Family needs during critical illness in the Emergency Department: A retrospective factor analysis of data from three countries.

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ABSTRACT

Aims and objectives: to examine underlying factor structure of the Critical Care Family Needs Inventory – Emergency Department (CCFNI-ED) across three countries to identify similarities and differences.

Background: Understanding family needs assists nurses to provide family-centred care to deliver optimal outcomes for critically ill patients and their families in Emergency Departments (EDs).

Design: Retrospective secondary analyses of data collected in three cross-sectional surveys.

Methods: Convenience samples involved recruitment of family members accompanying a critically ill relative into four Emergency Departments in Australia (2), South Africa (1) and Taiwan (1). Item-matched raw data from 374 responses to 40 items from the surveys were collated and analysed using confirmatory factor analysis methods. Reporting adhered to an adapted STROBE checklist.

Results: The factor structure of the 40-item CCFNI-ED differed between countries. Analyses of the Australian data revealed a four-factor solution comprised of 18 items across four categories of family need (support, communication, participation, comfort); the Taiwanese data also demonstrated a four-factor solution comprised of 13 items (support, communication, participation, comfort); alternatively, the South African data revealed a two-factor solution comprised of 9 items (communication, participation). Fifteen items did not match across the countries. However, loading for four items common across all three countries related to family participation (3) and communication (1).

Conclusions: The findings suggest family members from different countries responded to CCFNI-ED items in different ways. Consistent with concepts of family-centred care, the study identified participation and communication needs that were common across the countries. The outcomes illustrate the challenge of providing appropriate care for family members during critical illness of a relative in the ED.

Relevance to clinical practice: Family perceptions of important needs during critical illness in the ED differ across countries; hence, the CCFNI-ED has limited utility. Participation and communication needs emerged as common family needs.

Key words: critical care, Emergency Department, emergency nurses, factor analysis, family needs, survey

SUMMARY BOX

What does this paper contribute to the wider global clinical community?

- This paper identified a core construct of the CCFNI-ED that was consistent across families of critically ill patients in the ED in different countries.

- This paper demonstrates family perceptions of their needs during critical illness in the ED differed across different countries; most CCFNI-ED family needs domains were not consistent.

- These findings can assist Emergency Department staff use the CCFNI-ED to tailor general and specific care for families of critically ill patients in different countries.

INTRODUCTION

Family members' roles during critical illness include providing psychological and practical support to their critically ill or injured relative (Black et al., 2011, Cypress, 2014). Their involvement offers many benefits to enhance the quality of care delivery (Mitchell et al., 2009, Van Horn and Kautz, 2007), as well as improve patient and family psychological recovery outcomes (Alfheim et al., 2017, Jabre et al., 2013, Oczkowski et al., 2015). However, family members of critically ill patients are vulnerable to intense psychological distress as well as immediate and long term emotional suffering as a consequence of this experience (Barreto et al., 2017). Treatment of critical illness in the Emergency Department (ED) is particularly stressful for family members due to the unique, unfamiliar and often unanticipated and unpredictable nature of emergency care, and uncertainty about the outcomes of critical illness in this setting (Authors removed for blind review, Sucu Dag et al., 2017). Understanding family needs is critical to assist nurses to provide family-centred care that delivers optimal outcomes for both the patient and their family in EDs.

BACKGROUND

Psychological symptoms such as anxiety, depression and post-traumatic stress disorder (PTSD) are common amongst family members of critically ill patients. Research consistently shows between 10 and 69 per cent of family members with a critically ill relative report moderate to major symptoms of anxiety or psychological distress in the short to long term (Azoulay et al., 2005, Colville and Pierce, 2012, Dziadzko et al., 2017, Muscara et al., 2015, Paul and Rattray, 2008, Pochard et al., 2001).

