Development and Psychometric Evaluation of a Caregiver Survey to Assess Family-Centered Care in the Emergency Department

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Received for publication March 14, 2022; accepted October 19, 2022.

ABSTRACT

OBJECTIVE: To develop and evaluate the psychometric properties of a family caregiver-reported survey that assesses family-centeredness of care in the context of pediatric emergency department (ED) encounters.

METHODS: We created a caregiver-reported scale, incorporated content expert feedback, and iteratively revised it based on cognitive interviews with caregivers. We then field tested the scale in a survey with caregivers. We dichotomized items using top-box scoring and obtained a summary score per respondent. Using a sample of 191 caregivers recruited from 9 EDs, we analyzed internal consistency reliability, dimensionality via item response theory modeling, and convergent validity with the ED Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey.

RESULTS: Feedback from the 9 experts led us to remove 4 items. We conducted 16 cognitive interviews and revised the survey in 4 rounds. An 11-item survey was field tested. Mean (standard deviation) respondent 11-item summary score was 77.2 (26.6). We removed 2 items given inconsistent response patterns, poor variability, and poor internal consistency, which increased coefficient alpha from 0.85 to 0.88 for the final scale. A multidimensional model fit the data best, but factor scores correlated strongly with summary scores, suggesting the latter are sufficient for quality improvement and future research. Regarding convergent validity, adjusted partial correlation between our scale's 9-item summary score and the ED CAHPS summary score was 0.75 (95% confidence interval 0.67−0.81).

CONCLUSIONS: Psychometric analyses demonstrated strong item performance, reliability, and convergent validity for the 9-item scale. This survey can be used to assess family-centered care in the ED for research and quality improvement purposes.

KEYWORDS: emergency department; patient-reported outcome measures; pediatrics; psychometric; surveys and questionnaires

ACADEMIC PEDIATRICS 2022;XXX:1−8

WHAT'S NEW

No family-centered care assessment tool is designed for a pediatric emergency department encounter. This survey demonstrated good item performance, reliability, and validity, supporting its use to assess family-centeredness of care in this setting for research and quality improvement purposes.

THE IMPORTANCE OF family-centered care, which places the family as the focus and unit of care,[1] is widely recognized among researchers, national health professional associations, and public health policy organizations.[2,3] Evidence demonstrates that family-centered care is associated with improvements in care quality, trust, medical goal achievement, patient and family satisfaction, patient and family anxiety, and costs.[1,4,5] Key attributes of family-centered care include collaboration among patients, families, and health care providers; empowerment; respect; communication; individualized care; and support.[1,6] Challenges to successful implementation of family-centered care include family and care team stress and competing demands, power imbalances, and organizational limitations.[7,8] These challenges are especially evident in the emergency department (ED) setting, where family caregivers are navigating a new or serious illness in a new setting with unfamiliar care providers.[2]

To improve the delivery of family-centered care, the health care field needs evaluation mechanisms to assess whether care is family-centered. While the Consumer Assessment of Healthcare Providers and Systems (CAHPS)[9] surveys measure patient experience, there is no

