

## Original Article

## Psychometric properties of the Korean version of ComOn coaching for oncology nurses

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## ABSTRACT

**Objective:** The available tools to assess the communication skills of oncology nurses are limited, and the ComOn Coaching scale may be appropriate for this purpose. The aim of this study was to evaluate the psychometric properties of the Korean version of the ComOn Coaching scale from a patient-centered perspective.

**Methods:** The participants were 296 oncology nurses and 42 nursing students. To assess construct, convergent, criterion, and known-group validities and the reliability of the ComOn Coaching scale, the Patient Care Communication Scale, the Korean version of the Watson Caritas Patient Score, and Cancer Survivor Integrated Supportive Care Competence were used. Exploratory and confirmatory factor analyses were conducted. Pearson correlation coefficients and Cronbach's alpha values were calculated. Differential item functions were analyzed.

**Results:** Three factors were extracted from 12 items, and the cumulative variance was 58.8% of the total variance. The three extracted factors were based on the contents of the original scale: Factor 1, Structure of conversation; Factor 2, Building rapport; and Factor 3, Verbal communications skills. Confirmatory factor analysis verified the construct validity of the instrument [ $\chi^2/df = 1.60$ , standardized root mean square residual (SRMR) = 0.06, root mean square error of approximation (RMSEA) = 0.06, goodness of fit index (GFI) = 0.92, Tucker Lewis Index (TLI) = 0.93, and comparative fit index (CFI) = 0.95].

**Conclusions:** The Korean ComOn Coaching scale may be a useful self-checking tool for the communication skills of oncology nurses. Repeated use of the Korean ComOn Coaching scale can provide practical information for developing a communication skills program for these professionals and testing its outcomes in the clinical setting.

## Introduction

Health coaching, a goal-oriented and client-centered partnership focusing on health,<sup>1,2</sup> is a method of inducing healthy behavior and improving health outcomes.<sup>2</sup> Nurse-led health coaching improves self-efficacy among patients with cancer,<sup>3</sup> increases physical activity among patients with chronic obstructive pulmonary disease,<sup>4</sup> and reduces systolic/diastolic blood pressure and glycated hemoglobin in patients with chronic diseases.<sup>5</sup> Health coaching increases the amount of pain data available to healthcare providers<sup>6</sup> by using communication based on a trusting and empathetic relationship.<sup>7</sup> Therefore, communication skills are a component,<sup>8</sup> goal of intervention,<sup>9</sup> and are vital for coaching patients with cancer.<sup>10</sup>

There are many instruments for measuring communication,<sup>11–13</sup> including 14 measurement tools for patient-centered doctor-patient communication,<sup>11</sup> six for team communication, and four for individual

communication performance.<sup>12</sup> Although these instruments assess performance in terms of leadership, teamwork, communication, and situation awareness,<sup>12</sup> most have yet to be evaluated in their psychometric properties (e.g., validity, reliability, and generalizability);<sup>11</sup> thus, they cannot be easily applied to nursing situations. In nursing research, there are 13 tools for self-reported therapeutic relational communication, comprising empathy, respect, listening, contact, communicative competence, communication quality, and communication skills.<sup>13</sup> Despite these tools having a communication skills category, most emphasize comprehensive communication behavior more than specific communication skills.

Communication skills can be classified according to sequence or purpose: initiation of the conversation, gathering information, providing information, building a relationship, understanding the patient's perception, and ending the conversation.<sup>14</sup> Although these skills are commonly assessed in the objective structured clinical examination

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(OSCE), they can also be analyzed through subject areas or domains of communication skills in a clinical setting.<sup>15</sup> Furthermore, there are many instruments to assess communication skills, such as the Calgary–Cambridge Observation Guide (28 items),<sup>16</sup> original and revised Maas-Global,<sup>17</sup> Frankfurt Observer Communication Checklist (31 items),<sup>18</sup> and Gap–Kalamazoo Communication Skills Assessment Form (24 items).<sup>19</sup> However, some of them can only analyze transcripts from audiotaped consultations, meaning that they put less focus on or completely disregard the non-verbal aspects of good communication.<sup>9</sup> Additionally, there is a mismatch between behaviors and the inventories of these instruments.<sup>20</sup>

