

Development and Psychometric Testing of an Oral Presentation Scale for Nursing Students

Yi-Chien CHIANG

Chang Gung University of Science and Technology

Hsiang-Chun LEE

Chang Gung University of Science and Technology

Tsung-Lan CHU

Chang Gung Medical Foundation

Chia-Ling Wu

Chang Gung University of Science and Technology

Ya-Chu HSIAO (✉ yjshiao@gw.cgust.edu.tw)

Chang Gung University of Science and Technology

Research Article

Keywords: evaluation, oral presentation, scale development

Posted Date: March 10th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-275523/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: Oral presentations are an important educational component for nursing students. However, there are no reliable tools for objective evaluations of presentations. We aimed to develop a measurement scale for nursing students' oral presentations and evaluate its reliability and validity.

Methods: A literature review and face-to-face interviews with university tutors in oral presentations and students generated 28 scale items. The validity and reliability of the scale was evaluated with exploratory and confirmatory factor analysis, criterion-related validity, internal consistency, and test-retest reliability.

Results: Nursing students provided data for exploratory factor analysis ($n = 325$), which resulted in 20 items. Three factors explained 64.75% of the total variance: accuracy of content, effective communication, and clarity of speech. The Cronbach's α value was .94 for the total scale and the three factors ranged from .84 to .93. Construct validity was examined with confirmatory factor analysis using data from another 325 students. Five items were deleted, and fit indices of the model were acceptable, with the exception of the adjusted goodness of fit index, which was below the minimum criteria. The final 15-item oral presentation scale (OPS) was significantly correlated with the Personal Report of Communication Apprehension scale ($r = -.51, p < .001$) and Self-Perceived Communication Competence Scale ($r = .45, p < .001$) indicating excellent criterion-related validity. The intra-class correlation coefficient for a 3-week test-retest ($r = .681, p < .001$) indicated the OPS was stable over time.

Conclusions: The OPS could be adopted to help nursing programs prepare for and improve students' oral presentations.

Background

Competence in oral presentations is important for medical professionals to communicate an idea to others, including those in the nursing professions. Oral presentations that are precise have been shown to be a useful and necessary ability for nurses [1, 2]. The ability to conduct an oral presentation effectively not only impacts the quality of nurse-client communications and the effectiveness of teamwork among groups of healthcare professionals, but also promotion, leadership, and professional development [2]. Nurses are also responsible for delivering health-related knowledge to patients and the community. Therefore, one important part of the curriculum for nursing students is the delivery of oral presentations related to healthcare issues. However, most nursing educators evaluate these presentations subjectively, which does not provide students with objective feedback on how to improve their presentation.

Three components have been identified as important for improving communication. First, a presenter's self-esteem can influence the physio-psychological reaction towards the presentation; presenters with low self-esteem experience greater levels of anxiety during presentations [3]. Therefore, increasing a student's self-efficacy can increase confidence in their ability to effectively communicate, which can reduce anxiety [3, 4]. Second, improving speaking efficacy can also improve oral communications [5]; Liao found that collaborative learning among students could improve speech efficacy and decrease speech anxiety.

Increasing presentation skills can also improve communication by improving self-regulation (De Grez et al., 2009). [6] provided students with a list of skills to practice, which allowed them to feel more comfortable when a formal presentation was required. Third, Carlson and Smith-Howell (1995) determined quality and accuracy of the information presented was also an important aspect of public speaking performances. Therefore, all three above mentioned components are important skills for effective communication during an oral presentation.

Instruments that provide an objective assessment of a public speaking performance are critical for helping students' improve oral presentation skills (Carlson & Smith-Howell, 1995). A study [7] found peer evaluations were higher than those of university tutors for student presentations, using a student-developed assessment form. The assessment criteria included content (40%), presentation (40%), and structure (20%); the maximum percent in each domain was given for "excellence", which was relative to a minimum "threshold". Multiple "excellence" and "threshold" benchmarks were described for each domain; however, the percentage score did not provide any information about what specific benchmarks were met. Thus, these quantitative scores did not include feedback on specific criteria that could enhance future presentations.

At the other extreme is an assessment that is limited to one aspect of the presentation and is too detailed to evaluate the performance efficiently. An example of this is the 40-item tool developed by [6] to evaluate oral presentation skills, which measured several domains: voice (volume and speed), facial expressions, passion, and control of time. An assessment tool developed by [8] includes several domains: three subcategories for content (quality of introduction, structure, and conclusion), five subcategories of expression (eye-contact, vocal delivery, enthusiasm, interaction with audience, and body-language), and a general quality. Many items overlap, making it hard to distinguish specific qualities. Other evaluation tools include criteria that are difficult to objectively measure, such as body language, eye-contact, and interactions with the audience [9]. Finally, most of the previous tools were developed without testing the reliability and validity of the instrument.