national standard to measure patient- and family-centered care.[10] For this reason, the National Quality Forum identified "measurement of person-centered care" as 1 of 3 priority initiatives.[10] No published family-centered care measure was designed for pediatric ED encounters. Existing family-centered care measures assess the physician's approach based on multiple encounters over time (eg, "In the last 12 months...")[11] or include items that assume established relationships (eg, "My doctor and I have been through a lot together").[12] Such measures that were designed for the primary care or clinic setting are not appropriate for a single ED encounter. Other family-centered care measures were designed for patients with specific chronic diseases.[13] Furthermore, the body of literature includes patient-reported surveys to assess patient-centered care.[14] Our team therefore wanted to address this gap by providing a caregiver-reported measurement that is applicable for pediatric ED visits. This research focused on developing and evaluating the psychometric properties of a caregiver-reported survey to assess family-centeredness of care in the context of pediatric ED encounters.
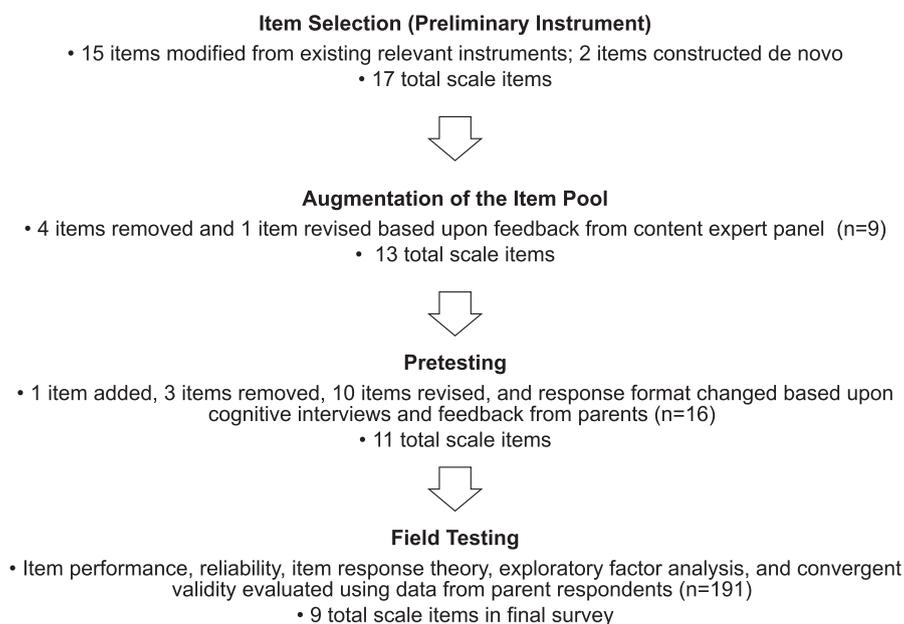
METHODS

We used standard procedures for instrument development[15] (Fig. 1) to draft the ED Family Centered Care Experience (ED-FACCE) survey, a caregiver-reported measure of family-centered care provided in the ED, to be used for research and quality improvement purposes. We solicited and incorporated feedback on the preliminary instrument from content experts. The instrument was then iteratively revised through cognitive interviews with caregivers, whereby caregivers completed the instrument and then participated in a semi-structured interview. Finally, we field tested the instrument with caregivers and

analyzed the scale's psychometric properties. We determined the reading grade level of the instrument using the Flesch-Kincaid scale (Microsoft, Redmond, Wash) throughout development. We included the entire text of the instrument (ie, instructions, items, response options) when assessing reading level. The University of California Institutional Review Board approved this study.

The Preliminary Instrument

The initial instrument draft was informed by Little et al,[14] who developed a survey to assess patient-centered care using the patient as the rater, which is more accurate at predicting outcomes than using a provider or research observer.[16,17] Our instrument was developed to assess the care provided by physicians, because prior research suggests that physicians' family-centeredness of care in the ED can be improved.[18] To adapt the Little et al survey to assess family-centered care for pediatric ED encounters from the caregiver's perspective, we identified content domains based on relevant published research and policy statements.[1,6,19,20] Individual items within these domains were adapted or written de novo using published guidelines for survey development.[21] Additional items were also adapted from the 20-item Measure of Processes of Care,[13] a survey used to measure caregivers' perceptions of family-centered behaviors of health care professionals for children with disabilities. The resulting initial instrument draft had 17 items in 4 domains: 1) listening to and respecting experiences and preferences, 2) sharing information, 3) providing support, and 4) collaborating and encouraging participation.

Consistent with the CAHPS[9] surveys, the response format for the preliminary instrument items was a 4-point scale (never, sometimes, usually, always) for rating the frequency of experiences with doctors (eg, "During this emergency department visit, how often did your child's doctors encourage you to ask questions?").