ComOn Coaching was developed to overcome the shortcomings of existing instruments.<sup>21</sup> It focuses on general communication skills and has a rating scale independent of a specific context. It has several advantages: representing key verbal and non-verbal communication skills, enabling quantitative and qualitative assessment, time efficiency, capability of assessing small changes, and acceptable internal consistency and inter-rater reliability.<sup>9</sup> For successful health coaching for cancer survivors, patient-centered communication such as understanding the patient's perspective, using language the patient according to the recurrence or progression can understand, and jointly working with patients to make decisions on healthcare<sup>21,22</sup> need to be performed. Considering this and the limitations of existing Korean instruments for assessing oncology nurses' communication skills, ComOn Coaching was considered appropriate for oncology nurses. The aim of this study was to evaluate the psychometric properties of the Korean version of the ComOn Coaching instrument from a patient-centered perspective. We hypothesized that the Korean ComOn Coaching instrument would have acceptable validity and reliability to assess communication competency among Korean oncology nurses.

## Methods

### *Design, setting and sample*

A methodological study design was used. The participants consisted of 296 nurses from oncology departments in six tertiary hospitals and one secondary hospital, and 42 nursing students from a nursing school in three metropolitan cities of Korea. Inclusion criteria for nurses were (1) caring for patients with cancer in the oncology department and (2) having at least three months of clinical experience; the exclusion criterion was being an administrative nurse (e.g., unit manager). We conducted randomized sampling for nurse participants and divided them into two groups: one for exploratory factor analysis (EFA) and the other for confirmatory factor analysis (CFA). For sample size in EFA, ten times the number of items was recommended,<sup>23</sup> so we deemed 146 participants as sufficient for this analysis. For CFA, prior research described 150 participants as the minimum sample size,<sup>24</sup> so we deemed 150 participants as acceptable for this analysis. The inclusion criterion for nursing students was having attended practical classes for at least three semesters; student data were used solely for conducting known-group validity.

### *Instruments*

The ComOn Coaching scale consists of 13 items categorized into seven subscales:<sup>9</sup> start of the conversation, assessment of the patient's perspective, structure of the conversation, emotional issues, end of the conversation, general communication skills, and overall evaluation. The intraclass correlation coefficient (ICC) for each subscale ranged from 0.44 to 0.77, and the overall coefficient of all items is 0.66. Each item is rated on a five-point Likert scale, with higher scores indicating better coaching behavior. Following the guidelines laid down by Beaton et al.,<sup>25</sup> we used the ComOn Coaching scale in a cross-cultural validation process. Two independent translators, a bilingual nurse with a Ph.D. who was aware of the concept of health coaching, and an English literature expert who was uninformed about the concept, carried out the initial forward

translation; it was then synthesized by three experts, including two nursing professors and one field expert. In this phase, the word “physician” was modified to “you” to enable self-checking in nurses. A translator from an editing institution retranslated the questionnaire into English; thereafter, with the help of an expert committee comprising two experts, the original version and retranslated version were reviewed and modified until the two experts reached consensus on any discrepancies. Finally, we conducted a pilot test of seven oncology nurses using cognitive interviewing; it yielded the final version of the Korean ComOn Coaching scale, which we then used in the survey.

The Patient Care Communication Scale (PCCS)<sup>26</sup> was used to examine convergent validity; this 14-item instrument was categorized into three subscales: respect (five items), genuineness (five items), and relationship (four items). Originally, this scale measured the level of recognition of nursing care by patients of internal medicine and surgical units, so we modified the items to be suitable for nurses. It has a five-point Likert scale (1 = definitely disagree to 5 = definitely agree), with higher scores indicating better communication skills. In the original study, the Cronbach's alpha for the scale was 0.92; in this study, it was 0.89.

To test criterion validity, we examined nurses' caring attitude using the Korean version of the Watson Caritas Patient Score<sup>®</sup> (WCPS), developed by Watson (Invoice: 2105-3582-4189-6499).<sup>3</sup> The instrument contains five critical questions that assess authentic human caring practices. While the content validity and overall model fit of the Korean version of the WCPS were good,<sup>3</sup> the items were modified for nurses in this study. For example, “My nurse provides care for me with loving kindness” was modified to “I provide care for my patient with loving kindness.” It has a seven-point Likert scale, with higher scores indicating a greater caring attitude. In this study, the Cronbach's alpha of the scale was 0.93.