Nurses have the responsibility of not only providing medical care, but also medical information to other healthcare professionals, patients, and members of the community. Therefore, improving nursing students speaking skills is an important part of the curriculum. An objective method of evaluating presentations given by nursing students could help increase competence in oral communication skills. However, to date, there is a no reliable and valid instrument of evaluating oral presentation performance in nursing education. Therefore, the aim of this study was to develop an oral presentation scale and test its reliability and validity. The scale could be used as an objective measure for evaluating nursing students' presentations, which could improve speaking skills.

Methods

This study developed an oral presentation scale (OPS) to objectively evaluate nursing students' oral presentations. We conducted the study in two phases: development of the initial items of the OPS (Phase

l); psychometric testing of the scale, internal the internal consistency reliability and three-weeks test-retest reliability (Phase II). Approval was obtained from Chang Gung Medical Foundation institutional review board (ID: 201702148B0) prior to initiation of the study. The informed consent was obtained from all subjects before the data collection of this study. All the study methods were carried out in accordance with relevant guidelines and regulations.

Phase I: Item development and content validity index

A review of the literature regarding oral performance, self-efficacy, and characteristics of oral communication was used to determine categories considered important for the objective evaluation of oral presentations [2, 6, 7, 10-13]. Three categories were determined to be important: preparation, presentation, and post-presentation.

We determined key elements of these presentation categories with individual face-to-face semi-structured interviews conducted with a sample of teachers (n = 8) and nursing students (n = 11). Nursing students give oral presentations to meet the curriculum requirement, therefore the teachers were university tutors experienced in coaching nursing students in preparing for and giving an oral presentation. All participants provided signed informed consent indicating willingness to be audiotaped during the interview. Teachers were recruited if they had at least ten years' experience coaching university students; students were included if they had given at least one oral presentation.

The teachers were asked the following questions: 1) What has been your reaction to oral reports or presentations given by your students? 2. What problems commonly occur when students are giving oral reports or presentations? 3. In your opinion, what do you consider a good presentation and could you describe the characteristics? 4. How do you evaluate the performance of the student's oral reports or presentations? Are there any difficulties or problems evaluating the oral reports?

Students were asked two questions: 1. Would you please tell me about your experiences of giving an oral report or presentation? 2. In your opinion, what is a good presentation and what are some of the important characteristics? Interviews lasted approximately 20-30 minutes.

Analysis of the interview data provided characteristics important to each of the three categories. Characteristics of a good preparation included: the presenter is well prepared before the presentation; the presenter prepares materials suitable for the target audience; the presenter practices giving the presentation in advance; and the presenter discusses the content of the presentation with classmates and teachers. Presentation included the following characteristics: obtain the attention of the audience; provide materials that are reliable and valuable; express confidence and enthusiasm; interact with the audience; and respond to the questions from the audience. The third category, post-presentation, involved feedback and evaluation from teachers and peers in order to improve performance: discuss the content of presentation with teachers; and gain feedback from the audience.

Content validity of the 28 items of the OPS was established with a panel of eight expert instructors in oral presentation. All instructors had over ten years' experience in coaching students in giving an oral presentation that would be evaluated for a grade. For the item-level content validity index (I-CVI), the experts were provided with a description of the research purpose, a list of the proposed items, and were asked to rate each item on a 4-point Likert scale (1 = not representative, 2 = item needs major revision, 3 = representative but needs minor revision, 4 = representative). Based on the suggestions of the experts, six items of the OPS were reworded for clarity: item 12 was revised from "The presentation is riveting" to "The presenter's performance is brilliant; it resonates with the audience and arouses their interests". Two items were deleted because they duplicated other items: "demonstrates confidence" and "presents enthusiasm" were combined and item 22 became, "demonstrates confidence and enthusiasm properly". The item "the presentation allows for proper timing and sequencing" and "the length of time of the presentation is well controlled" were also combined to one item (9), "The content of presentation follows the rules, allowing for the proper timing and sequence". Thus, a total of 26 items were included in the OPS. The I-CVI value was .88~1 and the scale-level CVI/universal agreement was .75, indicating that the OPS was an acceptable instrument for measuring an oral presentation [14].

Phase II: Psychometric testing of the OPS

Reliability and validity of the developed scale was determined with exploratory factor analysis (EFA), confirmatory factor analysis (CFA), internal consistency reliability, test-retest reliability (3-weeks), and criterion-related validity, respectively. The items in the scale for EFA and CFA were presented in random order and were not nested according to constructs.

