

Translation of the Chinese version of the Self-Care for Aspiration Pneumonia Prevention Scale and its validation among Chinese community dwelling elderly with risk of dysphasia

Zhen Yang¹  | Fengmin Chen² | Yibo Zhang¹ | Sien Pan¹ | Yingying Lu¹ | Huijun Zhang¹

¹Department of Nursing, Jinzhou Medical University, Jinzhou, China

²The First Affiliated Hospital, Jinzhou Medical University, Jinzhou, China

Correspondence

Huijun Zhang, Department of Nursing, Jinzhou Medical University, No. 40, Section 3, Songlu Road, Linghe District, Jinzhou 121001, China.
Email: 13904069606@163.com

Funding information

This work was supported by the Scientific Research Project of Liaoning Provincial Education Department [grant numbers JYTJZR2020085]

Abstract

Aim: To translate the Self-Care for Aspiration Pneumonia Prevention Scale into the Chinese and validate its reliability and validity among community dwelling elderly with risk of dysphasia.

Design: A cross-sectional survey.

Methods: A total of 430 elderly with risk of dysphasia were recruited. The reliability was measured by internal consistency, split half reliability, and test-retest reliability. The validity was evaluated by expert consultation and factor analysis.

Results: The translated scale had ideal reliability. The content validity index (S-CVI) was 0.952. The 3-factor structure, supported by the eigenvalues, total variance explained, and scree plot, was obtained by using exploratory factor analysis. And as a result of a confirmatory factor analysis, the model fitting indexes were all in the acceptable range. The Chinese version of the Self-Care for Aspiration Pneumonia Prevention scale can contribute to clinical practice and education to improve self-care for aspiration pneumonia prevention among elderly at risk of dysphasia.

KEYWORDS

aspiration pneumonia, confirmatory factor analysis, dysphasia, exploratory factor analysis, reliability, self-care, validity

1 | INTRODUCTION

Self-care, a positive organizational behavior characteristic, plays an indispensable role for disease prevention and management (Aga et al., 2020; Nordfonn et al., 2020). With the decrease in swallowing function, there will be an increased risk of aspiration pneumonia among the elderly, so the characteristic is of greater significance among the elderly with risk of dysphasia. In China, however, there is no unified standard for the assessment of self-care for aspiration

pneumonia prevention among community dwelling elderly with risk of dysphasia.

2 | BACKGROUND

With the development of economy and medical technology, aging process is intensifying, and the proportion of the elderly population is increasing in China. According to data released by the Chinese

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2021 The Authors. *Nursing Open* published by John Wiley & Sons Ltd.

National Bureau of Statistics, there were 254 million elderly people aged 60 and older in China, accounting for 18.1% of the total population (Zhang, 2020). The World Health Organization reported that by 2050, 35% of China's population will be over 60 years old, and the elderly population will reach 455 million, making China the most aging country in the world (Kowal et al., 2016). A consequence of the increasing percentage of the elderly is the sharp increase in the incidence and prevalence of age-related diseases (Stöber et al., 2015).

In recent years, the prevalence of aspiration pneumonia in the elderly has been increasing year by year and has become one of causes of death in elderly patients with chronic diseases (Longo et al., 2019). As a relevant research result, the elderly have weaker immunity and higher risk of pneumonia, among which aspiration pneumonia accounts for 10.4%–80.1% (Teramoto et al., 2008). In addition, aspiration pneumonia has a higher mortality rate than other types of community-acquired pneumonia (29.4% vs. 11.6%; Lindenauer et al., 2018). Therefore, the problem of aspiration pneumonia in the elderly is becoming more and more important with the increase in the elderly population.

Aspiration pneumonia is a bacterial inflammation caused by the aspiration of pathogens into lungs with respiratory movement (Herzig et al., 2017). A number of studies have found that oropharyngeal food and secretions caused by dysphagia is the primary risk factor for aspiration pneumonia in elderly patients (Harrington et al., 1998; Spatenkova et al., 2018). Likewise, the incidence of aspiration pneumonia in older adults with symptoms of dysphagia is 40.0% higher than that in older adults without complications (Serra-Prat et al., 2012). Furthermore, dysphagia can not only lead to aspiration pneumonia in the elderly, but can also predict other adverse health outcomes, and therefore, self-care, a means of health management and promotion for the aspiration pneumonia among elderly at risk of dysphagia, worthy of being discussed.

Self-care refers to the practice of health care, health management, and health promotion in individuals' daily life (LeBlanc & Jacelon, 2018). Before the influence of self-care on aspiration pneumonia prevention, traditional self-care models for helping patients have been useful, such as the increase in self-care knowledge can help patients have a deeper understanding for the disease and the significant self-care resources can enable patients to cope with the incidence of chronic diseases with more confidence (Jo et al., 2020; Ojewale et al., 2019). In addition, the increase in self-care knowledge and resources is also crucial for self-care behavior. Traditional self-care models, however, have sometimes presented self-care as a task, rather than a way of living.

Based on the Hertz and Baas (2006) self-care model, Korean scholar Lee (Yang & Lee, 2020) recently integrated traditional self-care and aspiration pneumonia prevention in the development of the Self-Care for Aspiration Pneumonia Prevention (SCAPP) Scale. Self-Care for Aspiration Pneumonia Prevention is an iterative process that involves the assessment of self-care knowledge, the use of self-care resources, and the implementation of self-care behaviors

related to aspiration pneumonia prevention. Therefore, the development of the SCAPP Scale has arisen out of this need to assess self-care ability of elderly with risk of dysphasia for aspiration pneumonia prevention to contribute to clinical practice, research, and education. In addition, as a significant measurement feature lacking in relevant research tools, the scale supported by a three-factor structure provides a comprehensive and effective assessment of self-care from multiple levels and perspectives, which makes up for the deficiency of a single-dimensional measurement tool. Therefore, in this study, Self-Care for Aspiration Pneumonia Prevention (SCAPP) Scale was introduced into China for the first time in the context of the lack of relevant assessment tools and tested its reliability and validity among elderly with risk of dysphasia.

