Original Article

Factor Analysis of Iranian Version of Nursing Students' Incivility Questionnaire

Abstract

Background: Uncivil student behavior is one of the challenging issues in the nursing schools that disrupts the learning process and teacher-student interactions. Planning to control student's incivility requires knowing the condition using valid tools. The purpose of this study was to investigate the validity and reliability of the incivility occurrence's questionnaire among Iranian students. **Materials and Methods:** This methodological study was conducted on 358 nursing students and 122 nursing faculty members. The samples were selected from the nursing students of second to fourth year from September to October 2019. McDonald's omega, Cronbach's alpha coefficients and composite reliability were calculated. Exploratory and confirmatory factor analysis were used to investigate the construct validity of tool. **Results:** Content validity index was 0.94 for the whole instrument. In factor analysis, three factors of irresponsible, violent, and unsound behaviors were identified. These factors explained more than 50.52% of the variance. Model fit indices Parsimonious Normed Fit Index) = 0.74, Root Mean Square Error of Approximation = 0.05, Parsimonious Comparative Fit Index = 0.78, Goodness-of-Fit Index = 0.92, Comparative Fit Index (CFI) = 0.92, Adjusted Goodness-of-Fit Index) = 0.89, CIMN=2.58) indicated the proportion of factors. Internal consistency was 0.77 to 0.89. **Conclusions:** This questionnaire is a three-dimensional tool with appropriate validity and reliability that can be used to evaluate occurrence rate of nursing student incivility in Iran.

Keywords: *Incivility, Iran, nursing, factor analysis*

Zahra Abedini[1],
Maryam Saeedi[2],
Ashraf Khoramirad[1],
Hamid Sharif Nia[3]

[1]*Department of Nursing, School of Nursing and Midwifery, Qom University of Medical Sciences, Qom, Iran,* [2]*Department of Nursing, Social Determinants of Health Research Center, Saveh University of Medical Sciences, Saveh, Iran,* [3]*Department of Nursing, School of Nursing and Midwifery, Mazandaran University of Medical Science, Sari, Iran*

Introduction

Disrespect, unwillingness to listen to others' opinions, lack of honesty and violence have been recognized as uncivil behaviors that undermine one's self-esteem,[1] Incivility can be found as defamation, humiliation, rudeness, and intimidation.[2] The ethics and professional behaviors must be learned during the educational course. Learning ethical traits such as maintaining dignity and integrity in educational institutions helps to develop healthy relationships in the clinical setting and to achieve positive outcomes in patient care.[3] Disregarding the individual dignity and providing respectful condition is a priority in nursing education and practice.[4] If such behaviors are approved in nursing school, it leads to conditions that are associated with patient comfort and satisfaction.[5] Experts also believed that civil behavior is part of the nursing art and respectful relationships between nurses and patients are necessary to maintain professional integrity.[6] Past evidence indicates a significant prevalence of incivility among Iranian nursing students.[7] In a similar study, about two-thirds of professors reported uncivil behavior.[8] Also, more than 70% of students cheated at least once in formal exams.[9] About 90% of nurses were witness of student's incivility.[10] In the USA, most students and faculty members reported the occurrence of uncivil behavior among nursing students.[11] According to one study, 60.2% of students engaged in mild uncivil behavior and 47.8% behaved with severe incivility.[12] Vickous (2015) reported the existence of incivility in more than 50% of students.[13] Adopting appropriate strategies to prevent and control uncivil behavior is particularly important.[14] Fostering uncivil behavior requires understanding the current situation and planning to reduce the occurrence rate of incivility among nursing students.[15]

Address for correspondence:
Dr. Ashraf Khoramirad, Assistant Professor, Department of Nursing, School of Nursing and Midwifery, Qom University of Medical Sciences, Qom, Iran.
E-mail: parsian_ins_kh@yahoo.com