Item Selection (Preliminary Instrument)
• 15 items modified from existing relevant instruments; 2 items constructed de novo
• 17 total scale items

Augmentation of the Item Pool
• 4 items removed and 1 item revised based upon feedback from content expert panel (n=9)
• 13 total scale items

Pretesting
• 1 item added, 3 items removed, 10 items revised, and response format changed based upon cognitive interviews and feedback from parents (n=16)
• 11 total scale items

Field Testing
• Item performance, reliability, item response theory, exploratory factor analysis, and convergent validity evaluated using data from parent respondents (n=191)
• 9 total scale items in final survey

Figure 1. *Overview of instrument development and evaluation process.*

CONTENT EXPERT ASSESSMENT

We convened a panel of 9 family-centered care experts, including 3 researchers, 1 leader of a family-centered care organization, 1 bioethicist and family-centered care author, 1 hospital-based family engagement director, 2 hospital-based family engagement program managers, and 1 pediatric emergency medicine chief, to evaluate content validity and potential augmentation of the item pool. We asked panelists to identify missing items or domains and to provide feedback on instrument wording and duplicative items. We also asked panelists to rate each item's relevance to assessing family-centeredness of care (coded as not relevant = 1, somewhat relevant = 2, quite relevant = 3, highly relevant = 4).[22] For each item, we computed the item-level content validity index (I-CVI), which was the number of experts giving a rating of 3 or 4 divided by the total number of experts.[22] Items with I-CVI below the thresholds established by Lynn[23] (eg, I-CVI < 0.778 with 9−10 experts) were flagged as needing to be revised or removed. We calculated the scale-level content validity index (S-CVI/Ave) as the average I-CVI value.[24]

PRETESTING: COGNITIVE INTERVIEWS

PARTICIPANTS

We conducted one-on-one cognitive interviews with English-speaking, adult parents or guardians who were at their child's bedside during an eligible encounter in 1 of 9 northern California EDs. Eligible encounters were for children aged 0 to 18 years, identified by care team providers (eg, physicians and nurses). We used convenience sampling to recruit participants to complete the instrument within 30 days of the ED encounter. The instrument was designed to be self-administered (electronically or on paper) or interviewer-administered (face-to-face). Participants anonymously completed the instrument and then completed an interview within 3 weeks.

DATA COLLECTION

We used 2 main cognitive interview techniques: think-aloud interviewing and probing.[25] A researcher trained in cognitive interviewing (J.L.R) asked the participants to "think aloud" as they completed the instrument, whereby the caregiver read each question out loud and described the thought process used to get to their answer. Next, the interviewer used the probing method with a semi-structured question guide to assess participants' comprehension of each question, response, retrieval, judgment, and usability. Interviews were conducted in-person, by video-conference, or by phone. Participants received a $50 gift card. Interviews were audio recorded, transcribed, and reviewed for accuracy by the interviewer. The interviewer maintained field notes and prepared a written summary of each interview, including potential problems identified during the interview. Summaries were combined into a report that collated the identified problems under each individual item.

ANALYSIS

Data were analyzed concurrently with data collection, using deductive and inductive strategies. We used an initial codebook of a priori codes developed from the question-and-answer model from cognitive psychology.[26] Three researchers with qualitative expertise (J.L.R, S.L.P., and H.M.Y.) reviewed completed instruments and transcriptions. We began by independently memo-writing and coding the first 3 transcripts with the a priori codes. We also identified emergent codes. Our team met to compare codes and discuss discrepancies to ensure consensus on application of codes, refine codes dimensions, add new codes, and develop tentative categories. We reviewed and discussed the report of written summaries, deleting, adding, or modifying items to improve face validity, understandability, and usability. The revised instrument and codebook were used for subsequent interviews and transcripts. We revisited earlier transcripts as new codes were identified. This process was repeated for every 3 to 5 transcripts until no further areas for instrument improvement were identified.