Molter (Molter, 1979) and Leske's (Leske, 1992, Leske, 1991, Leske, 1986, Leske, 1991) seminal works led to the development of the Critical Care Family Needs Inventory (CCFNI), a self-report survey tool to examine family needs in the Intensive Care Unit (ICU), that was later adapted for the ED (Author removed for blind review). Research using these tools has consistently demonstrated that families of patients with a critically ill relative have specific needs related to four domains; assurance, participation and proximity, communication, support, comfort and meaning, but the importance families place on these needs differs across clinical settings and study populations (Al Ghabeesh et al., 2014, Bandari et al., 2014, Barreto et al., 2017, Chien et al., 2005, Hinkle et al., 2009, (Author removed for blind review), Noor Siah et al., 2012, Author removed for blind review, Sucu Dag et al., 2017). In an increasingly globalised society, ED care must be sensitive and tailored to the diverse cultures and ethnicities of patients and their families (Bernal et al., 2009).

Previous research investigating family needs during critical illness in EDs in various countries has revealed subtle differences in findings that suggest family perceptions of important needs may differ across cultures and their ethnic sub-groups (Botes and Langley, 2016, Dağ et al., 2017, (Author removed for blind review), Kohi et al., 2016). However, no studies to examine the validity of tools commonly used to measure family needs across different cultural groups were identified in the literature. A recent study that examined the psychometric properties of the Critical Care Family Needs Inventory modified for the Emergency Department (CCFNI-ED) within a Turkish population (Dağ et al., 2017) revealed a different tool structure to that reported in the original Australian study Author removed for blind review). This research highlights the need to examine the influence of culture on the validity of tools commonly used to measure family perceptions of important needs during critical illness in the ED (Al-Mutair et al., 2013). In this context, culture is used to indicate the dominant national ideas, customs, and social behaviour of a country as this best captures the diversity of those using the local emergency departments.

The current study involved a retrospective secondary analysis of data collected using CCFNI-ED to examine family needs in the EDs of hospitals in three different countries: Australia, Taiwan and South Africa. Specific objectives were to identify similarities and differences in family needs data across the three countries. We examined the data for similarities and differences in the underlying factor structure of the CCFNI-ED across the three groups.

METHODS

Design

The study involved secondary analyses of item-matched raw data from three descriptive cross-sectional surveys that used the Critical Care Family Needs Inventory – Emergency Department (CCFNI-ED) (Author removed for blind review). The three studies were independently conducted by researchers between 2009 and 2016 in three countries: Australia (2009), Taiwan (2013) and South Africa (2009). Reporting adhered to an adapted EQUATOR STROBE checklist for cross-sectional studies (see supplementary file 1); this checklist provided the best fit for this secondary analysis of retrospective data.

Setting and sample

Data were collected in EDs of participating hospitals in the three countries. Data from South Africa were reported in a student research thesis; the Australian and Taiwanese data have been previously published (Author blinded for review; Author blinded for review). However, none of these papers

TABLE 1 Setting and samples across the three countries

	Australia	Taiwan	South Africa
Setting	Emergency Departments of a 600 bed tertiary referral centre and 400 bed outer suburban hospital in Melbourne	Emergency Department of 3,700 bed medical centre in Taiwan	Emergency Department of 1,700 bed public tertiary teaching hospital in Gauteng
Year of data collection	2007	2014	2009
Sample type	Convenience, consecutive	Purposeful	Convenience, consecutive
Family member participants	124	150	100
Age			
18-29 years	8.5%	12.1%	25%
30-50 years	47%	52.4%	56%
<50 years	44.4%	35.6%	19%
Female (%)	60.5%	57.4%	54%
Relationship to the critically ill patient **Partner/ spouse**	40%	NA*	20%
Child	19.5%	31.8%	17%
Parent	28%	29.1%	27%
Other	6%	39.2%	36%
Missing	6.5%		
Response rate	73%	82%	100%
Inclusion criteria	Family member aged 18 years or over; accompanied a category 1 or 2	Family member aged 20 years of over; accompanied a category 1, 2 or 3	Family member aged 18 years or over; accompanied a patient to the ED;

(Australasian Triage Scale) patient to the ED; self-assessed to meet the definition of 'family member'; remained in the ED for 30 minutes or longer; could communicate in English.	(Taiwanese Triage and Acuity Scale) patient to the ED; was related to the patient by blood, marriage or adoption; could communicate in Chinese.	remained in the ED while patient was treated; could communicate in English or Afrikaans or another of the official languages spoken in the local community.