The Cancer Survivor Integrated Supportive Care Competence (CSISCC)<sup>27</sup> scale consists of 22 items across five subscales: professionalism enhancement (five items), care coordination (five items), comprehensive nursing needs assessment (five items), tailored information and education provision (four items), and recurrence surveillance/secondary cancer prevention (three items). It has a five-point Likert scale (1 = definitely disagree to 5 = definitely agree), with higher scores indicating better integrated supportive care competence for cancer survivors. In this study, the Cronbach's alpha of this study was 0.92.

### *Data collection*

We conducted two waves of data collection: firstly, from October to December 2020; secondly, from November to December 2021. First, the primary investigator recruited eight nurses for snowball sampling, and these nurses distributed a URL Linked to the web-based survey from nurse to nurse; through this process, 217 nurses were recruited. The retest was performed two weeks after the first test. For recruiting the nursing students, the primary investigator visited their classroom after a lecture, where they were informed on study aims and procedures. Second, to ensure an appropriate sample size for conducting EFA and CFA, we recruited an additional 79 nurses. We designed the online survey using Naver form. The mean time required to complete the questionnaire was 10 min.

### *Data analysis*

We performed data analysis using SPSS 27.0 and AMOS 21.0 (IBM Corp., Armonk, NY, USA). We conducted EFA with varimax rotation of the principle component analysis. The Kaiser–Meyer–Olkin and Bartlett's sphericity tests were conducted to confirm data appropriateness for factor analysis. We determined the number of factors based on scree plots and extracted only items with factor loadings of 0.5 and above (i.e., significant). Further, we conducted Velicer's minimum average partial (MAP) test and parallel analysis to determine the number of factors. For CFA, we used structural equation modeling with the following model fit

indices: Chi-square test ( $\chi^2$ ), standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), goodness of fit index (GFI), Turker Lewis Index (TLI), and comparative fit index (CFI). Moreover, we used Pearson's correlation coefficients for analyzing convergent, criterion, and known-groups validity; Cronbach's alpha and item–total correlations for assessing internal consistency; ICC for determining test–retest reliability; and Mantel–Haenszel procedures, based on the classical test theory, to determine differential item functions.

**Ethical considerations**

This study was approved by the institutional review board of the concerned institution (IRB No. 1041386-202009-HR-54-02). On the first page of the web-based survey, the purpose of the study, research methods, voluntary participation, assurance of anonymity, and possibility of withdrawal from participation were explained in detail. All participants provided written informed consent prior to the survey.

**Results**

*Participant characteristics*

The characteristics of the 296 participants are shown in Table 1. Of the participants, 95.9% were women, their average age was 27.93 years, 71.3% were under 30 years of age, most had a bachelor's degree (88.2%), and most were unmarried. The average clinical experience was 4.77 years and most participants (54.7%) had less than 3 years of experiences in the oncology department.

*Linguistic validation and item analysis*

The 13th item, which concerned the observer of the conversation, was removed because it was inappropriate for the intended self-checking nature of our scale. The item-level content validity index value for 12 items was 1.00, so it was acceptable based on Lynn's criteria.<sup>23</sup> The

**Table 1**  
General characteristics of participants (n = 296).

Characteristics	Categories	n (%)
Gender	Male	12 (4.1)
	Female	284 (95.9)
Age (years) (Mean ± SD: 27.93 ± 4.12)	< 30	211 (71.3)
	30-39	81 (27.3)
	≥ 40	4 (1.4)
Education	Associate	17 (5.7)
	Bachelor's	261 (88.2)
	Master's	17 (5.8)
	Doctoral	1 (0.3)
Marital status	Single	234 (79.1)
	Married	60 (20.3)
	Divorced or bereaved	2 (0.6)
Work department	Medical ward	130 (43.9)
	Surgical ward	113 (38.2)
	Pediatric ward	9 (3.0)
	Obstetrics and gynecology ward	5 (1.7)
	Others*	39 (13.2)
Total clinical experience (year) (Mean ± SD: 4.77 ± 3.25)	< 3	107 (36.2)
	3-5	62 (20.9)
	5-10	107 (36.1)
	≥ 10	20 (6.8)
Clinical experience in oncology department (Mean ± SD: 3.25 ± 2.41)	< 3	162 (54.7)
	3-5	66 (22.3)
	5-10	63 (21.3)
	≥ 10	5 (1.7)
Position	Staff nurse	285 (96.3)
	Charge nurse	11 (3.7)

Others\*: medical intensive care unit, neonatal intensive care unit, surgical intensive care unit, cardiac intensive care unit, rehabilitation ward, outpatient department.

