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Research Article

Association between psychosocial factors and satisfaction with communication in family members of intensive care unit patients during COVID-19 pandemic: An exploratory cross-sectional study

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ABSTRACT

Objective: To investigate the relationship between satisfaction with communication and perceived stress, depressive symptoms and perceived social support among family members of critically ill.
Research Methodology/Design: Exploratory, cross-sectional study was conducted.
Setting: Private teaching hospital in Santiago, Chile.
Main Outcomes Measures: Family members of critically ill patients with 3–7 days of stay and respiratory support were approached. Questionnaires were used to assess satisfaction with communication (Family Satisfaction in the Intensive Care Unit-24), perceived stress (Perceived Stress Scale-10), depressive symptoms (Patient Health Questionnaire-9) and perceived social support (Medical Outcomes Study Social Support Survey). The relationship between satisfaction with communication and relevant variables was investigated using bivariate analyses and a beta regression.
Results: The study included 42 family members, with 71.4% being female and 52.4% having prior critical care experience. There was a positive correlation between perceived stress and depressive symptoms ($r = 0.32$, $p = 0.039$). According to the beta regression, perceived social support (B; 95% confidence interval, 0.44 [1.05–2.29]) and the number of calls with unit staff (0.17 [1.06–1.32]) were positively associated with satisfaction with communication but negatively with college education (−1.86 [0.04–0.64]) and perceived stress (−0.07 [0.87–0.99]).
Conclusion: Psychosocial factors, such as higher educational level, perceived stress and perceived social support, can influence family members' evaluation of communication with staff. Current communication practices in acute care settings should be adapted to family members' psychosocial context to improve their satisfaction with the communication process.
Implications for clinical practice: Critical care professionals must be aware of the influence of family member-related factors on the quality and effectiveness of the communication process. Psychosocial features of the family members are likely to impact their satisfaction with communication and should be assessed on admission and during their stay to assist clinicians to adjust and improve their communication practices.

Introduction

Patients and family members experience stress when admitted to an intensive care unit (ICU) (Boulton et al., 2022; Kohi et al., 2016). Psychological distress among ICU family members has been widely described in the literature (Haines et al., 2015; van Beusekom et al.,

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2016) and is often related to the patient's life-threatening condition, prognosis uncertainty and unfamiliar technological environment (Abdul Halain et al., 2022). Family members have specific needs during their stay in the ICU that may be unknown or undervalued by the ICU team (Padilla Fortunatti, 2014), influencing family members' perceptions of the quality of the various dimensions of the ICU experience.

Within the literature, information and communication needs have been identified as the most important for ICU family members (Kohi et al., 2016; Padilla Fortunatti, 2014) and a key factor for family satisfaction (Fumis et al., 2008; Rothen et al., 2010). Adequate communication with family members may improve their emotional adaptation to the patient's serious condition (Fumis et al., 2008) and psychological distress symptoms (Damghi et al., 2008; Sundararajan et al., 2012). On the other hand, inadequate communication can mislead ICU family members' expectations, heighten fears and doubts and promote a loss of trust in the ICU staff (Damghi et al., 2008; Fumis et al., 2008). From a cognitive perspective, ICU family members' stress may impair functions related to communication and decision-making, such as information organisation and processing, flexible reasoning, attention and reaction time (Moretta et al., 2017; Sandi, 2013), generation of alternative solutions and assessment of available options (Gok and Atsan, 2016).

The psychological distress associated with an ICU admission affects the integrity and functioning of the patient's remaining family members (Abdul Halain et al., 2022), dampening their coping efforts and ability to support and work together to manage the stressful event. Perceived social support (PSS) is defined as the perception of the availability of various types of resources (e.g. informational, emotional, or instrumental) that can be provided by the individual's social network as a significant moderator of stress (e.g. family and friends) (Cohen, 2004). Although PSS has been identified as a coping strategy among ICU family members (Rückholdt et al., 2019), studies investigating the relationship between PSS and psychological distress are limited, with conflicting results (Chang et al., 2018; Nadig et al., 2016).

