Satisfaction of older patients with Emergency Department care: Psychometric properties and construct validity of the Consumer Emergency Care Satisfaction Scale

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Abstract

Background: Patient satisfaction is an important indicator of quality of care, but its measurement remains challenging. The Consumer Emergency Care Satisfaction Scale (CECSS) was developed to measure patient satisfaction in the ED. Whereas this is a valid and reliable tool, several aspects of CECSS need to be improved, including as the definition, dimension, and scoring of scales.

Purpose: The purpose of this study was to examine the construct validity of the CECSS and make suggestions on how to improve the tool to measure overall satisfaction with ED care.

Methods: We administered 2 surveys to older adults who presented with a fall to the ED and used EHR data to examine construct validity of the CECSS and ceiling effects.

Results: Using several criteria, we improved construct validity of the CECSS, reduced ceiling effects, and standardized scoring.

Conclusion: We addressed several methodological issues with the CECSS and provided recommendations for improvement.

Keywords

CECSS; confirmatory factor analysis; emergency department; older patients; falls

INTRODUCTION

Patient satisfaction is becoming increasingly viewed as a key component of high-quality care. Patient satisfaction is defined as "the degree of congruency between a patient's expectations of ideal care, and their perception of actual care received."[1(p146)] Recent research has shown relationships between high patient satisfaction and improved patient and hospital outcomes, including profitability.[2,3] Many studies have focused on patient satisfaction with hospital care, also because hospitals are required by the Centers for Medicare and Medicaid Services (CMS) to administer the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) patient satisfaction survey.[4] Less is known about patient satisfaction with emergency department (ED) care. In this study, we examine patient satisfaction of older adults (those greater than 65 years old) who present to the ED with a fall. Older patients account for nearly 25% of all ED visits and are more likely to experience adverse outcomes after an ED visit compared with younger patients, including ED readmission, hospitalization and death.[5,6] Eighteen percent of ED visits for older adults are fall-related. In 2018, people aged greater than 65 made over 2.4 million ED visits in the United States due to injuries; unintentional falls accounted for more than 90% of these visits.[7]

Consumer Emergency Care Satisfaction Scale (CECSS)

One of the most used instruments to measure patient satisfaction with nursing care in the ED is the Consumer Emergency Care Satisfaction Scale (CECSS).[8–14] The CECSS has been shown to be valid and reliable in previous research.[14] However, there are several issues with the current version of the CECSS.[14] First, the CECSS does not apply to all patients in the ED, only to those patients who are discharged home. It does not apply, for example, to patients who are admitted to the hospital. Part of the questions in the CECSS are about discharge instructions, and patients who are admitted to the hospital do not receive discharge instructions in the ED. Second, there are some issues with the construct validity of the CECSS, in particular the underlying factor structure. Results of the original factor analysis by Davis et al.[11] with the CECSS show 2 subscales: Caring (12 items) and Discharge Teaching (3 items). The CECSS also contains 4 negatively worded items. Initially, the negatively-worded items were not used for analysis, only to prevent response bias. Recent studies have found different factor solutions. For example, studies by Kristinsson et al.[15] and Ekwall and Davis[12] found 3 dimensions: Caring (11 items: numbers 5, 10–19; Cronbach's alpha=0.92), Discharge Teaching (4 items: numbers 4, 6, 7, and 8; alpha = 0.88) and Clinical Competence (4 items: numbers 1, 2, 3, and 9; alpha=0.83). These factors

include the negatively worded items (4 items: numbers 5, 9, 14 and 17), which are recoded. Results of a study by Botngard et al.[16] showed 3 other factors: Caring, Discharge Teaching, and Dissatisfaction. The last subscale was created by using the 4 negatively worded items. Larsson et al.[17] also used the Dissatisfaction items, but excluded the Discharge Teaching scale from their study. In summary, the construct validity of the CECSS is not clear.

