Intensive care unit family satisfaction survey

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ABSTRACT

Objectives: To examine the level of family satisfaction in a local intensive care unit and its performance in comparison with international standards, and to determine the factors independently associated with higher family satisfaction.

Design: Questionnaire survey.

Setting: A medical-surgical adult intensive care unit in a regional hospital in Hong Kong.

Participants: Adult family members of patients admitted to the intensive care unit for 48 hours or more between 15 June 2012 and 31 January 2014, and who had visited the patient at least once during their stay.

Results: Of the 961 eligible families, 736 questionnaires were returned (response rate, 76.6%). The mean (± standard deviation) total satisfaction score, and subscores on satisfaction with overall intensive care unit care and with decision-making were 78.1 ± 14.3, 78.0 ± 16.8, and 78.6 ± 13.6, respectively. When compared with a Canadian multicentre database with respective mean scores of 82.9 ± 14.8, 83.5 ± 15.4, and 82.6 ± 16.0 (P<0.001), there was still room for improvement. Independent factors associated with complete satisfaction with overall care were concern for patients and families, agitation management, frequency of communication by nurses, physician skill and competence, and the intensive care unit environment. A performance-importance plot identified the intensive care unit environment and agitation management as factors that required more urgent attention.

Conclusions: This is the first intensive care unit family satisfaction survey published in Hong Kong. Although comparable with published data from other parts of the world, the results indicate room for improvement when compared with a Canadian multicentre database. Future directions should focus on improving the intensive care unit environment, agitation management, and communication with families.

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New knowledge added by this study
- This study provides the first dataset on the level of family satisfaction with intensive care unit (ICU) care in Hong Kong.
- Factors that independently affected family satisfaction include the ICU environment, agitation management, and communication between health care workers and families. These are all potentially amenable to improvement.

Implications for clinical practice or policy
- Factors identified to be independently associated with higher family satisfaction will provide directions for future improvement.
- Such baseline data will allow for assessment of the efficacy of future improvement initiatives.

Introduction

Providing professional care and establishing a good rapport with patients is the mission of all health care workers. This relationship building is part of the patient-centred health care delivery model that is currently being advocated over a clinician- or disease-centred model.[1] It is associated with better clinical outcomes and may reduce potential complaints due to miscommunication.[2-4] In the intensive care setting where patients often cannot make their own decisions, either due to their illness or to the effect of medications,[5] building a good relationship with the patients' family is especially important. Furthermore, it has been recognised that families of patients admitted to the intensive care unit (ICU) are at higher risk of developing anxiety, depression, and post-traumatic stress disorder.[6,7] They are suddenly subjected to an uncertain outcome

深切治療部病人家屬滿意度調查

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目的：探討深切治療部（ICU）患者家屬的滿意度，與國際標準作比較，並找出與較高滿意度相關的獨立因素。

設計：問卷調查。

安排：香港一所分區醫院的內外科成人ICU。

參與者：2012年6月15日至2014年1月31日期間病人入住ICU不少於48小時並於逗留期間曾到訪至少一次的家庭成員。

結果：961個符合條件的家屬中，共收回問卷736份（回應率76.6%）。對於ICU整體護理總滿意度評分的平均值（±標準差）為78.1 ± 14.3，其整體護理次量表得分為78.0 ± 16.8，另決策次量表得分為78.6 ± 13.6。另一個加拿大多中心研究的評分依次為82.9 ± 14.8、83.5 ± 15.4和82.6 ± 16.0（P<0.001）。比較兩組的數據，發現本地ICU患者的家屬滿意度仍有改進的空間。與ICU整體護理完全滿意的獨立相關因素為對病人和家屬的關心、躁動管理、與護士溝通的次數、醫生的能力和表現，以及ICU環境。重要度—表現程度分析法確定ICU環境和躁動管理兩項因素均須更迫切關注。

結論：這是本港首個ICU患者家屬滿意度的調查。雖然結果可媲美世界其他地區公佈的數據，但若與另一項加拿大多中心研究的評分比較，本研究的結果還有改進的空間。未來發展方向應着重改善ICU環境和躁動管理，以及與病人家屬的溝通。

for their loved ones, with associated emotional, social and financial consequences, and in a strange environment packed with complex technological advancements. The long-term psychological impact on the family after an ICU encounter is now termed as post-intensive care syndrome–family (PICS-F).[7] This adds to the society's health care burden and reduces the family ability to provide care. Evidence suggests that the risk of developing PICS-F is affected by the manner in which health care workers interact with the family.[8] For these reasons, ICU quality measurement should include the families' perspective and their satisfaction with the care process.[9,10]