FIELD TESTING

PARTICIPANTS AND DATA COLLECTION

Eligible caregivers, using the same eligibility criteria, completed the ED-FACCE instrument. One caregiver per patient was eligible to complete the instrument within 30 days of the ED visit. Each participant received a $25 gift card. We documented the number of participants invited to take the survey to monitor the proportion of respondents among all approached individuals. Participants were additionally invited via flyer advertisements.

To examine similarity between our family-centeredness measure and a theoretically related outcome, we used 15 questions from the ED CAHPS Survey[27] that solicit information on going to the ED, family-provider communication, and overall experience. Questions about being discharged home and nurse-specific questions were omitted. Demographic questions addressed participants' age, gender, race, ethnicity, education, child's age, child's ED use, relationship to the child, amount of time spent at the ED bedside, and child's ED disposition.

ITEM AND SCALE SCORING

We assigned a numeric value to each item response to develop item raw scores (ie, No = 0, Yes, somewhat = 1, Yes, definitely = 2 for the 9 positively worded items and the reverse for the 2 negative-worded items). These item raw scores were used in item analyses, but all subsequent analyses were conducted with "top-box" scoring (ie "1" for most favorable response, "0" otherwise). We used top-box scoring to highlight the fact that family-centered care should result in caregivers reporting definitively positive experiences rather than experiences that are somewhat positive.[28] CAHPS research has also demonstrated that top-box scoring, compared to linear means, has higher hospital-level reliability[29] and greater patient and family understandability.[30]

We examined response patterns across both the raw scores and the top-box binary indicators to identify inconsistent responses and item missingness. Summary tox-box scores for each respondent were obtained by computing the proportion of top-box scores among the answered items and multiplying it by 100. We used a linear regression model to examine whether mean summary scores varied by mode of administration (in person, paper, electronic).

RELIABILITY

Internal consistency of the scale was assessed using coefficients alpha (tau-equivalent reliability) and omega (congeneric reliability).[31,32]

ITEM SELECTION AND ASSESSMENT OF SCALE DIMENSIONALITY

After removing items with low variability and/or internal consistency, we assessed dimensionality using item response theory modeling, including models with item difficulty/location parameters (Rasch model), item discrimination (2-parameter logistic or 2PL model), and multiple dimensions/factors. Relative model fit was evaluated using Akaike and Bayes Information Criteria (AIC and BIC, respectively). We also considered root mean square error of approximation (RMSEA) as an absolute measure of model fit. Models were fit using the mirt R package.[33,34]

The aim of the dimensionality analysis was to identify the best fitting model, to summarize the underlying structure of the instrument and provide evidence of construct validity. This aim was balanced against finding a scoring process that would be interpretable operationally, where parsimony is preferred. We compared factor scores with simple summary scores. Strong positive correlations would justify the use of summary scores in reporting.

CONVERGENT VALIDITY

We estimated the partial correlation between the ED-FACCE summary top-box score and the 15-item ED CAHPS summary top-box score, adjusting for family caregiver demographics, relying on the Fisher Z transformation to calculate 95% confidence interval (CI).[35]

RESULTS

CONTENT EXPERT ASSESSMENT

CONTENT VALIDITY

The 17-item preliminary instrument had a reading grade level of 6.7. Expert assessment I-CVI for each item ranged from 0.44 to 1. The S-CVI/Ave was 0.83. No experts identified missing domains. Three experts each suggested adding 1 item, but no suggestion was made by multiple experts. We judged the suggested items to be duplicative of existing items and therefore did not incorporate them, but we adopted minor working suggestions.

Four items were removed based on perceptions by experts that they were confusing, not relevant, or duplicative. These items included 3 of the 4 items with an I-CVI

below the 0.778 threshold plus 1 item with an I-CVI 0.778. The 1 remaining item rated with low relevance (I-CVI 0.667) was revised. Following these changes, the resulting instrument had 13 items and a reading grade level of 7.0.

