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Family satisfaction in the intensive care unit: what makes the difference?

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Abstract *Purpose:* To assess family satisfaction in the ICU and to identify parameters for improvement. *Methods:* Multicenter study in Swiss ICUs. Families were given a questionnaire covering overall satisfaction, satisfaction with care and satisfaction with information/decision-making. Demographic, medical and institutional data were gathered from patients, visitors and ICUs. *Results:* A total of 996 questionnaires from family members were analyzed. Individual questions were assessed, and summary measures (range 0–100) were calculated, with higher scores indicating greater satisfaction. Summary score was 78 ± 14 (mean $\pm$ SD) for overall satisfaction, 79 ± 14 for care and 77 ± 15 for information/decision-making. In multivariable multilevel linear regression analyses, higher severity of illness was associated with higher satisfaction, while a higher patient:nurse ratio and written admission/discharge criteria were associated with lower overall satisfaction. Using performance-importance plots, items with high impact on overall satisfaction but low satisfaction were identified. They included: emotional support, providing understandable, complete, consistent information and coordination of care. *Conclusions:* Overall, proxies were satisfied with care and with information/decision-making. Still, several factors, such as emotional support, coordination of care and communication, are associated with poor satisfaction, suggesting the need for improvement.

Keywords Patient care · Intensive care unit · Professional–family relation · Quality indicators · Communication · Consumer satisfaction

Introduction

Severity-adjusted mortality and functional status have long been considered the main measures of outcome in medicine. Over time, interest has focused on additional aspects, such as quality of life [1, 2], processes of care [3] and resource use [4]. Recently, outcome research has been extended to the care of patients and their next of kin [5]. Quality of care, quality of information and decision-making, and quality of death and dying have been recognized as additional outcome parameters [6, 7].

Regardless of a patient's medical outcome, families have been recognized as a group with particular needs in the ICU. They are confronted with a complex technical environment and frequent changes in staff, and they have a multitude of expectations. The critical care environment may place a prolonged burden on patients [8, 9] and their next of kin [7, 10–12]. Families are not just visitors in the ICU; they experience the process of care along with their loved ones [13, 14]. Consequently, assessing family needs and satisfaction with care and information/decision-making must be an integral part of quality assessment in the ICU [15, 16].

First reports of families' opinions date from the 1970s [17]. However, only recently have instruments been validated—e.g., the CCFSS [18] and the FS-ICU [19–21]—which systematically assess family satisfaction.

Our hypothesis was that patient- and next of kin-related parameters as well as ICU-infrastructural parameters influence family satisfaction in the ICU. Thus, the primary aims of this study were to assess the level of satisfaction of next of kin in the ICU and to identify parameters associated with higher satisfaction. The secondary aim was to identify opportunities for improvement in family satisfaction.

Materials and methods

All certified adult ICUs in German-speaking Switzerland were invited to take part in the investigation. By definition, certified ICUs are operated as closed units. The study was approved by the ethics committees of all participating ICUs.

During a 4-month period in 2007, next of kin, e.g., family members, partners or close friends, of eligible patients were approached to participate. Inclusion criteria for patients were: length of stay in the ICU >2 days and age >16 years. Patients of all diagnostic groups were eligible. Inclusion criteria of next of kin were age >18 years, adequate knowledge of the German language and a minimum of two visits of more than 10 min each at the bedside. A maximum of two next of kin per patient were allowed in order to avoid overrepresentation of a single family.

Following an explanatory conversation and consent to participate, a validated German-language version [21] of the FS-ICU [19, 20] was distributed to next of kin. Using this instrument, overall satisfaction can be divided into two dimensions: "care" (including patient care, family care, professional care and ICU environment) and "information/decision-making" (covering information needs and family needs) [19, 21].

The following patient-specific data were recorded: emergency status upon admission, surgical status (surgery within 48 h before or after admission), age, gender, length of stay in the ICU (LOS-ICU), severity of illness upon admission (SAPS II), ICU survival status and diagnostic group (cardiovascular, gastrointestinal, respiratory and ear, nose and throat, neurological, metabolic, trauma, burn and other). For analysis, the following diagnostic groups were combined due to the small number of patients: trauma and burn; neurological, metabolic and other.