* Not captured as a specific category in this population

report confirmatory factor analyses of the data. Details of the setting and sample across the three countries are outlined in Table 1.

Data collection – research instrument

The CCFNI-ED (Author removed for blind review) was used in all three countries to collect data about the needs of family members accompanying a critically ill patient to an ED. The CCFNI-ED was developed from the Critical Care Family Needs Inventory (CCFNI) initially developed by Molter (1979) and Leske (1986) to measure the perceived needs of family members of critically ill patients in critical care units. (Author removed for blind review) modified the tool for use in an Australian EDs. The CCFNI-ED consist of 40 items with good overall reliability (Chronbach alpha 0.90) (Author removed for blind review). Exploratory factor analysis of the Australian data identified four domains with satisfactory Cronbach's alpha coefficient: 1)'communication' captured the sharing and understanding of information exchanged between family members and the healthcare team(0.87)*;* 2) 'participation' captured family members' desire to participate in care and be with the patient in the ED (0.86); 3) 'comfort' captured both emotional and physical comfort (0.83); 4) 'support' captured the support provided by ED personnel (0.56).

The CCFNI-ED items were translated into Chinese for use in Taiwan; detail concerning this translation has been published elsewhere (Hsiao et al., 2017). Modifications to adapt the tool to accommodate the context of the South African population included: (1) verbal administration by data collectors fluent in all local languages and trained to collect data; (2) expert consensus to refine the wording to ensure all items were appropriate and easily understood by the target population; and (3) transformation of the four-point Likert scale into a visual response scale that used four boxes of increasing size to correspond with the increased importance of each need to ensure ease of use for participants with low literacy.

Data collection methods were also tailored to the setting where data were collected. In Australia and Taiwan the survey was self-administered. Alternatively, in South Africa all data were collected by research assistants using interviews in the preferred language of the participants.

Local Human Research Ethics approvals were obtained at all sites prior to data collection, in Australia (hospital approval numbers 02098B and 120/02 and university EC 140-2002); in Taiwan (hospital approval number 102-2728C); and in South Africa (university approval S27/2007).

The same 40 CCFN-ED survey items used in each country and collated. Any site-specific data collected by individual researchers, such as new items they added to the CCFNI-ED tool, were excluded from the analysis.

Data analysis

Data were analysed to explore cultural differences in the factor structure of the CCFNI-ED using data collected in three countries using SPSS24 (IBM Corporation, 2017) and Mplus 8 (Muthén and Muthén, 1998-2017). Confirmatory factor analysis (CFA), a special case of structural equation modelling (SEM), not previously used to analyses these data, was used in the present study. SEM outperforms traditional multivariate statistical analyses for this purpose in a number of ways: accounting for measurement errors, providing tests of goodness-of-fit for hypothesised theoretical models to sample data, and allowing to estimate model-based measures of reliability and validity (Bollen, 1989). One-factor congeneric models (Jöreskog, 1971) of *Support needs*, *Comfort needs*, *Communication needs*, and *Participation needs* were firstly examined among the three countries due to relatively small samples. It is recommended the ratio of cases to parameters of 5-10:1 (Bentler and Chou, 1987, Tanaka, 1987). The present sample sizes of 100 to 150 across the three countries and the number of items of 6 to 13 for each domain fit with this requirement. If the one-factor congeneric models fit the data well, a measurement model was assessed for each country. The robust maximum likelihood (MLR) estimation method was used in the CFAs as it is robust to non-normally distributed data. It is hypothesised that there is a difference between the matrices of implied and empirical sample variances/covariances. Commonly reported model fit criteria (Kline, 2015) included: chi-square statistics, its accompanying significance tests and scaling correction factor for MLR; root mean square error of approximation (RMSEA) with its 90% confidence interval (a known distribution for RMSEA permits the calculation of confidence intervals); standardized root mean square residual (SRMR); Tucker-Lewis index (TLI), and Comparative Fit index (CFI). The models were considered to fit the data well when the chi-square probability was $p > .05$ or the scaling correction factor for MLR $> .05$, RMSEA $< .05$, SRMR $< .05$, TLI $> .95$, and CFI $> .95$ (Hu and Bentler, 1999, Hu and Bentler, 1998, Marsh et al., 2004).