2.1 | Research question

Whether and to what extent, does the Chinese version of the SCAPP Scale exhibit satisfactory psychometric properties among community dwelling elderly with risk of dysphasia?

3 | THE STUDY

3.1 | Study design and participants

A cross-sectional study was conducted and involved three communities—Longjiang community, Tiexin community, and Jiqing community of Jinzhou City, Liaoning Province, China—from September 2020 to December 2020. The sample size was determined using the general rule for factor analytic procedure that requires a minimum of three respondents per item (Kline, 1998), but a larger sample is desirable. In this study, ten respondents per item were required to ensure the accuracy of exploratory factor analysis and confirmatory factor analysis. Therefore, participants were recruited by convenience sampling from community with the assistance of community workers and consisted of a total of 430 elderly patients. Inclusion criteria were patients aged 60 years and older with risk of dysphasia. Exclusion criteria included patients with severe cognitive and mental disorders, communication disorders, unable to clearly communicate, and involuntary participants.

3.2 | Measurements

3.2.1 | General demographic characteristics questionnaire

A thorough literature review was conducted after which the team designed the questionnaire. Six sociodemographic items were: age, gender, education level, marital status, monthly income level, and health self-assessment.

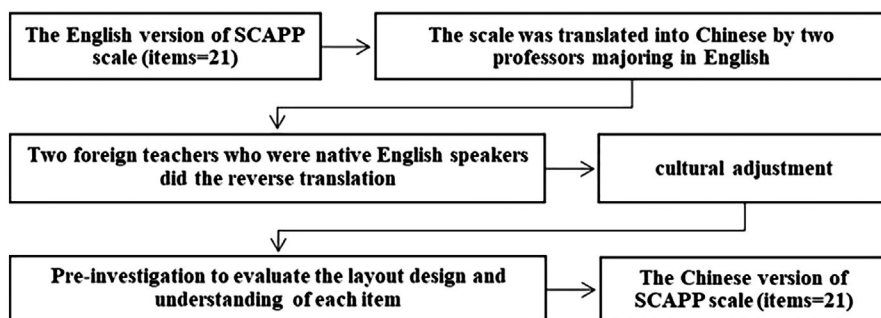


FIGURE 1 The translation procedure for Chinese version of the SCAPP scale

3.2.2 | Eating Assessment Tool-10 (EAT-10)

The tool, developed by Belafsky (Belafsky et al., 2008) in 2008, is a self-assessment scale. There are 10 items covering various symptoms of dysphasia, clinical features, psychological feelings, and social effects, and items were rated on a Likert scale (0 = none to 4 = very severe) with scores ranging from 0 to 40 points. EAT-10 ≥ 3 points indicates that patients exist swallowing efficiency and safety problems. In 2013, the Consensus Group of Experts on the rehabilitation assessment and treatment of dysphasia in China recommended and translated into Chinese and it has good internal consistency, repeatability, and validity (Expert consensus on rehabilitation assessment & treatment of dysphagia in China, 2013).

3.2.3 | Self-Care for Aspiration Pneumonia Prevention Scale (SCAPP Scale)

The scale was developed by Yang and Lee (2020) and applied to elderly at risk of dysphasia to assess their level of self-care for aspiration pneumonia prevention. The scale included 21 items measured on a Likert scale that revealed three domains: "self-care knowledge," "self-care resources," and "self-care behavior." The score ranged from 21 to 105. The higher the total score, the higher the level of self-care for aspiration pneumonia prevention. The total Cronbach's α value was .90, and the Cronbach's α value of self-care knowledge, self-care resources, and self-care behavior was .91, .88 and .89, respectively. CFA model fitness index is good (Yang & Lee, 2020).

3.3 | Data collection procedure

The researchers were divided into three groups (3 people per group). After receiving relevant training, researchers went to three communities, respectively, and recruited participants in the form of posters with the assistance of community workers. The elderly who were interested in this study were assessed if they are at risk of dysphasia using the questionnaire. After that, the elderly at risk of dysphasia completed the questionnaire in a quiet classroom arranged by community workers. For the elderly who could not complete the questionnaire due to impaired vision, the investigator invited them to answer the questions orally (The investigator only stated the items,

without adding any personal feelings). To evaluate test-retest reliability, 40 community dwelling elderly were asked to complete the questionnaire again after one week.

3.4 | Translation procedure

Our translation work has obtained professor Lee's permission. First, the SCAPP Scale was translated into Chinese by two Chinese professors majoring in English. Then, two foreign teachers who were native English speakers did the reverse translation. In addition, psychological experts were invited to cultural adjustments for the translated scale. Finally, 10 community dwelling elderly were selected to conduct a preliminary survey using the translated scale and were invited to evaluate the layout design and understanding of each item. The elderly all indicated that the scale structure was clear and the items were easy to understand. The translation procedure is shown in Figure 1.

3.5 | Data analysis

Data were analyzed using SPSS 22.0 and AMOS 23.0 statistical software. For items analysis, the total score of the translated scale was ranked from high to low, and the relationship between the first 27% (high-score group) and the last 27% (low-score group) was analyzed to judge whether the translated scale has ideal discrimination. The correlation between the items and the translated scale and the Cronbach's α coefficient if item deleted are analyzed to evaluate whether each item of the translated scale can be retained.

For reliability analysis, Cronbach's α coefficient of the translated scale and its dimensions is calculated to evaluate the internal consistency reliability of the translated scale. And the items were divided into two parts according to the order of oddness and evenness, and the correlation between the results on both sides was calculated to evaluate the split-half reliability of the translated scale. One week later, the translated scale was used to examine 40 community dwelling elderly with risk of dysphasia to assess the test-retest reliability.