Participants

A sample of nursing students was recruited purposively from a university in Taiwan to conduct EFA and CFA. Students were included if they were: (a) full-time students; (b) had declared nursing as their major; and (c) were in their sophomore, junior, or senior year. First-year university students were excluded (freshman). A bulletin about the survey study was posted outside of classrooms; a total of 707 students attend these classes. The bulletin included a description of the inclusion criteria and instructions to appear at the classroom on a given day and time, if students were interested in participating in the study. Students who appeared at the classroom on the scheduled day (N = 650) were given a packet containing a demographic questionnaire (age, gender, year in school), a consent form, and the OPS instrument; the documents were labeled with an identification number in order to anonymize the data. These 650 surveys were divided into two groups, based on the demographic data: one for EFA (the calibration sample, n = 325) and one for CFA (the validation sample, n = 325), using the SPSS random case selection procedure, (Version 23.0; SPSS Inc., Chicago, IL, USA). The selection procedure was performed repeatedly until the homogeneity of the baseline characteristics was established between the two groups ($p > .05$). The mean age of the participants was 20.5 years (SD = 0.98) and 87.1% were female (n = 566). Most participants were third-year students (40.6%, n = 274), followed by fourth-year (37.9%, n = 246) and second-year (21.5%, n = 93).

Exploratory factor analysis

Data from the 325 students designated for EFA was used to determine the construct validity of the OPS. The Kaiser-Meyer-Olkin measure for sampling adequacy and Bartlett's test of sphericity demonstrated factor analysis was appropriate (Nunnally & Bernstein, 1994). Principal component analysis was performed on the 26 items to extract the major contributing factors; varimax rotation determined relationships between the items and contributing factors. Factors with an eigenvalue > 1 were further inspected. A factor loading greater than .50 was regarded as significantly relevant (Hair et al., 2006). All item deletions were incorporated one by one, and the EFA model was respecified after each deletion, which reduced the number of items in accordance with a priori criteria. In the EFA phase, the internal consistency of each construct was examined using Cronbach's alpha, with a value of .70 or higher considered acceptable (DeVellis, 2003).

Confirmatory factor analysis

Data from the 325 students designated for CFA was used to validate the factor structure of the OPS. In this phase, items with a factor loading less than .50 were deleted (Hair et al., 2006). The goodness of the model fit was assessed using the following: absolute fit indices, including goodness of fit index (GFI), adjusted goodness of fit index (AGFI), standardized root mean squared residual (SRMR), and the root mean square error of approximation (RMSEA); relative fit indices, normed and non-normed fit index (NFI and NNFI, respectively), and comparative fit index (CFI); and the parsimony NFI, CFI, and likelihood ratio (χ^2/df ; Bentler, 1992).

In addition to the psychometric testing, a research team, which included a statistician, determined the appropriateness of either deleting or retaining each item. The convergent validity (internal quality of the items and factor structures), was further verified using standardized factor loading, with values of .50 or higher considered acceptable, and average variance extraction (AVE), with values of .5 or higher considered acceptable (Hair et al., 2006). Convergent reliability (CR) was assessed using the construct reliability from the CFA, with values of .7 or higher considered acceptable (Fornell & Larcker, 1981). The AVE and correlation matrices among the latent constructs were used to establish discriminant validity of the instrument. The square root of the AVE of each construct was required to reach a value that was larger than the correlation coefficient between itself and the other constructs (Fornell & Larcker, 1981).

Criterion validity of the OPS

Criterion validity was determined by examining the relationship of the developed OPS with constructs of two scales for assessing performance of an oral presentation: the Personal Report of Communication Apprehension (PRCA) scale was developed by McCroskey (1977); and the Self-Perceived Communication Competence SPCC ([15].

The 24-item PRCA scale. The PRCA scale is a self-report instrument for measuring communication apprehension, which is an individual's level of fear or anxiety associated with either real or anticipated

communication with a person or persons [16]. The 24 scale items are comprised of statements concerning feelings about communicating with others. Four subscales are used for different situations: group discussion, interpersonal communication, meetings, and public speaking. Each item is scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree); scores range from 24 to 120, with higher scores indicating greater communication anxiety. The PRCA has been demonstrated to be a reliable and valid scale across a wide range of related studies [5, 17-20]. The Cronbach's alpha for the scale is .90 [21]. We received permission from the owner of the copyright to translate the scale into Chinese. Back-translation was used to ensure that the semantic validity of the translated scale. The Cronbach's alpha value in the present study was .93.