A systematic review of incivility measurement tools by Masoumpour *et al.* (2015) indicated that the tools available were tailored to the target population and were not designed for nursing students. The only tool that assessed students' behaviors from both teacher and student perspectives was Clark's incivility questionnaire. Another benefit of the questionnaire was that it had fewer questions than the others. It was also designed specifically for nursing students, while other tools were generally used to measure uncivil behavior in students.[16] The validity of the Clark questionnaire has been confirmed in previous studies and reviewed by the instrument designer. This tool is suitable for evaluating all kinds of uncivil behavior and focuses on physical, non-verbal, verbal behaviors and inappropriate use of technology in the classroom. The tool has been translated and used in various languages.[17] The Clark Questionnaire was first designed in 2004[18] and revised in 2014. The new version includes 24 behaviors of nursing students over the past 12 months. Likert-scale behavior assessments (always, sometimes, often, never) are performed and the overall score is calculated on average.[19] These behaviors are the violation of social norms and has been attributed to diversity of values and rules. Treats of physical harm and weapons are examples of specific uncivil behaviors in some cultures.[16] Due to the necessity of recognizing the appropriateness of the features of this valid and comprehensive tool in the Iranian population, this study aimed to psychometric evaluation of the incivility occurrence questionnaire among Iranian nursing students.

Materials and Methods

This methodologic study included factor analysis, testing construct validity and reliability. This research was conducted on 358 nursing students and 122 nursing faculty members. The minimum number of persons for factor analysis is 10 samples per item.[20] Participants were selected from second to fourth year nursing students from July to April 2019. Inclusion criteria included having Iranian nationality, attending college for at least one year, and willingness to participate in the study. After obtaining permission from the tool designer,[19] the questionnaire was translated by forward-backward method. At first, the questionnaire was translated by two nursing faculty members from English to Persian. The Persian version was then translated into English by two other faculty members. They were specialist in English language. The final version was sent to the tool designer and verified in terms of the content of the items.

Qualitative and quantitative methods were used to assess the face validity. Interviews were conducted by 10 nursing students and 10 faculty members. Quantitative evaluation also assessed the difficulty level, proportion, clarity, and essentiality of the items. The Content Validity Ratio (CVR) of the tool was also evaluated. The tool was given to 15 nursing faculty members to evaluate items based on the

importance, necessity, use of appropriate words, grammar compliance, and phrase placement. Items were reviewed by researchers and modified based on suggestions. Fifteen faculty members were asked to determine the necessity of each item. Items higher than 0.6 according to the Lawshe table were considered meaningful.[21] Content Validity Index (CVI) was the number of persons who gave a score of 3 or 4 divided on all of them. The scores above 0.8 were considered acceptable.[21] Values of CVI were considered acceptable.

Three factors were identified through exploratory factor analysis. Bartlett test and determination of sampling adequacy index of Kaiser-Meyer-Olkin (KMO) were calculated. To extract latent factors, maximum likelihood was calculated. Data were analyzed by SPSS software (version 25). The presence of an item in the factor using $CV = 5.15 \sqrt{(n-2)}$ was considered to be 0.30 (CV is the number of agents and n is the sample size). There must be at least three items per factor for each latent variable.[22] The extracted factors were evaluated using confirmatory factor analysis. The most common goodness-of-fit indices were calculated using AMOS 24 software. Reliability was assessed using test-retest method. The questionnaire was sent to 15 nursing students and 15 faculty members within a two-week interval, and the Intra Class Correlation (ICC) was calculated. Internal consistency of questionnaire was assessed by calculating McDonald's Omega and Cronbach's alpha coefficients. Construct Reliability (CR), Maximum Shared Squared Variance (MSV), and Average Variance Extracted (AVE) were calculated.[23] CR values above 0.7 were acceptable.[20] Absolute reliability was calculated using Standard Error of Measurement (SEM) and the formula $SEM = SD \times \sqrt{(1 - ICC)}$.[24]

Ethical considerations

The Ethics Committee of Qom University of Medical Sciences in Iran approved this research (IR.MUQ. REC.1396.46). The aim of the study was explained to students and faculty members. They were assured that the data would remain confidential and written consent was obtained. This paper was part of an extensive research.

Results

In the factor analysis, 122 faculty members and 358 students participated. The mean(SD) age of students was 23 (9.22) years. The majority of students were single (87.52%) and female (70.23%). The mean age of faculty members was 45 (3.15) years and most of the professors were married (88.03%) and female (94.56%). The content validity was confirmed after receiving expert views. CVI and CVR were at the optimum level. CVR value of the instrument was 0.96. CVI values for the items were 0.91 to 0.87 and 0.89 for the whole questionnaire. No item was removed in this stage. The result of Bartlett test was

3790.47, df = 231, p < 0.001) and KMO was 0.90. Factors identified in the questionnaire items analysis included irresponsible, violent, and unsound behaviors [Figure 1]. These factors accounted for 50.52% of the total variance of uncivil behavior variables [Table 1].

