Migration Letters

Volume: 21, No: S10 (2024), pp. 559-575

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)

www.migrationletters.com

Development And Validation Of Communication Skills Assessment Tool For Effective Doctor-Patient Consultations In Lahore, Pakistan

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ABSTRACT

Objective: *To develop and validate a tool that assesses the communication skills of doctors, and patients during medical consultations in hospitals.*
Methods: *This study is a part of a larger multiphase project that identified the linguistic barriers (related to habitus, capital and field) in communicative practices of doctors, nurses and patients. The Communication Skills Assessment Tool (CSAT) is developed from the identified barriers. The tool development process includes conducting Delphi rounds, assessing the content validity by CVI and CVR, giving weight to each item, and evaluating each item on a Likert scale. The reliability of the developed tool is assessed by pilot testing. This includes evaluating its face validity, psychometric properties, and internal consistency reliability by Exploratory Factor Analysis (EFA).*
Results: *The computations of Delphi tests (in three rounds) results in retaining 39/94 items under four categories. The S-CVI/Ave with the retained items is 95.9%, while their S-CVI/UA is 97.6%. EFA yields 30 items with variance 71.74%. The reliability measure Cronbach alpha is 86.5%*
Conclusion: *CSAT is a valid and reliable instrument to evaluate communicative practices of doctors with patients in hospitals. However, further validation by Confirmatory Factor Analysis (CFA) is required. Medical schools can use CSAT as an evaluation tool for the continuous quality improvement of healthcare communication and patient safety.*

KEYWORDS: *Healthcare Communication, Communication Skills Assessment Tool, Patient safety.*

INTRODUCTION

There has been an increasing awareness amongst medical educationists to train and assess healthcare professionals (HPs) in their communication skills. Good communication skills of HPs with their peers and patients can have an impact on patient safet[1]y, their compliance with the treatment plan, and their satisfaction with the medical consultation.[1] In the US, the Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Medical Specialties (ABMS) have identified communication skills as one of the six major competencies for HPs.[2] In this regard, there are many scales developed in the Western contexts

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to assess the communication skills of HPs. However, there is a gap of such research conducted in Pakistan.

To develop an effective assessment tool, it is important to take into account the context, inclusiveness and representation of all stakeholders, and the method of development of tool. Although there are some communication assessment tools (such as SBAR)[3] that exist, they have been developed in the Western contexts and therefore might not be appropriate for use in Pakistan. Furthermore there are some tools that cater to barriers in communication[4] however they do not explicitly deal with linguistic barriers in communication. Similarly there are other tools (such as Trier Social Stress Tool)[5] that deal with non-verbal aspects of communication, but ignore verbal communication skill assessment or vice-versa. Moreover, to develop a holistic tool that can assess the communication skills of doctors and nurses with patients, it is important to get voices of representatives of all stakeholders in healthcare settings.[6] However most of the tools have been developed by taking the perspectives of either doctors, nurses or patients, thereby lacking voices of the other groups.[7] In addition to that, some tools have been developed based on the data collected through review of literature, or surveys that involve quantitative analysis.[8] Scale development process through such methods is often unclear. Such method lacks in-depth qualitative analysis of data collected from semi-structured interviews, video recordings or observations, and usually the tool developed through such methods has modest internal consistency and reliability.[9]

With reliability, face validity, content validity and feasibility as my goals, I developed a tool that can assess the communication skills of HPs with their patients in healthcare settings. The objective of my research was to develop a tool based on the perspectives of doctors, nurses and patients about linguistic barriers in communication. The rationale of development of such a tool was to identify the barriers and facilitators in communicative practices of HPs with patients in medical consultations. The research findings may contribute in finding solutions to eradicate linguistic barriers in hospital contexts for patient safety, satisfaction and compliance with their treatment plan.

METHODS

This study was conducted in four phases in 2019-2023. Phase one and two identified linguistic barriers in the communicative practices of HPs with patients. The phase three enumerated and described the steps involved in tool development. This involved giving weight to each item in the tool, and the evaluation of each item by a Likert scale. Phase four validated the tool with the help of statistical procedures such as face validity, construct validity, internal consistency and reliability through EFA. The phases are described as under:

Phase One and Two:

The first two phases identified linguistic barriers in communicative practices of doctors, nurses and patients. This was made possible by interview and video data analysis.

Phase Three: Development of CSAT items:

Based on the results of phases one and two, the first draft of the tool was made. In order to get the feedback of expert doctors and nurses on the content, format and terminology of the tool's items and categories through Delphi technique,[10] two columns were created in front of the items to be rated as relevant or not relevant. The process resulted in the initial design of the tool ready to be tested through Delphi rounds for content validity.