scale-level content validity index exceeded 0.9, so it was valid according to the Polit and Beck's recommendation.<sup>28</sup> In item analysis, mean item scores ranged from 3.12 to 4.00 (Table 2). The skewness was less than 3.0 and kurtosis less than 7.0. The corrected item–total correlation coefficient range for the 12 items was 0.38–0.67, meeting the reference value of 0.30.<sup>29</sup>

*Verification of validity: construct, convergent, criterion, and discrimination validity*

We conducted EFA to verify construct validity. The Kaiser–Meyer–Olkin value was 0.85 and the Bartlett's test of sphericity value was statistically significant ( $\chi^2 = 588.52, P < 0.001$ ), verifying that the data were suitable for factor analysis. Community ranged from 0.46 to 0.80, the eigenvalue was greater than 1.0, and the factor loading was above ± 0.50. Then, we determined the appropriate number of factors based on the MAP test, parallel analysis, and scree plot. Using MAP test, we obtained the smallest average 4th power partial correlation of 0.0016 (Supplemental Table S1). Through parallel analysis, we observed that the first two eigenvalues were 4.78 and 1.27. The corresponding first two 95th percentile random data eigenvalues were 1.62 and 1.44, indicating that one factor was the best option for the structure of the Korean ComOn Coaching scale (Supplemental Table S2). However, we rejected this one-factor structure because of a theoretical problem with the original instrument; this led us to the three-factored structure for the scale, which is described herein.

We extracted three factors from the 12 items and the cumulative variance was 58.8% of the total. The three factors extracted were named based on the contents of the original scale: Factor 1 was named “structure of conversation” (items 1, 2, 3, and 4), Factor 2 was named “building rapport” (items 5, 6, 9, 10, and 11), and Factor 3 was named “verbal communication skills” (items 7, 8, and 12; Table 2). The correlations between each factor ranged from 0.53 to 0.58 and were statistically significant (Table 4).

After conducting CFA on the three factors, we confirmed that the model had a good fit for the data, as the indices met the acceptance criteria.<sup>30,31</sup> The result for each index was as follows:  $\chi^2/df = 1.60$ , SRMR = 0.06, RMSEA = 0.06, GFI = 0.92, TLI = 0.93, and CFI = 0.95 (Table 3). Additional data about CFA results are presented in Figure 1.

The score of the Korean ComOn Coaching scale was significantly positively correlated with the score for the PCCS ( $r = 0.44–0.58, P < 0.001$ ), verifying the convergent validity of the scale (Table 3). The correlation coefficient between the Korean ComOn Coaching score and the score for the WCPS and the CSISCC was 0.48 ( $P < 0.001$ ) and 0.56 ( $P < 0.001$ ), respectively; since each factor of the Korean ComOn Coaching scale showed positive correlations with these two scales, we deemed that the criterion validity of the scale was verified (Table 4). To test known-groups validity, 42 nursing students were asked to respond to the Korean ComOn Coaching scale; they showed statistically significantly higher average scores than the oncology nurses ( $t = 4.34, P < 0.001$ ; Table 5).

*Reliability*

The corrected item–total correlation ranged from 0.38 to 0.67, meeting the criterion of being above 0.30 (Table 2),<sup>32</sup> verifying the internal consistency of the scale. The Cronbach's alpha for total scale was 0.76 and the overall ICC was 0.81 (95% confidence interval 0.63–0.93).

*Differential item functions*

For examining differential item functions, we divided our sample into two groups: those with more than 3 years of clinical experience and those with less than 3 years of clinical experience; this examination served to check whether there were group differences in perceptions of the items in the Korean ComOn Coaching scale. The items that showed a  $\chi^2$  value