The results of confirmatory factor analysis showed that the goodness of fit of Chi-square was (X^2 = 374.78, df = 145, p < 0.001). Other model fit indices were also calculated. Indices Parsimonious Normed Fit Index (PNFI) = 0.74 (above 0.5 acceptable), Parsimonious Comparative Fit Index (PCFI) = 0.78, Root Mean Square Error of Approximation (RMSEA) = 0.05 (less than 0.05), Comparative Fit Index (CFI) = 0.92 (above 0.90 acceptable), Goodness-of-Fit Index (GFI) = 0.92. Adjusted Goodness-of-Fit Index (AGFI) = 0.89, X^2/df = 2.58 (less than 3 acceptable) confirmed appropriate fit in the final model [Table 2]. Factor load values in this study were more than 0.3 and significant. Internal consistency and reliability of the questionnaire were higher than 0.7 which was acceptable. ICC was calculated 0.9. The domains had a proper ICC of 0.8 and 0.9.

Discussion

Evaluation of psychometric properties of incivility questionnaire showed that this tool is suitable for measuring Iranian students' behavior. People's views on uncivil behavior in each society are different and culturally dependent. Based on the results, three factors were identified that explained more than 50.52% of the variance. The three factors of irresponsible, violent, and unsound behaviors and total variance are consistent with those reported by the original instrument designer. In Clark's initial questionnaire, uncivil behaviors were described at three levels of threatening, irresponsible, and inappropriate behavior.[18] Other researchers have identified uncivil behavior at three levels of aggressive, irresponsible, and inappropriate.[12]

The first factor in this questionnaire was irresponsible behaviors that included 9 items (7, 6, 9, 8, 10, 4, 4, 5, 512) that were highly correlated with the factor. Irresponsible behavior as one of the dimensions of incivility is also presented in the main questionnaire. This factor has been assessed as mild uncivil behavior.[19] The

Table 1: Exploratory factors extracted from Nursing Students' occurrence incivility Questionnaire

Factor	Items	Factor loading	h^{2*}	λ^{**}	% of Variance
Irresponsible behaviors	Q7. Leaving class or other scheduled activities early	0.86	0.57	5.47	32.40
	Q6. Arriving late for class or other scheduled activities	0.77	0.58		
	Q9. Skipping class or other activities	0.68	0.39		
	Q8. Being unprepared for class or other activities	0.55	0.37		
	Q10. Being cold and distant toward others	0.49	0.29		
	Q4. Refusing or reluctant to answer questions	0.48	0.29		
	Q2. Making rude gestures or nonverbal actions toward others	0.38	0.30		
	Q5. Using a phone, computer or other media device during class	0.37	0.42		
	Q12. Holding side conversations that distract others				
Violent behaviors	Q22. Threats of physical harm against others	0.83	0.54	3.85	10.00
	Q21. Using profanity directed toward others	0.69	0.53		
	Q23. Property damage	0.67	0.39		
	Q20. Making discriminating statement toward others	0.53	0.44		
	Q19. Sending inappropriate or rude e- mails to others	0.51	0.43		
Unsound behaviors	Q16. Failing to address, ignoring or encouraging rude behaviors	0.84	0.59	5.39	4.77
	Q13. Cheating on quizzes or exams	0.57	0.42		
	Q15. Demanding make-up exams or other favors	0.53	0.27		
	Q17. Wanting a passing grade when a grade has not been acquired	0.48	0.33		
	Q14. Making condescending or rude remarks toward others	0.43	0.44		
	Q18. Being unresponsive to emails or other communications	0.37	0.34		

*h^2: Communality, *λ: Eigenvalue

Table 2: Fit indices scores of the confirmatory factor analysis

CFA* Index	PGFI**	CFI***	GFI****	AGFI*****	PNFI******	PCFI*******	RMSEA********	CMIN/ df*********	p	df	χ^2
Indices	0.70	0.92	0.92	0.89	0.74	0.78	0.05	2.58	<0.001	145	374.78

*Confirmatory Factor Analysis, ** Parsimonious Goodness-of-Fit Index, *** Comparative Fit Index, ****Goodness-of-Fit Index, ***** Adjusted Goodness-of-Fit Index, ****** Parsimonious Normed Fit Index, ******* Parsimonious Comparative Fit Index, ******** Root Mean Square Error of Approximation, ********* Chi-square/degree-of-freedom ratio, CMIN/DF (<3 good, <5 acceptable), AGFI (>.5), CFI, IFI (>.9), RMSEA (<0.08)