Although the psychological response of family members to ICU admission has been studied, the ongoing COVID-19 pandemic has had a global impact. Since January 2020, approximately 4,540,000 COVID-19 cases and over 60,000 deaths have been reported in Chile (https://covid19.who.int/region/amro/country/cl), causing a significant impact on the healthcare system, including ICU. Pandemic-related visiting restrictions became highly prevalent in acute care settings, limiting family members' proximity to the patient and changing the amount (and quality) of communication with ICU staff (Azoulay and Kentish-Barnes, 2020). In this case, ICU staff had to switch from in-person interactions with family members to phone and/or video calls (Boulton et al., 2022; Tabah et al., 2022). Furthermore, COVID-19-related lockdowns and moving restrictions may have had an impact on psychological distress and PSS levels in the general population (Di Blasi et al., 2021) but to a greater extent among subjects who were burdened with additional burdens, such as ICU family members.

There is little evidence to date on the relationship between family members' psychosocial factors and perceived quality of communication with ICU staff, including during the COVID-19 pandemic. Given the social and sanitary context of the COVID-19 pandemic, this study aims to investigate the relationship between satisfaction with communication (SC) and perceived stress, depressive symptoms and PSS in family members of critically ill patients in Santiago, Chile, during the COVID-19 pandemic.

Materials and methods

Study design and setting

This study used an exploratory cross-sectional design and was conducted in a medical–surgical ICU of a private teaching hospital in Santiago, Chile between November 2020 and May 2021, during the COVID-19 pandemic. Concerning the interaction between family members and ICU staff, at the start of the pandemic, a communication protocol was established, which included a liaison ICU nurse acting as a coordinator for communication between the healthcare team and the patient's RFM. The protocol for communication included an initial phone call to the patient's relatives in which the RFM was identified and general information about the unit was provided. The staff ICU physician then called to provide at least one update on the patient's health status. The liaison nurse held video calls to clear up any confusion about information and RFM was able to see and speak with the patient whenever possible. The remaining members of the ICU interprofessional team (bedside nurse, physiotherapist and occupational therapist) held sporadic phone/video calls with the RFM and/or other family members depending on the patient's condition and staff availability.

Study subjects

Adult RFMs of critically ill patients who met the following inclusion criteria were considered eligible subjects: (a) being on respiratory support, (b) being $\geq$ 18 yr old, (c) ICU length of stay of 3 and 7 days at inclusion to study, and (d) communicating with ICU staff at least twice since ICU admission. Family members of patients receiving only comfort measures (e.g., palliative care) and those with an estimated survival time of $<$ 24 h were excluded. Only 1 RFM per patient was considered for the study. Because this was an exploratory study, the sample size was not determined a priori.

Data collection and study procedures

Two forms were used to collect sociodemographic and clinical data from RFMs and patients. Then, over the phone, four validated self-reported questionnaires were used to assess SC, perceived stress, depressive symptoms and PSS:

1. Satisfaction with communication: The SC subscale of the Family Satisfaction in the Intensive Care Unit-24 questionnaire (Padilla-Fortunatti et al., 2022a; Wall et al., 2007) was used. The SC subscale consists of eight items on a Likert scale ranging from 1 (*excellent*) to 5 (*poor*) and assesses family members' satisfaction with the frequency, honesty, understandability, ease of getting information and completeness of information provided by ICU staff. Likert scale responses are converted to a numerical scale ranging from 0 to 100 and the overall score is computed by averaging the scores of all items (range = 0–100). Higher scores indicate a higher SC (Wall et al., 2007). The SC dimension of the Chilean–Spanish version reported adequate reliability of $\alpha = 0.91$ (Padilla-Fortunatti et al., 2022a).
2. Perceived stress: The 10-item version of the Perceived Stress Scale (PSS-10) was used to assess how stressful a situation is to subjects (Cohen et al., 1983; Tapia et al., 2007). PSS-10 uses a Likert scale of 0 (*never*) to 4 (*always*) and the overall score is calculated by reversing positive statement items and then summing them all. The higher the overall score, the greater the perceived stress (range = 0–40) (Cohen et al., 1983). The internal consistency of the PSS-10 Chilean–Spanish version is $\alpha = 0.79$ (Tapia et al., 2007).
3. Depressive symptoms: The Patient Health Questionnaire (PHQ-9) was used to investigate DSM-IV depressive symptoms (Kroenke et al., 2001; Saldivia et al., 2019). PHQ-9 is scored on a Likert scale of 0 (*never*) to 3 (*almost all days*). The overall score is calculated by adding the scores of all the items (range = 0–27), with higher scores indicating a greater presence of depressive symptoms (Kroenke et al., 2001). Internal consistency for the Chilean–Spanish version of the PHQ-9 is reported to be $\alpha = 0.89$ (Saldivia et al., 2019).
4. Perceived social support: The Medical Outcomes Study Social Support Survey (MOS-SSS) was used to evaluate the subject's perceptions of the availability of emotional, instrumental and informational resources from their social network (Poblete et al., 2015; Sherbourne and Stewart, 1991). MOS-SSS consists of 18 items graded on a 1