Third, the current method to calculate the CECSS score does not allow for missing values. Only cases with responses to all items can be used for analysis. This is strongly related to the first issue, that not all patients receive discharge instructions. However, this can lead to an important loss of data. For example, a study by Buckley et al.[18] showed that in a sample of 100 patients, only 87 completely filled out all items of the Caring subscale, 79 completed all items in the Discharge Teaching subscale, and only 75 patients completed all items in the questionnaire. That means that a quarter of the data could not be used for analysis. Fourth, the current method to calculate the CECSS results in scores between 15 and 95 for the full CECSS scale, between 12 and 60 for the Caring subscale, and between 3 and 15 for the Discharge Teaching subscale. It would be easier to interpret the scores if they were standardized. Fifth, like most patient satisfaction surveys, the CECSS suffers from ceiling effect.[14] A study by Messina et al.[19] found that 98.5% of respondents indicated that they agreed completely with the statement: "The nurse performed his/her duties with skill." Ceiling effects can cause several problems.[14] First, it is impossible to increase a perfect score. Second, if many respondents select the highest score, it is not feasible to use correlation and regression analysis to examine relationships with other key variables. Finally, the current CECSS is limited to satisfaction with nursing care. It would be useful to have an instrument that measures patient satisfaction with care received from clinicians and staff in the ED.

Study goals

In this study, we sought to address most of the CECSS weaknesses. We analyzed all CECSS data including the 4 negative items, examined the factor structure, proposed ways to deal with missing data, developed a standardized scoring system, calculated new cut-off scores, and made CECSS suitable to evaluate emergency care received from all ED health care workers (eg, nurses, physicians).

METHODS

Study design, setting, and sample

A cross-sectional observational design was used for this study. The study took place in an academic ED in the Midwestern United States. The participating ED is an American College of Surgeons certified level 1 trauma center, and cares for over 60,000 patients per year. In 2019, more than 13,000 were aged 65 or older (22%), with 3,120 (24%) of these older patients seen for fall-related issues. Our sample consisted of older patients (greater than 65 years) who presented to the ED with a fall. In our study, a fall was defined as "any event in the past 7 days which resulted in a person coming to rest inadvertently on the ground or floor or other lower level [where the ground or other object is the thing that stops the fall], excluding those due to assault, intentional self-harm, animals, burning buildings, transport

vehicles, and falls into fire, water, and machinery (eg, tripped over a rug and fell, fell from a ladder)."[20(p1)] Patients who were 65 years or older, who spoke English, and understood the risks and benefits of the study, were included. Patients who did not meet the fall criteria, whose medical acuity was too severe for enrollment (Emergency Severity Index (ESI) = 1), whose provider stated not to approach the patient, or had mental health complaints, were excluded from the study. A total of 255patients filled out 2 surveys.

Data collection procedure

A group of dedicated ED Research Coordinators (EDRCs) consented participants and collected the data. When an older patient with a fall presented to the ED, the EDRC introduced him- or herself and asked whether the patient was willing to participate in the study. If the patient agreed, the EDRC went over the inclusion criteria to determine whether the patient could be included. When a patient met the inclusion criteria, the EDRC administered 2 surveys. The first survey was administered shortly after admission. The second survey was administered right before discharge from the ED. The EDRCs also conducted an electronic health record (EHR) review. Data were collected between December 1, 2019 and April 30, 2021. Data collection was halted in the months of April and May 2020 due to COVID-19. Between June 2020 and March 1, 2021 some of the surveys were administered remotely because of COVID-19. The study was approved by the university's Institutional Review Board.

Data collection instruments

For this study, we used EHR data and data from the 2 surveys (personal and health characteristics, and CECSS).

Electronic Health Records data—The EDRCs gathered information about the patient's ESI, where the patients came from (eg, home, assisted living, other medical setting, skilled nursing facility [SNF]), and their disposition (eg, discharged home, admitted to hospital, SNF), and whether the patient's admission was an ED and/or hospital readmission.

Personal and Health Characteristics Survey—This survey contained 21 questions that covered the following areas: personal characteristics (5 items: age, gender, marital status, education, living situation), experienced health (Short Form [SF]-8, 8 items),[21] recent hospital and ED admissions (4 items), and the Brief Health Literacy Screening Tool (BRIEF) (4 items).[22]

CECSS survey—The CECSS contained 19 items.[10,14,23] We made several changes to the CECSS. To better measure the overall patient ED experience and not only satisfaction with nursing, we replaced the word "Nurse" in the questionnaire with "health care worker(s)" (eg, "The health care worker was skillful in performing her/his duties"). The original CECSS contained 2 subscales: Caring (12 items, eg, "The health care workers were genuinely concerned about my pain, fear, and anxiety") and Discharge Teaching (3 items, eg, "The health care worker gave me instructions about caring for myself at home") as well as 4 additional negatively worded items (eg, "The health care worker treated me as a number instead of a person"). The 4 negatively worded items were only included to prevent response

bias. In our study, reliability of the overall CECSS (all 19 items) was 0.81. Cronbach alpha scores for the Caring subscale was 0.91, for the Discharge Teaching subscale 0.84, and for the Dissatisfaction subscale (4 negative items) 0.62.