RESULTS

Data from 374 responses to 40 CCNFI-ED items were analysed: 124 from Australia, 150 from Taiwan and 100 from South Africa.

Consistent with earlier exploratory factor analysis, the four sub-constructs of family needs in the ED fitted the Australian data well for *Support needs*, *Comfort needs* and *Participation needs* and reasonably well for *Communication needs*. For the Taiwanese sample, a different pattern emerged: the one-factor congeneric models of *Comfort needs*, *Communication needs* and *Participation needs* fitted the data well. However, there were only three items measuring *Support needs* after removing inappropriate items. Therefore, the one-factor model of *Support needs* was saturated (no degree of freedom) and the model fit indices were not displayed. The one-factor models of *Support needs, Communication needs* and *Participation needs* fit the South African data well. All the fit indices were in the desired range. Similarly, *Comfort needs* was measured by three adequate items and the model cannot be estimated. Table 2 shows the model fit indices derived from the one-factor congeneric models of *Support needs, Comfort needs, Communication needs* and *Participation needs* across three countries after removing inappropriate items (for example, items with low factor loadings).

The analysis suggests that all standardised factor loadings were greater than .40 except items 21 (.38) and 35 (.39) measuring *Support needs* of the South African sample. Table 3 shows the standardised factor loadings for the one-factor congeneric models of *Support needs, Comfort needs, Communication needs* and *Participation needs* across the three countries.

Table 4 shows model fit indices for the three measurement models for the Australian, Taiwanese and South African samples, and indicates that the model fit for the three countries reasonably well. With the Australian sample, the chi-square probability *p* value was less than .05 but its scaling correction factor for MLR was greater than .05. The TLI was slightly below .90 but the remaining fit indices showed a reasonable fit of the model to the data. For the South African sample, items measuring *Support needs* and *Comfort needs* were removed based on model modification indices and the standardised residual correlations. Therefore, family needs in the ED comprised two constructs: *Communication needs* and *Participation needs.*

Table 5 shows the standardised factor loading and Cronbach's alphas of the sub-scales represented in the final measurement models for the three countries. The magnitude of the standardised factor loadings were all above .50 except item 27 (.45) measuring *Participation needs* for the South African sample, indicating reasonably strong associations between the constructs and the items. Apart from the scale measuring *Support needs,* Cronbach's alpha values were all above .70, suggesting good item reliabilities for most of the sub-scales. The items measuring its corresponding constructs, standardised factor loadings, and correlations between the constructs are presented in Figure 1.

TABLE 2 Model fit indices of the four one-factor congeneric modes across three countries

Family needs	χ^2 (df) Aus	TW	SA	P Aus	TW	SA	RMSEA (90%CI) Aus	TW	SA	SRMR Aus	TW	SA	CFI Aus	TW	SA	TLI Aus	TW	SA
A	.41 (2)	*	1.07 (2)	.81	*	.59	.00 (.00, .11)	*	.00 (.00, .17)	.01	*	.02	1.00	*	1.00	1.16	*	1.10
B	3.02 (5)	.21 (2)	*	.70	.90	*	.00 (.00, .10)	.00 (.00,.07)	*	.02	.01	*	1.00	1.00	*	1.02	1.05	*
C	7.62 (5)	3.68 (2)	3.44 (5)	.18	.16	.63	.07 (.00, .15)	.08 (.00, .19)	.00 .00, .11)	.03	.02	.04	.96	.98	1.00	.93	.95	1.05
D	18.18 (14)	.77 (2)	5.46 (5)	.20	.68	.36	.05 (.00, .11)	.00 (.00, .12)	.03 (.00, .15)	.05	.01	.03	.96	1.00	1.00	.95	1.05	.99