In early 2012, the Department of Intensive Care, Pamela Youde Nethersole Eastern Hospital, Hong Kong (PYNICU) initiated the Family Satisfaction Enhancement (FAME) programme that aimed to improve family satisfaction with ICU care. A regular satisfaction survey was performed that intended to identify problem areas and make subsequent improvements. The current study was part of the FAME programme that evaluated the level of family satisfaction in a local ICU and its performance in comparison with international standards, and determined factors that are independently associated with a higher family satisfaction and could be used to plan future initiatives.

Methods

This was a questionnaire survey carried out at PYNICU, which is a mixed medical-surgical 22-bed adult ICU in a regional hospital with 1633 beds in Hong Kong. It is a closed ICU with 24-hour intensivist coverage.

The Family Satisfaction in the ICU (FS-ICU) questionnaire is a patient family satisfaction questionnaire originally developed in 2003 by a group of health care professionals in Canada: the Canadian Researchers at the End of Life Network (CARENET).[5] The questionnaire has been validated for use in North America and Europe,[11-14] and has been translated into other languages including Chinese. The questionnaire is accessible online (http://www.thecarenet.ca). The questionnaire consists of 37 items in two parts: satisfaction with overall ICU care, and satisfaction with decision-making around the care of critically ill patients; and three open-ended questions. Respondents were asked to provide baseline data (sex, age, relationship with the patient, prior experience with ICU, and whether they lived together before admission) at the start of the questionnaire. Corresponding patient data were retrieved from the Clinical Management System, electronic Patient Record, and Clinical Data Analysis and Reporting System.

Patients who were admitted to the ICU for 48 hours or more between 15 June 2012 and 31 January 2014, and were visited by their next-of-kin (NOK; defined as the key contact person nominated by the family and documented on the nursing chart on admission) during their stay in the ICU were eligible. Once an eligible patient was nearing ICU discharge (defined as an expected date of ICU discharge within the next 5 days as judged each morning by a senior clinician or nurse consultant), or had passed away in the ICU, his/her NOK was invited by an independent research assistant not involved in clinical care to participate in the survey. A minimum stay of 48 hours was used as in previous studies to ensure an adequate exposure of families to the ICU.[15,16] A copy of the questionnaire and an envelope were given to the NOK to be completed based on his/her opinion. He/she was asked to return the questionnaire in the envelope provided, which was opened only by researchers. Those who failed to return the questionnaire were contacted by phone within 2 months of ICU discharge or death, and the questionnaire was sent to them with a stamped addressed envelope if they agreed to participate. All respondents were ensured of the confidentiality and anonymity of their response. For patients who were admitted to the ICU more than once within the same hospitalisation, only the last was analysed.

The study protocol was reviewed by the Hong Kong East Cluster Ethics Committee and the need for consent was waived.

Statistical analyses

Items in the FS-ICU questionnaire were scored as previously described[12]: each item was recoded into a linear scale ranging from 0 to 100, with 0 as very poor or very dissatisfied, and 100 as excellent or completely satisfied. Three items ("received appropriate amount of information", "had enough time to think in decision-making process", and "adequate time to address concerns and answer questions") were recoded into dichotomous variables, while two items ("involved at right time in decision-making process", and "given right amount of hope patient would recover") were recoded into a 3-point Likert scale.[12] A mean (± standard deviation [SD]) score was computed for each item. Subscores for satisfaction with overall ICU care (FS-ICU/Care) and satisfaction with role in decision-making (FS-ICU/DM), and a total score (FS-ICU/Total) were generated by averaging available items, provided that the respondent answered 70% or more of the items in the respective sections.[12]

Results were compared using Mann-Whitney U test with those of a multicentre Canadian database (written communication, Daren Heyland, Feb 2014) that comprised data captured from 2003 to 2006 at 12 Canadian sites.

Univariate analyses of satisfaction with overall ICU care and satisfaction with role in decision-making were conducted. Variables included the baseline respondent's and patient's characteristics, as well as items of part 1 or part 2 of FS-ICU, respectively. Continuous variables were categorised using their median, and questionnaire items were categorised into "completely satisfied" and "less than completely satisfied". Factors with a P value of ≤0.1 were entered into multivariable logistic regression using stepwise backward elimination to identify independent factors associated with complete family satisfaction with overall ICU care and role in decision-making.

