

# Psychometric Characteristics of a Quality of Communication Questionnaire Assessing Communication about End-of-Life Care

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## ABSTRACT

The importance of good clinician–patient communication to quality end-of-life care has been well documented yet there are no validated measures that allow patients to assess the quality of this communication. Using a sample of hospice patients ( $n = 83$ ) and patients with chronic obstructive pulmonary disease (COPD) ( $n = 113$ ), we evaluated the psychometric characteristics of a 13-item patient-centered, patient-report questionnaire about the quality of end-of-life communication (QOC). Our purpose was to explore the measurement structure of the QOC items to ascertain if the items represent unitary or multidimensional constructs and to describe the construct validity of the QOC score(s). Analyses included: principal component analyses to identify scales, internal consistency analyses to demonstrate reliability, and correlational and group comparisons to support construct validity. Findings support the construction of two scales: a six-item “general communication skills” scale and a seven-item, “communication about end-of-life care” scale. The two scales meet standards of scale measurement, including good factor convergence (values  $\geq 0.63$ ) and discrimination (values different  $\geq 0.25$ ), percent of variance explained (69.3%), and good internal consistency ( $\alpha \geq 0.79$ ). The scales’ construct validity is supported by significant associations ( $p \leq 0.01$ ) with items assessing overall quality of doctor communication and quality of care, number and type of end-of-life discussions, and doctor’s awareness of patient’s treatment preferences. The general communication skills scale correlates more strongly with the general communication items while the communication about end-of-life care scale correlates more strongly with items addressing end-of-life topics. While further validation studies are needed, this assessment of the QOC represents an important step toward providing a measure of the quality of end-of-life communication.

## INTRODUCTION

**T**HE CONTRIBUTION OF GOOD CLINICIAN–PATIENT and clinician–family communication to quality end-of-life care has been well documented and is a priority for improving care to patients facing terminal or life-limiting illnesses.<sup>1–9</sup> Efforts to improve communication have used different ap-

proaches including nurse-directed communication interventions,<sup>10,11</sup> physician-focused educational interventions,<sup>12–16</sup> and interdisciplinary family conferences.<sup>17,18</sup> In addition, palliative care and ethics consultations have been shown to improve quality of end-of-life care in the intensive care unit likely due, in part, to a focus on communication with families.<sup>19–22</sup> These efforts have been evalu-

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ated primarily with professionally determined goals and objectives<sup>23,24</sup> including the completion or presence of advance directives,<sup>25-28</sup> correspondence between patients, families and clinicians on end-of-life preferences,<sup>29-31</sup> improved physician skills as self-evaluated or expert-evaluated,<sup>13,14,32,33</sup> and decreased resource use at the end of life.<sup>19-22</sup> Outcomes using patient-centered goals and objectives are less common and primarily include patient and family satisfaction with communication or decision making.<sup>10,34-38</sup> This omission of patient-centered outcome measures may be due, in part, to the lack of standardized, validated measures of the quality of communication. Although questionnaires are available that evaluate a number of characteristics associated with the quality of end-of-life care,<sup>39</sup> no measure is currently available that allows patients to specifically assess the quality of clinician-patient communication about end-of-life care.

In this paper, we describe the domain structure and the construct validity of the Quality of Communication questionnaire (QOC), a patient-centered, patient-completed questionnaire evaluating satisfaction with the quality of physicians' communication about end-of-life care. We assess whether responses to items on the QOC result in a unitary, underlying communication construct or if more than one construct is represented. We also evaluate the QOC's construct validity, defined as the extent to which it "relates to other measures in ways consistent with plausible hypotheses."<sup>40</sup> If the QOC is shown to be a reliable and valid measure of the patient's assessment of the quality of communication about end-of-life care, it may become a useful patient-centered outcome measure for interventions designed to improve clinician-patient communication. Thus, there are two research aims of this report: to explore the measurement structure of the QOC items to ascertain if the items represent unitary or multidimensional constructs and to describe the construct validity of the QOC score(s).

## SUBJECTS AND METHODS

### *Procedure*

The QOC questionnaire was administered to two patient samples, one composed of patients in hospice and the other composed of patients with oxygen-dependent chronic obstructive pul-

monary disease (COPD). Recruitment and study procedures for both samples have been previously described.<sup>41,42</sup> In brief, hospice patients were recruited from two programs, one providing outpatient services and the other providing both inpatient and outpatient programs. Eligible patients were identified either through the hospice manager or nursing intake reports. Eligible patients were English-speaking, at least 18 years of age, without mental impairments that would prevent them from being able to complete an interview, with an estimated survival prognosis of more than 2 weeks, and with a family member or friend who would agree to participate in the study as well. There were 309 consecutive eligible patients admitted to the hospice programs between October 1998 and September 2000.