Aus=Australia, TW=Taiwan, SA=South Africa; *one-factor congeneric model with three items.
A=Support needs, B=Comfort needs, C=Communication needs, D=Participation needs

TABLE 3 Standardised factor loading of one-factor congeneric models

SUPPORT NEEDS			
Item	Australia	Taiwan*	Africa#
1. To have a doctor or nurse meet you on arrival at the hospital	.63		.78
2. To have one person to care for the family	.52	X	.60
3. To find out the condition of your ill relative before being asked to sign papers	.47		x
4. To have friends and/or relatives with you while in the emergency department	.49	X	x
21. To have a staff member with you while visiting your relative	x	X	.38
35. To feel there is hope	x		.39
COMFORT NEEDS	Australia	Taiwan	Africa
5. To have a private place to wait	X	x	x
28. To feel accepted by hospital staff	X	.51	x
29. To be treated as an individual	.56	x	x
32. To be encouraged to express emotions	.86	x	
33. To be reassured what normal emotional responses are	.90	x	
34. To share emotions with staff	.75	x	x
36. To be told about religious services	X	.70	
37. To have food and refreshments nearby	X	.64	x
38. To have a telephone in or near the waiting room	X	.80	x
39. To have toilet facilities nearby	X	x	x
40. To be able to contact staff at a later date to ask questions	.48	x	x
COMMUNICATION NEEDS			
6. To have explanations given in understandable terms	X	x	x
7. To be kept updated frequently	X	x	.73
8. To know all the specific facts concerning your relative's progress	.67	x	.63
11. To talk to a doctor	X	x	x
14. To know about the expected outcome	.79	x	.67

15. To have questions answered honestly	X	.77	.59
16. To be told about transfer plans while they are made	.71	.85	.54
17. To be assured that the best care possible has been given to your relative	.72	.73	x
30. To feel hospital staff care about your relative	X	x	x
31. To be assured of the comfort of your relative	.79	.54	x
PARTICIPATION NEEDS			
9. To know why things were done for your relative	.63	x	x
10. To be spared distressing details about your relative's illness or injury	X	x	x
12. To talk to a nurse	X	x	.53
13. To know about the expertise of staff caring for your relative	.57	x	.74
18. To stay out of the way during your relative's care	X	x	x
19. To see your relative as soon as possible	.60	x	x
20. To have explanations about the treatment area before going in to see your relative for the first time	X	x	x
22. To see what was happening to your relative	X	x	x
23. To be with your relative at any time	X	x	x
24. To be given directions regarding what to do at the bedside	.55	.71	.69
25. To feel helpful to your relative's care	.69	.73	.89
26. To be included when decisions were made	.58	.65	x
27. To have time alone with your relative	.57	.76	.45

x = item removed; * one-factor congeneric model with three items; # one-factor congeneric model with three items is saturated.

TABLE 4 Model fit indices of three measurement models of three countries

	χ^2 (df)	P	Scaling correction factor for MLR	RMSEA (90%CI)	SRMR	CFI	TLI
Australia	181.26 (129)	.00	1.15	.06 (.04, .08)	.07	.91	.89
Taiwan	72.47 (59)	.11	1.24	.04 (.00, .07)	.06	.97	.96
South Africa	37.41 (26)	.07	.89	.07 (.00, .11)	.07	.95	.92

TABLE 5 Standardised factor loading of the measurement models across three countries