The independent factors thus identified by multivariable logistic regression were used in the construction of performance-importance plots to identify those factors that deserve more urgent attention because of their higher importance (regression weights above the median) but lower performance (percentage of that item being rated as "excellent" being below the median).

By applying the rule of 10 on logistic regression analysis of family satisfaction with overall ICU care, a target sample size was estimated to be 725 with 29 covariates with an estimated 40% of respondents being "completely satisfied" with overall care. All tests were two-sided, and a P value of <0.05 was considered statistically significant. All data were analysed using the Statistical Package for the Social Sciences (Windows version 20; SPSS Inc, Chicago [IL], US).

Results

From 15 June 2012 to 31 January 2014, 961 patients were eligible and 822 families agreed to participate; 736 questionnaires were eventually returned, with a response rate of 76.6%. Excluding the three questions only applicable to families of patients who passed away in ICU and the three open-ended questions, 23 766 (95.0%) of the total 25 024 questions were completed. Baseline characteristics of the respondents and patients are shown in Table 1.

Our mean (± SD) FS-ICU/Total, FS-ICU/Care, and FS-ICU/DM scores were 78.1 ± 14.3, 78.0 ± 16.8, and 78.6 ± 13.6, respectively. Table 2 shows the percentage of responses and mean score for each questionnaire item.

When results were compared with the Canadian data (written communication, Daren Heyland, Feb 2014), the latter had a higher mean FS-ICU/Total, FS-ICU/Care, and FS-ICU/DM score of 82.9 ± 14.8, 83.5 ± 15.4, and 82.6 ± 16.0, respectively (P<0.001 for all three scores when compared with PYNICU). Table 2 shows the result for each FS-ICU item; PYNICU achieved a significantly higher mean score for item "control over care". There was no significant difference in scores between the two databases for items "frequency of communication by physicians", "atmosphere of ICU waiting room", "involved at the right time in decision-making", "received appropriate amount of information", and "given right amount of hope". The Canadian sites achieved higher scores for the remaining items.

In the univariate analysis of satisfaction with overall ICU care, none of the patient's or respondent's characteristics had a P≤0.1. Items "spiritual support for family", "support from social workers", and "support from pastors" were excluded since more than 30% of the responses were either missing or deemed not applicable. Thus, a total of 14 covariates were analysed in the multivariable analysis. The independent factors identified were "concern and caring for patients", "agitation management", "concern and caring for family", "frequency of communication by nurses", "physician skill and competence", "atmosphere of ICU", and "atmosphere of ICU waiting room" (Table 3). In the multivariable analysis of satisfaction with role in decision-making, 16 covariates including "age of respondent", "sex of respondent" (with P values of 0.005 and 0.08, respectively in the univariate analysis), and all items in part two of the questionnaire excluding item "given right amount of hope" (P=0.214 in univariate analysis) were tested. Independent factors identified were "honesty of information", "completeness of information", "control over care", "agreement within family regarding care patient received", "satisfaction with amount of health care", and "age of respondent ≥47 years" (Table 3).

Performance-importance plots identified the following items as being more important but performed less satisfactorily: "atmosphere of ICU

TABLE I. Baseline characteristics of respondents and patients (n=736)

Characteristic	No. (%) or median (interquartile range)
Respondents	
Sex	
Female	421 (57.2)
Male	315 (42.8)
Age (years)*	47 (38-55)
Relationship with patient	
Children	350 (47.6)
Spouse	164 (22.3)
Parent	87 (11.8)
Sibling	81 (11.0)
Others†	54 (7.3)
Prior experience with ICU‡	
No	513 (69.7)
Yes	218 (29.6)
Lives with patient before current admission	
No	354 (48.1)
Yes	382 (51.9)
Patients	
Sex	
Female	290 (39.4)
Male	446 (60.6)
Age (years)	68 (55-80)
Ethnic group	
Asian	728 (98.9)
Caucasian	2 (0.3)
Others	6 (0.8)
ICU admission diagnosis	
Medical	502 (68.2)
Postoperative	234 (31.8)
No. of co-morbid disease	
None	139 (18.9)
1	186 (25.3)
2	178 (24.2)
3	233 (31.7)
APACHE II score	23 (17-29)
Mechanical ventilation	
No	183 (24.9)
Yes	553 (75.1)
ICU length of stay (days)	5 (3-10)
ICU survival	
Survived	672 (91.3)
Died	64 (8.7)

Abbreviations: APACHE = Acute Physiology And Chronic Health Evaluation; ICU = intensive care unit
* Total No. = 716
† Others included in-laws, grandparent, grandchildren, cousin, aunt, nephew, and niece
‡ Total No. = 731

waiting room", "atmosphere of ICU", "agitation management" (overall care), and "satisfaction with amount of health care" (decision-making) [Fig 1].