Validation of CSAT Categories and Items:

Content Validation:

The first version of CSAT was reviewed by a panel of six expert doctors, nurses and linguists from Lahore, Pakistan. Experts rated the relevance of each item to the identified categories, in which they were placed, on a two-point scale (relevant, not relevant). The experts were informed about the study objectives and definitions of the constructs relevant to the research. They were instructed to add, delete and/or reformulate the items, if required. To achieve desired results, the assessment process was carried out in three rounds. The assessment process included using the Content Validity Index (CVI).[11] Item Level Content Validity Index (I-CVI) and Scale Level Content Validity Index (S-CVI) were used to evaluate CVI. The Content Validity Ratio (CVR) and the degree of interrater agreement (Kappa statistics) were calculated by using Lawshe CVR sheet, and the Kappa calculator respectively. Results of CVR and CVI helped decide whether to retain/eliminate the item from the list. The I-CVI was calculated to assess the relevance and clarity of each item. The range of I-CVI is from 0 to +1. If the raters are 3 or more, the recommended I-CVI value is more than .78. Items with I-CVI values between .78 and .70 needed revision, whereas items with I-CVI values lower than .70 were eliminated from the list. The CVR values ranged from -1 to +1. Higher scores of CVR reflected higher content validity of the items.[12] Given six raters, items with CVR values equal to 1 were considered essential.

Kappa statistics or the degree of chance agreement supplements CVI. The agreement level is strong if the Kappa value is between .80-.90, whereas the level of agreement is almost perfect if the Kappa value is above .90.[13] The Scale Level Content Validity Index (S-CVI) was computed to see if the proportions of all items were relevant. The acceptable value of S-CVI is .80. Both methods of S-CVI were computed: S-CVI/Ave and S-CVI/UA. S-CVI/Ave is the average of S-CVI and is more tolerant, whereas S-CVI/UA is a strict measure as it is the sum of all CVIs with values of 1, divided by the total number of items. Therefore three rounds were carried out to achieve acceptable S-CVI/UA. The higher the number of raters or experts involved in measuring the relevance of an item, the harder it becomes to reach total agreement in rating.[14]

Giving Weight to each Item in the Tool

Not every item in any checklist has the same importance. To identify the items according to their degree of importance for the evaluation of communication in consultations, a focus group discussion was held. The medical superintendents of the selected hospitals were requested to invite volunteers from doctor and nurse groups. These experts were different from the previous group. 10 experts (5 nurses and 5 doctors) rated each item in terms of their importance in consultation from 1 (Yes) to 2 (No). The mean importance score of each item served as its weight.

Phase 4-Factorial Structure of the CSAT

Phase four of the study assessed the reliability of the developed tool. In the first section, pilot testing evaluated the face validity of the tool. The second section assessed the psychometric properties of the tool, which included internal consistency reliability.

Pilot Testing and Face Validity

In order to measure the face validity of the CSAT, it was pilot tested. The main purpose of piloting the CSAT was to identify ambiguous, poorly written and unclear items, difficult language, mis-interpretable or double meanings in items. The rating of items was carried out on a 5-point Likert-type scale by the two raters, who also used the tool for actual research in the next stage.

Validation of CSAT Using Observations in Actual Consultations

In this stage, 200 observations of actual medical consultations in private and public hospital fields (100 each) were carried out in different departments. The two research assistants were requested to help and they could join according to their availability. In this process, the tool was also kept under check for the identification of any ambiguous items, or the identification of items that could not be observed or to detect any problems in terms of grouping of items in categories.

Exploratory Factor Analysis

In order to analyse the tool's dimensionality and the loading of items, EFA was conducted in this phase. IBM's SPSS 25 with Principal Component Factor Analysis was used to analyse the collected data. In order to run EFA, 100 or more cases are needed.[15] The required ratio between sample sizes relative to variables is 5:1. The data of 200 observations were therefore considered adequate for running EFA for 39 variables.

To determine the adequacy of the data, the KMO measure of sampling adequacy was used. The range of the KMO measure is between zero to one. The acceptable range is 0.50. The Bartlett's test of sphericity should also be significant. If $p<0.50$, EFA is suitable to be applied. To determine the optimal number of factors to be extracted, three criteria were considered for triangulation and reducing subjectivity:[16] Kaiser-Guttman Eigen values,[17] scree test and parallel analysis by Brian O' Conner.[18] All the factors with Eigen values equal to or greater than 1 are extracted for further exploration. Factors having larger Eigen values demonstrate the greater variance of that factor. The rule of extraction of factors by parallel analysis syntax is that the Eigen values generated from the real data for each factor should be greater than those generated from the random data.

Internal Consistency and Reliability.

First, reliability of CSAT was evaluated by Cronbach's alpha by including all the factors. Next, the internal consistency of items in each factor was calculated. EFA was run a number of times to ensure clean loading of items.

Ethical Approval

Ethical approval for the study was sought from the Department of Graduate Committee (DGC), and School of Graduate Committee (SGC), and the Board of Advanced Studies and Research (BASAR), at the University of Management and Technology, Lahore where I was enrolled as a Ph.D. candidate. I received approval from these standing committees to carry out my research. The head of the linguistics department of my university helped to gain ethical approval from the hospitals where the research was conducted. Anonymity of the participants was maintained. Special care was taken to get 200 observations using CSAT. Participants were informed of the observer. The observers were asked to sit quietly in a corner from where they could observe the doctor, nurse and patient clearly. To avoid researcher's bias, two other observers also took observations. The researcher explained the contents and use of the checklist in detail to observers and they were asked to report what actually happened during medical consultations objectively.

RESULTS

This study involved a total of 225 participants including 13 interviewees, eight experts and four observers, who were doctors, nurses and linguists from Lahore, Pakistan.