For content validity analysis, 7 experts in related fields were invited to evaluate the content validity of the translated scale using Delphi method. The content validity index (I-CVI) of the items and the content validity index (S-CVI) of the scale were calculated.

According to the correlation between each item and the theme, each item was given four options (no correlation, somewhat correlation, quite correlation, and highly correlation) and counted no correlation, somewhat correlation as 0 point and quite correlation and highly correlation as 1 point. I-CVI is the ratio of the number of experts with 1 point for each item to the total number of experts. S-CVI is the mean of I-CVI for all of the items.

For structure validity analysis, to investigate the underlying factor structure of the translated scale, an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA) were performed. The sample of 430 cases was randomly divided into 2 groups, one ($n = 215$) for EFA and the other ($n = 215$) for CFA. In EFA ($n = 215$), a principal component analysis (PCA) with varimax rotation was performed on the 21 items of the scale. Varimax rotation is the most commonly used orthogonal technique that minimizes factor complexity with a maximized variance of factor loading. The sampling adequacy for the factorability was assessed using the Kaiser-Meyer-Olkin (KMO) measurement and Bartlett test of sphericity. Only when the Bartlett test of sphericity was significant ($p < .05$) and the KMO was > 0.60 , the dataset was considered appropriate for PCA. The factors were extracted based on the comprehensive consideration of eigenvalues, explained total variance, and a visual inspection of the scree plot. AMOS was used to perform the CFAs of SCAPP Scale, analyzing the fit of models. The data analysis procedure is shown in Figure 2.

4 | RESULTS

4.1 | Descriptive statistics

The total mean score of SCAPP scale ranged from 21 to 105. The average score was 64.41 ± 8.84 . The score of self-care knowledge dimension was 4 to 20, with an average score of 10.69 ± 2.81 ; the score of self-care resource dimension was 7 to 35, with an average score of 21.82 ± 3.39 . The score of self-care behavior dimension was 10 to 50, with an average score of 31.90 ± 4.85 . Other sociodemographic information is shown in Table 1.

4.2 | Item analysis

The critical ratio (CR) > 3.000 indicated the higher discriminability of items. The CR of 21 items in the scale was 8.440–15.963, which indicated that the discrimination of each item was good. The scores of each item were positively correlated with the total score ($r = .412-.640$), indicating that each item was moderately correlated with the scale. After deleting each item, Cronbach's α coefficient of the scale was .880 to .887, which does not exceed Cronbach's α coefficient of the scale (.885), indicating that all 21 items of the scale can be retained (Table 2).

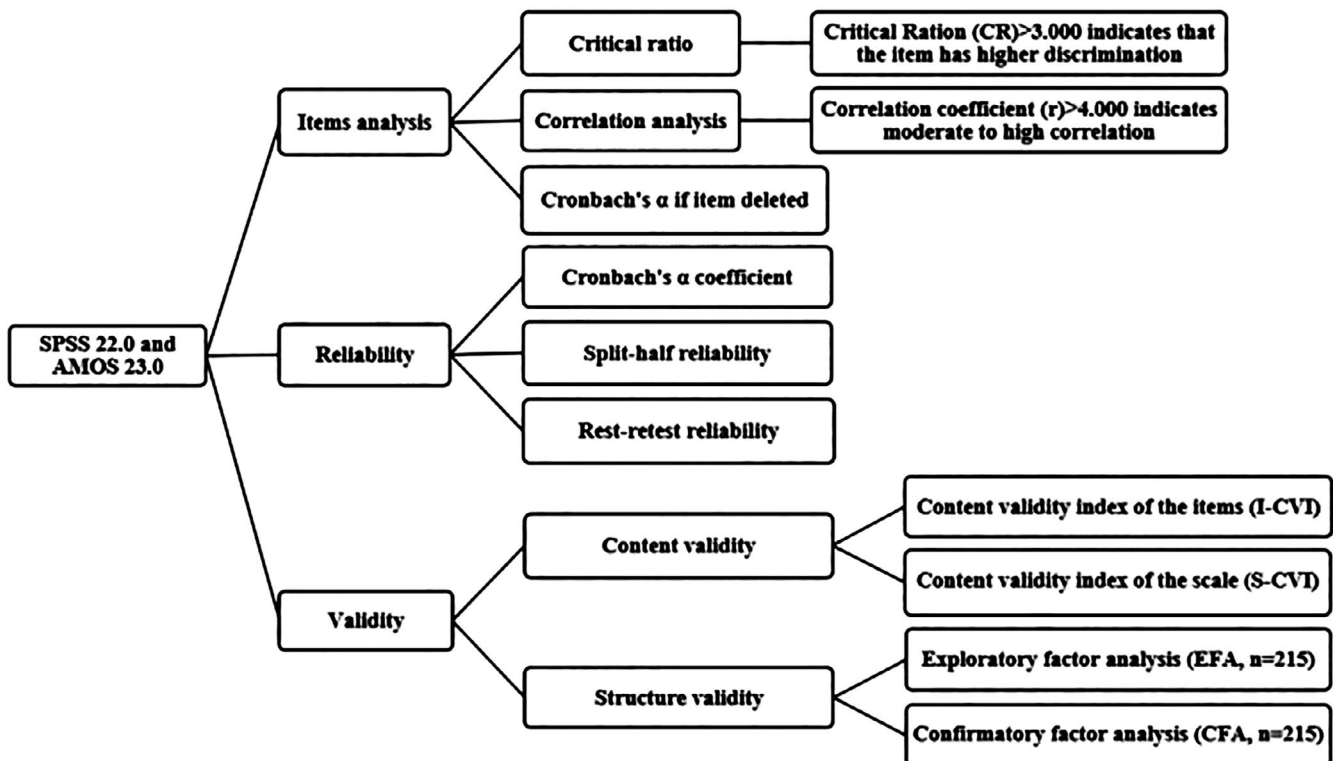


FIGURE 2 The data analysis procedure for Chinese version of the SCAPP scale

TABLE 1 Frequency distribution of demographic characteristics ($n = 430$)