Discussion

This is the first ICU family satisfaction survey published in Hong Kong, and was conducted following implementation of the FAME programme in 2012. Following a small-scale survey carried out by PYNICU in 2010 (written communication, HL Wu, 2012), staff awareness about the importance of family satisfaction has increased. Family satisfaction was added to the regular agenda at our weekly business meetings, where comments and feedback from NOKs were discussed. These discussions led to various measures to improve communication (unsolicited nurses' update during visiting hours), access to information (information booklets in waiting rooms and noticeboard displays for families), and facilities (chairs for families at bedside, televisions for awake patients, and refurbishment of the waiting rooms). This survey showed high satisfaction scores in 2012 to 2014 that were similar to figures reported around the world (Fig 2[16-18] as well as the multicentre Canadian database)—a German study reported their mean FS-ICU/Total, FS-ICU/Care, and FS-ICU/DM as 78.3 ± 14.3, 78.6 ± 14.3, and 77.8 ± 15.6[16]; a Swiss study reported scores of 78 ± 14, 79 ± 14, and 77 ± 15[17]; and an American study achieved scores of 76.6 ± 20.6, 77.7 ± 20.6, and 75.2 ± 22.6, respectively.[18] Nonetheless the Canadian centres were able to achieve a significantly better result in most items and in the summary scores. This might be explained by cross-cultural (different expectations from families), as well as administrative differences (nurse-patient and doctor-patient ratios), but it may also indicate room for further improvement.

Independent factors that affected satisfaction with overall care and identified by this study can be grouped into: care of the patient and family (concern and caring for the patient and family; agitation management), professional care (frequency of communication by nurses; physician skill and competence), and the ICU environment (atmosphere of the ICU and its waiting room). Consistent with prior studies, none of the patient's or respondent's characteristics, including the ICU survival status, was found to be independently associated with satisfaction of overall care.[16,19] Setting professional skills aside, the perceived physician competence and amount of concern and care shown to patients and their families were largely affected by the communication skill of the health care providers and their manner when interacting with patients and families. The importance of communication has been emphasised by numerous studies.[20-25] One study found that longer periods of communication between health care providers and

TABLE 2. Family satisfaction with overall care and role in decision-making, and benchmarking with Canadian multicentre database