Phase Three: Development of CSAT items:

Phases one and two led to the identification of linguistic barriers in the communicative practices of HPs with patients. A list of barriers containing 114 items was created. The researcher used some measures such as double checking for poorly constructed items and deleting them, such

as those that were too general and addressed multiple issues[19] e.g., 'Doctor/nurse expressed care, concern and empathy for the patients (verbally and non-verbally)'. The language of items was checked and rephrased 14 items for clarity. At this stage, 20 items were deleted from the list, yielding a tool with 94 items. The extracted items were organized and then listed them under headings: habitus non-verbal communication (HNV) (34 items), habitus verbal communication (HV) (17 items), capital (C) (35 items), and field (F) (8 items).

First Evaluation. In the first round the list of 94 items was sent to six experts, who evaluated each item by selecting either 'relevant' or 'not relevant' as rating options. The experts were instructed to make changes (if required) in the items in the evaluation sheets. They were asked to highlight the changes by either using word formatting tools or highlighter markers on hard copies. The experts were asked to confirm whether they were happy with the changes or whether they wanted to edit the tool further. If the majority (four out of six) agreed on a change, addition, deletion or reformulation of an item was carried out.

Results. Based on the computations of first Delphi round, 24 redundant items were deleted from the list of 94 items, leaving behind a total of 70 items for the second draft list. The items that were retained had CVI values greater than .8. The deleted items had a CVI of .66 or lower. The S-CVI/Ave with the retained items was .839 which is an acceptable measure. However the S-CVI/UA was .457 which is rated as fair. In order to improve the content validity of the construct, the computation was done again after incorporating some changes in the checklist items, as were suggested by the experts. For example, for clarity the item 89 'Doctor/nurse used jargon without explanation' was reformulated as: 'Doctor/nurse used medical language/jargon with patient without explanation'.

The new list had 22 items under HNV, 14 items under HV, 28 items in C and 6 items in F. Due to the lower score of S-CVI/UA, a second round of content validity was run.[20]

Second Evaluation. In the second Delphi round, the list of 70 items was sent to the same 6 experts for evaluation. Experts used the same criteria for evaluation as they did in the first round. To obtain the content validity (CV) of the instrument, all CVI measures computed in the first round were repeated again.

Results. Based on the second round of CV measure, 21 items were deleted out of the 70 items, leaving 49 items in the checklist. The items that could not be observed in a medical consultation or those that dealt with intentions or cognitive processes were deleted (e.g., items 63 and 64 from the category capital: 'Doctor/nurse did not just assume that the patient knows,' and 'Doctor and nurse use medical terms to impress patients'). The new tool had 49 items in total. The new list had 15 items in HNV, 11 items in HV, 17 items in C and 6 items in F. Although the deleted items had an acceptable CVI rating of .83, their CVR rating was .667 which is less than the acceptable value .78. All the items that had a CVR value =1, were retained. The S-CVI/Ave increased to 0.944. However, S-CVI/UA=.671 was still below the standard level 0.8. Therefore, the third round of CV was run with the number of raters reduced to 2 experts because only two experts responded this time.

Third Evaluation. The list of 49 items was emailed to the same six raters. However, it was evaluated by only two raters: Expert 4 and Expert 6. They suggested some changes in the formulation of items. Some of the items were therefore reworded. The Kappa value was calculated by Kappa calculator.

Results. After the third Delphi round, 10 items were deleted and linguistic elements of the tool were revised to make it more representative. The new list contained 11 items in HNV; 10 items

in HV; 10 items in C. In the final draft, items 38 and 39 were added. In the third round of evaluation, the words 'doctor and nurses' were replaced by 'healthcare professionals'. Items 3, 6 and 7 were replaced for clarity. The Kappa was .85. The percentage of the rater's agreement was perfect: S-CVI/UA was 95.9% and S-CVI/Ave was 97.9. The total number of items left in the checklist was 39.

Giving Weight to each Item in the Tool

To ensure expert consensus regarding the changes made in the tool, it was sent back to the same six experts to review and finalize the remaining 39 items. No addition or deletion of items was done at this stage. The structure of the tool at this stage was changed. A box containing the specification of the type of hospital and experience of doctors and nurses observed was added in the table for clarity. I removed the rows of relevant and non-relevant rating categories, and replaced them by a Likert scale with five scoring categories: 1 (not at all), 2 (to least extent), 3 (not sure), 4 (to some extent) and 5 (yes, always). A Likert scale increases the accuracy of the evaluation of each item.

The final tool to be administered for piloting had 10 items each in HNV and HV, 11 items in C and 8 items in F. The tool was named 'Communication Skill Assessment Tool' or 'CSAT'.

Pilot Testing and Face Validity

At this stage, the tool consisted of the 39 items. None of the items was considered ambiguous by the raters. They considered the tool easy and applicable for evaluation in medical consultations. The raters considered readability of the tool appropriate. The average time for marking the tool was 20 minutes, indicating that the survey length was reasonable. The overall results of the pilot test revealed that the two raters considered the items appropriate for the study. Therefore, no changes were made and all 39 items were retained for EFA.

Step 4: Final Delphi Round

Exploratory Factor Analysis

Table 1 shows that the results supported the suitability of the data to perform EFA. The overall measure of sampling adequacy for the CSAT for the correlation matrix was .681 and Bartlett's test of sphericity was significant (p=.000).