PRETESTING: COGNITIVE INTERVIEWS

Sixteen interviews were conducted between August and November 2020: 9 in person, 2 by telephone, and 5 by videoconference. Ten caregivers completed a self-administered instrument; 6 caregivers completed an interviewer-administered instrument. Twelve of the participants were female; 4 were male. Participant ages ranged from 23 to 53 years (mean = 37.4). Ten participants were White; 2 were Black; 2 were Asian; and 2 described their race as "other." Four participants were Hispanic or Latinx. Highest education attained among the participants ranged from less than high school to more than a 4-year degree; the modal category (n = 5) was having a high school degree or equivalent credential. Four of the children had a chronic medical condition. Seven of the children were discharged home from the ED; 4 were admitted locally; and 5 were transferred to another hospital.

The 13-item instrument was revised in 4 rounds. Four categories of instrument problems were identified as presented in Appendix 1. In brief, participants expressed concerns regarding the phrasing of the questions, duplicative constructs, unclear terms, and a missing construct. As a result of the cognitive testing, 10 items were revised, 3 were deleted, and 1 novel item was added. Following these revisions, no further problems with the instrument were identified by participants. The reading grade level was 6.9.

FIELD TESTING

Field testing of the 11-item instrument (Appendix 2) was conducted from March to August 2021. Among the participants directly invited to take the ED-FACCE survey, the response rate was 92.7% (190 of 205). One participant completed the survey via flyer advertisement. Among the 191 respondents, the mode of administration was 54 (28.3%) in person, 60 (31.4%) paper, and 77 (40.3%) electronic. Table 1 shows respondent characteristics. Most participants (70%) were mothers of the child; 23% were fathers; 6% were grandparents; and 2% were other types of guardians. Compared to the overall representation of California residents,[36] the participants in this study had a greater proportion of individuals reporting Black or African American race, a greater proportion of Native Hawaiian or Other Pacific Islander race, a smaller proportion of Hispanic or Latinx ethnicity, a greater proportion of high school graduates or higher, and a smaller proportion of those with a bachelor's degree or higher. Most participants (88%) completed the survey about their child's ED visit in an urban level I trauma center with a 121-bed quaternary care children's hospital. This teaching hospital is a referral center for children across a 33-county

Table 1. Field Testing Participant Characteristics

	N (%)
About the Participant	
Age, in years	
≤29	57 (29.8)
30−39	88 (46.1)
40−49	31 (16.2)
50+	15 (7.8)
Gender	
Female	143 (74.9)
Male	47 (24.6)
Nonbinary	1 (0.5)
Race	
White	100 (52.6)
Black or African American	23 (12.1)
Asian	20 (10.5)
Native Hawaiian or other Pacific Islander	4 (2.1)
American Indian or Alaska Native	3 (1.6)
Other	40 (21.0)
Ethnicity	
Hispanic or Latinx	50 (26.2)
Not Hispanic or Latinx	141 (73.8)
Highest education attained	
Some high school, but did not graduate	5 (2.6)
High school graduate or GED	106 (56.1)
Some college or 2-year degree	26 (13.8)
4-year college graduate	38 (20.1)
More than 4-year college degree	14 (7.4)
About the participant's child	
Child's age, in years	
<1	27 (14.1)
1−5	92 (48.2)
6−12	52 (27.2)
13−18	20 (10.5)
Relationship to the child	
Mother	134 (70.2)
Father	43 (22.5)
Grandmother	9 (4.7)
Grandfather	2 (1.0)
Other	3 (1.6)
Number of ED visits for the child in last 6 months	
1 time	145 (75.9)
2 times	31 (16.2)
3 times	13 (6.8)
4 times	2 (1.0)
5 or more times	0 (0.0)
About the emergency department visit	
Main reason for the child's ED visit	
An accident of injury	114 (59.7)
A new health problem	53 (27.8)
An ongoing health condition or concern	24 (12.6)
Child arrived to the ED by ambulance	
Yes, by ambulance	115 (60.2)
Amount of time spent at the child's ED bedside	
A little of the time	0 (0.0)
Some of the time	3 (1.6)
Most of the time	21 (11.0)
All or nearly all of the time	167 (87.4)
Child's ED disposition	
Discharged home	94 (49.2)
Transfer to different hospital	23 (12.0)
Admitted for hospitalization	74 (38.7)