(*never*) to 5 (*always*) Likert scale. The overall score is determined by averaging all items (range = 1–5), with higher scores indicating higher PSS (Sherbourne and Stewart, 1991). The Chilean–Spanish version of the MOS-SSS has an acceptable internal consistency of $\alpha = 0.89$ (Poblete et al., 2015).

Two ICU nurses who were part of the research team screened for eligible subjects on a daily basis. A research assistant called potential subjects and explained the study's aims and objectives. Subjects who verbally agreed to participate completed the questionnaires after reviewing the informed consent. All RFM responses were entered directly into a secure electronic database (KoBo toolbox). Similarly, data from patients' medical charts was extracted and entered into the database.

Data analysis

Descriptive statistics were used to analyse the data based on their distribution and nature (continuous vs categorical). Bivariate analyses were performed using Spearman's rank correlations, Mann–Whitney *U* test and Kruskal–Wallis test to characterise potential associations between variables. Finally, because the overall SC score follows a beta distribution and is bounded between 0 and 1, the association between it and other variables was investigated using beta regression models (Ferrari & Cribari-Neto, 2004). Cronbach's α was used to calculate the internal consistency of the questionnaires. All analyses were conducted using R Core Team (version 4.1.2; R Core Team, 2021), with native functions and the *betareg* package (Cribari-Neto & Zeileis, 2010) for beta regression. Variables included on the beta regression model were selected from theory and previous literature. The report of this study followed the recommendations of the STROBE guidelines (von Elm et al., 2008).

Ethics

This study was conducted following the principles of the Declaration of Helsinki. Approval from the Health Sciences Ethical Committee (IRB) at Pontificia Universidad Catolica (# 200702003) was obtained in August 2020. All subjects provided verbal informed consent and participated voluntarily.

Results

Sample characteristics

Forty-two subjects were recruited, with a median age of 40 yr and an interquartile range (IQR) of 16.3 yr, predominantly female (71.4%) and 52.4% ($n = 22$) of whom had prior ICU experience as RFMs (Table 1). The response rate was 21.1%, with the majority of RFMs (40.2%) being excluded because they no longer met inclusion criteria or the research team was unable to contact them. Then, data on patient characteristics were obtained for 85.7% ($n = 36$) of the sample, with a median age of 51 yr (IQR = 24.5 yr), 83.3% ($n = 30$) on mechanical ventilation and a median sequential organ failure assessment score of 7.9 (IQR = 3.3) (Table 2).

Descriptive data and bivariate analysis

Satisfaction with communication had a median (IQR) of 81.3 (25), 16.6 (5.2) for perceived stress, 9 (8) for depressive symptoms and 4.8 (0.8) for PSS. All questionnaires had acceptable reliability scores ($\alpha \geq 0.70$). Bivariate analyses (Tables 3 and 4) revealed a significant difference in depressive symptoms based on subjects' educational level ($p = 0.041$) and a significant positive correlation between perceived stress and depressive symptoms ($\rho = 0.32$, $p = 0.039$).