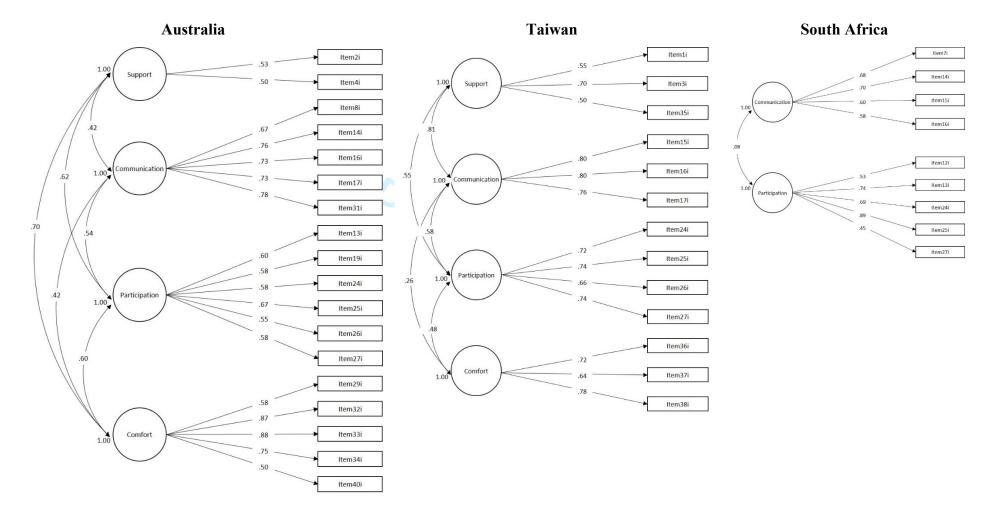|	Australia	Taiwan	Africa
Support needs	α = .42	α = .57	
1. To have a doctor or nurse meet you on arrival at the hospital	X	.55	x
2. To have one person to care for the family	.53	x	x
3. To find out the condition of your ill relative before being asked to sign papers	X	.70	x
4. To have friends and/or relatives with you while in the Emergency Department	.50	x	x
21. To have a staff member with you while visiting your relative	X	x	x
35. To feel there is hope	X	.50	x
Comfort needs	α = .84	α = .75	
5. To have a private place to wait	X	x	x
28. To feel accepted by hospital staff	X	x	x
29. To be treated as an individual	.58	x	x
32. To be encouraged to express emotions	.87	x	x
33. To be reassured what normal emotional responses are	.88	x	x
34. To share emotions with staff	.75	x	x
36. To be told about religious services	X	.72	x
37. To have food and refreshments nearby	X	.64	x
38. To have a telephone in or near the waiting room	X	.78	x
39. To have toilet facilities nearby	X	x	x
40. To be able to contact staff at a later date to ask questions	.50	x	x
Communication needs	α = .85	α = .83	α = .72
6. To have explanations given in understandable terms	X	x	x
7. To be kept updated frequently	X	x	.68
8. To know all the specific facts concerning your relative's progress	.67	x	x
11. To talk to a doctor	X	x	x
14. To know about the expected outcome	.76	x	.70

15. To have questions answered honestly	X	.80	.60
16. To be told about transfer plans while they are made	.73	.80	.58
17. To be assured that the best care possible has been given to your relative	.73	.76	x
30. To feel hospital staff care about your relative	X	x	x
31. To be assured of the comfort of your relative	.78	x	x
Participation needs	α = .74	α = .80	α = .79
9. To know why things were done for your relative	X	x	x
10. To be spared distressing details about your relative's illness or injury	X	x	x
12. To talk to a nurse	X	x	.53
13. To know about the expertise of staff caring for your relative	.60	x	.74
18. To stay out of the way during your relative's care	X	x	x
19. To see your relative as soon as possible	.58	x	x
20. To have explanations about the treatment area before going in to see your relative for the first time	X	x	x
22. To see what was happening to your relative	X	x	x
23. To be with your relative at any time	X	x	x
24. To be given directions regarding what to do at the bedside	.58	.73	.69
25. To feel helpful to your relative's care	.67	.74	.89
26. To be included when decisions were made	.55	.66	x
27. To have time alone with your relative	.58	.74	.45

x = item removed; α = Cronbach's α

Figure 1 Constructs, standardised factor loadings, and correlations between constructs

Of the 40 items included in the CCFNI-ED, loading for four items were common across all three countries: *To be told about transfer plans while they are made* (16); *To be given directions regarding what to do at the bedside* (24); *To feel helpful to your relative's care* (25); and *To have time alone with your relative* (27). Three of these (24, 25 and 27) related to the domain of family participation, and one (16) was included in the communication domain.