Factors related to next of kin included age, gender, relationship to patient (spouse or partner; adult child; sibling, parent or other), educational level (university degree or equivalent; vocational training or equivalent; no certified professional training) and number of visits per week.

Structural and process parameters of ICUs were assessed according to the minimal data set of the Swiss Society of Intensive Care Medicine (www.ssicm.ch): type of hospital (public or private), university affiliation; presence of an emergency department in the hospital with a certified attending physician (7 days, 24 h); number of beds in the ICU; type of ICU (interdisciplinary/medical/surgical/specialized ICU: burn, trauma); number of physicians per bed; patient:nurse ratio, i.e., number of patients per bedside nurse; presence of a dedicated family/waiting room; written formal admission and discharge policy; visiting hours (liberal vs. restricted, i.e., >6 vs. <6 h/day); information policy (structured formal information for every patient one to two times a day vs. information on demand); and availability of written information (none, short general information, extended information).

Analysis of individual satisfaction items were performed as suggested [19], with rescaling of answers from the 5-point Likert scale to values between 0 and 100, with higher numbers indicating greater satisfaction. There were four questions where a Likert scale was not appropriate [19]. For these questions, the distribution of answers among different degrees of satisfaction was calculated. The summary score FS-ICU$_{total}$ (for overall satisfaction) and subscales were calculated as described previously [20]. The subscales were FS-ICU$_{care}$ for care and FS-ICU$_{dm}$ for information/decision-making. Performance–importance plots were constructed to assess the degree of satisfaction and the correlation of each individual item to the summary scores [22]. Each point on the

plot refers to one specific item in the questionnaire (see Fig. 2). On the *x* axis, the percentage of ratings given as "excellent" for this specific item is given. On the *y* axis, the correlation (Spearman's correlation coefficient) of the item with a summary score is shown. Items with a low degree of satisfaction and a high correlation (upper left quadrant, marked "A") can be identified as deserving more urgent improvement. In contrast, items with a low degree of satisfaction but a low correlation (quadrant "C") may be classified as less important.

Satisfaction scores were analyzed using univariable and multivariable multilevel linear regression models with three levels: (1) ICUs, (2) patients and (3) next of kin. These models were fitted using the "xtmixed command" implemented in Stata (StataCorp, College Station, TX), and included random coefficients at the level of ICU and of patient. These models appropriately account for the clustered nature of the data introduced by the multiple levels [23]. To include categorical characteristics, appropriate indicator variables were constructed and included in the models (e.g., to include the four ICU types, indicator variables for medical, surgical and trauma ICU were included). Continuous characteristics like SAPS II score or age were included continuously as linear terms. From these regression models we report parameter estimates and the 95% confidence intervals, as well as the *P* value testing the hypothesis whether the parameter equals zero. A *P* value <0.05 was considered statistically significant.

Results

Twenty-three out of 56 (41%) adult Swiss-German ICUs participated in the study. Details of participating ICUs are given in Table 1. During the study period, 2,387 patients stayed in the ICUs for over 48 h. A total of 1,321 eligible next of kin consented and received a questionnaire, and 1,013 questionnaires were returned. Seventeen questionnaires were excluded because they were returned empty except for personal remarks. Thus, 996 next of kin participated in the investigation, resulting in a return rate of 75.4%. For 114 patients, two next of kin returned questionnaires, so that 882 patients were represented. Of all questions ($n = 33,864$) in all analyzed questionnaires, 2,065 answers were left empty; thus, 93.9% of all questions were answered. Questions left empty most often were those concerning social work and pastoral staff, who are not present in most Swiss ICUs on a regular basis.

Demographic data of patients and next of kin are presented in Tables 2 and 3. Overall, family satisfaction was rated with 78 ± 14 (mean $\pm$ SD) out of 100 points, and 79 (71–89) was the median (25th–75th percentile). Satisfaction with care was rated slightly higher at 79 ± 14, 80 (71–90), as compared to information/decision-making with 77 ± 15 points, 78 (69–88), see Fig. 1.