	PYNICU, Hong Kong (present study)						Canadian multicentre database (CARENET)†		P value‡
	No.	Responses (%)*				Score (mean ± SD)	No.	Score (mean ± SD)	
		Excellent	Very good	Good	Fair	Poor				
Aspect of care: care of patient									
Concern and caring for patients	721	55.5	34.4	9	1.1	0	86.1 ± 17.6	2468	91.9 ± 15.4	<0.001
Pain management	676	36.7	44.5	15.8	2.5	0.4	78.6 ± 20.1	2382	89.0 ± 17.3	<0.001
Breathlessness management	590	38.5	40.8	16.8	3.6	0.3	78.4 ± 21.0	2286	89.2 ± 18.0	<0.001
Agitation management	578	33	39.3	21.3	6.2	0.2	74.7 ± 22.5	2244	84.8 ± 21.2	<0.001
Care of family									
Consideration of family needs	718	49.2	34.5	13.9	2.4	0	82.6 ± 19.9	2440	85.1 ± 21.5	<0.001
Emotional support for family	660	37.1	41.4	17.3	4.1	0.2	77.8 ± 21.1	2394	81.5 ± 23.2	<0.001
Spiritual support for family	412	30.8	33	21.8	14.3	0	70.1 ± 25.8	1584	78.8 ± 25.1	<0.001
Coordination of care	710	44.5	36.9	16.1	2.5	0	80.8 ± 20.2	2444	87.8 ± 18.5	<0.001
Concern and caring for family	720	50	35.7	12.1	1.9	0.3	83.3 ± 19.6	2450	86.4 ± 20.5	<0.001
Professional care									
Nursing skill and competence	724	45.6	39.2	13.5	1.7	0	82.2 ± 19.0	2454	92.3 ± 14.7	<0.001
Frequency of communication by nurses	729	45.8	37	14.1	2.7	0.3	81.3 ± 20.5	2448	85.4 ± 21.6	<0.001
Physician skill and competence	714	43.8	38.1	15	2.8	0.3	80.6 ± 20.6	2432	88.1 ± 19.2	<0.001
Frequency of communication by physicians	704	31.3	37.4	21.7	8.9	0.7	72.4 ± 24.3	2408	70.6 ± 29.7	0.887
Support from social workers	345	28.1	36.8	24.3	9	1.7	70.1 ± 25.1	1336	74.3 ± 29.6	<0.001
Support from pastors	228	26.8	32	28.9	11.8	0.4	68.2 ± 25.0	1238	77.8 ± 25.8	<0.001
ICU environment									
Atmosphere of ICU	717	23.8	40	25.4	10.6	0.1	69.2 ± 23.4	2436	80.1 ± 22.7	<0.001
Atmosphere of ICU waiting room	663	21.9	39.7	27	11	0.5	67.9 ± 23.6	2370	64.9 ± 29.3	0.201
Overall satisfaction with care	**729**	**45**	**39.9**	**13.6**	**1.5**	**0**	**82.1 ± 18.8**	**2466**	**85.0 ± 20.5**	**<0.001**
Aspect of decision-making									
Ease of getting information	716	38.5	42.6	15.4	3.2	0.3	79.0 ± 20.4	2436	85.5 ± 20.5	<0.001
Understanding information	715	33.4	44.2	19.2	2.9	0.3	76.9 ± 20.4	2440	83.6 ± 20.2	<0.001
Honesty of information	712	36.1	43.1	17.3	3.4	0.1	77.9 ± 20.4	2438	84.4 ± 21.6	<0.001
Completeness of information	680	37.2	40.3	18.1	4.0	0.4	77.5 ± 21.5	2442	82.8 ± 23.2	<0.001
Consistency of information	696	32.0	45.0	19.1	3.9	0	76.3 ± 20.4	2396	78.3 ± 25.6	<0.001
Inclusion in decision-making	695	30.5	36.5	29.5	1.9	1.6	73.1 ± 22.6	2402	75.4 ± 30.3	<0.001
Involved at the right time in decision-making	638	86.7	-	12.7	-	0.6	93.0 ± 18.2	2204	92.7 ± 21.8	0.266
Received appropriate amount of information	641	90.3	-	-	-	9.7	90.3 ± 29.6	2246	89.3 ± 30.9	0.460
Had enough time to think in decision-making process	668	85.9	-	-	-	14.1	85.9 ± 34.8	2184	89.8 ± 30.2	0.005
Supported during decision-making	638	23.0	24.3	46.9	5.3	0.5	66.0 ± 22.7	2246	72.1 ± 25.8	<0.001
Control over care	685	37.2	37.7	15.5	5.8	3.8	74.7 ± 26.3	2336	68.3 ± 28.8	<0.001
Given right amount of hope	693	81.1	-	11.1	-	7.8	86.7 ± 29.7	2316	87.8 ± 27.8	0.582
Agreement within family regarding care patient received	702	9.3	74.8	13.2	2.6	0.1	72.6 ± 14.4	2330	79.8 ± 22.6	<0.001
Adequate time to address concerns and answer questions	644	80.7	-	-	-	19.3	80.7 ± 39.5	2212	90.2 ± 29.7	<0.001
Satisfaction with amount of health care	704	23.2	46.6	29.4	0.6	0.3	72.9 ± 18.8	2420	83.5 ± 22.7	<0.001
Overall satisfaction with role in decision-making	**694**	**17.9**	**56.5**	**24.9**	**0.3**	**0.4**	**72.8 ± 17.2**	**2308**	**76.3 ± 25.6**	**<0.001**

Abbreviations: CARENET = the Canadian Researchers at the End of Life Network; ICU = intensive care unit; PYNICU = Department of Intensive Care, Pamela Youde Nethersole Eastern Hospital; SD = standard deviation
* Because of rounding, not all percentages total 100
† Written communication, Daren Heyland, Feb 2014
‡ P value when each item score of PYNICU and CARENET was compared using Mann-Whitney U test