Table 1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.681
Bartlett's Test of Sphericity Approx. Chi-Square	4153.786
Df	496
Sig.	.000

Table 2 (Appendix A) displays the total variance explained by each factor. The first factor explains the greatest variance (19.791%) of the 39 items while the last factor explains the least variance. All 12 factors with Eigen values greater than 1 had a cumulative variance of 75.918%. The common criterion to extract factors in social sciences is that they should account for a total of 50-60% of all the variance explained by all the factors.[21]

Figure 1 (Appendix B) is a scree plot that shows the cut off of the elbow at the 12th factor. This demonstrates that all these 12 factors have larger variance than the rest of the

factors. Figure 1 shows that there is a sudden flattening of line after the 12th factor. This suggests keeping all 12 factors as was indicated by latent root analysis.

Table 3 (Appendix C) shows the comparison of the analysis of actual data and random data. The Eigen values of the 8 factors of the actual data were greater than the Eigen values of random parallel analysis data, and therefore, were retained for analysis.

Factor Solution and Results. It is important to report here that the EFA was run a couple of times with Varimax rotation to determine the dimensionality and psychometric properties of the CSAT. The factor loading was restricted to 8 factors with 39 items to reach the most interpretable factor structure of the tool. This decision was supported by the results of parallel analysis. The optimal results were obtained by using an 8-factor solution with total variance explained at 63.691% of all 39 items.

The pattern matrix in each rotated factor was examined to evaluate item loading and to refine the structure of CSAT. On first EFA run, the items x4, x14, x19, x34, x36, x38 and x39 did not load cleanly. Therefore, these items were investigated one by one in the given order and each time the test was re-run. The commonly used rule for item loadings was implemented. For a sample size of 200, factor loading on .40 is considered the minimal acceptable level of significance.[21] Therefore, the coefficient display format was set at an absolute value below .40. This means that any items having a correlation below .40 will not appear on the rotation matrix.

Items x34, x36 and x14 showed multiple-collinearity, which means that they were loaded on more than one factors. For example, Item x14 'Health professionals seek permission of patient for conducting physical examination' loaded on F1 and F6. However, it was retained because the difference in loading was greater than two. On the other hand, Items x34 and x36 loaded on F2 and F8, and F6 and F8 respectively. Item x34 was deleted. The re-run of the test showed that Items x4, x38 and x39 loaded individually on F6, F3 and F8 respectively. Therefore, Item x38 was deleted. Now the re-run of EFA revealed that Item x19 and x21 showed multiple-collinearity, while Item x39 was negative. Therefore, Item x39 was deleted. The re-run of EFA this time showed double loading of Item x18 on F3 and F7 and double loading of Item x21 on F3 and F6. Item x21 was deleted. Item x18 still double loaded, so this time it was deleted. The re-run of EFA illustrated that Item x19 did not load on any factor, so it was deleted. As Item x4 double loaded on both F2 and F8, so it was deleted. The re-run of EFA revealed that Items x30 and x31 were individually loading, so first Item x30 was deleted. Later Item x31 was also deleted, because it didn't load on any factor on this re-run. The final re-run revealed clean loading of all the other remaining 30 items on 8 factors on the rotation matrix.

Factor Labelling. In order to identify the theoretical meaning of items that loaded on each factor (F1, F2…F8), they were evaluated and renamed. For example, Factor 1 was labelled as F1: 'Embodied Habitual Dispositions to enhance Cultural Capital of Patients'; F2: 'Relational Communication Skills to Enhance Social Capital of Patients'; F3: 'Cultural Capital of HPs'; F4: 'Enhancing Cultural Capital of Patients'; F5: 'Visual Linguistic Field'; F6: 'Linguistic Habitus'; F7: 'Embodied Habitual Dispositions', and F8: 'Embodied Linguistic Practices'.

Internal Consistency and Reliability. Internal consistency and reliability of individual factors as well the overall reliability value of the scale was measured several times. The internal consistency of all items for all factors was above or equal to .700, which is the acceptable value.[22] On first run, the results were high scores on internal consistency of items in each factor except F8. Therefore, the matrix was reinvestigated to improve the reliability. The overall reliability score after deleting Items x38 and x39 was improved to .880.

At this stage, CSAT had 36 items. EFA was re-run to check factor loading after deletion of items. There were double loadings of Items x21 and x18. Therefore, they were

deleted one by one and each time EFA was run. This time Item x19 did not appear on any factor, so it was deleted too and EFA was run. Again, Item x4 loaded on two factors, so it was deleted. On running EFA this time, all items loaded neatly on their respective factors. Table 5 shows 30 remaining items.

As evident in Table 5, the items loaded on F3 and F4 interchanged. Also F7 and F8 changed their relative positions. The total variance explained of 30 items was 71.738%. Six items loaded on F1; four items each in F3 and F4. Three items loaded each on F5, F6 and F7 while F8 had only 2 items. The overall Cronbach's alpha value also changed from .880 to .865.