Factors	Group	n	%
Age	60–69	186	43.3
	70–79	164	38.1
	≥80	80	18.6
Sex	Male	182	42.3
	Female	248	57.7
Education level	Primary schools or below	206	47.9
	Middle school–high school	168	39.1
	College or above	56	13.0
Marital status	Unmarried	45	10.5
	Married	211	49.1
	Divorced/Widowed	174	40.5
Monthly income(RMB)	<2,000	96	22.3
	2,000–4,000	203	47.2
	>4,000	131	30.5
Self-evaluation of health	Poor	101	23.5
	Average	154	35.8
	Good	175	40.7

Note: 1 RMB = 0.1514 dollars.

4.3 | Reliability analysis

The Chinese version of SCAPP scale has ideal internal consistency and split-half reliability. In addition, after one week, 40 Chinese community dwelling elderly with risk of dysphasia were randomly selected for re-testing, and the test-retest reliability was 0.822 (Table 3).

4.4 | Validity analysis

4.4.1 | Content validity analysis

Seven experts were invited to evaluate the content validity of the scale. The results showed that the I-CVI of the Chinese version of SCAPP scale was 0.857–1.000 (Table 4), and the S-CVI was 0.952.

4.4.2 | Structure validity analysis

Exploratory factor analysis

The Kaiser–Meyer–Olkin measure of sampling adequacy was 0.894, and the Bartlett test of sphericity was significant ($\chi^2 = 1,658.791$; $p < .001$). Therefore, the matrix is not an identity matrix and is appropriate for factor extraction, and factor loadings are displayed in Table 5. In addition, 3 factors explained 50.231% of the variance, which were confirmed by the scree plot (Figure 3).

Confirmatory factor analysis

The results of confirmatory factor analysis are shown in Figure 4. According to the modification indices (MI), the initial model was revised 8 times in order: e6 and e9, e17 and e19, e5 and e8, e8 and e19, e11 and e21, e15 and e21, e6 and e8, e2 and e13, respectively. The model fitting indexes are shown in Table 6.

5 | DISCUSSION

5.1 | The level of self-care for aspiration pneumonia prevention

Chinese community dwelling elderly with risk of dysphasia had moderate levels of self-care for aspiration pneumonia prevention, which is consistent with Lee's research results (Yang & Lee, 2020), and the score is higher than the self-care level of patients with chronic kidney disease (Wang et al., 2019). For the aspiration pneumonia prevention, the elderly with risk of dysphasia can accumulate self-care experience and have certain self-care ability in the past long-term actions, but their self-care ability is often limited due to their lower education level (Umeda et al., 2020). Therefore, community health workers should pay attention to this target group and publicize self-care knowledge, so that they can make full use of self-care resources and further promote their self-care ability.

5.2 | The Chinese version of SCAPP Scale has ideal distinction and suitability

In this study, based on the Brislin translation principle (Khalaila, 2013), nursing experts were invited to adjust the translation draft according to relevant guidelines on aspiration pneumonia prevention and Chinese expression habits, and the Chinese SCAPP scale was finally formed. The equivalence between the Chinese scale and the original scale is fully guaranteed. Through preliminary investigation, 40 elderly people believed that the semantic expression of the Chinese SCAPP scale was clear and easy to understand, and the scale structure was reasonable. Furthermore, in this study, the critical ratio method, correlation analysis, and internal consistency test all proved that the Chinese version of SCAPP scale had better distinction and suitability.

5.3 | The Chinese version of SCAPP Scale has ideal reliability

Reliability analysis, a method of measuring the consistency and stability of the measured tool, is used to reflect the authenticity of the measured tool (Koo & Li, 2016). In this study, the reliability of the Chinese version of SCAPP scale was evaluated from three aspects: internal consistency reliability, test-retest reliability and split-half reliability. The internal consistency reflects the homogeneity among all

TABLE 2 Item analysis for Chinese version of the SCAPP scale

Item	Item score	Critical ratio	Correlation coefficient between item and total score	Cronbach's alpha if item deleted
SK-1	2.81 ± 0.85	13.078	.616	.878
SK-2	2.34 ± 0.90	13.623	.598	.879
SK-3	2.82 ± 0.78	9.111	.468	.883
SK-4	2.73 ± 0.83	8.861	.476	.883
SR-1	3.46 ± 0.67	11.487	.495	.882
SR-2	2.93 ± 0.85	13.589	.640	.877
SR-3	2.57 ± 0.83	13.231	.591	.879
SR-4	3.57 ± 0.66	14.474	.594	.879
SR-5	2.96 ± 0.75	8.440	.412	.885
SR-6	2.92 ± 0.74	11.696	.557	.880
SR-7	3.41 ± 0.70	12.185	.564	.880
SB-1	2.58 ± 0.78	13.343	.580	.879
SB-2	3.48 ± 0.62	9.735	.443	.883
SB-3	2.87 ± 0.71	11.639	.580	.879
SB-4	2.81 ± 0.71	12.886	.580	.879
SB-5	3.62 ± 0.69	11.347	.524	.881
SB-6	3.46 ± 0.71	8.952	.484	.882
SB-7	3.39 ± 0.75	10.847	.513	.881
SB-8	2.88 ± 0.87	15.963	.631	.878
SB-9	3.28 ± 0.80	13.261	.584	.879
SB-10	3.53 ± 0.78	13.324	.633	.878

Abbreviations: SB, self-care behavior; SK, self-care knowledge; SR, self-care resource.