**Table 2**  
Item analysis and exploratory factor analysis of the Korean ComOn coaching scale (n = 146).

ComOn coaching No	Korean ComOn Coaching Items	Item analysis				ITC	Factor analysis		
		Range	Mean ± SD	Kurtosis	Skewness		F1	F2	F3
<b>Factor 1. Structure of conversation</b>									
3	1. Do you actively give structure to the conversation?	1–5	3.48 ± 0.82	−0.12	−0.32	0.60	0.87		
2	2. Do you manage to get an idea of the patient's perspective at the beginning of, or during the conversation?	2–5	3.71 ± 0.78	0.01	−0.49	0.59	0.76		
4	3. Do you set sub-sections in the course of the conversation (in detail)?	1–5	3.12 ± 0.89	−0.71	−0.00	0.51	0.73		
1	4. Do you initiate the conversation appropriately?	2–5	3.86 ± 0.60	0.25	−0.15	0.58	0.55		
<b>Factor 2. Building rapport</b>									
9	5. Do you use appropriate non-verbal communication during the conversation?	1–5	3.68 ± 0.78	0.53	−0.55	0.38		0.80	
6	6. Do you offer emotional support?	2–5	3.93 ± 0.64	0.80	−0.42	0.67		0.66	
11	7. Do you offer the patient the chance to ask questions during the conversation?	2–5	3.93 ± 0.60	1.74	−0.51	0.53		0.61	
5	8. Do you recognize the patient's emotions?	2–5	4.00 ± 0.63	1.16	−0.50	0.53		0.56	
10	9. Do you adjust his pace during the conversation and does he make appropriate pauses?	2–5	3.70 ± 0.68	0.02	−0.22	0.51		0.54	
<b>Factor 3. Verbal communication skills</b>									
12	10. Do you check whether the patient has understood the conversation?	2–5	3.83 ± 0.60	0.92	−0.48	0.47			0.76
8	11. Do you use clear and appropriate words during the conversation?	2–5	3.79 ± 0.65	0.14	−0.22	0.50			0.71
7	12. Do you summarize the content of the conversation and does he/she close the conversation appropriately?	1–5	3.78 ± 0.71	1.06	−0.48	0.56			0.69
Eigen value							4.78	1.27	1.02
Variance (%)							22.06	19.44	17.33
Cumulative variance (%)							22.06	41.50	58.83
<b>KMO = 0.85, Bartlett's test of sphericity = 588.52 (P &lt; 0.001)</b>									

ITC, Item-total correlation; KMO, Kaiser-Meyer–Olkin.

**Table 3**  
Confirmatory factor analysis of the Korean ComOn coaching scale (n = 150).

Model fit	$\chi^2$ (P)	df	$\chi^2$ /df	SRMR	RMSEA	GFI	TLI	CFI
Korean ComOn Coaching	80.18 (0.004)	50	1.60	0.06	0.06	0.92	0.93	0.95

SRMR, Standardized root mean square residual; RMSEA, Root mean square error of approximation; GFI, Goodness-of-fit index; TLI, Tucker–Lewis index; CFI, Comparative fit index.

were items 1, 5, 9, and 10. For the response of “definitely agree” to items 1 and 5, the delta Mantel–Haenszel was 3.12 ( $\chi^2 = 9.18, P = 0.002$ ) and 3.04 ( $\chi^2 = 14.10, P < 0.001$ ), respectively. For the responses of “disagree” and “neutral” to the item 10, the delta Mantel–Haenszel was −1.94 ( $\chi^2 = 8.86, P = 0.003$ ) and 1.43 ( $\chi^2 = 5.48, P = 0.019$ ), respectively. Namely, those with more than 3 years of clinical experience selected more positive response options (Table 6).

**Discussion**

This study was the first to translate ComOn Coaching scale into Korean and evaluate its psychometric properties in Korean oncology nurses. The Korean ComOn Coaching scale addressed essential communication skills in three dimensions. It maintains the original characteristics of the tool of representing key communication skills, time efficiency, and acceptable reliability.<sup>9</sup> Oncology nurses described facing challenges in communicating empathy and discussing death, dying, and end-of-life goals of care.<sup>33</sup> Although educational interventions can enhance nurses' capacity to communicate with patients, their direct impact on nurses' communication skills is difficult to measure because of the lack of standardized measurement tools.<sup>34</sup> As the Korean ComOn Coaching scale seems to be an excellent self-checking tool for communication skills development, we focused on analyzing its psychometric properties.

The Korean ComOn Coaching scale was constructed to reflect the characteristics of the original. First, all items (except the 13th item) were included, and in the linguistic validation process, we followed the guidelines proposed by prior research for cross-cultural adaptation, aiming at semantic, idiomatic, experiential, and conceptual equivalence.<sup>25</sup> Therefore, although the subject was changed from “physician” to “you”, most items were almost identical. Second, the construction of the

subscales of the Korean version was similar to that of the original scale; this process was based on the SPIKES model, which included setting up the interview, assessing the patient's perceptions, obtaining the patient's invitation, providing knowledge and information to the patient, addressing the patient's emotions empathically, and developing strategies/summaries. The SPIKES emphasizes the techniques useful in responding to the patient's emotional reactions and supporting the patient during conversation.<sup>25</sup>

In this study, we applied various methods to extract the optimal factors that did not greatly differentiate from the framework of the original tool; our results of the final EFA showed that the explanatory power of the items was similar to the standard for reasonable total variance. Namely, communality was greater than 0.50,<sup>35</sup> eigenvalue greater than 1.0, and factor loadings greater than ± 0.50.<sup>36</sup> In our CFA, the goodness of fit indices satisfied the acceptance criteria,<sup>30,31</sup> demonstrating that the composition of each factor in the Korean ComOn Coaching scale was valid for measuring the core concept of the scale.