Patients with COPD were identified through ambulatory pulmonary clinics in three hospitals and through an oxygen delivery company. At two of the sites, a clinician familiar with the patient asked the patient if he/she would be willing to talk with study staff about the study. At the other two sites, a letter was mailed to all patients on oxygen asking them to contact the study office if they did not want to be contacted with further information about the study. Eligible COPD patients were English-speaking, at least 18 years of age, without mental impairments that would prevent their being able to complete an interview, had a diagnosis of COPD, and had been prescribed oxygen therapy for continuous home use. Patients were excluded if they were not expected to use oxygen for the remainder of their lives. Patients were asked to refer a family member or friend who would also participate in the study but were not excluded if they were unable to provide this person. There were 295 consecutive eligible patients with COPD identified between July 1999 and June 2002.

For both the hospice and COPD samples, the QOC questionnaire was completed as part of an in-person interview. Participants were interviewed in their homes or a place of their choosing.

Human Subjects Committee approval was obtained from the University of Washington's institutional review board.

### *Interview instruments*

*QOC questionnaire.* The 17-item QOC questionnaire was developed using qualitative and quan-

titative methods. It was originally developed and validated as a 4-item questionnaire<sup>43,44</sup> but ceiling effects in which 50% or more of physicians were given the highest rating for communication suggested that additional items were needed to enhance the questionnaire's ability to discriminate important aspects of clinician-patient communication. Additional focus groups involving patients with COPD, cancer, and acquired immune deficiency syndrome (AIDS) as well as family members and providers<sup>45-48</sup> were conducted and analyzed. Thirteen additional items were derived from these focus groups.

In the current version of the QOC, patients are asked to rate how good their doctor is at each of the communication skills on a scale of 0-10, with 0 indicating "the very worst" and 10 indicating "the very best." Patients are offered two additional response options, "My doctor did not do this" (allowing them to leave the item unrated when it does not occur), and "don't know" (indicating that they are unsure of how to rate their doctor on a particular skill). A trained interviewer administered the questionnaire; patients were provided with a copy of the instrument to read along if they chose to do so. The 17-item questionnaire is available on line ([www.depts.washington.edu/eolcare/instruments/index.html](http://www.depts.washington.edu/eolcare/instruments/index.html)).

*Communication items.* In addition to the QOC, a number of communication items were included for the validation analyses (Table 1). In the patient questionnaire, these included five rating items (rated on a scale from 0 to 10) and three report items (indicating whether an event had or had not occurred). With family members/friends, we included a report question and a rating question.

*Demographic items.* Demographic items included in the questionnaires were used to describe the sample. For patients and family members/friends, we collected age, gender, race, and education. From patients, we collected income and marital status. From family/friends, we asked for the respondent's relationship with the patient and the length of time the respondent had known the patient.

#### *Research aims and statistical analyses*

In order to explore the measurement structure of the QOC items, we ran a series of principal

TABLE 1. ITEMS FOR VALIDATION ANALYSES

Patient items	
Rating items	
1.	Rating of the overall quality of doctor's communication 0 "very worst" to 10 "very best"
2.	Number of discussions with doctor about end-of-life care
3.	Rating of the extent to which doctor knows kinds of treatment wanted if patient too sick to speak for him/herself? Definitely no Probably no Probably yes Definitely yes
4.	Overall quality of discussions about end-of-life care 0 "very worst" to 10 "very best"
5.	Rating of overall quality of care 0 "very worst" to 10 "very best"
Report items	
1.	Were there any face-to-face discussions with the doctor about treatments the patient wanted if too sick to speak for him/herself? Have not discussed; not ready yet Have not discussed; would like to Have discussed
2.	Ever talked to doctor about life support? No Yes
3.	Ever talked to doctor about when/how death might occur? No Yes
Family items	
Rating item	
1.	Rating of overall quality of care from current doctor 0 "very worst" to 10 "very best"
Report item	
1.	Have you ever met [patient's name]'s doctor? No Yes