TABLE 3 Reliability analysis for Chinese version of the SCAPP scale

The scale and its item	Score	Cronbach's alpha	Split-half reliability	Test-retest reliability
The scale	64.41 ± 8.85	.885	0.675	0.822
SK	10.69 ± 2.81	.854		
SR	21.82 ± 3.39	.770		
SB	31.90 ± 4.85	.849		

Abbreviations: SB, self-care behavior; SK, self-care knowledge; SR, self-care resource.

items in the scale (Anselmi et al., 2019). The better the homogeneity, the higher the consistency of all items in the scale for the measurement of the same index. Cronbach's coefficient is usually used to evaluate the internal consistency of the scale. The results showed that the Cronbach's coefficient of the scale was .885, the Cronbach's coefficient of each dimension was .770 to .854, indicating that the Chinese version of SCAPP scale has high internal consistency. Test-retest reliability refers to the consistency of the results obtained by repeatedly measuring a group of subjects with a research tool, and it reflects whether the measuring tool can stably measure the things or variables (Leppink & Pérez-Fuster, 2017). The test-retest correlation coefficient is between 0 and 1, and the closer it is to 1, the better the test-retest reliability is. In this study, the test-retest reliability of the Chinese version of SCAPP scale was 0.822, which shows that the scale is highly stability and could be reused among Chinese community dwelling elderly with risk of dysphasia.

5.4 | The Chinese version of SCAPP Scale has ideal validity

Validity refers to the degree to which the scale can reflect the expected research concepts (Frandsen et al., 2014). The higher the degree to reflect the expected research concepts, the better the validity. In this study, the reliability of the Chinese version of SCAPP scale was evaluated from content validity and structure validity. Content validity refers to the degree to which the items in the research tools can reflect the measured content, which is usually based on a large number of literature review, work experience, comprehensive analysis, and judgment, and is mostly evaluated by expert committees (Almanasreh et al., 2019). WALTZ et al (Waltz et al., 2016) believed that $S-CVI \geq 0.90$ represented that the research tools have ideal content validity. In this study, 7 experts evaluated all the items of the Chinese SCAPP scale.

TABLE 4 Content validity analysis for Chinese version of the SCAPP scale

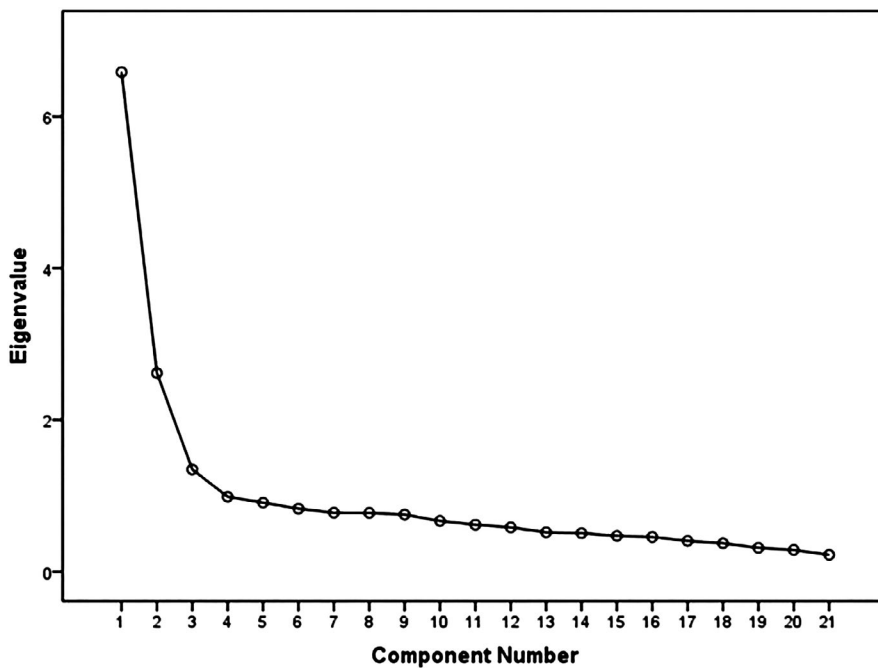
Item	Experts (score)							I-CVI
	1	2	3	4	5	6	7	
SK-1	1	1	1	1	1	1	1	1.000
SK-2	1	1	1	1	1	1	1	1.000
SK-3	1	1	1	1	1	1	1	1.000
SK-4	1	0	1	1	1	1	1	0.857
SR-1	1	1	1	1	1	1	1	1.000
SR-2	1	1	1	1	1	1	1	1.000
SR-3	1	1	1	1	1	1	1	1.000
SR-4	1	1	0	1	1	1	1	0.857
SR-5	1	1	1	1	1	1	1	1.000
SR-6	1	1	1	1	1	1	0	0.857
SR-7	1	0	1	1	1	1	1	0.857
SB-1	1	1	1	1	1	1	1	1.000
SB-2	1	1	1	1	1	1	1	1.000
SB-3	1	1	1	1	1	1	1	1.000
SB-4	1	1	1	1	0	1	1	0.857
SB-5	1	1	1	1	1	1	1	1.000
SB-6	1	1	1	1	1	1	1	1.000
SB-7	1	1	1	1	1	0	1	0.857
SB-8	1	1	1	1	1	1	1	1.000
SB-9	1	1	1	1	1	1	1	1.000
SB-10	1	1	1	0	1	1	1	0.857

Abbreviations: SB, self-care behavior; SK, self-care knowledge; SR, self-care resource.