The 12-item SPCC scale. The SPCC scale evaluates a persons' self-perceived competence in a variety of communication contexts and with a variety of types of receivers. Each item is a situation which requires communication, such as "Present a talk to a group of strangers", or "Talk with a friend". Participants respond to each situation by ranking their level of competence from 0 (completely incompetent) to 100 (completely competent). The Cronbach's alpha for reliability of the scale is .85. The SPCC has been used in similar studies [17, 22]. We received permission owner of the copyright to translate the scale into Chinese. Back-translation was used to ensure that the semantic validity of the translated scale. The Cronbach's alpha value in the present study was .941.

Stability

To determine the stability of the OPS, test-retest reliability was conducted with 89 of the participants enrolled in this study. The interval between the first and the second test was 3 weeks.

Statistical Analysis

In addition to the previous descriptions of statistical analysis, all data were analyzed using SPSS for Windows 23 (SPSS Inc., Chicago, IL, USA).

Results

Exploratory Factor Analysis

EFA was performed sequentially six times until there were no items with a loading factor < .50 or that were cross-loaded; six items were deleted (Table 1). EFA resulted in 20 items with a three factors solution, which represented 64.75% of the variance of the OPS. The Cronbach's alpha estimates for the total scale was .94. indicating the scale had sound internal reliability (Table 1). The three factors were labeled in accordance with the item content via a panel discussion and had Cronbach's alpha values of .927, .890, and .842 for factors 1, 2 and 3, respectively.

Table 1

Summary of exploratory factor analysis: descriptive statistics, factor loading, and reliability for nursing students (N = 325)

Item	Description	Score		Factor loading		
		Mean	SD	1	2	3
7	The content of the presentation matches the theme	4.25	0.62	.76	.20	.17
14	Presentation aids, such as PowerPoint and posters, highlight key points of the report	4.21	0.74	.75	.21	.30
15	Proper use of presentation aids such as PowerPoint and posters	4.32	0.69	.74	.12	.28
8	The content of the presentation is clear and focused	4.02	0.69	.72	.36	.11
10	The content of the presentation is organized and logical	3.93	0.75	.72	.38	.13
4	Preparation of presentation aids, such as PowerPoint and posters, in advance	4.53	.67	.70	-.10	.20
16	Presentation aids, such as PowerPoint and posters, help the audience understand the content of the presentation	4.26	0.68	.69	.20	.37
9	The organization of the presentation is structured to provide the necessary information, while also adhering to time limitations	4.10	0.69	.68	.30	.18
11	The content of the presentation provides correct information	4.12	0.66	.68	.31	.10
1	Preparation of the content in accordance with the theme and rules in advance	4.49	0.61	.64	-.02	.39
13	The entire content of the presentation is prepared in a way that is understandable to the audience	3.99	0.77	.61	.40	.09
22	Presenter demonstrates confidence and an appropriate level of enthusiasm	3.92	0.91	.17	.83	.25
21	Presenter uses body language in a manner that increases the audience's interest in learning	3.50	0.95	.09	.81	.22
24	Presenter interacts with the audience using eye contact during the question and answer session	3.65	0.92	.15	.77	.24

Abbreviations: SD = standard deviation; EFA = exploratory factor analysis

		Score		Factor loading		
23	Presenter responds to the audience's questions properly	3.63	0.87	.23	.77	.17
12	The presenter's performance is brilliant; it resonates with the audience and arouses their interests	3.43	0.78	.43	.65	.04
17	The pronunciation of the words in the presentation is correct	3.98	0.82	.31	.29	.74
18	The tone and volume of the presenter's voice is appropriate	3.82	0.82	.22	.50	.70
19	The words and phrases of the presenter are smooth and fluent	3.70	0.82	.26	.52	.65
20	The clothing worn by the presenter is appropriate	4.16	0.77	.33	.12	.57
	Eigenvalue (sum of squared loading)			6.01	4.34	2.60
	Explained variance			30.03%	21.72%	13.00%
	Cumulative variance			30.03%	51.75%	64.75%
	Cronbach's α for each subscale			.93	.89	.84
	Cronbach's α for the total scale			.94		
Item	Deleted following EFA					
2	Considers the background or needs of the audience to prepare the content of the presentation in advance	3.94	0.84			
3	Discusses the content of the presentation with experts, teachers or peers (classmates) in advance	3.94	0.89			
5	Practices several times in private in before the presentation	3.96	0.89			
6	Invites classmates or teachers to watch a rehearsal before the presentation	3.39	1.04			
25	Reflects on the experience as well as the strengths and weaknesses of the presentation	3.83	0.85			
26	Obtains feedback from peers (e.g. classmates), teachers, or an audience	3.92	0.81			
Abbreviations: SD = standard deviation; EFA = exploratory factor analysis						

Factor 1, Accuracy of Content, was comprised of 11 items and explained 30.03% of the variance. Items in *Accuracy of Content* evaluated agreement between the topic (theme) and content of the presentation, use of presentation aids to highlight the key points of the presentation, and adherence to time limitations. These items included statements such as: “The content of the presentation matches the theme” (item 7), “Presentation aids, such as PowerPoint and posters, highlight key points of the report” (item 14), and “The organization of the presentation is structured to provide the necessary information, while also adhering to time limitations” (item 9).