Data analysis

The EHR data were analyzed to create a patient journey (Figure 1). The survey data were used to describe the sample and to calculate CECSS scores. The 19 original CECSS items were scored on a scale from 1 (completely agree) to 5 (completely disagree).[10] However, in most studies the items are recoded so a higher score means a better patient experience.[14] In the original publication and most publications that followed, scores were calculated only for cases without missing values.[10] In general, 3 scores are calculated: a full CECSS score to measure overall patient ED experience based on the 15 positively worded items, with scores ranging from 15 to 75; a Caring subscale score, based on 12 positively worded items with scores ranging from 12 to 60, and a Discharge Teaching subscale score based on 3 positively worded items, ranging from 3 to 15. In our data analysis, we recoded the original (15) CECSS items to reflect a higher score indicating a better patient experience. However, we did not change the original negatively worded items, meaning a high score on the negative items reflected a negative patient experience. We used these 4 negatively worded items to create a third subscale: Dissatisfaction. The next step was to create a scale and subscales ranging from 0 – 100 to make it easier to compare scores on the different CECSS subscales. The scales from 0–100 were created by recoding the items from a score between 1 and 5 to a score between 0 and 100 and creating average scores for the subscales.

Confirmatory factor analysis—We used Mplus (version 8.6, Muthen & Muthen, 2017, Los Angeles, CA) to conduct confirmatory factor analysis, using pairwise deletion of the data. We compared 3 models:

- Model 1: the original model with 15 items and 2 subscales: Caring (12 items) and Discharge Teaching (3 items); and 2 models that included the 4 negatively worded items.

- Model 2: the model with 19 items (the original 15 positively worded items, and 4 recoded negatively worded items) and 3 subscales: Caring (11 items), Discharge Teaching (4 items) and Clinical Competence (4 items).

- Model 3: with also 19 items (the original 15 positively worded items and the original 4 negatively worded items) and 3 subscales: Caring (12 items), Discharge Teaching (3 items) and Dissatisfaction (4 items).

We used X^2/df, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), the root mean square error of approximation (RSMEA), and the Standardized Root Mean Squared Error (SRMR) to compare the 3 models.

RESULTS

A total of 255 patients were included in the study. The majority of older adults presenting with a fall (n=181, 71%) arrived in the ED from home or an assisted living facility. Other patients came from another medical setting such as primary care or urgent care, either

from the same (n=44, 17.3%) or another (n=27, 10.6%) health care organization. Only 3 patients (1.1%) arrived in the ED from a SNF. A very small percentage (0.4%, n=1) was kept overnight in the ED observation room (Clinical Decision Unit). More than half of patients (n=131, 55.3%) were discharged home or to an assisted living facility after their ED visit, with 3.4% (n=8) directly admitted to a SNF after their ED visit. A total of 97 patients (40.9%) were admitted to the hospital. After being discharged from the hospital, 28.7% (n=68) returned home, and 12.2% (n=29) were admitted to a SNF.

An overview of the patient's personal and health characteristics can be found in Tables 1 and 2. A majority of the patients were 75 years or older (50.6%, n=129), still live at home (88.6%, n=226), and were currently married (56.1%, n=143). Results show that nearly 14% (n=35) of respondents were in poor health. Several patients (12–14%) had been to the ED or admitted to the hospital in the previous 4 weeks, with 23% (n=59) reporting they had a fall in the past 4 weeks. Table 3 summarizes the results of the confirmatory factor analysis.

Results showed very few differences between the 3 models. The Comparative Goodness of Fit Indices (CFI) were 0.99 and 0.98 respectively, the Tucker-Lewis Indices (TLI) were 0.99, 0.98, and 0.98, RMSEA for all 3 models was lower than 0.07 and SRMR varied between 0.05 and 0.07. The data fit all 3 models, which means that based on the results of the confirmatory factor analysis, there is no clear superior model. Other criteria do need to play a role.

Results in table 4 show that scores on the CECSS were high. The average score of the full CECSS (original 15 item version) was 93.14 on a scale from 0 (lowest) to 100 (highest). The average score on the Caring subscale was 94.1 and on the Discharge Teaching subscale 85.3. More than 50% of respondents got the highest score (100) on these 2 subscales. The average score on the Dissatisfaction subscale was low: 10.2. By including the 4 negatively worded items in the CECSS scale score, the number of cases that scored the highest score was reduced to 0. To avoid ceiling effects, the model that includes the negatively worded items is preferred over the original model (Figure 2).