TABLE 3. Factors independently associated with complete satisfaction

	Odds ratio (95% confidence interval)	P value
Aspect of care (n=445)*		
Concern and caring for patients	2.35 (1.06-5.19)	0.035
Agitation management	4.15 (2.00-8.61)	<0.001
Concern and caring for family	2.76 (1.29-5.90)	0.009
Frequency of communication by nurses	2.60 (1.31-5.15)	0.006
Physician skill and competence	3.44 (1.75-6.76)	<0.001
Atmosphere of ICU	4.77 (1.54-14.78)	0.007
Atmosphere of ICU waiting room	5.86 (1.70-20.19)	0.005
Aspect of decision-making (n=524)†		
Honesty of information	4.29 (1.81-10.21)	0.001
Completeness of information	2.75 (1.16-6.55)	0.022
Control over care	2.32 (1.28-4.22)	0.006
Agreement within family regarding care patient received	3.34 (1.51-7.38)	0.003
Satisfaction with amount of health care	6.56 (3.54-12.15)	<0.001
Age of respondent ≥47 years	2.70 (1.47-4.93)	0.001

Abbreviation: ICU = intensive care unit
* All part 1 items except for "spiritual support for family", "support from social workers", and "support from pastors" were included in the analysis
† Age and sex of respondents, and all part 2 items except for "given right amount of hope" were included in the analysis
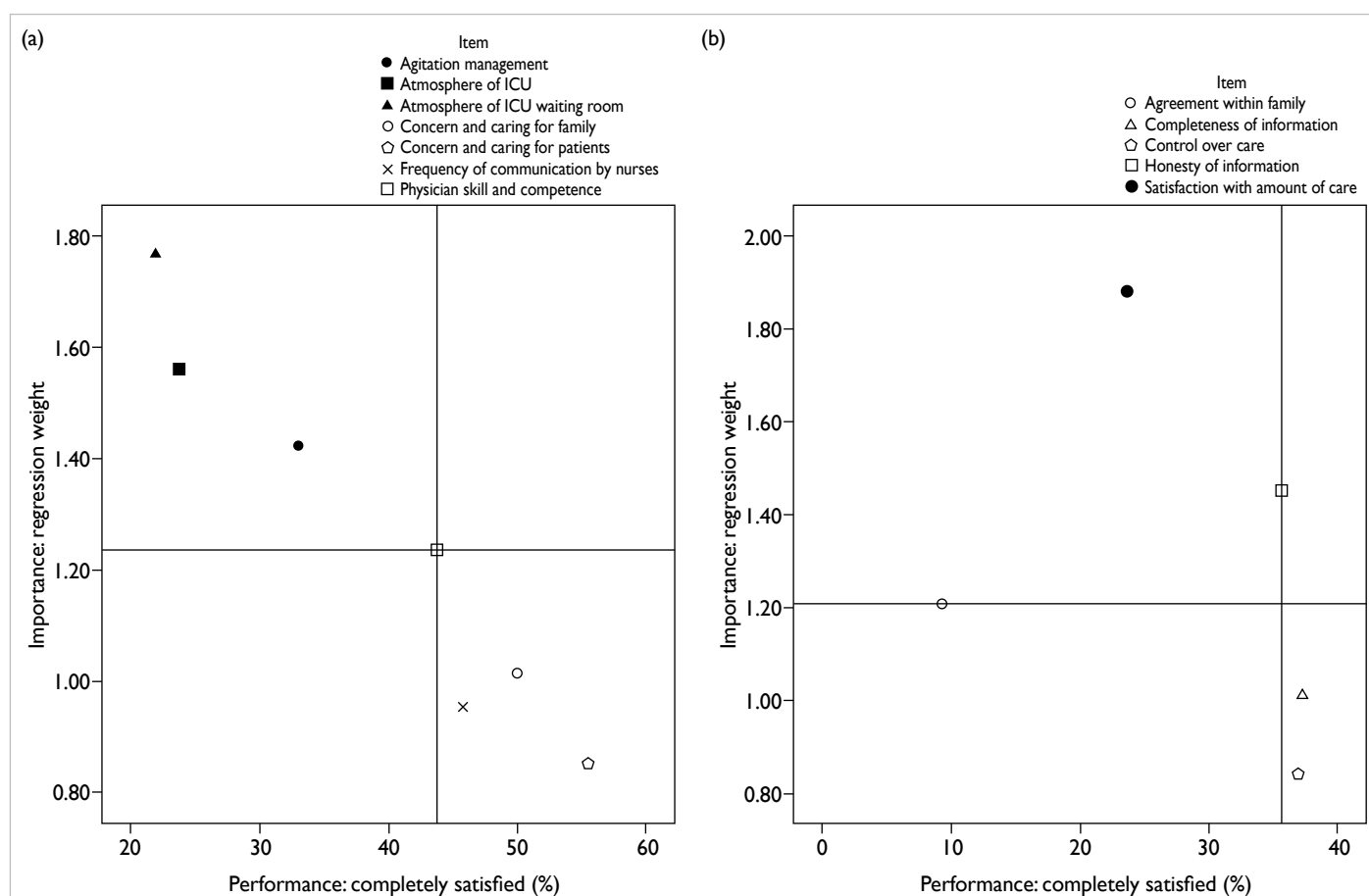