Factor 2, “Effective Communication”, was comprised of five items, which explained 21.72% of the total variance. *Effective Communication* evaluated the attitude and expression of the presenter. Statements included “Presenter demonstrates confidence and an appropriate level of enthusiasm” (item 22), “Presenter uses body language in a manner that increases the audience’s interest in learning” (item 21), and “Presenter’s interactions with the audience includes using eye contact and a question and answer session” (item 24).

Factor 3, “Clarity of Speech” was comprise four items, which explained 13.00% of the total variance. Factor 3 evaluated the presenter’s pronunciation with statements such as “The words and phrases of the presenter are smooth and fluent” (item 19).

Confirmatory factor analysis

The factor structure of the 20-items of the EFA were examined with CFA. We sequentially removed items 1, 4, 20, 15, and 16, based on modification indices. The resultant 15-item scale had acceptable fit indices for the 3-factor model of the OPS for chi-square ($\chi^2/df = 2.851$), RMSEA (.076), NNFI (.933), and CFI = .945. However, the AGFI, which was .876, was below the acceptable criteria of .9. A panel discussion with the researchers determined that items 4, 15, and 16 were similar in meaning to item 14; item 1 was similar in meaning to item 7. Therefore, the panel accepted the results of the modified CFA model of the OPS with 15 items and 3-factors.

As illustrated in Table 2 and Fig. 1, all standardized factor loadings exceeded the threshold of .50, and the AVE for each construct ranged from .517 to .676, indicating acceptable convergent validity. In addition, the CR was greater than .70 for the three constructs (range = .862 to .901), providing further evidence for the reliability of the instrument [23]. As shown in Table 3, all of the square roots of the AVE for each construct (values in the diagonal elements) were greater than the corresponding inter-construct correlations (values below the diagonal) [23, 24]. These findings provide further support for the validity of the OPS.

Table 2
 Confirmatory Factor Analysis: convergent reliability and validity of the OPS scale for nursing students (N = 325)

Construct/Item	Item score		Factor loading		Reliability		
	Mean	SD	λ	t	R^2	CR	AVE
Accuracy of content						.881	.517
Item 7	4.25	0.60	.695	13.774***	.483		
Item 14	4.23	0.68	.660	12.863***	.435		
Item 8	3.98	0.66	.786	16.352***	.617		
Item 10	3.88	0.69	.828	17.703***	.686		
Item 9	4.03	0.72	.766	15.753***	.586		
Item 11	4.08	0.65	.697	13.835***	.486		
Item 13	3.92	0.78	.569	10.687***	.324		
Effective Communication						.901	.647
Item 22	3.58	0.91	.894	20.230***	.799		
Item 21	3.43	0.97	.817	17.548***	.668		
Item 24	3.69	0.91	.794	16.816***	.631		
Item 23	3.64	0.87	.854	18.802***	.730		
Item 12	3.41	0.79	.639	12.490***	.408		
Clarity of speech						.862	.676
Item 17	3.94	0.76	.765	15.541***	.586		
Item 18	3.81	0.79	.881	19.002***	.776		
Item 19	3.70	0.76	.817	17.026***	.667		
Note. λ = standardized factor loading; R^2 = reliability of item (squared multiple correlation, SMC); CR = construct (component/composite) reliability; AVE = average variance extraction.							
*** $p < .001$							

Table 3
Discriminate validity among the latent variables of confirmatory factor analysis of the scale for nursing students ($N= 325$)

Construct	1	2	3
1. Accuracy of content	.719 ^a		
2. Effective communication	.696***	.804 ^a	
3. Clarity of speech	.597***	.703***	.822 ^a
^a The value in the diagonal element is the square root of AVE of each construct.			
*** $p < .001$			

Criterion-related validity and test-retest reliability

Criterion-related validity was examined for the total score of OPS and total scores of the PRCA and SPCC. Correlation coefficients were $-.51$ ($p < .001$) for the PRCA and $.45$ ($p < .001$), for the SPCC, indicating strong validity. The test-retest reliability was demonstrated with correlations between the first test of the OPS and 3-weeks later for 89 nursing students. The intra-class correlation coefficient indicated the OPS instrument was stable over time ($r = .681$, $p < .001$).