Table 1 Participating ICUs

Parameter	Median (25th–75th percentile) or *n* (%)
University/non-university	7 (30)/16 (70)
Public/private	19 (83)/4 (17)
Interdisciplinary/surgical/ medical/other	16 (69)/3 (13)/2 (9)/2 (9)
Visiting hours per day $\geq 6/<6$	18 (78)/5 (22)
Waiting room: yes/no	9 (39)/14 (61)
Written information: detailed/ summary/none	8 (35)/6 (26)/9 (39)
Written admission/discharge criteria: yes/no	7 (30)/16 (70)
Emergency room 24/7: yes/no	18 (78)/5 (22)
Number of beds	10 (6.5–18.5)
Physicians per bed	0.7 (0.5–1.04)
Patient:nurse ratio	1.29 (1.05–1.49)

Data are presented as number and percentage or median and interquartile range (IQR), as appropriate

The performance–importance plot (Fig. 2) shows the rating of each individual question and the correlation with the summary measure overall satisfaction. The items in quadrant "A" that offer the most opportunities for improvement of overall satisfaction are: emotional support for proxy; consistency of information; completeness of information; understanding of information; general atmosphere in the ICU; coordination of care; assessment and treatment of agitation. Similarly, waiting room atmosphere and support during decision-making were generally given a poor satisfaction rating. However, the latter two items had only a minor correlation with overall satisfaction (quadrant "C").

Table 2 Demographic data of patients

Parameter	Median (25th–75th percentile) or *n* (%)
Patients *n* = 882	
Age	68 (56–76)
Gender male	574 (66)
Missing	9 (1)
Admission diagnostic group	
Cardiac	344 (39)
Respiratory/ear, nose and throat	102 (12)
Gastrointestinal	125 (14)
Neurologic/metabolic/other	194 (22)
Trauma/burn	80 (9)
Missing	37 (4)
Emergency admission, yes	578 (66)
Missing	16 (2)
SAPS II	32 (23–46)
Surgery, yes	452 (53)
Missing	25 (3)
Length of stay in the ICU	6 (3–11)
Discharged alive	801 (93)

Data are presented as number and percentage or median and interquartile range (IQR), as appropriate

Table 3 Demographic data of next of kin

Parameter	Median (25th–75th percentile) or n (%)
Next of kin $n = 996$	
Age	53 (43–65)
Gender male	291 (29)
Missing	17 (2)
Relationship	
Spouse/partner	474 (47)
Adult child	347 (35)
Sibling/parent/other	166 (17)
Missing	9 (1)
Education	
University degree	80 (8)
Craftsman	657 (66)
No special	204 (20)
Missing	55 (6)

Data are presented as number and percentage or median and interquartile range (IQR), as appropriate
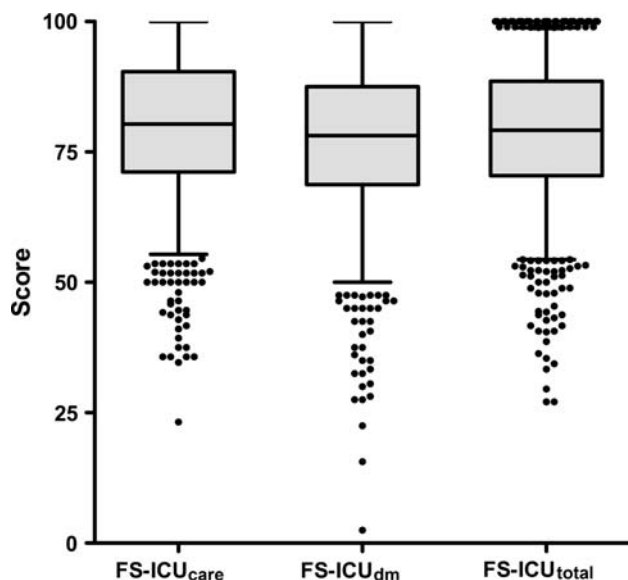

Fig. 1 Summary scores of family satisfaction in the intensive care unit (FS-ICU). Box plots for satisfaction with care (FS-ICU$_{care}$), satisfaction with information/decision making (FS-ICU$_{dm}$) and overall satisfaction (FS-ICU$_{total}$). *Boxes* show medians and quartiles, whiskers show 5th and 95th percentiles, *dots* are outliers

Results of the regression analysis concerning overall satisfaction (FS-ICU$_{total}$) are given in Table 4. Higher satisfaction with care was significantly associated with higher severity of illness, i.e., a higher SAPS II score, while lower satisfaction was noted with a written admission/discharge policy and with a higher patient:nurse ratio.