FIG 1. Performance-importance plots of satisfaction with (a) overall care and (b) role in decision-making
(a) Horizontal and vertical lines indicate the medians of regression weights (1.236) and performances (43.8), respectively
(b) Horizontal and vertical lines indicate the medians of regression weights (1.207) and performances (35.7), respectively
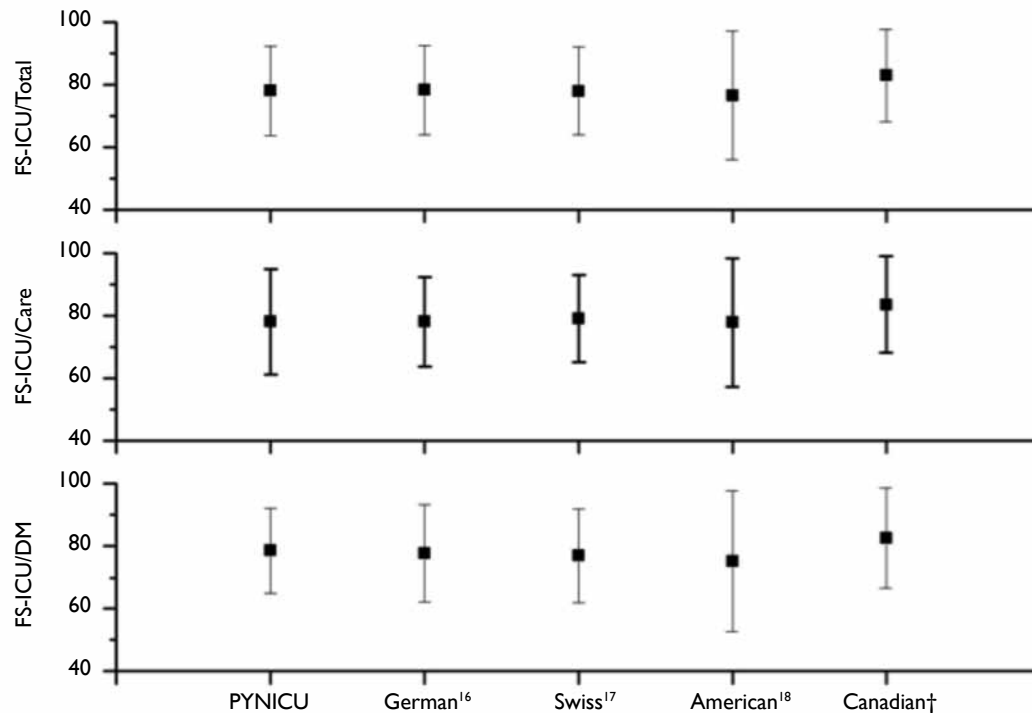Abbreviation: ICU = intensive care unit

FIG 2. Comparison of mean total and subscores across centres*[16-18]
Abbreviations: FS-ICU = Family Satisfaction in the Intensive Care Unit questionnaire; PYNICU = Department of Intensive Care, Pamela Youde Nethersole Eastern Hospital
* Subscores for satisfaction with overall ICU care (FS-ICU/Care) and role in decision-making (FS-ICU/DM), and a total score (FS-ICU/Total) are shown, with error bars denoting standard deviations
† From a multicentre Canadian database (written communication, Daren Heyland, Feb 2014)