Discussion

The 15-item OPS was found to be a reliable and valid instrument for assessing oral presentation performance. The strength of this study is that the initial items were developed using both literature review and interviews with teachers, who were university tutors in oral presentation skills, as well as nursing students. Another strength of this study is the multiple methods used to establish the validity and reliability of the OPS, including construct validity (both EFA and CFA) and criterion-related validity.

The OPS was composed of three factors: accuracy of content, effective communication, and clarity of speech, which are similar to constructs used by other oral presentation instruments. Constructs that focus on a person's ability to deliver accurate content are important components for evaluations of classroom speaking because they have been shown to be fundamental elements of public speaking ([13]. Accuracy of content as it applies to oral presentation for nurses is important not only for communicating information involving healthcare education for patients, but also for communicating with team members providing medical care in a clinical setting.

The two other factors identified in the OPS, effective communication and clarity of speech, are similar to constructs for delivery of a presentation, which include interacting with the audience through body-language, eye-contact, and question and answer sessions. These behaviors indicate the presenter is confident and enthusiastic, which engages and captures the attention of an audience. It seems logical

that the voice, pronunciation, and fluency of speech were not independent factors because the presenter's voice qualities all are keys to effectively delivering a presentation. A clear and correct pronunciation, appropriate tone and volume of a presentation assists audiences in more easily receiving and understanding the content.

Our 15-item OPS scale evaluated the performance based on outcome. The original scale was composed of 26 items that were derived from qualitative interviews with nursing students and university tutors in oral presentations. These items were the result of asking about important qualities at three timepoints of a presentation: before, during, and after. However, most of the items that were deleted were those about the period before the presentation (1 to 6); two items (25 and 26) were about the period after the presentation. Analysis did not reflect the qualitative interview data expressed by teachers and students regarding the importance of preparing with practice and rehearsal, and the importance of peer and teacher evaluations. Other studies have suggested that preparation and self-reflection is important for a good presentation, which includes awareness of the audience receiving the presentation, meeting the needs of the audience, defining the purpose of the presentation, use of appropriate technology to augment information, and repeated practices to reduce anxiety [2, 5, 25]. However, these items were deleted in the scale validation stage. Possibly because it is not possible to objectively evaluate how much time and effort the presenter has devoted to the oral presentation.

The deletion of item 20, "The clothing worn by the presenter is appropriate" was also not surprising. During the interviews, teachers and students expressed different opinions about the importance of clothing for a presentation. Many teachers believed the presenter should be dressed formally; students believed the presenter should be neatly dressed. These two perspectives might reflect generational differences. However, these results are reminders assessments should be based on a structured and objective scale, rather than one's personal attitude and stereotype of what should be important about an oral presentation.

The application of the OPS may be useful for both students and teachers. The OPS could be used as a checklist to help students determine how well their presentation matches the 15 items, which could draw attention to deficiencies in their speech before the presentation is given. Once the presentation has been given, the OPS could be used as a self-evaluation form, which could help them make modifications to improve the next the next presentation. Teachers could use the OPS to evaluate a performance during tutoring sessions with students, which could help identify specific areas needing improvement prior to the oral presentation. Although, analysis of the scale was based on data from nursing students, additional assessments with other populations of healthcare students should be conducted to determine if the OPS is applicable for evaluating oral presentations for students in general.

This study had several limitations. Participants were selected by non-random nature sampling, therefore, additional studies with nursing students from other nursing schools would strengthen the validity and reliability of the scale. In addition, the OPS was developed using empirical data, rather than basing it on a theoretical framework, such as anxiety and public speaking. Therefore, the validity of the OPS for use in

other types of student populations or cultures that differ significantly from our sample population should be established in further studies.

Conclusion

Oral presentations are an important component evaluating a student's comprehension of a subject. However, subjective assessments of an oral presentation may result in an inaccurate evaluation of how much a student has learned. Our findings demonstrated the reliability and validity of this newly developed three-factor, 15-item OPS for measuring an oral presentation given by nursing students. To our knowledge, this is the first study to report on the development and psychometric testing of instrument for the objective evaluation of a nursing student's oral presentation. The OPS could be an important tool in nursing education as a means of providing feedback to students and teachers, and improving oral presentations that provide information to healthcare professionals.

Declarations

Ethics approval and consent to participate

The procedures established by the hospital's institutional review board for the protection of participants' confidentiality were strictly followed. All of the participants received oral and written explanations of the study and its procedures, as well as informed consent was obtained from all subjects.

Consent for publication

Not applicable.