DISCUSSION

The literature shows that the CECSS is a reliable and valid instrument. However, it also shows that the CECSS has limitations and can be improved.[14] There are several issues with the CECSS and most of them have been addressed in this study. First, a large proportion of ED patients (41% in our study) are not discharged from the ED but admitted to the hospital and therefore, do not receive discharge instructions. As such, the items in the CECSS that apply to discharge do not apply to them. In the current instructions for calculating the scores, cases with missing values were excluded. That means that in practice, a large part of the ED population cannot share their opinion of the care that they received. The method that we have proposed to calculate the CECSS score allows for missing values. In addition, our method also standardizes the scores of the CECSS and the different subscales. This makes it much easier to see, for example, that patients in the ED are more satisfied with Caring than with Discharge Teaching. By including the 4 negatively worded items in the CECSS, it is also easier to see that a small percentage of patients are dissatisfied with some aspects of

the care that they receive. Including the 4 negatively worded items in calculating the CECSS score has also an important impact on the ceiling effects of the CECSS. The previous way of calculating CECSS scores showed that 42% of patients in the ED gave the maximum score for the care that they received. When we included the scores on the 4 negatively worded items, the percentage of patients with a maximum score was reduced from 42% to 0%. Finally, the CECSS was focused on nursing care in the ED. We made some minor changes to the item wordings to examine satisfaction with care received from all health care workers in the ED.

Factorial validity of the CECSS

Results of this study show that several models fit the data. The difference in fit between the models is not large. Therefore, in choosing a model that best fits the data, other criteria play a role. One important criterion is the above mentioned ceiling effects. Like many other patient satisfaction questionnaires, CECSS suffers from these ceiling effects: overall patients are (very) satisfied with the care they receive in the ED. For example, in a study by Messina et al.,[24] 98.5% of respondents agreed completely with the statement: "The nurse performed his/her duties with skill." The ceiling effect is important, because it makes it very difficult to use the CECSS in studies where results are compared, for example in a pre-post intervention study. If the ED experience is overall highly positive (say 95% of respondents agree or agree completely with the positive statements in the CECSS), it is very difficult to further improve that score. Further, if a large part of the sample selects the highest score, making use of statistical analysis such as correlational analysis or regression analysis is not feasible. To reduce the ceiling effect, we suggest using the negatively worded items in the CECSS, and create a Dissatisfaction subscale. In most studies, these items are not used to calculate scale scores, but only to reduce response bias. Although the percentage of people that score high on these negative items is small, some respondents have -apart from positive experiences in the ED- also some negative experiences.

Limitations

This study took place in one ED of a large academic hospital in the Midwestern United States. Patients who were 65 years or older and presented to the ED with a fall were included in this study, which limits the generalizability of the results. However, older patients with a fall are one of the largest groups who present to the ED. Another limitation is that data were collected during the COVID-19 pandemic, which may have impacted the data. Care offered in EDs was even more hectic than usual, and there were many restraints to the care received, including patients and personnel having to wear masks, which may have made communication difficult, and limited bringing a care partner into the ED. It is yet impossible to assess the impact that the COVID-19 pandemic has had on patients and care providers, but it must have been substantial.