Table 6 (Appendix D) shows high inter-rater reliability of items in respective factors. A general accepted rule is that alpha of .6-.7 determines the acceptable level of reliability, whereas value .8 or greater shows very good reliability. However if the value of alpha exceeds .95 or higher, it is not an indicator of good value because it shows redundancy.[22]

The CSAT developed as an outcome of the study is structured with 8 factorial dimensions and 30 items rated on a 5-point Likert-type scale.

Table 5 Factor Loadings of Items

No.	Items	Factors							
		1	2	3	4	5	6	7	8
F1	**Factor 1: Embodied Habitual**								
1.	**Dispositions to Enhance Cultural**	.867							
2.	**Capital of Patients**	.829							
3.	X11. Patient is encouraged to	.735							
4.	provide non-hurried,	.731							
5.	comprehensive responses.	.749							
6.	X10. Health professionals respond professionally and politely to the questions of patient.	.722							
	X12. Medical professionals used medical language/jargon in consultation without explanation to patients.								
	X13. Health professionals speak in the first language of patient								
	X14. Health professionals seek permission of patient for conducting physical examination								

	by using inclusive language. X15. Health professional makes sure that the session ends with patient satisfied.	
F2	**Factor 2: Relational**	
7.	**Communication Skills to Enhance**	.895
8.	**Social Capital of Patients**	.890
9.	X8: Gestures and words used are	.841
10.	socially, culturally and religiously	.763
11.	appropriate in the context of consultation. X5: Healthcare professionals took into account the background knowledge of the patient X7: Healthcare professionals conveyed the same message to patients in more than one way X6: Healthcare professionals followed the necessary plan of action (taking history of the patient) X9: Pleasant tone is maintained throughout the consultation.	.523

F3	**Factor 3: Cultural Capital of HPs**	
12.	X24: There is no interruption during consultation.	.834
13.	X23: Health professional asks open ended questions to allow patient to tell his story.	.812
14.	X26: Summary is provided at the end of the consultation by either of the health professionals.	.805
15.	X25. Patient is treated as an equal partner with health professionals in consultation (checking understanding by asking questions).	.778
F4	**Factor 4: Enhancing Cultural Capital of Patients**	
16.	X20: Patient is provided an opportunity to ask questions for clarification.	.772
17.	X22: Health professional acts as a facilitator for the patient such as role modelling the use of an instrument/inhaler.	.751
18.	X17: Hospital allows doctor and nurse to act as a team for the treatment of patient.	.740
19.	X16: Doctor's consultation room provides confidentiality to patients for discussion of their illness.	.743

F5	**Factor 5: Visual**			
20.	**Linguistic Field**	.870		
	X1:The consultation			
21.	room is conducive	.785		
22.	for	.827		
	doctor/nurse/patient interaction			
	X2: Signage in hospital is patient friendly			
	X3: Charts, brochures, reading materials and pamphlets are available to compliment information provided through verbal communication.			
F6	**Factor 6: Linguistic**			
23.	**Habitus**		.860	
	X27: Health			
24.	professionals address patient using appropriate titles.		.789	
25.	X29: Health professional repeats to patient about what he had advised him in easy language.		.559	
	X28: Health professionals use sign posting (we did this and now we will do that for involvement of patient in decision making. E.g., I have taken your history and now I would like to take your physical examination).			
F7	**Factor 7:**			
26.	**Embodied**			.747
	Linguistic Practices			
27.	X37: Healthcare professionals			.663
	encouraged patient			
28.	to ask questions			.652
	X35: Health professionals gave			

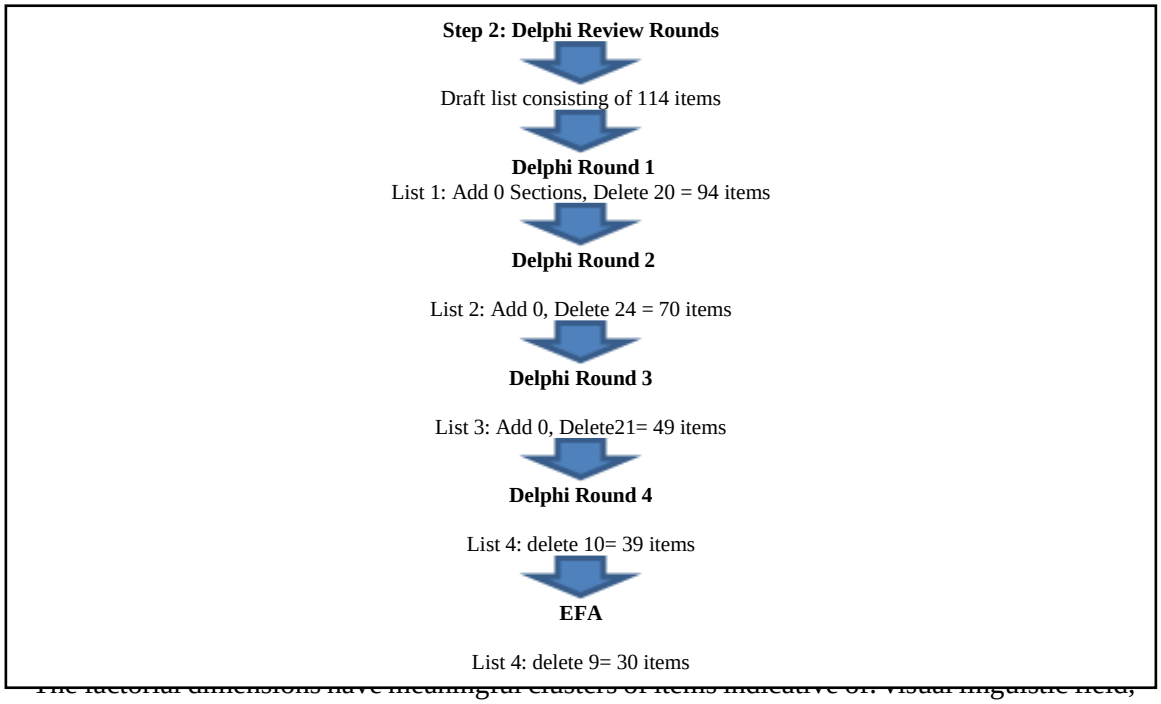
	full time and listened attentively to the questions of patient. X36: Healthcare professionals had social talk with patients before coming to the relevant medical talk	
F8	**Factor 8:**	
29.	**Embodied Habitual Dispositions**	.816
30.	X32: The speech is audible to all the interlocutors (Doctor, Nurse and Patient) during consultation. X33: Health professionals greet patient warmly.	.868