Table 3: Convergent and divergent validity, internal consistency						
Factor	Ω*	α**	CR***	Max R (H)****	MSV*****	AVE******	ASV******
Irresponsible behaviors	0.83	0.82	0.82	0.83	0.56	0.37	0.83
violent behaviors	0.80	0.79	0.78	0.80	0.47	0.43	0.80
unsound behaviors	0.78	0.77	0.79	0.80	0.56	0.39	0.80

McDonald omega coefficient, **Cronbach's alpha coefficients, *** Construct Reliability, ****Maximum Reliability, *****Maximum shared Squared Variance, *******Average Variance Extracted, ********Average shared Squared Variance
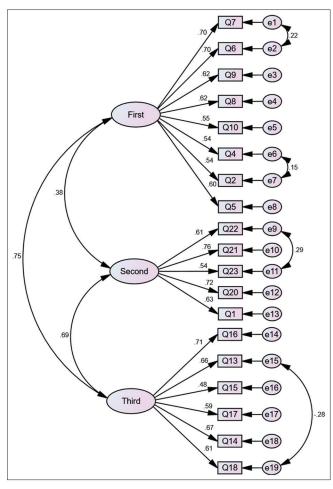

Figure 1: Confirmatory factor analysis model of the incivility occurrence's questionnaire

second factor identified in the tool was violent behaviors, which included five items (22, 21, 23, 20, 19). This dimension is consistent with threatening behaviors in the model of incivility in education. In similar studies, this factor has been introduced as a severe level of uncivil behavior.[17] The third factor or unsound behaviors with 6 items (16, 13, 15, 17, 14, 18) is devoted to measuring incivility. This factor is consistent with inappropriate uncivil behavior in the main tool.[19] Gagne *et al*. also presented the dimensions of incivility as high, medium, and low-level behaviors which are consistent with the three factors extracted in this study.[17] The irresponsible behaviors in Clark's model of incivility were low-level uncivil behaviors. The first and second factors included

irresponsible and violent behaviors that are consistent with the high-level incivility in Clark's study.[25] As such, the items that cause the most violent and inappropriate behaviors have been identified as high-level incivility.[19] Researchers has also equated these items with the high level of incivility.[17] Questions omitted based on factor analysis results included 11 and 24. To the participants of the study, these behaviors did not exist in nursing students or were seen as a problem in the nursing education environment. It also appears that the threatening statements about weapons was not in line with Iranian culture and therefore did not exist among the nursing students in question. Similar studies have not reported the elimination of items[17] that may be due to different indigenous cultures and social conditions in Iran.

CR, McDonald's Omega, and Cronbach's alpha values were above 0.7, indicating good reliability in three factors [Table3]. The alpha coefficient in the original version of the tool was 0.889 between items.[19] The reliability of the tool in Korean students was also confirmed.[17] CR in the questionnaire were desirable. For convergent validity, it must be AVE > 0.5 and CR > AVE and for divergent validity it must be AVE > MSV.[23] The extracted values indicate the absence of convergent and divergent validity. To achieve convergent validity, it is recommended that further investigation with larger sample size be performed. The present study involved more samples than other studies. The difference in findings could be related to the number of students and faculty. A similar study involved 284 students.[17] Clark's survey included 310 students and 182 faculty members.[19] Different understanding of participants may be helpful in extracting findings. Correlation between some items indicate measurement errors. These items may have had similar meanings. On the other hand, participants may answer the questions differently in two times.[26] This questionnaire, which is used to measure the incidence of incivility occurrence of nursing students, is a self-report tool and its responses can be biased by the accuracy and honesty of students and faculty members. Also, the number of professors and students participating and their views may vary. On the other hand, cultural and class differences between samples may affect the data. Researchers has used random sampling from the two provinces to elicit these limitations. Students and faculty members were in a variety of characteristics and contexts.

Conclusion

This questionnaire has a proper factor structure and its internal consistency is confirmed. This questionnaire can be used to measure the incidence of incivility among Iranian nursing students and based on the data, appropriate measures can be taken to promote civility. It was also used to determine the impact of interventions.

Acknowledgements

Financial support and sponsorship

Conflicts of interest

Nothing to declare.