Fifteen items did not match across the three countries. Overall, the Australian data highlighted a four-factor solution comprised of 18 items across the four categories of family need (2 support, 5 communication, 6 participation, 5 comfort). The Taiwanese data also resulted in a four-factor solution comprised of 13 items (3 support, 3 communication, 4 participation, 3 comfort). Alternatively, the South African data analyses resulted in a two-factor solution comprised of nine items (4 communication, 5 participation).

DISCUSSION

The study found that while the psychometric properties of the CCFNI-ED differed across countries, a small number of family needs related to participation were consistent across the three culture groups. The participation category had the highest number of items common to all three countries. The findings identified that regardless of the country's local culture, participation in providing care to their loved one in the ED was a consistent family need. This aligns with the World Health Organisation's (2018) focus on people-centred healthcare that emphasises the importance of healthcare delivery that addresses as a priority the needs of patients and their families in relation to empowerment and participation. National and international health policies (Australian Commission on Safety and Quality in Health Care, 2012, World Health Organization, 2013, World Health Organization Regional Office for the Eastern Mediterranean, 2015), together with nursing codes of ethics (International Council of Nurses, 2012, Nursing and Midwifery Board of Australia, 2018), promote active family involvement in healthcare decision-making to ensure holistic care delivery that respects the values, customs, beliefs and preferences of patients and their families. The core concepts of patient and family care include dignity and respect; information sharing; participation in care and decision-making; and collaboration with healthcare providers, with the patient's family being at the centre of care delivery (Institute of Family Centred Care, n.d.). The promotion of patient- and family-centred care has led to increasing recognition of the role of families in supporting and advocating for their relatives during hospitalisation for critical illness in the ED (Goldberger et al., 2015). However, while the goal of patient- and family-centred care has often been on improving patient health and safety outcomes (Australian Commission on Safety and Quality in Health Care, 2017, Balik et al., 2011, World Health Organization, 2013), the study findings

suggest the importance of family participation to meet felt family needs is shared across cultural groups.

While identifying common family needs across the three countries, the findings also highlighted variance in family needs that may be attributed to cultural influences between the study samples; the findings suggest family member responses to the CCFNI-ED items differed between cultural groups. The Australian study reported the highest number of valid items (18) compared with Taiwan and South Africa, possibly reflecting the resource-rich, highly educated Australian culture that results in high expectations of families that their needs should be met. The expectations of Australian families may also be influenced by the current focus of Australian healthcare services on implementing changes to reflect the National Safety and Quality Health Service (NSQHS) Standards which promote the significant role of patients and their families in healthcare decision-making (Australian Commission on Safety and Quality in Health Care, 2017) in hospital performance and accreditation standards.

The South African study reported the lowest number of items (9), with no needs identified in the support or comfort categories. This may suggest that families in this context expect health professionals to care for their ill family member, but not to provide support and comfort for themselves; this may be explained in part by a public health system which, while servicing more than 80% of the South African population, has been reported as underfunded, under-resourced and understaffed (Organization, 2016). In a culture where extended family ties are highly valued, South African families may also rely on other family members for social support rather than seeking this from health professionals (Brysiewicz and Bhengu, 2010).

In the Taiwanese study, the 13 items reported were spread across four categories of family need. A possible explanation may be that family involvement in healthcare in Taiwan can extend beyond decision-making to the provision of physical and nursing care. A 2008 study on family involvement in Taiwanese hospitals identified that most patients had a family member who stayed with them during hospitalisation and undertook physical and nursing tasks that were delegated to them by health professionals (Tzeng and Yin, 2008). In such a case, it is plausible that family members would require clear communication to understand the care needed, as well as support to undertake these tasks safely. Comfort, in the context of meeting physical needs such as for food or toileting, as well as emotional comfort, for example, a sense of identity and importance (Author removed for blind review), would also be required for these families to undertake their caring role.