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Figure 2 is the overall development process of CSAT.

Figure 2

Delphi Review Process for the Development of Checklist

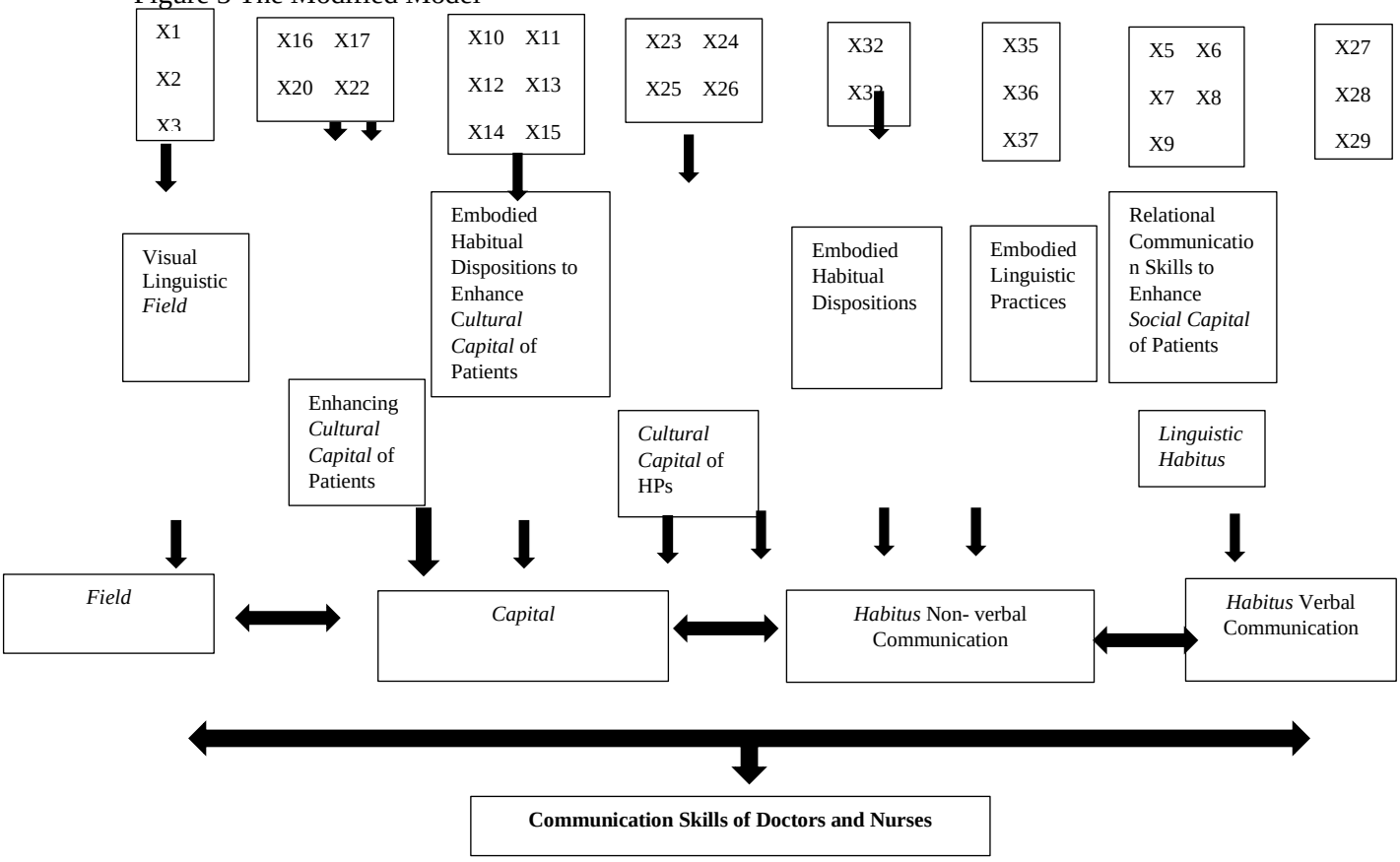


The factorial dimensions have meaningful clusters of items indicative of: visual linguistic field; embodied habitual dispositions; embodied habitual dispositions to enhance cultural capital of

patients; embodied linguistic practices; linguistic habitus; cultural capital of HPs; and relational communication skills to enhance social capital of patients.[23, 24] The CSAT displays good psychometric properties such as high inter-rater reliability. The Cronbach's alpha for all subscales exceeds the lower acceptable level of .60.[21]