The Korean ComOn Coaching scale was highly correlated with the Korean PCCS, WCPS, and CSISCC. The PCCS was developed to measure concepts of good communication with patients through a patient-centered approach,<sup>26</sup> the WCPS shows caring attitudes related to patient-centered care,<sup>3</sup> and the CSISCC estimates oncology nurses' competencies for supportive care.<sup>27</sup> Namely, the correlation of the Korean ComOn Coaching scale with these instruments demonstrated its convergent and criterion validity; this means that it is adequate for examining oncology nurses' communication competencies and patient-centered caring attitudes. Regarding known-groups validity, the mean score of oncology nurses was statistically significantly lower than that of nursing students, which can be attributed to a gap between theory and practice. Oncology nurses are well aware of the practical challenges

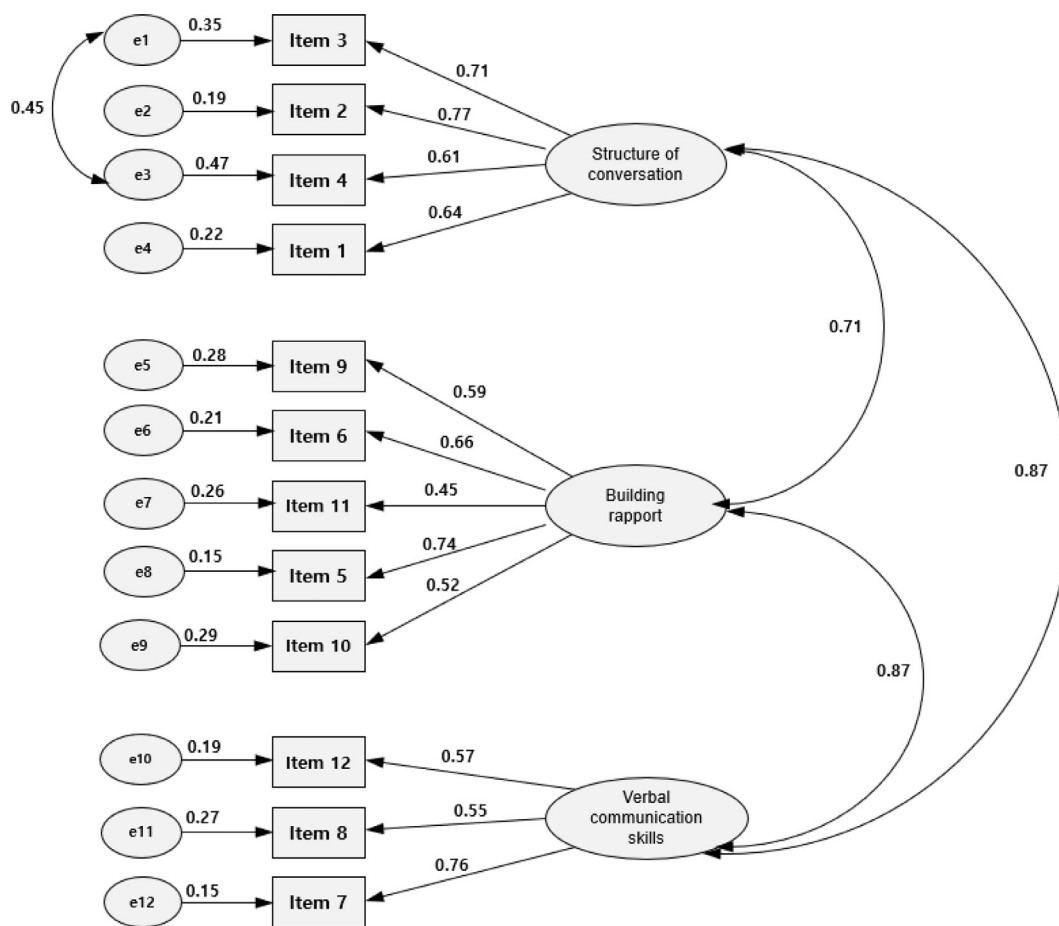


Figure 1. Confirmatory factor analysis model.