References

1. Hyun MS, De Gagne JC, Park J, Kang HS. Incivility experiences of nursing students in South Korea. Nurs Ethics 2018;25:186-98.
2. Peters AB. The concept of incivility: A case study. Teach Learn Nurs 2015;10:156-60.
3. Vermeesch A, Cox PH, Baca S, Simmons D. Strategies for strengthening ethics education in a DNP program. J Nurs Educ Perspect 2018;39:309-11.
4. Parandeh A, Khaghanizade M, Mohammadi E, Mokhtari-Nouri J. Nurses' human dignity in education and practice: An integrated literature review. Iran J of Nurs Midwifery Res 2016;21:1-8.
5. Woodworth JA, editor. Promotion of Nursing Student Civility in Nursing Education: A Concept Analysis. Nursing forum; 2016: Wiley Online Library.
6. Russell MJ. Teaching civility to undergraduate nursing students using a virtue ethics-based curriculum. J Nurs Educ 2014;53:313-9.
7. Rafati F, Nouhi E, Sabzevar S, Nayyeri ND. Nursing students, experiences of incivility and received support in the clinical setting. Int J Adv Biotechnol Res 2017;8:1503-15.
8. Joibari L, Mohammadi Z, Sanagoo A. A Glance at students and faculty members perceptions of incivil behavior in educational settings. J Strides Dev Med Educ 2011;7:127-33.
9. Abedinipoor A, Samadi F, Momeniyan S. Prevalence and factors associated with cheating among students of Qom University of Medical Sciences. J Med Educ Dev 2015;8:73-80.
10. Bambi S, Foà C, De Felippis C, Lucchini A, Guazzini A, Rasero L. Workplace incivility, lateral violence and bullying among nurses. A review about their prevalence and related factors. J Acta Biomed 2018;89(Suppl 6):51-79.
11. Clark CM. An evidence-based approach to integrate civility, professionalism, and ethical practice into nursing curricula. Nurse Educ 2017;42:120-6.
12. Ibrahim SAE-A, Qalawa SA. Factors affecting nursing students' incivility: As perceived by students and faculty staff. J Nurse educ Today 2016;36:118-23.
13. Vickous KEY. Perceptions of incivility in nursing education: A survey of associate and baccalaureate program nursing students [Doctor of Education]; 2015.
14. Abedini Z, Parvizi S. Student's perceptions of using scenario-based education to improve civility: A mixed method study. J Adv Med Educ Prof 2019;7:165-74.
15. Abedini Z, Parvizy S. The effects of group discussion and self-learning on nursing students' civility. Iran J of Nurs Midwifery Res 2019;24:268-73.
16. Masoumpoor A, Abbaszadeh A, Rassouli M, Alavimajd H. Critical review of scales of incivility behaviors in nursing education. Med Ethics J 2017;11:93-102.
17. De Gagne JC, Kang HS, Hyun MS. Psychometric properties of the Korean version of the incivility in nursing education-revised (INE-R) survey. Nurs Health Sci 2016;18:425-34.
18. Clark CM, Farnsworth J, Landrum RE. Development and description of the incivility in nursing education (INE) survey. Journal of Theory Construction & Testing 2009;13:7-15.
19. Clark CM, Barbosa-Leiker C, Gill LM, Nguyen D. Revision and psychometric testing of the incivility in nursing education (INE) survey: Introducing the INE-R. J Nurs Educ 2015;54:306-15.
20. Kellar SP, Kelvin EA. Munro's Statistical Methods for Health Care Research. Wolters Kluwer Health/Lippincott Williams & Wilkins; 2013.
21. Lawshe CH. A quantitative approach to content validity 1. Pers Physchol 1975;28:563-75.
22. Soleimani MA, Sharif SP, Allen KA, Yaghoobzadeh A, Nia HS, Gorgulu OJ. Psychometric properties of the Persian version of spiritual well-being scale in patients with acute myocardial infarction. J Relig Health 2017;56:1981-97.
23. Hair JF, Black WC, Babin BJ, Anderson RE, Tatham RL. Multivariate Data Analysis. NJ: Prentice Hall Upper Saddle River; 1998.
24. Javali S B, Gudaganavar N V, Raj S M. Effect of Varying Sample Size in Estimation of Coefficients of Internal Consistency. Webmed Central BIOSTATISTICS 2011;2:WMC001649.
25. Clark CM. Pursuing a culture of civility: An intervention study in one program of nursing. J Nurse Educ 2011;36:98-102.
26. Bandalos DL. Measurement Theory and Applications for The Social Sciences. Guilford Publications; 2018.