Conclusion

Patient satisfaction with health care is increasingly important. Measuring patient's satisfaction has challenges. In this study, we addressed several issues with one of the most used instruments, the CECSS, to measure patient experience in the ED.
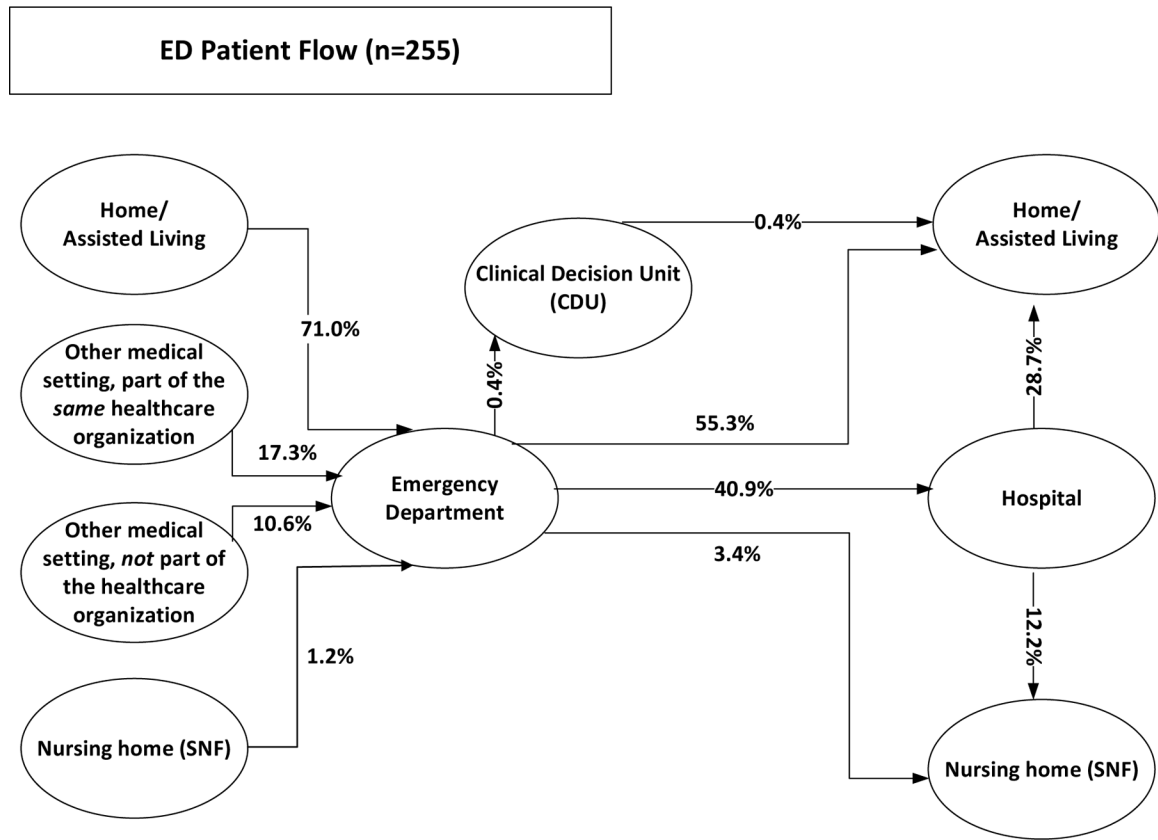
Acknowledgements

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ED Patient Flow (n=255)

Home/
Assisted Living

Other medical
setting, part of the
same healthcare
organization

Other medical
setting, *not* part of
the healthcare
organization

Nursing home (SNF)

71.0%

17.3%

10.6%

1.2%

Emergency
Department

Clinical Decision Unit
(CDU)

0.4%

0.4%

55.3%

40.9%

3.4%

Home/
Assisted Living

28.7%

Hospital

12.2%

Nursing home (SNF)

Figure 1.
Patient Course
ED=Emergency Department
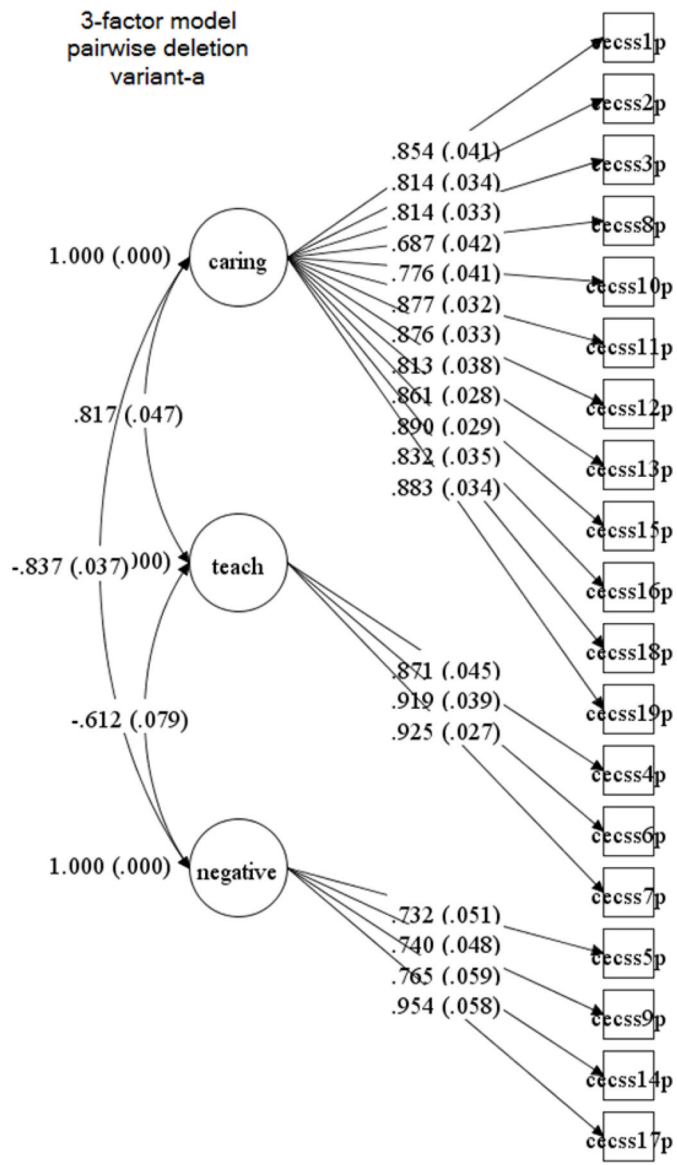
Figure 2.
Preferred model with (standardized) factor loadings and inter-correlations