Table 4  
Correlation matrix (n = 296).

Variables	Korean ComOn Coaching	F1	F2	F3	PCCS	WCPS	CSISCC
Korean ComOn Coaching	1.00						
Structure of conversation (F1)	0.86***	1.00					
Building rapport (F2)	0.85***	0.53***	1.00				
Verbal communication skills (F3)	0.79***	0.54***	0.58***	1.00			
Patient Care Communication Scale (PCCS)	0.58***	0.44***	0.57***	0.46***	1.00		
Watson Caritas Patient Score (WCPS)	0.48***	0.47***	0.36***	0.33***	0.56***	1.00	
Cancer Survivor Integrated Supportive Care Competence (CSISCC)	0.56***	0.47***	0.47***	0.46***	0.58***	0.51***	1.00

\*\*\*P < 0.001.

Table 5  
Known-groups validity and reliability (n = 338).

Name (number of items)	Nurses (n = 296)	Nursing students (n = 42)	t (P)	Cronbach's coefficient (n = 296)	ICC (95% CI) (n = 15)
	Mean ± SD	Mean ± SD			
Korean ComOn Coaching (12)	44.20 ± 5.13	47.64 ± 4.77	-4.34 (<0.001)	<b>0.76</b>	<b>0.81 (0.63–0.93)</b>
Structure of conversation (4)	13.92 ± 2.42	15.40 ± 2.08	-4.21 (<0.001)	0.77	0.83 (0.66–0.94)
Building rapport (5)	19.05 ± 2.24	20.95 ± 2.14	-5.35 (<0.001)	0.78	0.75 (0.50–0.91)
Verbal communication skills (3)	11.22 ± 1.46	11.29 ± 1.85	-0.23 (0.817)	0.83	0.83 (0.64–0.94)

ICC, intraclass correlation coefficient.

of communicating while providing information and caring for patients, as well as communicating on a variety of topics.<sup>33</sup> However, as nursing students experience communication in a training environment only, they may be unaware of the difficulties faced in an actual work environment; this can make them overestimate their skills. Therefore, this scale can excellently distinguish oncology nurses from nursing students.

The first factor of the Korean ComOn Coaching scale was “structure of conversation,” with an explanatory power that accounted for approximately one-fifth of the scale. It consisted of items related to the beginning of the conversation and the structured process thereafter. A structured conversation is a method of transferring specific information in a collaborative and goal-oriented manner.<sup>37</sup> In a previous study, patients

**Table 6**  
Differential item function using Mantel–Haenszel method.

Item	Response option	$\Delta_{MH}$	$\chi^2(P)_{MH}$	Advantageous group
1	Definitely agree	3.12	9.18 (0.002)	Nurse having more than 3 years of clinical experience
5	Definitely agree	3.04	14.10 ( $<0.001$ )	Nurse having more than 3 years of clinical experience
9	Neutral	-1.49	4.44 (0.035)	Nurse having less than 3 years of clinical experience
10	Disagree	-1.94	8.86 (0.003)	Nurse having less than 3 years of clinical experience
10	Neutral	1.43	5.48 (0.019)	Nurse having more than 3 years of clinical experience

perceived nurses to be more patient-centered with increased contextual conversations, not when they seemed to visit for a specific purpose.<sup>38</sup> Addressing the patient's interests, delving into the topic, and actively initiating and advancing the central topic can be perceived as important aspects of communication skills. Therefore, structured conversation is considered to be a core communication skill.

The second factor was “building rapport.” It consisted of items concerning emotional issues and non-verbal communication skills, which were present in the original scale. Empathy, caring interaction, and non-verbal communication (e.g., eye contact, smiles, and gestures) are important elements of patient-centered communication and in forming a helping relationship. For example, although patients with cancer perceive their disease as being an illness of the mind, they are often not adequately cared for in consultations with care providers.<sup>39</sup> Therefore, they often seek nurses' empathetic recognition of their psychological needs.<sup>39</sup> Nurses' empathetic attention and recognition of their pain and sadness, along with the encouragement to not endure them alone, can be greatly comforting to patients with cancer.<sup>40</sup> Further, nurses' humanized interest in patients can aid sincere communication,<sup>26</sup> and patient-centered communication (e.g., maintaining the appropriate pace and providing opportunities for questions) can positively impact health behavior and quality of life among patients with chronic diseases.<sup>41</sup> Therefore, building rapport is also an important skill to be dealt with in coaching and communication with patients with cancer.