Further data regarding the individual satisfaction items are available in the web appendix. Also, results concerning the subscales satisfaction with care (FS-ICU$_{care}$) and satisfaction with information/decision-making (FS-ICU$_{dm}$), including the respective regression analyses and performance–importance plots, can also be found in the web appendix. Highest scores were reported for courtesy/respect for the patient and lowest scores for waiting room atmosphere. Family satisfaction with care was significantly lower if proxies were adult children and with a patient's admission diagnosis of gastroenterology. Further, there was a tendency toward higher satisfaction with information/decision-making in case of a patient's death and with longer visiting hours.

Discussion

In this multicenter study we analyzed family satisfaction in the ICU. Contrary to previous studies, which focused mainly on referral hospitals [24–27], we included all types of institutions where critical care services are delivered, such as university hospitals, large and small community hospitals, and private institutions. The main finding is that the level of satisfaction is associated to institution-related but also to patient-related characteristics. In our study, patient:nurse ratio, presence of written admission/discharge criteria and severity of acute illness were identified as factors. Such findings were not reported previously [24, 25, 27]. Even though overall satisfaction may seem high by numbers, relevant shortcomings still exist, leaving room for improvement. Possibilities to identify such fields of interest and opportunities for improvement found in the present sample will be discussed in the following paragraphs.

Satisfaction is a complex emotion, influenced by the gap between expectation and perception [22]. Satisfaction in the ICU is composed of different dimensions, two of these being "care" and "information/decision-making" [20]. Our data suggest that several parameters related to the ICU itself and to the patient can significantly influence overall satisfaction.

A higher patient:nurse ratio was associated with lower satisfaction. This suggests that with increasing workload, less time was available for an individual patient. Thus, there may have been fewer opportunities for care or for communication with families, which translated into lower satisfaction. A similar relation has recently been found for hospitals in general [28] as well as for ICUs in France [29]. These findings further concur with investigations concerning postoperative complications and resource use [30] as well as with infection rate [31], where a higher patient:nurse ratio has been associated with increased risk of complications and resource use.