GED indicates General Educational Development; ED, emergency department.

region covering 65,000 square miles. It receives pediatric transfers from ∼30 hospitals in the region; 12% of participants completed the survey about a visit in 1 of those referring ED sites.

SUMMARY SCORE

The mean (standard deviation) ED-FACCE 11-item summary score was 77.2 (26.6); the median (25%−75% interquartile range) was 81.8 (54.5−100). In a linear regression model, the summary score did not vary by the mode of administration ($P = .50$). There were no missing responses for any item from any respondent.

RESPONSE PATTERNS AND ITEM VARIABILITY

Four of 191 respondents selected "Yes, definitely" for all 11 items. This pattern suggests inconsistent responding for these participants, at least with the last 2 items, since the first 9 items were positively worded attributes and the last 2 were negatively worded. Figure 2 shows the mean (95% CI) top-box score for each item, which ranged from 61.2% to 95.3%. Two "low-variability" items had top-box scores greater than 95% (items 10 and 11).
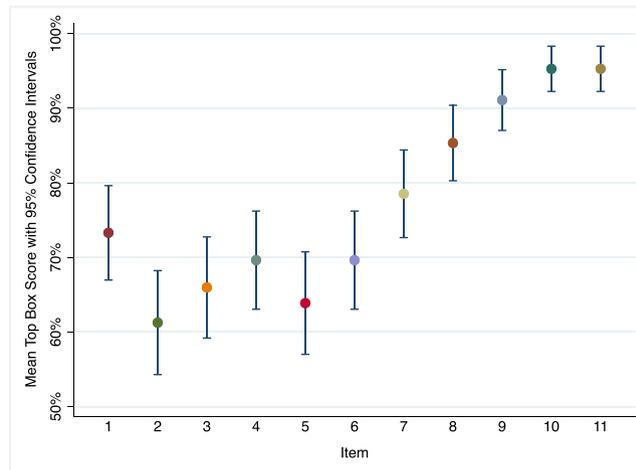
RELIABILITY

Coefficients alpha and omega for the ED-FACCE scale (raw scores, all 11 items) were both 0.85. Items 10 and 11 demonstrated corrected item-total correlations (a measure of item discrimination) of 0.08 and 0.14, respectively. Restricting the scale to items 1 through 9, the correct item-total correlations ranged from 0.46 to 0.79, with 7 items above 0.60. Deleting any of these 9 items would not have improved reliability; however, deleting either item 10 or 11 would increase alpha and omega to 0.86. In support of top-box scoring, coefficients alpha and omega for the 9-item subset using the original raw scoring were 0.88 and 0.89, respectively. For top-box scoring, these values were both 0.90.

ITEM SELECTION

We removed items 10 and 11 given their poor variability and adverse effects on internal consistency reliability. Removing these 2 items also addressed the unbalanced inclusion of 2 negatively worded items in a scale of 11 total items. Items 1 through 9 were used as a scale for the subsequent analyses. Table 2 presents the text of the final ED-FACCE survey items. Table 3 contains item analysis results.