components analyses based on polychoric correlations using MicroFact for Windows.<sup>49</sup> Data procedures for each analysis included: (1) omitting items on which 30% or more of the respondents had missing data; (2) substituting sample median values for responses of "don't know" or "no response"; and (3) imputing a value of 0 for "doctor didn't do this." The imputation of a 0 for "doctor didn't do this" was based on the assumption that because all of the items identified important aspects of end-of-life communication, the failure to complete or address an item warranted a low score. In order to assess the impact of missing data (for "don't know" or "no response"), we ran a confirmatory factor analyses (CFA) in which we used a full information maximum likelihood approach for handling missing data that allowed us

to use only the available data. We also ran this CFA with values trichotomized into three categories (0, 1–9, 10) to see if the solution would be affected by differentially grouping the response categories. These analysis resulted in the same component structures, giving us additional confidence in the EFA using median substitution (analyses not shown).

We used a parallel analysis approach to determine the number of components to extract for each sample,<sup>50</sup> and applied varimax rotation to enhance the interpretability of the components. In order to evaluate the solutions, we considered convergent and discriminant characteristics of the factor loadings. Factor loadings within a component that were 0.71 or more were defined as “excellent” and factor loadings 0.63 or more were defined as “very good.” Factor loadings differing between components by 0.25 or more were defined as demonstrating good discrimination.<sup>51</sup> We initially analyzed the hospice and COPD samples separately and then compared the separate solutions, using coefficients of congruence.<sup>52</sup> After determining that the component structures were sufficiently similar (coefficients of congruence  $\geq 0.90$ ), we combined the samples and repeated the analysis with the merged dataset. To assess whether the larger COPD sample was unduly influencing the component structure in the merged-sample analysis, we randomly removed a subset of COPD records to equalize the two subsample sizes and repeated the merged-sample analysis on this reduced sample.

Once the final component structure was defined, we computed scale scores for each extracted component, with the scale score representing the participant’s mean value for valid responses to items with high loadings on the component. We examined the internal consistency of each component by evaluating Cronbach  $\alpha$  for items loading on the component. Values equal to or greater than 0.70 are the standard for good internal consistency reliability for questionnaire development and group comparisons.<sup>53</sup>

To assess the appropriateness of computing an overall QOC score, comprising all items, we completed the following analyses: (1) we computed the Spearman correlation between the scale scores and required a minimum standard of  $\rho \geq 0.40$ <sup>54</sup> in order to combine the scales; (2) we evaluated Cronbach  $\alpha$  for the full set of items, using an  $\alpha \geq 0.70$  to assess whether there was sufficient

internal consistency to justify the use of a total score; and (3) we forced a single principle component solution and examined the factor loading convergence values, using the criteria described above.

In order to validate the QOC, we tested hypothesized associations between the QOC composite scores and other questionnaire items, using Spearman correlations for ordinal rating items, Mann-Whitney/Wilcoxon independent samples tests for dichotomous report items and Kruskal-Wallis tests for nonordinal report items with more than two categories. We chose non-parametric analyses because of the non-normal distributions of the QOC scores. Because of the number of comparisons, we chose a conservative significance level,  $p \leq 0.01$ . We examined the following hypothesized associations to support the QOC’s convergent construct validity: (1) patients’ answers to communication items and quality of care items would be significantly and positively associated with the QOC domain scores (e.g., same-respondent comparisons); and (2) family members’/friends’ responses to having met the physician and ratings of quality of care would be positively but less strongly associated with patients’ responses on the QOC domain scores (cross-respondent comparisons). To examine the QOC’s discriminant construct validity, we assessed whether the two scale scores would differentially correlate with items representing associated constructs. This is a type of known-groups validation in which groups or items with certain characteristics are expected to have differential associations with a measure than groups or items without those characteristics.<sup>55</sup> We evaluated whether items specifically addressing end-of-life discussions would be more strongly associated with the communication skills about end-of-life care scale than with the general communication skills scale. Conversely, we examined whether items evaluating general communication and quality of care would be more strongly associated with the general communication skills score than with the communication about end-of-life care score. For ordinal variables, we compared the strength of Spearman correlations. For nonordinal categorical variables, we used the Kruskal-Wallis analyses. Because this hypothesis was based on the identification of these scales after data collection, the analyses were exploratory and hypothesis generating.

## RESULTS

*Study sample*

Study staff conducted interviews with 95 hospice patients (of 309 eligible patients, response rate 31%) and 115 patients with COPD (of 295 eligible patients, response rate 40%). These samples have been described previously.<sup>41,42</sup> Twelve hospice patients and two patients with COPD did not respond to any QOC items. We therefore based analyses on the remaining 83 hospice patients and 113 patients with COPD. Also included were 148 family members or friends (81 hospice family members, 67 family members of patients with COPD). Demographics of the sample are described in Table 2.