families was associated with reduced anxiety among family members of ICU patients.[24] They reported a median (range) time of staff contact as 10 (1-60) minutes. In addition to the duration, a proactive, structured, and multidisciplinary communication strategy that incorporated the five objectives in the mnemonic "VALUE" (to Value and appreciate what the family members said, to Acknowledge the family members' emotions, to Listen, to ask open-ended questions that would allow the caregiver to Understand who the patient was as a person, and to Elicit questions from family members) was shown to lessen symptoms of anxiety, depression, and post-traumatic stress disorder.[25] Education and training in communication skills, especially the power of listening and to allow families more opportunity to speak during conferences also improved family satisfaction in the ICU.[26] It is also essential to diagnose the root cause of any communication problem.[15] Removing barriers in the health care system that discourage communication, for example heavy workload rendering insufficient time spent with families and restrictive visiting policies, would be beneficial.[27]

Factors in the left upper quadrant of the performance-importance plots (Fig 1) had greater regression weights but performed less satisfactorily, and therefore warrant more urgent attention. Among these were the ICU and waiting room environment. The questionnaire items do not specify the particular areas of concern that individual families had in mind, but responses to the three open-ended questions were illuminating. Comments related to the ICU environment focused on the availability of facilities for patients (visual and audio entertainment devices) and their families (chairs and toilet), ICU noise level, room temperature, space, and privacy. In fact, the ICU environment has been repeatedly identified as a factor that affects satisfaction.[13,18,19] One study found that migration of an ICU with multiple beds in one ward to another with single-room design significantly improved family and patient satisfaction.[13] These findings offer opportunities for improvement, and also provide valuable information for administrators when designing a new ICU.

Agitation management also warranted more urgent attention (Fig 1a). Although evidence supports maintenance of a light rather than deep

level of sedation in adult critically ill patients to shorten duration of mechanical ventilation and ICU length of stay,[28,29] a balance needs to be struck to prevent excessive pain, agitation, or adverse experiences that are associated with a higher incidence of post-traumatic stress disorder in ICU survivors and could negatively impact their families.[30] The revised 2013 version of Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult ICU Patients has recommended routine monitoring of the depth of sedation and targeted titration of preferably non-benzodiazepine sedatives.[31]

Our subscore for decision-making was higher than that for overall care, in contrast to the overseas counterparts.[16-18] We do not know if this is unique to the Chinese population since no other Chinese survey is available for comparison. One interesting finding was that younger respondents were less satisfied with their role in decision-making than older respondents. A similar observation has been made before.[32] In this information explosion era where electronic data are easily available, it can be understood that the younger generation wants to play a greater role in making decisions for their sick family member. A paternalistic approach will be less appealing to our future generation, and a deliberative model should therefore be adopted, with an emphasis on provision of complete and honest information to increase their sense of control over the care of their family member.

There are limitations to our study. First, the reason for refusal to participate in the survey was not documented and therefore we cannot rule out a response bias, where dissatisfied families might have declined participation in the survey, thus overestimating satisfaction. The high return rate compared with other studies (76.6% vs 27.8-75.4%[15-17]) would have lessened any effect of a response bias. Second, social desirability bias cannot be ruled out as most respondents completed the questionnaire while their sick family member was still under our care. We tried to minimise this by reassuring families of the confidentiality of their response and providing an envelope in which to return the completed questionnaire that was only opened by researchers at a later time. Third, questionnaires completed before ICU discharge might not reflect the whole ICU experience. Recruiting NOKs when the patient was nearing ICU discharge reduced premature data capture and prevented the otherwise increased administrative cost, increased recall bias, and anticipated lower response rate that would be involved when tracing eligible NOKs following ICU discharge. Fourth, FS-ICU has not been validated in the Chinese language. The Chinese (Taiwan) version provided by CARENET was modified by the co-authors wherein Taiwanese terms were replaced by ones familiar to the Hong Kong people and questions on the respondent's demographics were added as in the original English questionnaire. This modified version was circulated to and approved by all co-authors to ensure face validity. The high return rate of the questionnaire and the high response rate to questions (95.0%) indicated feasibility of this modified Chinese version.[11] Last, this was a single-centre study and thus generalisability of the results to other settings may not be appropriate.

Conclusions

Family satisfaction is an important measure of ICU quality. We found that families were satisfied with the ICU care we provided and with their role in decision-making. Their satisfaction was comparable with most overseas centres. Nonetheless there remains room for improvement when compared with the Canadian database. Future initiatives will focus on improving the ICU environment, agitation management, and enhancing communication with families.

Acknowledgements

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