ITEM RESPONSE THEORY

An exploratory 2PL model (all items free to load on 2 factors, promax rotation) produced factors correlating at 0.77 and sums of squared loadings of 4.32 and 2.22. A trend was evident in the factor loadings, with the first 6 items loading more on 1 factor and the last 3 items loading on the other (Table 3). A multidimensional confirmatory 2PL model (AIC 1285, BIC 1346) included loadings as specified

Figure 2. *Variability of item top-box scores. Top-box scores calculated as the proportion of respondents answering the most favorable response option among the number of respondents answering the item.*

in the exploratory model, and a bifactor model (AIC 1293, BIC 1381) included a general factor and 2 specific factors, again following the structure from above. The multidimensional 2PL produced the best fit, with lower AIC and BIC than any other model, including unidimensional Rasch (AIC 1316, BIC 1348) and 2PL (AIC 1300, BIC 1359) models. All models had RMSEA below 0.05. Item parameters for the final multidimensional 2PL model are given in Table 3. Factor scores from the multidimensional 2PL correlated at 0.98 and 0.96 with summary scores.

CONVERGENT VALIDITY

The mean (standard deviation) ED CAHPS summary score for each respondent was 68.3 (25.3); median (25% −75% interquartile range) was 70 (50−90). Adjusted partial correlation between the 9-item ED-FACCE summary core and the 15-item ED CAHPS summary score was 0.75 (95% CI 0.67−0.81).

DISCUSSION

This study developed and evaluated the ED-FACCE survey, which measures family-centered care provided by physicians during pediatric ED encounters. The multi-phased development and evaluation process resulted in a

survey with sufficient evidence supporting its reliability and validity for research and quality improvement purposes. The usability of the instrument is supported by positive feedback from cognitive interviews as well as the lack of missing values during field testing. Psychometric analyses demonstrated good item performance, reliability, and convergent validity of a 9-item scale.

Content validity is deeply connected to the definition of the measured construct. Unfortunately, no consensus definition exists for family-centered care.[4,6,37,38] We began each cognitive interview by reading a family-centered care definition that used the 4 attributes described in the concept analysis by Coyne et al.[1] This definition stated that the core concepts of family-centered care include: 1) Listening to and Respecting Experiences and Preferences, 2) Sharing Information, 3) Providing Support, and 4) Collaborating and Encouraging Participation. Should others seek to measure a differently defined construct, our present instrument might not be applicable. Of note, although the adjusted partial correlation between our scale's 9-item summary score and the ED CAHPS summary score supports convergent validity, it also suggests that these 2 scales give different results.

Family-centered care has been the gold standard approach to pediatric care delivery for decades.[39]

Table 2. Final Survey Instructions and Items

Mark one answer for each question. Answer the questions about your child's recent <u>EMERGENCY DEPARTMENT</u> **visit**. If your child recently visited more than one emergency department, answer the questions about only one of those visits. Do not include any other visits in your answers.

During your child's recent <u>EMERGENCY DEPARTMENT</u> visit. . .

Item 1	Did your child's doctors seem interested in your worries about your child's problem?
Item 2	Did you feel comfortable sharing your ideas with your child's doctors?
Item 3	Did your child's doctors focus on what matters to you the most?
Item 4	Did your child's doctors clearly explain to you their ideas about your child's medical care?
Item 5	Did your child's doctors give you information in ways that you understood?
Item 6	Did your child's doctors encourage you to ask questions?
Item 7	Did your child's doctors involve you in making decisions about your child's medical care?
Item 8	Did your child's doctors propose next steps for your child's medical care that were acceptable to you?
Item 9	Did your child's doctors address your child's needs?

Response options for each item: Yes, definitely; Yes, somewhat; No. The contents of the instrument are distributed under a Creative Commons Attribution 4.0 International License (https://creativecommons.org/licenses/by/4.0/).