Figure 3 presents a speculative framework for the CSAT model. This model is based on the factor solution that determined CSAT as a multi-factor model formulated of multiple indicators for four latent constructs: habitus verbal communication, habitus non-verbal communication, capital and field. The structure demonstrates the rationale for the clustering of constructs. For example, Item x12 about jargon was initially categorized under field. However, it loaded on F1. Figure 3 shows that the items that were initially pooled under HV and HNV loaded on four factors that are aspects of habitus. Therefore, five items loaded on F2; three items on F6; three items on F7; and two items on F8. Similarly, the aspects discussed under 'Capital' split themselves over three Factors: four items on F3; five items on F1; and four items on F4; Only 3 items loaded on F5 under 'visual linguistic field.'

Figure 3 The Modified Model



It is noteworthy that the results of EFA confirm Bourdieu's postulation that the boundaries of habitus, capital and field are fuzzy.[23, 24] This explains why some items that were categorized under one category loaded on another category. This formative model should be thoroughly affirmed and investigated in future research by CFA to examine the best structure fit of the tool, before its practical use.[25]

CONCLUSION

This research provides the substantial evidence of the process of development of the CSAT. The Cronbach alpha test, Delphi test and EFA applied on the tool demonstrated that the tool is

highly reliable and valid. By using this tool, healthcare administrators can assess the communication skills of HPs. The tool is based on the theoretical concepts of habitus, field and capital which appears very relevant for the success of two-way communication in healthcare. However, it is important to apply CFA before making further claims.

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APPENDIX A

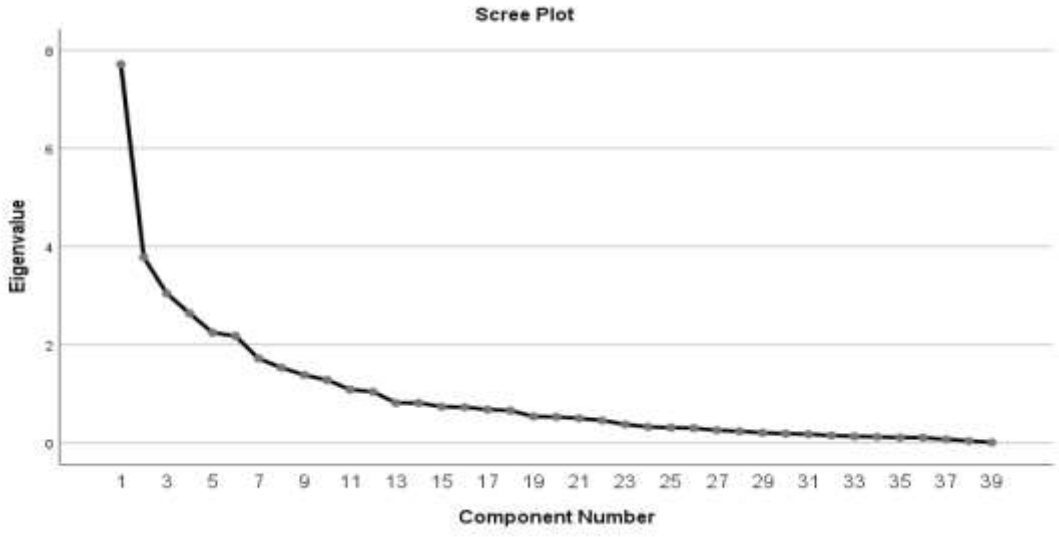
Table 2 Total Variance Explained (39 Items, n=200)
Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.718	19.791	19.791	7.718	19.791	19.791
2	3.782	9.697	29.488	3.782	9.697	29.488
3	3.043	7.802	37.291	3.043	7.802	37.291
4	2.636	6.759	44.050	2.636	6.759	44.050
5	2.242	5.748	49.798	2.242	5.748	49.798
6	2.175	5.477	55.374	2.175	5.477	55.374
7	1.716	4.401	59.775	1.716	4.401	59.775
8	1.527	3.915	63.691	1.527	3.915	63.691
9	1.377	3.532	67.222	1.377	3.532	67.222
10	1.275	3.270	70.492	1.275	3.270	70.492
11	1.080	2.770	73.262	1.080	2.770	73.262
12	1.036	2.656	75.918	1.036	2.656	75.918

APPENDIX B

Figure 1 Scree Plot Conducted to Extract the Factors/Components



APPENDIX C

Table 3 Parallel Analysis Solution to Extract Factors

Component	Eigen Values of the Real Data	Random Eigen Values Parallel Analysis	Decision
1.	7.718	2.0754	Accept
2.	3.782	1.916	Accept
3.	3.043	1.817	Accept
4.	2.636	1.733	Accept
5.	2.242	1.656	Accept
6.	2.175	1.596	Accept
7.	1.716	1.533	Accept
8.	1.527	1.481	Accept
9.	1.377	1.437	Reject
10.	1.275	1.378	Reject
11.	1.080	1.328	Reject
12.	1.036	1.284	Reject

