ment Defic 1981;86:127-37.
23. Hair JF, Black B, Babin B, Anderson RE. Multivariate Data Analysis. 7th ed. Upper Saddle River, NJ: Pearson Education; 2016. p. 900.
24. Tabachnick BG, Fidell LS. Using Multivariate Statistics. 6th ed. Upper Saddle River, NJ: Pearson Education; 2013. p. 983.
25. Brown TA. Confirmatory Factor Analysis for Applied Research. 2nd ed. New York: Guilford Press; 2015. p. 35-130.
26. Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ 2011;2:53-5.
27. Polit DF. Assessing measurement in health: Beyond reliability and validity. Int J Nurs Stud 2015;52:1746-53.
28. DeVon HA, Block ME, Moyle-Wright P, Ernst DM, Hayden SJ, Lazzara DJ, *et al*. A psychometric toolbox for testing validity and reliability. J NursScholarsh 2007;39:155-64.