TABLE 5 Factor loadings of exploratory factor analysis for Chinese version of the SCAPP scale

Item	Factor 1	Factor 2	Factor 3
SB-8	0.746	-	-
SB-7	0.681	-	-
SB-4	0.652	-	-
SB-10	0.642	-	-
SB-9	0.636	-	-
SB-3	0.615	-	-
SB-6	0.607	-	-
SB-5	0.595	-	-
SB-2	0.557	-	-
SB-1	0.492	-	-
SR-4	-	0.695	-
SR-3	-	0.681	-
SR-1	-	0.665	-
SR-2	-	0.659	-
SR-6	-	0.543	-
SR-7	-	0.512	-
SR-5	-	0.483	-
SK-1	-	-	0.856
SK-2	-	-	0.816
SK-4	-	-	0.781
SK-3	-	-	0.777

Abbreviations: SB, self-care behavior; SK, self-care knowledge; SR, self-care resource.

**FIGURE 3** Screen plot of exploratory factor analysis for Chinese version of the SCAPP scale

In order to obtain a scale that conforms to Chinese expression habits and China's national conditions, after repeated adjustment and verification of each item of the scale, the final evaluation results of I-CVI were 0.857 to 1.000 and S-CVI was 0.952, indicating that the Chinese version of the scale has a good content validity. Exploratory factor analysis is the most commonly used and effective method to evaluate the structure validity of a scale based on the relevant theoretical or conceptual framework (Kang, 2013). It is generally believed that the ideal structure validity is reflected in two aspects: (a) The factors extracted by exploratory factor analysis can explain 40.00% or more of the total data variation; (b) Each item has a higher load value on one common factor (>0.400) and a lower load value on other common factors. In this study, exploratory factor analysis was used to extract three common factors, which could explain 50.231% of the total variation. The structure was consistent with that of the original scale, including three dimensions. After further applying the maximum variance orthogonal rotation method for factor load analysis, the load values of each observed variable on their corresponding common factors were 0.492–0.856 (all >0.400), and most of the items were above 0.600, indicating that the scale had good structural validity.

5.5 | Limitations and perspectives

There are some limitations to this study, which should be noted and discussed. First, the samples used in this study were limited to community dwelling elderly with risk of dysphasia in one province in China and so the results may not be generalizable. Multicenter large-sample research needs to be conducted across China to supplement existing results from this and other studies. Additionally, bias was inevitable because of the self-reporting nature of this investigation. Besides, we did not investigate whether the subjects had ever suffered from aspiration pneumonia in this study, but the experience of having suffered from aspiration pneumonia may have an impact on self-care ability, so it is suggested to investigate whether there has been aspiration pneumonia in future studies.

6 | CONCLUSION

The cross-cultural adjustment and translation of the SCAPP scale was successfully carried out among Chinese community dwelling elderly with risk of dysphasia. And through factor analysis, it has been concluded that the Chinese version of SCAPP scale has the

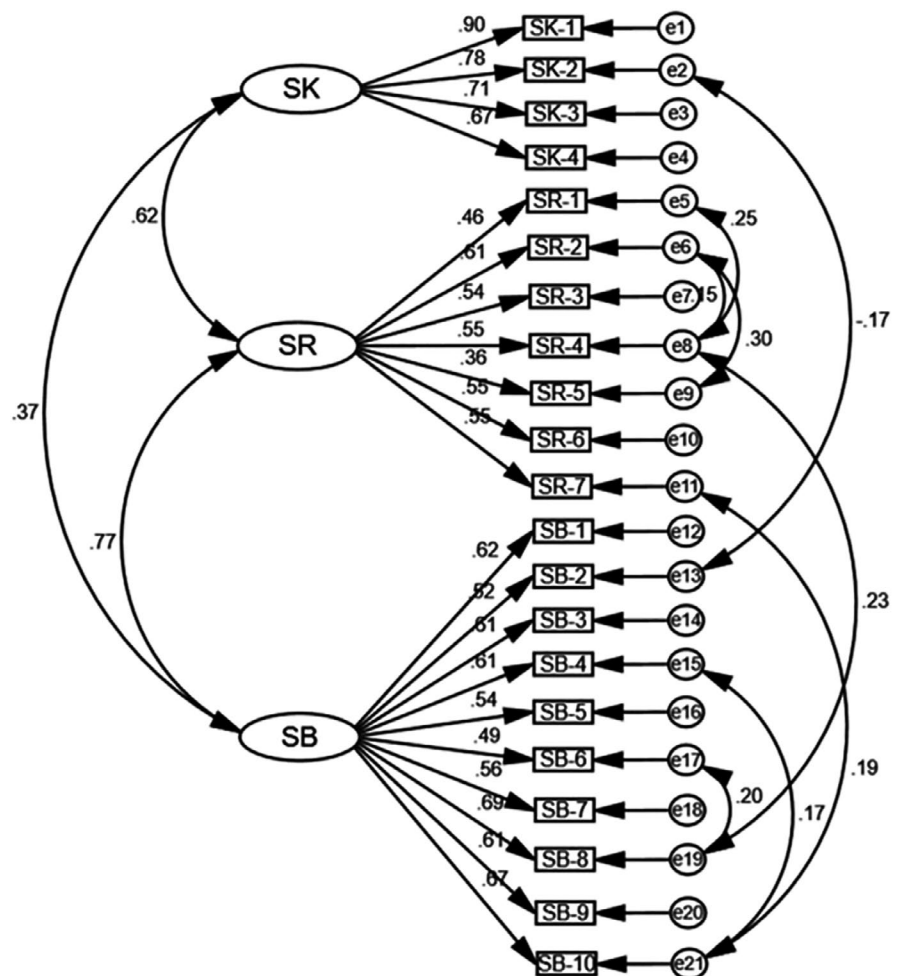


FIGURE 4 Standardized three-factor structural model of the SCAPP scale (n = 215). SK (self-care knowledge, four items), SR (self-care resource, seven items), SB (self-care behavior, ten items)