Table 1
Family members' sociodemographic characteristics.

Characteristic	*n*	%
Sex		
Female	30	71.4
Male	12	28.6
Age (Mdn, IQR)	40, 16.3	–
Kinship		
Spouse/ significant other	9	21.4
Adult Child	18	42.9
Other	15	35.7
Education		
Elementary	4	9.5
High School	15	35.7
Associate degree	6	14.3
College/University	17	40.5
Socioeconomic level [a]		
High	1	2.4
Medium	14	33.3
Low	27	64.3
Prior ICU experience (yes)	22	52.4
Living with the patient (yes)	20	47.6
Communication with ICU staff (Mdn, IQR)		
Number	7, 3.8	–
Length [b]	5, 5	–

Note. $N = 42$. ICU: intensive care unit, Mdn: median, IQR: Interquartile range.
[a] Self-reported.
[b] In minutes, on average.

Table 2
Patients' sociodemographic and clinical characteristics ($N = 36$).

Characteristic	*n*	%
Sex		
Female	7	19.4
Male	29	80.6
Lives in the regional capital (yes)	23	63.9
Insurance (private)	14	38.9
Admission source		
Ward	11	30.6
Emergency room	7	19.4
Transfer from another hospital	18	50.0
Mechanical ventilation (yes)	30	83.3
	Mdn	IQR
Age	51	24.5
SOFA score[a]	8	4
ICU length of stay[b]	6	2

Note. $N = 36$. ICU: intensive care unit, Mdn: median, IQR: Interquartile range, SOFA = Sequential Organ Failure Assessment.
[a] On family member's enrollment day.
[b] Until family member's enrollment day (N = 42).

Factors associated with Satisfaction with Communication

The proposed model included RFM's gender, age, kinship, education level, previous experience in ICU, number of calls between ICU staff and relatives, average length of calls, perceived stress score, social support score and depressive symptoms score. Table 5 shows all of the model's coefficients, which accounted for 27.9% of the variance in overall SC scores. Satisifaction with communication was found to be positively associated with PSS (95% confidence interval, 0.44 [1.05–2.29]) and the number of calls with ICU staff (0.17 [1.06–1.32]); conversely, a negative association was found with a college education (vs elementary; −1.86 [0.04–0.64]) and perceived stress (−0.07 [0.87–0.99]), holding remaining variables constant.

Discussion

To the best of our knowledge, this is one of the first studies to investigate the impact of psychosocial factors on RFM's perceptions of communication quality in an ICU during the COVID-19 pandemic.

Table 3
Bivariate analyses for sociodemographic variables regarding satisfaction with communication, perceived stress, depressive symptoms, and perceived social support.

	Satisfaction with communication			Perceived stress			Depressive symptoms			Perceived social support		
Variable	Mdn	IQR	*p*	Mdn	IQR		Mdn	IQR	*p*	Mdn	IQR	*p*
Sex			0.254			0.823			0.194			0.117
Female	84.4	26.5		19.5	7.6		11	8		4.85	0.74	
Male	75	17.9		15	8.7		7	9.3		4.62	1	
Relationship with the patient			0.961			0.603			0.550			0.433
Spouse/partner	81.2	12.5		16	3		9	5.95		4.82	0.76	
Adult child	81.2	29.9		19	9.2		12.5	8.8		4.82	0.56	
Other	84.4	25		19	7		8	8		4.41	1.71	
Education			0.401			0.673			**0.041***			0.805
Elementary	90.6	26.6		17.5	4.2		6.5	3.75		3.76	1.79	
High School	84.4	25		19	9.5		7.5	3.5		4.76	0.62	
Associate degree	93.3	16.4		20.5	6.8		16.5	1.8		4.76	0.67	
College/university	75	18.8		15	7		11	8		4.82	0.82	
Socioeconomic level[a]			0.762			0.096						0.390
High	75	0		9	0		0	0		5	0	
Medium	84.4	25		15	2		11	8		4.76	0.74	
Low	79.1	36.7		19.5	8.5		7.5	0.190		4.62	1.09	
Prior ICU experience			0.395			0.830			0.217			0.730
Yes	84.4	30.4		19	6.8		11	8		4.68	1.43	
No	79.7	17.2		16	10		8	9.75		4.76	0.76	
Living with the patient			0.713			0.810			0.844			0.110
Yes	81.2	29.1		17.5	6.4		11	7.5		4.38	1.62	
No	81.2	21.1		17	9.5		8	8		4.85	0.5	

Note. [a] self-reported. ICU: intensive care unit, Mdn: median, IQR: Interquartile range.
*$p < 0.05$.