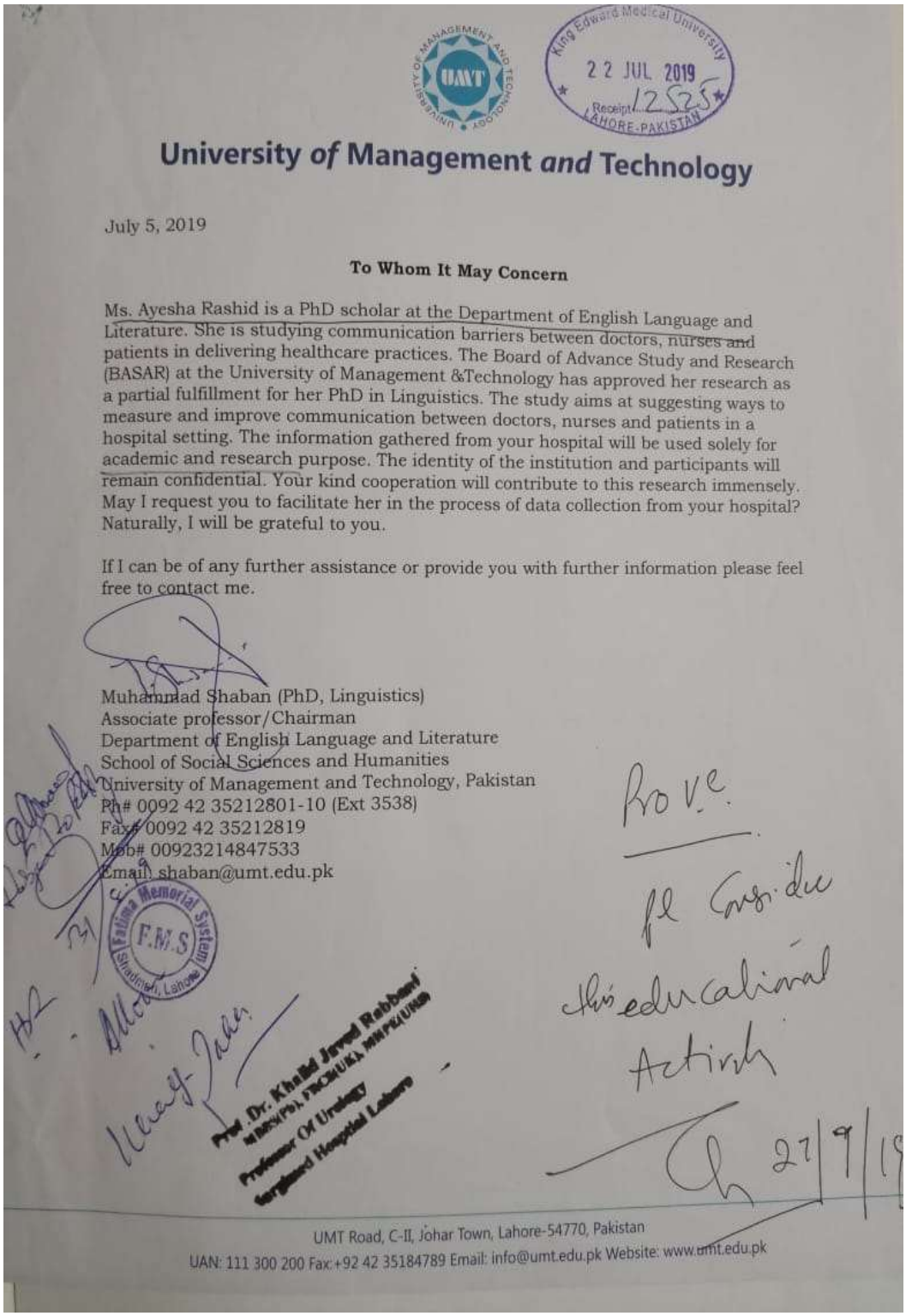
APPENDIX D

Table 6 Reliability Statistics

Factors	**Cronbach Alpha**
1	.882
2	.889
3	.854
4	.700
5	.830
6	.702
7	.600
8	.809
Overall	.865

APPENDIX E

Ethical Approval Form from Hospitals and UMT.



University of Management and Technology

July 5, 2019

To Whom It May Concern

Ms. Ayesha Rashid is a PhD scholar at the Department of English Language and Literature. She is studying communication barriers between doctors, nurses and patients in delivering healthcare practices. The Board of Advance Study and Research (BASAR) at the University of Management &Technology has approved her research as a partial fulfillment for her PhD in Linguistics. The study aims at suggesting ways to measure and improve communication between doctors, nurses and patients in a hospital setting. The information gathered from your hospital will be used solely for academic and research purpose. The identity of the institution and participants will remain confidential. Your kind cooperation will contribute to this research immensely. May I request you to facilitate her in the process of data collection from your hospital? Naturally, I will be grateful to you.

If I can be of any further assistance or provide you with further information please feel free to contact me.

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