The third factor was “verbal communication skills.” It consisted of items to help or confirm verbal interaction and understanding at the stage of communication. As nurses used verbal communication when summarizing coaching content and closing conversations, we changed the name of this factor from “end of conversation” to “verbal communication skills.” According to the 7-38-55 rule, only 7% of the meaning is expressed through verbal communication and 93% through non-verbal communication.<sup>42</sup> Although this may imply that verbal communication is not very important, the reality is that the conjunction of these skills forms the foundation of daily communication.<sup>43</sup> Thus, it may be a matter of concern that most nurses had a weak knowledge about verbal communication, and that only 36% had knowledge about listening and speaking skills. Verbal communication skills are also critical in supporting the transition from the hospital to homecare setting for patients with end-stage cancer.<sup>44</sup> Since nurses need to use appropriate verbal communication strategies to effectively communicate in coaching for patients, this was loaded as the third factor in our scale.

In our study, the Cronbach's  $\alpha$  of the total scale was 0.76, denoting satisfactory reliability;<sup>45</sup> however, we could not conduct direct comparisons regarding internal consistency between our scale and the original scale because the latter did not have its internal consistency verified. The stability indicated acceptable reproducibility, as its overall ICC (0.81) was consonant with the criterion of being 0.70 or higher. In the Mantel–Haenszel method, when the degree of freedom is 1 at the significance level of 0.05, items which show a  $\chi^2$  greater than 3.84 may present less homogeneity between groups.<sup>46</sup> In our results, for three items (5, 9, and 10 items) in the “building rapport” factor, oncology nurses with more than 3 years of clinical experience were more likely to select a more positive

response option. Therefore, some items under the “building rapport” factor were shown to have the function of discriminating by clinical experience.

### Strengths and limitation

This study is important for two reasons. First, its rigorous linguistic cross-cultural validation process ensured the consistency of the ComOn Coaching scale. Second, the various tests on the validity and reliability of the Korean ComOn Coaching scale provided acceptable results, ensuring its generalizability.

Despite these strengths, this study had several limitations. The first limitation was the small number of participants in the factor analysis and stability test. Although it is ideal to have at least 300 participants in the factor analysis, several high-loading marker variables ( $>0.80$ ) do not require such a large number of participants.<sup>23</sup> However, this study did not contain many variables with high loadings, and thus, the small number of participants was a limitation. Further psychometric studies are needed to test the factor analysis results with a larger sample size. Second, this validation study is based on classic theory test (CTT). A limitation of CTT is that the difficulty and discrimination of items may be estimated differently depending on the participant characteristics. An alternative method, Item Response Theory (IRT), allows for the estimation of item characteristics without the influence of participant characteristics. Furthermore, IRT can be used to calculate the item information function according to ability level. In future studies, reevaluation of the validity of the ComOn Coaching scale using IRT is needed.<sup>47,48</sup> Third, further research using generalizability theory is needed to determine whether the Korean ComOn Coaching scale is a state scale or a characteristic scale. In general, a “state” refers to a person's short-term experience in a given situation, while a “trait” refers to a stable, established, long-term characteristic of a person. Finally, a minimum clinically important difference (MCID) analysis of this instrument must be conducted to enable the appropriate assessment of communication skill changes in oncology nurses.<sup>49</sup>

### Conclusions

The Korean ComOn Coaching scale consisting of three subcategories may prove to be a useful self-checking tool for the communication skills of Korean oncology nurses, because it represents their key desired communication skill components. Assessments with this scale can be completed within a short time and the results show that the validity and reliability of this instrument are acceptable. Repeated use of the Korean ComOn Coaching scale can provide practical information toward developing a communication skills program for these professionals and testing its outcomes in the clinical setting.

### Authors' contributions

Concept & design: MS. Kim, EJ. Bae, and JY. Uhm.  
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### Supplementary material

To access the supplementary material accompanying this article, visit the online version of the *Asia-Pacific Journal of Oncology Nursing* at <https://doi.org/10.1016/j.apjon.2021.12.016>.

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## Declaration of competing interest

None declared.

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