*Domain structure*

Descriptive statistics for the 17 items are provided in Table 3. From the initial set of 17 items, we excluded 4 items from the analyses due to a high proportion of missing values (30%–87%). Two of these items were inappropriate for respondents who did not have a family member or friend, or whose family member or friend had not met with the physician (including your loved ones in decisions about your illness and treatment, talking with your loved ones about what

your dying might be like). The other 2 items required an inference about physician intent that many patients did not feel able to make (respecting things in your life that are important to you, respecting your spiritual or religious beliefs). For the remaining 13 items, we imputed the sample median for each item that had missing data, and we substituted 0 for all items with the response, “Doctor did not do.”

The parallel analyses suggested that, in both the hospice and COPD sample, two components should be extracted. Table 4 contains the loadings for the two-component solution in each sample after varimax rotation. In both samples, the first 6 items loaded primarily on component 1, and the last 7 items on component 2. In the hospice sample, all but two of the items displayed excellent (values  $\geq 0.71$ ) or very good (values  $\geq 0.63$ ) convergent factor loadings. Loadings for the two items with lower convergence (involving you in treatment discussions about your care, asking about spiritual, religious beliefs) qualified as good (value = 0.55). All except one item (involving you in treatment discussions) displayed good discriminant loadings. The two components accounted for 72.2% of the variance in the 13 items. The two-component solution in the COPD sample demonstrated excellent or very good convergent component loadings for all but 3 items. Of

TABLE 2. SAMPLE DEMOGRAPHICS: HOSPICE AND PATIENTS WITH COPD, FAMILIES OR FRIENDS, AND CLINICIANS

	<i>Patients (n = 196)</i>		<i>Families/friends (n = 148)</i>	
	<i>Hospice (n = 83)</i>	<i>COPD (n = 113)</i>	<i>Hospice (n = 81)</i>	<i>COPD (n = 67)</i>
Age (mean, SD)	70.8 (13.38)	67.3 (9.47)	57.6 (15.3)	55.9 (16.0)
% Female ( <i>n</i> )	59.0 (49)	27.4 (31)	65.4 (53)	73.1 (49)
% Nonwhite ( <i>n</i> )	6.0 (5)	15.5 (17)	7.4 (6)	13.4 (9)
% $\geq$ High school ( <i>n</i> )	90.4 (75)	86.7 (98)	95.1 (77)	88.1 (59)
Marital status				
Single	4.8 (4)	21.2 (24)		
Married/partner	48.2 (40)	46.0 (52)		
Divorced	14.5 (12)	24.8 (28)		
Widowed	32.5 (27)	8.0 (9)		
% Income ( <i>n</i> )				
<\$12,000	22.9 (19)	30.1 (34)		
\$12,000–\$24,000	32.5 (27)	24.8 (28)		
\$24,001–\$36,000	14.5 (12)	12.4 (14)		
>\$36,000	24.1 (20)	23.0 (26)		
Unknown	6.0 (5)	9.7 (11)		
% Relationship to patient ( <i>n</i> )				
Spouse			43.2 (35)	56.7 (38)
Adult children			37.0 (30)	23.9 (16)
Other (parent, friend, relative, other)			19.8 (16)	19.4 (13)
# Years known patient (mean, SD)			42.5 (16.1)	35.4 (17.4)

COPD, chronic obstructive pulmonary disease; SD, standard deviation.

TABLE 3. ITEM DESCRIPTIVES FOR THE COMBINED HOSPICE AND COPD SAMPLES: MISSING RESPONSES, ORIGINAL AND TRANSFORMED DATA<sup>a</sup>

Items	Original data— #Missing responses		Original data mean (SD)	Transformed data mean (SD)
	# Missing	Doctor didn't do		
1. Using words you understand	6	6	8.80 (1.55)	8.54 (2.14)
2. Looking you in eye	8	5	9.08 (1.57)	8.89 (2.10)
3. Answering all questions about illness	6	8	9.08 (1.64)	8.74 (2.41)
4. Listening to what you have to say	3	3	9.08 (1.66)	8.96 (1.98)
5. Caring about you as a person	13	3	8.96 (1.69)	8.89 (1.98)
6. Giving full attention	3	3	9.24 (1.40)	9.11 (1.79)
7. Talking about your feelings about getting sicker	7	84	8.67 (1.86)	4.99 (4.55)
8. Talking about details if you got sicker	7	82	8.57 (2.14)	5.04 (4.57)
9. Talking about how long you have to live	7	120	8.35 (2.68)	3.30 (4.45)
10. Talking about what dying might be like	6	161	8.55 (2.31)	1.57 (3.50)
11. Involving you in treatment discussions about your care	9	73	8.77 (1.95)	5.54 (4.53)
12. Asking you about important things in life	10	103	8.48 (2.00)	4.09 (4.51)
13. Asking about spiritual, religious beliefs	5	151	7.95 (2.59)	1.87 (3.63)