Availability of data and materials

The datasets and materials of this study are available to the corresponding author on request.

Competing interests

No conflict of interest has been declared by the authors.

Funding

This study was supported by grants from the Ministry of Science and Technology Taiwan (MOST 107-2511-H-255-007), Ministry of Education (PSR1090283), and the Chang Gung Medical Research Fund (CMRPF3K0021, BMRP704, BMRPA63).

Authors' contributions

Study design: Y.-C.H., Y.-C.C., H.-C.L., T.-L.C., and C.-L.W.; data collection: Y.-C.H. and H.-C.L.; data analysis: Y.-C.H. and Y.-C.C.

Acknowledgements

The authors would like to thank all of the participants for their kind cooperation.

References

1. Hadfield-Law L Presentation skills. Presentation skills for nurses: how to prepare more effectively. *Br J Nurs* 2001; 10(18):1208-1211.
2. Longo A, Tierney C Presentation skills for the nurse educator. *J Nurses Staff Dev* 2012; 28(1):16-23.
3. Elfering A, Grebner S Getting Used to Academic Public Speaking: Global Self-Esteem Predicts Habituation in Blood Pressure Response to Repeated Thesis Presentations. *Appl Psychophysiol Biofeedback* 2012; 37(2):109-120.
4. Turner K, Roberts L, Heal C, Wright L Oral presentation as a form of summative assessment in a master's level PGCE module: the student perspective. *Assess Eval High Educ* 2013; 38(6):662-673.
5. Liao H-A Examining the Role of Collaborative Learning in a Public Speaking Course. *College Teaching* 2014; 62(2):47-54.
6. Tsang A Positive effects of a programme on oral presentation skills: high- and low-proficient learners' self-evaluations and perspectives. *Assess Eval High Educ* 2018; 43(5):760-771.
7. Langan AM, Wheeler CP, Shaw EM, Haines BJ, Cullen WR, Boyle JC, Penney D, Oldekop JA, Ashcroft C, Lockey L *et al*/Peer assessment of oral presentations: effects of student gender, university affiliation and participation in the development of assessment criteria. *Assess Eval High Educ* 2005; 30(1):21-34.
8. De Grez L, Valcke M, Roozen I The Impact of an Innovative Instructional Intervention on the Acquisition of Oral Presentation Skills in Higher Education. *Comput Educ* 2009; 53(1):112-120.
9. Murillo-Zamorano LR, Montanero M Oral presentations in higher education: a comparison of the impact of peer and teacher feedback. *Assess Eval High Educ* 2018; 43(1):138-150.
10. Brown T, Morrissey L The effectiveness of verbal self-guidance as a transfer of training intervention: its impact on presentation performance, self efficacy and anxiety 1. *Innovations in Education & Teaching International* 2004; 41(3):255-271.
11. Fowler DL, Jones DJ Professional Presentation Skills Development in a Graduate Nursing Program. *J Nurs Educ* 2015; 54(12):708-711.
12. Magin D, Helmore P Peer and Teacher Assessments of Oral Presentation Skills: how reliable are they? *Studies in Higher Education* 2001; 26(3):287-298.
13. Carlson RE, Smith-Howell D Classroom Public Speaking Assessment: Reliability and Validity of Selected Evaluation Instruments. *Commun Educ* 1995; 44:87-97.
14. Polit DF, Beck CT The content validity index: are you sure you know what's being reported? Critique and recommendations. *Res Nurs Health* 2006; 29(5):489-497.

15. McCroskey JC, McCroskey LL Self-report as an approach to measuring communication competence. *Commun Res Rep* 1988; 5:108-113.
16. McCroskey JC Oral Communication Apprehension: A Summary of Recent Theory and Research. *Hum Commun Res* 1977; 4(1):78-96.
17. Dupagne M, Stacks DW, Giroux VM Effects of Video Streaming Technology on Public Speaking Students' Communication Apprehension and Competence. *Journal of Educational Technology Systems* 2007; 35(4):479-490.
18. Kim JY The effect of personality, situational factors, and communication apprehension on a blended communication course. *Indian Journal of Science & Technology* 2015; 8(S1):528-534.
19. Pearson JC, Child JT, DeGreeff BL, Semlak JL, Burnett A The influence of biological sex, self-esteem, and communication apprehension on unwillingness to communicate. *Atlantic Journal of Communication* 2011; 19(4):216-227.
20. Degner RK Prevalence of Communication Apprehension at a Community College. *International Journal of Interdisciplinary Social Sciences* 2010; 5(6):183-191.
21. McCroskey JC: An introduction to rhetorical communication, vol. 4th Ed. NJ: Prentice-Hall: Englewood Cliffs; 1982.
22. Hancock AB, Stone MD, Brundage SB, Zeigler MT Public speaking attitudes: does curriculum make a difference? *J Voice* 2010; 24(3):302-307.
23. Hair JF, Black WC, Babin BJ, Anderson RE: Multivariate data analysis: A global perspective vol. 7th ed. NJ: Pearson Prentice Hall; 2009.
24. Fornell C, Larcker D Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* 1981; 18:39-50.
25. Foulkes M Presentation skills for nurses. *Nursing Standard (Royal College Of Nursing (Great Britain): 1987)* 2015; 29(25):52-58.