Table 4
Spearmańs correlations between family membeŕs continuous variables.

	1	2	3	4	5	6
1. Satisfaction with communication	1					
2. Perceived stress	−0.22	1				
3. Depressive symptoms	0.080	**0.324***	1			
4. Perceived social support	0.280	−0.063	−0.072	1		
5. Age	0.035	−0.014	−0.042	−0.124	1	
6. Number of communications with ICU staff	0.289	0.156	−0.014	−0.013	0.272	1
7. Length of communications with ICU staff [a]	0.120	0.089	−0.102	−0.149	0.008	−0.1

Note. ICU: intensive care unit. [a] minutes.
*$p < 0.05$.

Although the characteristics of adequate communication between RFM and ICU staff have been extensively reported (Adams et al., 2017; Ågård et al., 2019), evidence on factors influencing SC related to RFM is limited and has primarily focused on facilitators from the perspective of ICU staff (Wittenberg et al., 2021). In our study, the number of phone conversations was positively associated with SC, which could be attributed to a variety of factors. First, the attending ICU physicians on the unit where the study was conducted had extensive ICU experience. Higher family satisfaction has been associated with information delivered by an experienced physician (Damghi et al., 2008; Omar et al., 2015), a multidimensional construct that includes communication with ICU staff as a core attribute (Padilla Fortunatti et al., 2021).

Besides, attending physicians rotated weekly in the ICU, allowing RFMs to be informed by the same physician 7 days a week. The relationship with the attending physician is critical due to the nature of the ICU admission, in which RFMs must act as a surrogate decision-maker (JanardhanIyengar et al., 2019). Furthermore, information about a patient's status should be delivered by the same physician on a regular basis (Mistraletti et al., 2020), because having more than two attending ICU physicians treating a patient has been associated with lower family satisfaction scores among RFMs (Johnson et al., 1998). The weekly rotation and experience of ICU physicians, along with the work of the liaison ICU nurse, may have increased SC scores by improving communication consistency, clarity and understandability, which could also explain why the number (but not the length) of phone calls was significantly associated with SC. Moreover, during the COVID-19 pandemic, fewer interactions between RFMs and physicians can have a negative impact on communication and trust in ICU staff (Azoulay et al., 2022).

Regarding the negative impact of educational level on SC scores, our findings are consistent with the findings of Hwang et al. (2014), who found that RFM with a high school education (as opposed to a college or graduate degree) were more likely to be completely satisfied with the frequency of communication with ICU physicians but did not describe the impact of educational level on remaining SC dimension items. According to the literature, RFMs with a higher educational level may be more aware of their rights and more demanding in several aspects of the ICU experience, such as communication frequency, exhaustiveness, clarity, or ease of access (Khalaila, 2013; Neves et al., 2009). Conversely, less educated RFMs may have lower communication standards and may agree to accept any type of information from ICU staff (Damghi et al., 2008).

During the COVID-19 pandemic, high levels of PSS were reported among RFMs of ICU patients (Azoulay et al., 2022), but studies on PSS and SC among ICU RFMs are few. A study found a positive relationship between PSS and RFM satisfaction with information, which is similar to our findings (Avcı and Ayaz-Alkaya, 2022). Nonetheless, the study was not conducted during the COVID-19 pandemic, and it used a different social support questionnaire, and the SC subscale was composed of only five of the eight items in our study. Then, the positive relationship between PSS and SC could be explained by the advice and clarification provided by RFM's social network (informational support), which could have assisted RFM understand the information provided by ICU staff, thereby increasing SC (Iverson et al., 2014). However, the remaining aspects of SC, such as frequency, ease of getting information and consistency, are dependent on ICU staff and may not be significantly influenced by RFM's social network (Padilla-Fortunatti et al., 2022b).