<sup>a</sup>Missing includes: question not asked, respondent refused to answer or respondent didn't know COPD, chronic obstructive pulmonary disease; SD, standard deviation.

the 3 items with lower loadings (using words you understand, involving you in treatment discussions, asking about spiritual/religious beliefs), 2 displayed good loadings. All but 1 item (asking about spiritual and religious beliefs) displayed good discriminant factor loadings. The two component solution with the COPD sample accounted for 66.9% of the total item variance.

Coefficients of congruence comparing the solutions for the two samples were 0.958 for component 1 and 0.959 for component 2. The high values suggested the appropriateness of repeating the principal components analysis for the full set of 196 patients. A parallel analysis again suggested a two-component solution. Table 4 summarizes the final solution. All convergent factor loadings for the final solution were excellent or very good except for "asking about spiritual/religious beliefs" which had a factor loading of 0.619, meeting standards for good convergence. All of the items showed good discriminant validity, with loadings on the two factors differing by  $\geq 0.25$ . The two component solution explained 69.3% of the total item variance.

The first component, general communication skills, comprised characteristics required for excellence in general aspects of clinician-patient communication. The scale score was computed as the mean score for items 1 through 6. Cronbach

$\alpha$  for the general communication scale was 0.91. The second component, communication about end-of-life care, comprised characteristics that were more specific to communication about end-of-life issues. The scale score was computed as the mean score for items 7 through 13. Alpha for the end-of-life communication subscale was 0.79. Analyses with matched sample sizes for the hospice and COPD samples produced the same component structure (data not shown).

Analysis of the relationship between the two composite measures and of the internal reliability of the full set of 13 items gave equivocal support for the use of a total communication excellence scale. The Spearman correlation between the two scale scores was 0.41, and Cronbach  $\alpha$  for the full set of 13 items was 0.50. Six items met the standard for excellent convergent factor loadings ( $\geq 0.71$ ) and 6 met the standard for very good factor loadings ( $\geq 0.63$ ). One item (asking about important things in your life) displayed only fair convergence ( $\geq 0.45$ ). The single component solution accounted for only 52.9% of the total item variance.

Table 5 shows the distributions of the two scales for the samples taken individually and combined. For the general communication skills scale, the measures of central tendency were similar both for the separate and combined samples,

TABLE 4. PRINCIPAL COMPONENTS ANALYSIS FOR HOSPICE, COPD, AND COMBINED SAMPLES

	Questionnaire item #	Hospice		COPD		Combined	
		Component 1	Component 2	Component 1	Component 2	Component 1	Component 2
1. Using words you understand	1	0.855	0.112	0.618	0.341	0.727	0.228
2. Looking you in eye	2	0.808	0.325	0.833	0.148	0.810	0.265
3. Answering all questions about your illness	4	0.893	0.250	0.867	0.113	0.886	0.176
4. Listening to what you have to say	5	0.867	0.301	0.955	0.095	0.919	0.195
5. Caring about you as a person	6	0.881	0.278	0.873	0.220	0.871	0.272
6. Giving full attention	7	0.830	0.446	0.935	0.135	0.887	0.303
7. Talking about your feelings about getting sicker	9	0.411	0.679	0.144	0.790	0.251	0.379
8. Talking about details if you got sicker	10	0.345	0.718	0.231	0.829	0.264	0.798
9. Talking about how long you have to live	11	0.363	0.707	0.139	0.835	0.227	0.807
10. Talking about what dying might be like	12	0.049	0.821	-0.128	0.829	-0.026	0.841
11. Involving you in treatment discussions about your care	14	0.557	0.614	0.161	0.594	0.321	0.678
12. Asking you about important things in life	15	0.144	0.843	0.307	0.650	0.258	0.680
13. Asking about spiritual, religious beliefs	17	0.278	0.608	0.370	0.503	0.303	0.619

COPD, chronic obstructive pulmonary disease.

with significant skewness and kurtosis. For the combined sample, the mean and median scores on the general communication skills scale were 8.9 and 9.5 with a standard deviation of 1.7, an interquartile range (IQR) of 8.5, 10, and a skew of -2.65.