TABLE 6 The model fitness index of confirmatory factor analysis the Chinese version SCAPP scale

Fit measures		Criteria	Index
Absolute fit measures	GFI	≥0.900	0.922
	AGFI	≥0.900	0.900
	RMSEA	≤0.050	0.024
Incremental fit measures	TLI	≥0.900	0.981
	CFI	≥0.900	0.984
	IFI	≥0.900	0.984
Parsimonious fit measures	PGFI	≥0.500	0.711
	PNFI	≥0.500	0.741
	CMIN/DF	≤2.000	1.124

Abbreviations: AGFI, adjusted goodness-of-fit index; CFI, comparative fit index; CMIN/DF, Chi-square degree of freedom; GFI, goodness-of-fit index; IFI, incremental fit index; PGFI, parsimonious goodness-of-fit index; PNFI, parsimonious normed-of-fit index; RMSEA, root mean square error of approximation; TLI, Tucker–Lewis index.

ideal reliability and validity. Under the background of aged tendency of population and healthy China strategy, this provides an effective measurement tool for assessing the self-care ability for aspiration pneumonia prevention among Chinese community dwelling elderly with risk of dysphasia, provides a basis and premise for the related research on the health belief level of the elderly for the aspiration pneumonia prevention and screening, and provides an effective evaluation tool to further develop relevant intervention measures to improve the self-care ability among Chinese community dwelling elderly with risk of dysphasia.

ACKNOWLEDGEMENTS

The authors are grateful to elderly patients who participated in this study, and also to the community workers for their strong support in collecting samples.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Zhen Yang conceptualized the study, analysed the data, and drafted the initial introduction, results, and discussion sections. Fengmin Chen conceptualized the study, drafted the abstract, and reviewed the manuscript. Yibo Zhang, Sien Pan and Yingying Lu assisted in data collection, and provided important contributions throughout. Huijun Zhang conceptualized the study, drafted the limitations and conclusion section, and reviewed the manuscript. All authors hold themselves jointly to the content in the manuscript.

ETHICAL APPROVAL

Participants were informed of the purpose and methods of the study, risks and benefits of participation, confidentiality of their data, and the voluntary nature of participation. Written informed consent was obtained before the interviews for item development and refinement

study. The return of the filled anonymous questionnaire was taken as consent to participate in the main study. The study protocol was approved by the Ethics Committee of the Jinzhou Medical University.

DATA AVAILABILITY STATEMENT

This is an open-access article under the terms of the Creative Commons Attribution License, which permits use, distribution, and reproduction in any medium, provided the original work is properly cited. The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Zhen Yang  <https://orcid.org/0000-0002-6197-6168>

REFERENCES

- Aga, F., Dunbar, S. B., Kebede, T., Higgins, M. K., & Gary, R. (2020). Relationships of diabetes self-care behaviours to glycaemic control in adults with type 2 diabetes and comorbid heart failure. *Nursing Open*, 7, 1453–1467. <https://doi.org/10.1002/nop2.517>
- Almanasreh, E., Moles, R., & Chen, T. F. (2019). Evaluation of methods used for estimating content validity. *Research in Social & Administrative Pharmacy*, 15, 214–221. <https://doi.org/10.1016/j.sapharm.2018.03.066>
- Anselmi, P., Colledani, D., & Robusto, E. (2019). A Comparison of classical and modern measures of internal consistency. *Frontiers in Psychology*, 10, 2714. <https://doi.org/10.3389/fpsyg.2019.02714>
- Belafsky, P. C., Mouadeb, D. A., Rees, C. J., Pryor, J. C., Postma, G. N., Allen, J., & Leonard, R. J. (2008). Validity and reliability of the Eating Assessment Tool (EAT-10). *The Annals of Otolaryngology, Rhinology, and Laryngology*, 117, 919–924. <https://doi.org/10.1177/000348940811701210>
- Expert consensus on rehabilitation assessment and treatment of dysphagia in China (2013 version). (2013). *Chinese Journal of Physical Medicine and Rehabilitation*, 35, 916–929. <https://doi.org/10.3760/cma.j.issn.0254-1424.2013.12.002>
- Frandsen, T. F., Dyrvig, A. K., Christensen, J. B., FASTERHOLDT, I., & OELHOLM, A. M. (2014). A guide to obtain validity and reproducibility in systematic reviews. *Ugeskrift for Laeger*, 176, V02130141.
- Harrington, O. B., Duckworth, J. K., Starnes, C. L., White, P., Fleming, L., Kritchevsky, S. B., & Pickering, R. (1998). Silent aspiration after coronary artery bypass grafting. *The Annals of Thoracic Surgery*, 65, 1599–1603. [https://doi.org/10.1016/s0003-4975\(98\)00239-2](https://doi.org/10.1016/s0003-4975(98)00239-2)
- Hertz, J. E., & Baas, L. (2006). Self-care: Knowledge, resources, and actions. In H. L. Erickson (Ed.), *Modeling and role-modeling: A view from the client's world* (pp. 5–32). Unicorns Unlimited.
- Herzig, S. J., LaSalvia, M. T., Naidus, E., Rothberg, M. B., Zhou, W., Gurwitz, J. H., & Marcantonio, E. R. (2017). Antipsychotics and the risk of aspiration pneumonia in individuals hospitalized for nonpsychiatric conditions: A cohort study. *Journal of the American Geriatrics Society*, 65, 2580–2586. <https://doi.org/10.1111/jgs.15066>
- Jo, A., Ji Seo, E., & Son, Y. J. (2020). The roles of health literacy and social support in improving adherence to self-care behaviours among older adults with heart failure. *Nursing Open*, 7, 2039–2046. <https://doi.org/10.1002/nop2.599>
- Kang, H. (2013). A guide on the use of factor analysis in the assessment of construct validity. *Journal of Korean Academy of Nursing*, 43(5), 587–594. <https://doi.org/10.4040/jkan.2013.43.5.587>
- Khalaila, R. (2013). Translation of questionnaires into Arabic in cross-cultural research. *Journal of Transcultural Nursing*, 24(4), 363–370. <https://doi.org/10.1177/1043659613493440>

- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. Guilford Press.
- Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, 15, 155–163. <https://doi.org/10.1016/j.jcm.2016.02.012>
- Kowal, P., Goodkind, D., & He, W. (2016). *An Aging World: 2015, International Population Reports*. U.S. Government Printing Office, Washington DC. <http://www.census.gov/library/publications/2016/demo/P95-16-1.html>
- LeBlanc, R. G., & Jacelon, C. S. (2018). Self-care among older people living with chronic conditions. *International Journal of Older People Nursing*, 13, e12191. <https://doi.org/10.1111/opn.12191>
- Leppink, J., & Pérez-Fuster, P. (2017). We need more replication research – A case for test-retest reliability. *Perspectives on Medical Education*, 6, 158–164. <https://doi.org/10.1007/s40037-017-0347-z>
- Lindenauer, P. K., Strait, K. M., Grady, J. N., Ngo, C. K., Parisi, M. L., Metersky, M., Ross, J. S., Bernheim, S. M., & Dorsey, K. (2018). Variation in the diagnosis of aspiration pneumonia and association with hospital pneumonia outcomes. *Annals of the American Thoracic Society*, 15, 562–569. <https://doi.org/10.1513/AnnalsATS.201709-728OC>
- Longo, D. L., Mandell, L. A., & Niederman, M. S. (2019). Aspiration pneumonia. *New England Journal of Medicine*, 380(7), 651–663. <https://doi.org/10.1056/NEJMra1714562>
- Nordfon, O. K., Morken, I. M., & Lunde Husebø, A. M. (2020). A qualitative study of living with the burden from heart failure treatment: Exploring the patient capacity for self-care. *Nursing Open*, 7, 804–813. <https://doi.org/10.1002/nop2.455>
- Ojewale, L. Y., Oluwatosin, A. O., Fasanmade, A. A., & Odusan, O. (2019). A survey on patients' characteristics, perception of family support and diabetes self-management among type 2 diabetes patients in South-West Nigeria. *Nursing Open*, 6, 208–215. <https://doi.org/10.1002/nop2.236>
- Serra-Prat, M., Palomera, M., Gomez, C., Sar-Shalom, D., Saiz, A., Montoya, J. G., Navajas, M., Palomera, E., & Clavé, P. (2012). Oropharyngeal dysphagia as a risk factor for malnutrition and lower respiratory tract infection in independently living older persons: A population-based prospective study. *Age and Ageing*, 41, 376–381. <https://doi.org/10.1093/ageing/afs006>
- Spatenkova, V., Krejzarova, P., & Jedlicka, J. (2018). Pre-stroke undiagnosed dysphagia lusoria as a rare cause of aspiration pneumonia with respiratory failure in a stroke patient. *SAGE Open Medical Case Reports*, 6, 2050313X1876130. <https://doi.org/10.1177/2050313X18761308>
- Stöber, J., Hong, H., Czado, C., & Ghosh, P. (2015). Comorbidity of chronic diseases in the elderly. *Computational Statistics & Data Analysis*, 88, 28–39. <https://doi.org/10.1016/j.csda.2015.02.001>
- Teramoto, S., Fukuchi, Y., Sasaki, H., Sato, K., Sekizawa, K., & Matsuse, T. & Japanese Study Group on Aspiration Pulmonary Disease. (2008). High incidence of aspiration pneumonia in community- and hospital-acquired pneumonia in hospitalized patients: A multicenter, prospective study in Japan. *Journal of the American Geriatrics Society*, 56, 577–579. <https://doi.org/10.1111/j.1532-5415.2008.01597.x>
- Umeda, E., Shimizu, Y., & Kawai, N. (2020). Difficulties in daily life and the association with self-care ability in adults with type 1 diabetes mellitus in Japan: A cross-sectional study. *Nursing Open*, 7(4), 943–950. <https://doi.org/10.1002/nop2.466>
- Waltz, C. F., Strickland, O. L., & Lenz, E. R. (2016). *Measurement in nursing and health research* (4th ed., pp. 87–89). Springer Publishing Company.
- Wang, S. L., Chiu, Y. W., Kung, L. F., Chen, T. H., Hsiao, S. M., Hsiao, P. N., Hwang, S. J., & Hsieh, H. M. (2019). Patient assessment of chronic kidney disease self-care using the chronic kidney disease self-care scale in Taiwan. *Nephrology (Carlton)*, 24(6), 615–621. <https://doi.org/10.1111/nep.13475>
- Yang, E. Y., & Lee, S. Y. (2020). Development and validation of the self-care for aspiration pneumonia prevention scale in the community dwelling elderly with risk of dysphasia. *Journal of Korean Academy of Nursing*, 50, 474–486. <https://doi.org/10.4040/jkan.20041>
- Zhang, Y. (2020). National Bureau of Statistics, People's Republic of China: The population growth slows down and the urbanization level continues to improve. http://www.stats.gov.cn.proxy.stats.gov.cn/tjsj/zxfb/202001/t20200119_1723767.html

How to cite this article: Yang Z, Chen F, Zhang Y, Pan S, Lu Y, Zhang H. Translation of the Chinese version of the Self-Care for Aspiration Pneumonia Prevention Scale and its validation among Chinese community dwelling elderly with risk of dysphasia. *Nurs Open*. 2022;9:1902–1911. <https://doi.org/10.1002/nop2.940>