The negative relationship between perceived stress and SC is consistent with previous studies conducted prior to the COVID-19

Table 5
Beta regression model for variables associated with satisfaction with communication.

Variable	Estimate	Standard Error	z-value	*p-value*	95% CI	
					Lower	Upper
Intercept	1.074	1.554	0.691	0.490	0.139	61.484
Sex						
Female	Ref					
Male	−0.053	0.408	−0.131	0.896	0.426	2.110
Age	−0.025	0.019	−1.334	0.182	0.940	1.012
Relationship with the patient						
Children	Ref					
Spouse/partner	0.273	0.468	0.583	0.560	0.525	3.286
Other	0.292	0.460	0.635	0.525	0.544	3.310
Education						
Primary	Ref					
High school	−1.094	0.775	−1.413	0.158	0.073	1.527
Associate degree	−1.501	0.867	−1.731	0.083	0.041	1.219
College/university	−1.856	0.719	−2.581	0.001**	0.038	0.640
Prior ICU experience						
No	Ref					
Yes	0.452	0.390	1.157	0.247	0.731	3.378
Number of calls	0.166	0.056	2.952	0.003**	1.057	1.318
Length of each call (minutes)	0.002	0.032	0.068	0.946	0.941	1.067
Perceived stress	−0.074	0.034	−2.206	0.027*	0.869	0.992
Depressive symptoms	0.069	0.036	1.899	0.058	0.998	1.150
Perceived social support	0.438	0.200	2.193	0.028*	1.048	2.294

Note. ICU = intensive care unit. * $p < 0.05$, ** $p < 0.01$.

pandemic (Carlson et al., 2015; Jo et al., 2019). However, in these studies, SC was defined as the independent variable, and perceived stress was defined as the dependent variable. Thus, poor communication with ICU staff increased perceived stress levels among RFMs. In our study, we hypothesised an association between perceived stress and SC based on the possibility of stress interfering with RFM's cognitive processes related to communication with ICU staff. Although we found a significant relationship, the limitations of our study prevented us from establishing a temporal precedence between SC and perceived stress. Future research should focus on identifying and comprehending the various pathways by which perceived stress (and other psychological distress measures) and SC are related.

Strengths and limitations

There are several limitations to this study. Our findings' external validity is limited by their cross-sectional and single-centre design. Besides, the small sample size and low response rate may limit the generalizability of our findings. Despite the fact that evidence on patient-related variables showing an association with SC is limited (Jo et al., 2019), the exclusion of patient-related variables from the beta regression may limit the external validity of the identified SC factors. Also, we did not differentiate the source of the call (e.g. physician, nurse). Future studies should explore the impact of nursing phone calls and if there is any difference in the impact considering who makes the phone calls to RFM in the ICU. A strength is the use of psychometrically sound instruments and multivariate analysis to identify factors related to SC.

Conclusion

Psychosocial variables may influence RFM's perception of the quality of communication with ICU staff in a pandemic scenario with visiting restrictions. The evaluation of RFM's educational level, perceived stress and PSS during admission may assist ICU staff in identifying RFM in need of tailored communication approaches. More research is needed to investigate the impact of RFM's social network and psychological distress on how RFM evaluate communication with ICU staff and their overall experience in the ICU. Researchers may benefit from using qualitative approaches to identify the specific processes and factors that influence the relationship between perceived stress, PSS and SC.

Contributions

Study design: Cristobal Padilla Fortunatti, Noelia Rojas, Yasna Palmeiro, Angelina Dois; Data collection: Damary Meneses, Gladys Gajardo, Jessica Espinoza; Data analyses: Cristóbal Padilla Fortunatti, Yasna Palmeiro Silva, Noelia Rojas. All authors read and approved the final manuscript.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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