For the communication about end-of-life care scale, the measures of central tendency varied significantly by sample, with the hospice sample having significantly higher mean and median

scores ( $p < 0.001$ ) than the COPD sample. This difference may be due, in part, to the significantly higher number of "doctor didn't do" responses in the oxygen-dependent COPD sample (which were then rescored as 0 for both samples). Using  $\chi^2$  analyses and a  $p \leq 0.01$ , the following five items in this scale were endorsed significantly more often as "doctor didn't do this" by patients with COPD: talking about details about getting sicker; talking about how long patient might live;

TABLE 5. QOC SCALE SCORES: DESCRIPTIVE STATISTICS

	General communication skills			Communication about end-of-life care		
	Hospice	COPD	Combined	Hospice	COPD	Combined
Mean (SD)	8.82 (2.05)	8.88 (1.44)	8.85 (1.72)	4.68 (2.99)	3.10 (2.53)	3.77 (2.84)
Median (IQR)	9.67 (8.5, 10)	9.33 (8.6, 9.9)	9.50 (8.5, 10)	4.29 (1.9, 7.1)	2.57 (1.3, 4.6)	3.57 (1.4, 5.7)
Skew	-2.72	-2.15	-2.65	0.001	0.68	0.41

QOC, quality end-of-life communication; COPD, chronic obstructive pulmonary disease; SD, standard deviation; IQR, interquartile range.

talking about what dying might be like; involving patient in future treatment discussions; and asking about spiritual/religious beliefs. For the combined sample, the mean and median scores on the communication about end-of-life care scale were 3.8 and 3.6 with a standard deviation of 2.8, an IQR of 1.4, 5.7, and a skew of 0.41.

*QOC validation*

Tables 6 and 7 present the convergent validity analyses. Strong and significant associations were demonstrated between the QOC scores and patients' ratings or reports on items measuring similar constructs. With only two exceptions, all predicted associations were supported at  $p \leq 0.001$  (exceptions were communicating about end-of-life care score with the rating of overall quality of care,  $p = 0.054$ ; general communication skills score with reports on the presence of discussions about treatment preferences,  $p = 0.047$ ). By contrast, the associations predicted between the patient-completed QOC and family member/friend items were not supported at  $p < 0.01$ . Both the

family rating of the quality of overall care and the report item assessing if the family member/friend had met the patient's doctor were associated with a  $p$  value  $>0.01$  and  $<0.05$ .

The discriminant validity analyses evaluating whether end-of-life reports and ratings would be more strongly associated with the communication about end-of-life care score than with the general communication skills score were partially supported. The number of end-of-life discussions correlated more strongly with the communication about end-of-life care score than with the general communication skills score ( $\rho = 0.508$  versus  $\rho = 0.217$ ,  $p = 0.001$ ). Similarly, the report item assessing whether the patient had already had, or would like to have, treatment discussions with his or her physician was significantly associated with the communication about end-of-life care scale but not significantly associated with the general communication skills score. However, the overall quality of discussions about end-of-life care correlated more strongly with the general communication skills score than with the more specific communication about end-of-life

TABLE 6. CONVERGENT VALIDITY ANALYSES: ASSOCIATIONS BETWEEN THE QOC AND PATIENTS' RATINGS ON SIMILAR CONSTRUCTS

	<i>General communication skills</i>		<i>Communication about end-of-life care</i>		<i># Subjects</i> n
	<i>Spearman correlation</i>	p	<i>Spearman correlation</i>	p	
Overall quality of doctor's communication (0–10)	0.738	0.000	0.267	0.008	99
Number of discussions with doctor about end-of-life care	0.217	0.003	0.508	0.000	190
Extent doctor knows kinds of treatment wanted if patient too sick to speak for self? (1–4)	0.233	0.002	0.390	0.000	181
Overall quality of discussions about end-of-life care (0–10)	0.642	0.000	0.432	0.000	93
Rating of overall quality of care (0–10)	0.542	0.000	0.184	0.054	110
	<i>Mean</i>	<i>p<sup>a</sup></i>	<i>Mean</i>	<i>p<sup>a</sup></i>	n
Any face-to-face discussions with doctor about treatments wanted if too sick to speak for self?					
Have not discussed; not ready yet	8.5328	0.047	2.4307	0.000	66
Have not discussed; would like to	8.7477		2.5328		37
Have discussed	9.1254		5.2120		93
Ever talked to doctor about life support?					
No	8.6333	0.008	2.6302	0.000	90
Yes	9.0198		4.7610		101
Ever talked to doctor about when/how death might occur?					
No	8.6316	0.003	3.0155	0.000	138
Yes	9.3814		5.8599		52