The satisfaction of next of kin increased for patients who were more severely ill. For many of these patients, there is an increased need for communication and the opportunity for a more intense family–staff relationship. Further, when patients are severely ill their families may be satisfied to see their loved ones still alive and being taken care of. Consequently, expectations may not be as
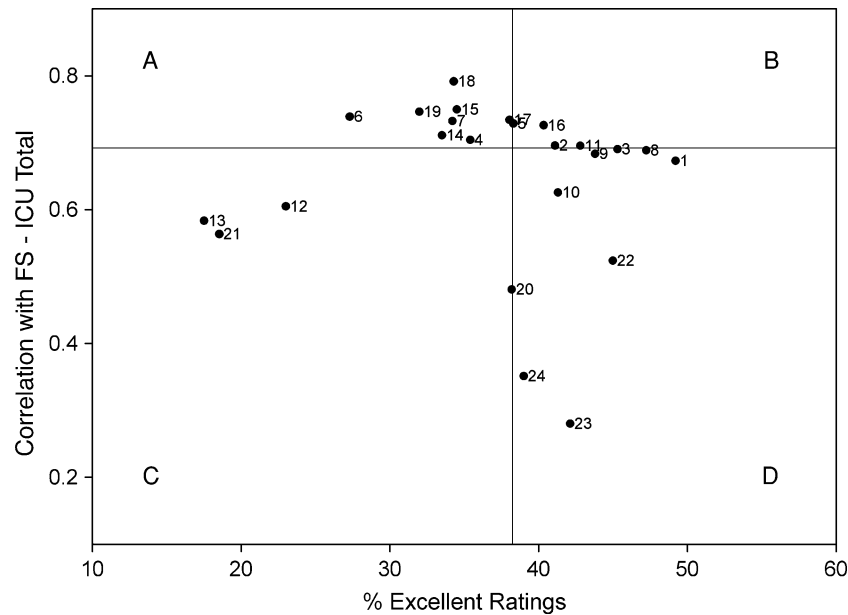
Fig. 2 Performance–importance plot for overall satisfaction (FS-ICU$_{total}$). Each point refers to one specific item in the questionnaire. On the *x*-axis, the percentage of ratings given as "excellent" for this specific item is shown; the further to the left a point is located, the lower the satisfaction for this individual item. On the *y*-axis, the correlation (Spearman's correlation coefficient) of the item with a summary score FS-ICU$_{total}$ is shown. Items with a low degree of satisfaction and a high correlation (upper left quadrant, marked "A") can be identified as deserving more urgent improvement. Gray vertical and horizontal bars delineate the median distributions. Each number refers to a question of the survey, as follows: *1* concern and caring for patient, *2* assessment and treatment of pain, *3* assessment and treatment of breathlessness, *4* assessment and treatment of agitation, *5* consideration of proxies' needs, *6* emotional support for proxy, *7* coordination of care, *8* concern and caring for proxy, *9* skills and competence of ICU nurses, *10* frequency of communication with ICU nurses, *11* skills and competence of doctors, *12* frequency of communication with doctors, *13* waiting room atmosphere, *14* general atmosphere in the ICU, *15* understanding of information, *16* ease of getting information, *17* honesty of information, *18* completeness of information, *19* consistency of information, *20* inclusion in decision-making, *21* support during decision-making, *22* control over patient's care, *23* agreement within your family, *24* amount of health care

high as during an uneventful course and can thus be fulfilled more easily. A recent study even found increased family satisfaction in connection with a patient's death [32]. Our family members showed a tendency towards greater satisfaction with information/decision-making in case of a patient's death, but not with overall satisfaction.

The lower satisfaction observed in ICUs with written admission/discharge policies was an unexpected finding and is difficult to explain. Indeed, some organizational parameters have been found to improve resource use and outcome [4]. In the present study, however, apart from the patient:nurse ratio, no other organizational parameter was associated with increased satisfaction. Our data do not allow further analysis of the negative association between written admission/discharge criteria and satisfaction.

The ultimate purpose of assessing family satisfaction is to introduce this information into a quality improvement program [22, 33]. However, only a few parameters have been identified that significantly influence overall satisfaction, and—contrary to previous findings [33]—in our study most of these are not under the caregiver's direct control. Nonetheless, the analysis points to several

opportunities for improvement. The performance–importance plots nicely indicate the parameters that influence overall satisfaction and that need to be addressed: in the graph the percentage of "excellent" rating of each item is plotted against the correlation with overall satisfaction. Items in quadrant "A" were rated as poorly satisfied, but had a high correlation with overall satisfaction. Therefore, to improve overall satisfaction, these items need to be addressed, e.g., emotional support for the proxy. In contrast, items in the lower left part of the plot, i.e., quadrant "C" were also rated as low, but correlated only little with overall satisfaction. Therefore, improving these items would improve overall satisfaction only little, e.g., waiting room atmosphere.

For improvement of a specific ICU, we suggest that performance–importance plots should be constructed for each individual ICU, as the results of the entire group of ICUs may not be applicable for an individual ICU. Further, the questionnaire also included open-ended questions that are not suitable for statistical analysis but show opportunities for improvement, as illustrated, e.g., by a note found on one of the returned questionnaires:

Table 4 Overall satisfaction FS-ICU$_{total}$

Item	Subgroup	Univariable		Multivariable		
		r	P	r	P	95% CI
Patient characteristics						
Length of stay	Per day more	0.06	0.15	0.04	0.40	−0.05, 0.12
SAPS II	Per point more	0.07	0.01	0.06	0.045	0.001, 0.11
Age	Per year older	−0.03	0.29	−0.02	0.55	−0.09, 0.05
Gender	Male	0		*		
	Female	−1.17	0.22			
Emergency status	Emergency	0		0		
	Elective	−1.58	0.11	−1.19	0.34	−3.65, 1.26
Surgery before admission	No	0		0		
	Yes	0.14	0.87	1.13	0.33	−1.15, 3.41
Discharge status	Alive	0		0		
	Dead	2.99	0.08	2.57	0.15	−0.92, 6.06
Diagnostic group	Cardiovascular	0		0		
	Respiratory	1.83	0.21	2.33	0.14	−0.76, 5.42
	Gastroenterology	−2.47	0.07	−2.58	0.07	−5.36, 0.20
	Neuro/meta/other	−0.86	0.46	−0.58	0.65	−3.07, 1.91
	Trauma/burn	2.19	0.18	2.27	0.25	−1.63, 6.18
Family member characteristics						
Age	Years	0.06	0.04	*		
Gender	Male	0		0		
	Female	−0.19	0.84	0.72	0.60	−1.52, 2.20
Education	No specialized	0		*		
	Apprenticeship	−0.84	0.59			
	University	−1.26	0.47			
Relationship	Spouse, partner	0		0		
	Adult child	−1.62	0.07	−1.50	0.13	−3.42, 0.42
	Parent/sibling/ other	0.84	0.49	0.35	0.78	−2.14, 2.83
ICU characteristics						
ICU type	Interdisciplinary	0		0		
	Medical	3.23	0.04	0.58	0.85	−5.26, 6.42
	Surgical	1.36	0.21	−0.66	0.75	−4.69, 3.38
	Trauma/burn	3.86	0.12	2.58	0.62	−0.71, 12.88
Hospital type	Public non-university	0		0		
	Public university	1.49	1.17	2.37	0.31	−2.23, 6.97
	Private	1.60	0.17	1.26	0.49	−2.31, 4.84
n beds		0.01	0.92	−0.10	0.54	−0.42, 0.22
Waiting room	No	0		0		
	Yes	−1.43	0.12	0.81	0.71	−5.11, 3.49
Written admission/discharge criteria	No	0		0		
	Yes	−1.05	0.29	−4.32	0.04	−8.45, −0.19
Visiting hours	<6 h/day	0		0		
	>6 h/day	−1.00	0.39	3.85	0.21	−2.21, 9.91
Information policy	On demand	0		0		
	Periodic 1−2×/day	0.19	0.84	−1.75	0.36	−5.54, 2.03
Written information	None	0		0		
	Summary	1.28	0.28	2.14	0.40	−2.90, 7.18
	Detailed	0.98	0.35	0.21	0.92	−4.05, 3.64
n MD/bed		1.22	0.33	−2.70	0.29	−7.73, 2.34
Patient:nurse ratio		−3.40	0.03	−8.08	0.02	−14.67, −1.49
Emergency room	No	0		0		
	Yes	−0.92	0.44	0.65	0.78	−5.15, 3.86

Results of univariable and multivariable multilevel linear regression analysis

r Regression coefficient of the respective item with FS-ICU$_{total}$

*Not included in multivariable analysis due to large number of missing values

"drenched in tears, I left to go home after having waited for an hour and a half."

It is not to be expected that 100% of next of kin are perfectly satisfied with a particular item. In fact, mean values of satisfaction range around 80 points, and the overall result may thus seem quite satisfactory. In our study, however, even for those items with best satisfaction, the rate of answers given as "excellent" did not exceed 50%. Taking into account that responders possibly might overstate their level of satisfaction, we conclude

that there is still significant room for improvement in all domains.

It may be inappropriate to focus exclusively on the greatest deficits, as a moderately dissatisfied consumer could be more amenable to improvement than a vehemently hostile one [22]. Further, small interventions, such as communicating in understandable terms [34], providing more opportunities for families to speak [35] or not sending families away in times of crisis [36], may have a large impact, and may reduce the families' risk of depression and post-traumatic stress disorder [7]. In addition, more support and appreciation of family members' contributions to care may provide families opportunities for intimacy [14].