Table 3. Item Analysis and Model Results

Factors Labels and Items	M	SD	AID	F1	F2	A1	A2	B
Communication/interaction								
1 Interested in your worries	0.73	0.44	0.88	0.89	-0.01	2.99		2.13
2 Comfortable sharing your ideas	0.61	0.49	0.87	0.95	0.03	7.03		2.30
3 Focus on what matters	0.66	0.48	0.89	0.85	-0.02	2.52		1.26
4 Clearly explain their ideas	0.70	0.46	0.88	0.77	0.15	3.35		1.94
5 Give information you understood	0.64	0.48	0.87	0.80	0.21	8.75		3.43
6 Encourage you to ask questions	0.70	0.46	0.88	0.78	0.17	3.84		2.18
Decision-making/delivery of medical care								
7 Involve you in making decisions	0.79	0.41	0.88	0.24	0.74		5.24	4.27
8 Propose next steps for care	0.85	0.36	0.89	0.07	0.90		4.73	5.18
9 Address your child's needs	0.91	0.29	0.90	0.00	0.88		3.03	4.64

SD indicates standard deviation.

M − proportion of respondents selecting the highest rating category "yes, definitely."

AID − alpha-if-item-deleted; what coefficient alpha would be for the scale if the item were deleted.

F1 and F2 − exploratory 2PL IRT loadings on factors 1 and 2.

A1 and A2 − discrimination parameters from the final confirmatory multidimensional 2PL model.

B − item location parameter.

Although less recognized, there is growing emphasis on an alternative concept: child-centered care.[1,40] The foundation of child-centered care is that the child's perspective is heard and valued.[1] Future iterations of the ED-FACCE tool can incorporate child-centered care attributes, while acknowledging that a construct that values the child's perspective and participation in decision-making would lack applicability for neonatal patients.

Future research should include testing versions of the ED-FACCE survey in languages other than English. Limited English-proficiency parents are more likely to report low satisfaction, poor comprehension, and non-family-centered care.[41,42] Their children are twice as likely to experience adverse events while hospitalized.[43] A language appropriate ED-FACCE survey is needed for research and quality improvement efforts targeting family-centered care for limited English-proficiency families.

Item response theory analyses identified that the ED-FACCE survey consists of 2 factors, which we labeled as 1) quality of communication and 2) clinical decision-making. Consistent with existing literature, these 2 topics encompass various attributes used to describe family-centered care.[4,6,37,38] These 2 dimensions also align with the 4 domains of the initial instrument draft. Future confirmatory factor analyses are needed and can begin by considering the multidimensional model. Although the multidimensional 2PL model provided the best fit, factor scores correlated strongly with summary scores, so we recommend the simpler summary scores for routine use.

This study has several limitations, to be addressed in future studies. The ED-FACCE survey was designed to measure physicians' family-centeredness of care. It does not assess care delivered by other provider groups (eg, nurses, nurse practitioners, physician assistants) or providers more broadly. Future research should adapt and evaluate the ED-FACCE survey for other types of providers, such as nurses. While the instrument measures family-centered care provided by physicians, respondents might not have known which ED providers were physicians. Additionally, the care provided by other health care professionals might have influenced their reporting about their child's physicians. Furthermore, our field testing participants largely responded about their experiences in the same ED, which was an urban level I trauma center and teaching hospital. Most field testing participants also reported being in the ED for a new injury or health problem; few respondents accompanied a child presenting to the ED for an ongoing health condition or concern. While the sample of field testing participants was not representative of California residents, this study included a diverse sample. Additional psychometric analyses are also needed of administration mode effects, which were only explored here at the scale level, as well as measurement invariance across participant subgroups, including for individual items. Finally, recruitment and testing occurred during the coronavirus disease 2019 pandemic; participants' varied experiences with the pandemic may have impacted their responses. Given the targeted nature of the questions, we do not expect the impact to be significant. Finally, we did not readminister the final 9 items on their own, and the presence versus absence of items 10 and 11 could potentially influence responses to items 1 through 9.

Despite these limitations, this study provides validity evidence supporting use of the ED-FACCE to assess family-centeredness of care for pediatric ED encounters. Future research should explore additional psychometric analyses, including with larger and more diverse samples. Future research should also test alternative iterations of the ED-FACCE survey, such as versions in additional languages and surveys measuring family-centered care provided by other provider groups and in other settings.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at https://doi.org/10.1016/j.acap.2022.10.018.

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