<sup>a</sup> $p$  value for dichotomous items based on Mann-Whitney/Wilcoxon independent samples test;  $p$  value for items with more than two categories based on Kruskal-Wallis test.  
QOC, quality end-of-life communication.



TABLE 7. CONVERGENT VALIDITY ANALYSES: ASSOCIATIONS BETWEEN THE QOC AND FAMILY/FRIENDS' RESPONSES ON SIMILAR CONSTRUCTS

	General communication skills		Communication about end-of-life care		# Subjects
	Spearman correlation	p	Spearman correlation	p	n
Family member/friend					
Rating of overall quality of care from current doctor (0–10)	0.205	0.016	0.201	0.018	139
	<i>Mean</i>	<i>p</i> <sup>a</sup>	<i>Mean</i>	<i>p</i> <sup>a</sup>	<i>n</i>
Has met patient's doctor					Subjects
False	7.9615	0.050	2.8352	0.022	26
True	8.9403		4.2762		120

<sup>a</sup>*p* value based on Mann-Whitney/Wilcoxon independent samples test. QOC, quality end-of-life communication.

care score ( $\rho = 0.642$  versus  $\rho = 0.432$ ,  $p = 0.04$ ). The converse hypothesis, that general communication and care ratings and reports would be more strongly associated with the general communication skills score than with the communication about end-of-life care score was supported. The overall quality of communication and overall quality of care correlated more strongly with the general communication skills score than with the communication about end-of-life care score (overall quality of communication:  $\rho = 0.738$  versus  $\rho = 0.267$ ,  $p < 0.001$ ; overall quality of care:  $\rho = 0.542$  versus  $\rho = 0.184$ ,  $p = 0.002$ ).

## DISCUSSION

These analyses support the construction of two scales from the QOC questionnaire: a 6-item general communication skills scale and a 7-item communication about end-of-life care scale. Four of the original 17 items were omitted from the principal components analyses because of a high number of "not applicable" responses. The two-component solution meets a number of standards of scale measurement including factor convergence and discrimination, and internal consistency reliability.<sup>53</sup> By contrast, a single-component total score using all items accounted for less variance and demonstrated poor internal consistency.

This component structure was stable both for the individual samples and for the combined

sample, despite sample differences on the communication about end-of-life care scale. We found that patients with COPD were more likely to endorse "doctor didn't do this" on these items. For example, 77% of patients with COPD versus 42% of hospice patients reported that their doctor did not talk with them about how long they might have to live. Similarly, 50% of patients with COPD versus 22% of hospice patients reported that their doctor did not address treatment decisions that they might make if they were too sick to make decisions for themselves. The failure to address end-of-life care issues among patients with COPD has been supported in other research.<sup>56–58</sup> One possible explanation for these differences may be in the uncertainty of the illness trajectory for patients with COPD in contrast to hospice patients. Additionally, while many patients with COPD desire additional information, some do not.<sup>59</sup> It may be difficult for physicians to distinguish these different patient needs. Despite these differences, the component structure was supported within and across the two samples, suggesting the robustness of the two component structure.

The creation of the two scales from the QOC questionnaire is also supported by content validity derived from the focus group methodology initially used to identify QOC items. Using comments from patients, family members, and health care workers, Wenrich et al.<sup>46</sup> described six components as centrally important to communicating with dying patients: (1) talking with patients in

an honest and straightforward way; (2) listening to patients; (3) encouraging questions; (4) willingness to talk about dying; (5) giving bad news sensitively; and (6) sensitivity to when patients are ready to talk about dying. The general communication skills scale contains the first three of these components and the communication about end-of-life care scale contains the last three components. Additionally, the two-scale solution is supported by the conceptual frameworks for physician communication developed from qualitative analyses of audiotaped family conferences in the intensive care unit setting. In a study of 51 family conferences, we identified two descriptive frameworks: a communication content framework (the “what” of the communication tasks—what information is shared, what decision-making tasks are addressed, what agenda/summaries are provided) and a communication style and support framework (the “how” of the communication tasks—how families are supported, how decisions are made and supported).<sup>60</sup> The two QOC scales similarly provide measures of content and style components of communication, with the general communication skills scale primarily assessing style (e.g., listening, asking questions, paying attention, being caring, using understandable language) and the communication about end-of-life care scale primarily assessing content concerning end-of-life care (e.g., talking about feelings and details about becoming sicker, talking about prognosis, talking about what dying may be like, talking about treatment choices, talking about spiritual beliefs).