In our study, lack of a waiting room, information only on demand and fewer visiting hours per day were not associated with lower satisfaction. Family members left alone in a waiting room may experience "the emotional hell of waiting" [37]. With no or fewer waiting rooms, next of kin may be admitted sooner to the patient's bed. Contrary to a previous study that found more satisfaction when an information leaflet was provided [29], availability of written information did not influence our families' satisfaction. It may be possible that the quality of a personal briefing is more important than the duration of a talk or that many of our family members are emotionally too exhausted to understand a detailed pamphlet.

Heyland et al. [25] analyzed satisfaction data in a binary way; i.e., excellent vs. less-than-excellent satisfaction. However, in our opinion a logistic regression analysis oversimplifies the complex nature of satisfaction. As an example, how large is the difference between satisfaction rated "excellent" and satisfaction judged only "very good?" Linear regression models using the full range of information are able to produce more stable parameter estimates than a logistic analysis [38] and have more statistical power. To take into account the different hierarchical levels that influence satisfaction (ICU level and patient level), our linear regression analysis accounted for the multilevel structure of the data [23].

A recent multicenter study of patient satisfaction identified hospitals that were "best in class" [28], and benchmarking is commonly performed to improve performance among ICUs and hospitals [39]. However, differences in infrastructure, patient selection, medical services and other parameters may impede direct comparison between units. These parameters must be considered when comparing private and small community ICUs as well as referral centers such as the ones that participated in our study.

Limitations of the study

One limitation of our study is that we do not know the opinions of non-participating families. In Switzerland four official languages are spoken, and approximately 20% of inhabitants are foreigners. Thus, many family members were not fluent enough in German to participate in the study. Further, some patients had no visitors, or these did not consent to participate. We did not assess the reasons why next of kin of some patients could not be included in the investigation. Furthermore, posttraumatic stress disorder and depression have been observed in next of kin [8–11], and it is conceivable that non-responding next of kin suffered from more stress and thus declined to answer. Nonetheless, a response rate of over 75% is rather high, and higher than reported in previous studies [1, 40].

A second limitation may have been that the minimum time for a visit was defined as at least two visits of >10 min each. This may be considered too short a time to assess a patient's care and the provision of adequate information. However, patients' median length of stay was 6 days, with 70% of all visitors appearing daily and a further 20% of visitors coming every other day. Thus, we assume that visitors had enough time to form an opinion about delivery of care and information.

Conclusions

Our study provides insight into family satisfaction in the ICU. Only a few parameters could be identified that influence satisfaction of next of kin. These factors were: severity of illness, patient:nurse ratio and written admission/discharge criteria. Even though satisfaction was generally rated good, our data suggest that there are opportunities for improvement, most notably with respect to emotional support for proxies, providing understandable, complete, consistent information and coordination of care.

Appendix

List of participating ICUs (in alphabetical order of the head of department): Dr. U. Denzler, Kantonsspital Schaffhausen; Dr. P. Eichhorn, Spital Schwyz; Dr. S. Elsasser, Medical ICU, Kantonsspital Luzern; Dr. D. Friedli, Klinik St. Anna, Luzern; Dr. R. Grimm, Kantonales Spital Sursee-Wolhusen; PD Ch. Haberthür, Surgical ICU, Kantonsspital Luzern; Dr. A. Haller,

Kantonsspital Winterthur; Dr. A. Heise, Regionalspital Thun-Simmental; Dr. R. Knöpfli, Klinik Beau Site, Bern; Dr. R. Lötscher, Kantonsspital Liestal; Dr. R. Lussmann, Surgical ICU, Kantonsspital St. Gallen; Prof. M. Maggiorini, Medical ICU, University Hospital Zürich; Dr. D. Marugg, Spital Samedan; Dr. G. Niedermeyer, Spital Davos; Prof. H. Pargger, Surgical ICU, University Hospital Basel; Dr. D. Ryser, Regionalspital, Burdgorf; Prof. E. Schmid, Cardiac Surgical ICU, University Hospital Zürich; PD. D. Schmidlin, Klinik im Park, Zürich; Dr. M. Stiner, Klinik Hirslanden, Zürich; Prof. R. Stocker, Burn Unit and ICU for Trauma, University Hospital Zürich; Prof. J. Takala, Bern University Hospital, Bern; Dr. L. Weibel, Stadtspital Triemli, Zürich.

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