Ranking of needs can provide useful information about priorities for families in the ED. The study found that communication was prioritised as a consistent need over participation but that this

differed across the countries. Participation and communication are both central concepts in family-centred care (Institute of Family Centred Care, n.d.). In Australia, the importance of effective communication between patients, families and healthcare professionals has been emphasised in current literature to improve patient safety and promote patient and family participation in healthcare delivery (Australian Commission on Safety and Quality in Health Care, 2017). The Australian families highlighted the importance of understanding their loved one's condition and progress, and being assured of the patient's care and comfort. This is consistent with the growing focus on patient- and family-centred care in Australian healthcare policy (Australian Commission on Safety and Quality in Health Care, 2012, Australian Commission on Safety and Quality in Health Care, 2017), and the corresponding expectation that consumers should be informed about their healthcare so they can participate in collaborative decision-making with health professionals. The Taiwanese data revealed a focus on having questions answered honestly, being told of transfer plans, and being assured that their relative is receiving the best care. This may be explained by the role Taiwanese family members often assume as the main communicators with health professionals to reduce patient anxiety (Lin et al., 2017). The current study makes clear that effective communication may also alleviate family member stress. The South African family members identified communication needs that centred on frequent updates, expected outcomes and honest answering of questions. However, the study identified that meeting family communication needs may be more complex in the South African context given the diversity of languages spoken and the inability of some families to communicate in the English language used in hospitals.

The findings of the study have highlighted some challenges in identifying and meeting the needs of families of critically ill patients in the ED. In an increasingly globalized world, there is a growing need to ensure care is tailored to the needs of individuals and groups. While the CCFNI-ED has emerged as a useful tool to examine family needs during critical illness in the ED, the findings of this study suggest the grouping proposed in the initial exploratory analyses (Author removed for blind review) may not be stable or relevant across different cultural groups. The findings suggest family members from different cultural groups responded to the items in different ways; hence, there is a need to reconsider how the need items are grouped when examining different cultural groups.

Limitations of this study relate to the nature of the convenience samples used in all studies, secondary use of data, and sample sizes that may be considered low for factor analysis (Tabachnick & Fidell, 2013). Despite this, analyses revealed metrics suggesting acceptability of the analyses. In addition, the data were collected in different years across the three countries and the methods were adapted to each local context (for example, translation and the visual response scale) which may have impacted participant responses and subsequent analyses. Finally, there is a possibility that

temporal factors, related to the different times elapsed since data collection, may have contributed to the differences observed between the datasets.

CONCLUSION

The findings illustrate the challenge of providing appropriate care for family members during critical illness of a relative in the ED. Accurate recognition of family needs specific to care settings is important to guide interventions to achieve optimal patient and family outcomes that are specific to preferences of the patient and their family. The ED presents many unique features not found in other settings that raise important considerations for family care, including unfamiliarity with the environment and caregivers, and uncertainties about care and outcomes. This study highlights the need for specific consideration of people living in different countries in identifying and addressing family needs within the ED.

RELEVANCE TO CLINICAL PRACTICE

Family perceptions of important needs during critical illness in the ED differ across people living in different countries; hence, the overall CCFNI-ED may have limited utility; however, participation and communication needs emerged as common family needs.

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STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-4, 5
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-5-settings, recruitment and data collection
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	4-5, Table 1
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	NA
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5 (matched items from CCFNI-ED)
Bias	9	Describe any efforts to address potential sources of bias	NA
Study size	10	Explain how the study size was arrived at	Convenience
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5-6
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6
		(*b*) Describe any methods used to examine subgroups and interactions	6
		(*c*) Explain how missing data were addressed	NA
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	NA
		(*e*) Describe any sensitivity analyses	NA
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	NA
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA

Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1
		(b) Indicate number of participants with missing data for each variable of interest	Table 1
Outcome data	15*	Report numbers of outcome events or summary measures	Table 1
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	NA
		(*b*) Report category boundaries when continuous variables were categorized	NA
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6
Discussion			
Key results	18	Summarise key results with reference to study objectives	6-8, Figure 1
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	8-10
Generalisability	21	Discuss the generalisability (external validity) of the study results	10
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.