Table 1:

Personal characteristics (n=255)

		n (%)
Gender	Female	148 (58.0%)
Age:	65–69	58 (22.7%)
	70–74	68 (26.7%)
	>/ 75	129 (50.6%)
Marital status:	Currently married	143 (56.1%)
	Separated	7 (2.7%)
	Divorced	38 (14.9%)
	Widowed	50 (19.6%0
	Never married	17 (6.7%)
Living conditions:	Home	226 (88.6%)
	Assisted living	14 (5.5%)
	Retirement community	14 (5.5%)
	Nursing Home	1 (0.4%)
Education:	8th grade or less	2 (0.8%)
	Some high school	3 (1.2%)
	High school graduate or GED	41 (16.1%)
	Some college or technical school	66 (25.9%)
	College graduate	63 (24.7%)
	More than a 4-year college degree	80 (31.4%)
Patient ESI [*]	Category 2 (Orange)	103 (40.6%)
	Category 3 (Yellow)	137 (53.9%)
	Category 4 (Green)	14 (5.5%)

[*] ESI= Emergency Severity Index, score from 1 (most urgent, excluded from this study) to 5 (least urgent)

Table 2:

Experienced health of the respondents (n=255)

Overall, how would you rate your health during the past 4 weeks?	n (%)
Excellent	34 (15.1%)
Very good	71 (27.8%)
Good	68 (26.7%)
Fair	47 (18.4%)
Poor	32 (12.5%)
Very poor	3 (1.2%)
Have you been in the Emergency department (ED) during the past 4 weeks (Other than visit today)? (Yes)	35 (13.7%)
Have you been admitted to the hospital during the past 4 weeks? (Yes)	32 (12.5%)
Have you had a fall during the past 4 weeks? (Yes)	59 (23.1%)

Table 3:

Goodness of fit of different models

Model	χ² (df)	*p*-value	χ²/df ratio	CFI	TLI	RMSEA	SRMR
Model 1: 2-Factor Model (12 Caring items, 3 Discharge Teaching items)	152.10 (89)	<0.001	1.70	0.989	0.987	0.053	0.050
Model 2: 3 Factor model (Caring, Discharge Teaching, Clinical Competence items)	304.80 (149)	<0.001	2.04	0.978	0.975	0.064	0.069
Model 3: 3-Factor Model (Caring, Discharge Teaching, Dissatisfaction items)	259.47 (149)	<0.001	1.74	0.984	0.982	0.054	0.060

Table 4:

Consumer Emergency Care Satisfaction Scale (CECSS) scores

	Mean	Median	Std. dev.	Mini-mum	Maxi-mum	Cases with maxi-mum score (#, %)	90% confidence interval	Cronbach Alpha
Full CECSS (original version, 15 items)	93.14	98.08	11.20	46.76	100	194 (42.0%)	64.92, 100	0.93
Full CECSS (19 items, including negative items, all positively worded)	92.38	96.05	11.49	30.0	100	161 (34.8%)	45.59, 100	0.92
Full CECSS (19 items, including negative items)	74.41	76.48	8.12	31.25	100	0 (0%)	56.67, 83.99	0.92
Caring subscale (12 items)	94.097	100	11.23	27.27	100	129 (50.6%)	68.75, 100	0.90
Teaching subscale (3 items)	85.32	100	23.25	0	100	108 (58.4%)	25, 100	0.84
Dissatisfaction Subscale (4 items)	10.19	0	17.84	0	100	1 (0.4%)	0, 50	0.69