Figures

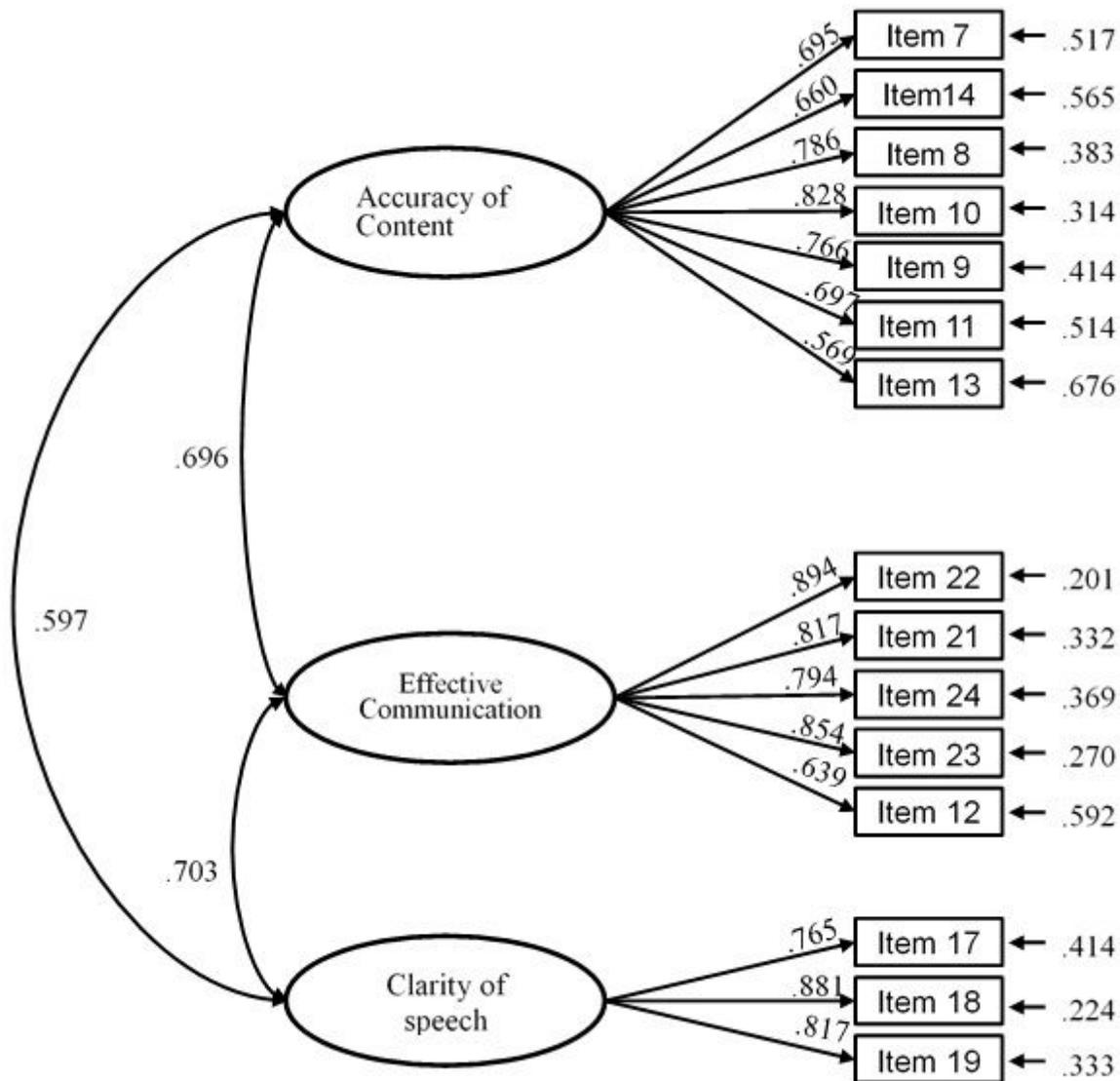


Figure 1

The standardized estimates of CFA model for validation sample

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Oralpresentationperformancequestionnaire.docx](#)