The two scales also demonstrate good convergent and discriminant construct validity in these populations. Higher scores on both of the scales are significantly associated with higher scores on patient-completed measures selected as indicators of similar constructs. By contrast, family and friend ratings of the overall quality of care and reports of having met the patient’s doctor did not achieve our criterion for statistical significance ( $p < 0.01$ ), although  $p$  values approached significance ( $p > 0.01, \leq 0.05$ ). While we expected that cross-respondent validation would be more difficult to support than same-respondent validation, the trends in these data suggest that associations between the QOC scores and family reported data may be present but require a larger sample for verification at our selected significance level of  $p < 0.01$ .

Discriminant validity, in which we used known groups analyses,<sup>55,61,62</sup> also supports the

construct validity of the scale scores. We found that items assessing general communication (i.e., overall quality of doctor’s communication, overall quality of care) were more strongly associated with the general communication skills scale than with the communication about end-of-life care scale. Similarly, items assessing conversations in which end-of-life care issues were specifically discussed were significantly and strongly associated with the communication about end-of-life care scale (i.e., number of discussions about end-of-life care, having had/desired face-to-face treatment discussions). These items were less strongly associated with the general communication skills.

While the analyses support the QOC two-scale structure and the validity of the scales, there are important limitations to these findings. First, respondents represent a select subset of potential subjects; these participants may be systematically different from those who declined to participate.<sup>42</sup> While there are few ethical solutions to the problem of poor response rates and sample selectivity when completing research with patients facing terminal or life-limiting illnesses, the generalizability of these findings may be limited.<sup>63</sup> Second, while these samples included subjects with different disease trajectories (e.g., COPD and hospice) and perhaps differing views toward end-of-life care discussions,<sup>42,47</sup> there are other patient groups not sampled who may bring different perspectives and responses to these items.<sup>7,64,65</sup> These other patient groups may shed light on whether item and scale variability may increase with diverse samples. Third, the mean QOC scores are high, despite expanding the response scale and adding questions. While positively skewed data are common for self-report surveys assessing patient satisfaction with care,<sup>66</sup> high item scores may have consequences for the questionnaire’s responsiveness as well as for the principal component analyses, especially for the general communication skills scale. Fourth, because the scales were identified statistically following the completion of data collection, we were able to conduct validity analyses using only those items already contained in the questionnaire. Additional validity analyses with prospectively selected items would be useful to confirm these findings. Furthermore, additional validation studies will better define and clarify whether our labels are accurate and appropriate.<sup>67</sup> Fifth, the QOC scales have not been tested for a number of other important measurement characteristics, in-

cluding stability (test–retest) and responsiveness (change over time).<sup>68</sup> These are necessary measurement characteristics that should be evaluated and assessed in future studies. Similarly, we did not explore whether item reliability and validity depended on the amount of communication between the physician and patient. This also deserves further examination. Sixth, patient assessment—although having the advantage of patient-centeredness—is not the only method for evaluating physician communication. Patients may have limited experience with good quality communication, and evaluation by experts is another approach that is likely to provide complementary information.<sup>69</sup> Finally, although the two QOC scales exceed psychometric standards for scale assessment, the total QOC score using the 13 items met some standards and not others. Further research is needed to determine the utility of the total QOC score.

The importance of patient–physician communication to end-of-life care has been widely recognized and accepted, yet there are no validated questionnaires that allow patients to evaluate the quality of this communication. Our research on the QOC is promising, suggesting that a patient self-report instrument may be useful to assess patients' perceptions of the quality of end-of-life care communication. Further testing and validation are needed to explore aspects of the QOC's psychometric characteristics, including responsiveness, stability and variability across diverse patient groups. If supported by other studies, the QOC may allow patients to assess physicians' end-of-life care communication skills, including process skills that are generally applicable to good communication and content skills that are more specifically targeted to end-of-life care conversations. Finally, a validated and responsive QOC may provide an important tool for assessing improvements in clinician–patient communication about end-of-life care resulting from intervention studies or quality improvement efforts.

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