Research article

An informative nursing intervention for families of patients admitted to the intensive care unit regarding the satisfaction of their needs: The INFOUCI study

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ABSTRACT

Aim: To evaluate whether an informative intervention by nursing professionals through Short Message Service (SMS) improved patients' family members' satisfaction with the intensive care experience.

Methods/design: This was an exploratory, two-armed, randomised, non-pharmacological, prospective study. The intervention consisted of providing information to the contact persons of patients admitted to the ICU of the University Hospital La Princesa (Madrid, Spain) through SMS based on the patient's nursing assessment. Nursing diagnoses established by NANDA and based on the Virginia Henderson model were used as a reference. The main result was the satisfaction levels of the contacts of patients admitted to the intensive care unit, which was evaluated with the Critical Care Family Needs Inventory.

Results: The total score on the Critical Care Family Needs Inventory was significantly better in the intervention group (16.6 ± 3.3 vs. 19.1 ± 4.7; p = 0.012) compared with the control group. All participants included in the intervention considered it useful to some degree. Even when the contact person received negative information, there was no demand for information outside established hours, which was included as a possible adverse effect of the intervention.

Conclusion: Support in the form of additional nursing information implied an increase in the satisfaction of the needs perceived by the contact persons of patients admitted to the intensive care unit, together with a better perception of the quality of intensive care unit care and a reassuring and beneficial effect.

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Implications for clinical practice

- Simple and concise messages provide enough information to reassure families, increasing their satisfaction and perceived quality of the nursing care in the intensive care unit.
- The SMS technology, as part of the eHealth concept, seems to be a simple and feasible tool to communicate with families of patients admitted to intensive care units.
- The inclusion of the family in the human being–centred care model should have more attention from health care providers.
- Hospital administrators need to recognise and implement a permanent nursing care information in the Spanish Intensive Care Units.

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Introduction

Admission to an intensive care unit (ICU) is usually unexpected and, in many cases, it occurs under life-threatening circumstances; it occurs without time for the adaptation that every disease process requires from the patient and the family, who suddenly find themselves in an aggressive and stressful environment (Olano & Vivar, 2012). As described in several studies, the patient's family experiences shock, disbelief and anxiety (Holden et al., 2002; Stayt, 2007, 2009) and may endure psychological and social changes (Holden et al., 2002). Therefore, in critical care units, not only must medical and technological attention be given to treat the patient, but the family must also be included in that care. The International Research Project for the Humanisation of the Intensive Care Units (Proyecto HU-CI) (https://humanizandoloscuidadosinten-sivos.com/en/home/) was created in 2014 and is currently one of the main strategic resources in most Spanish hospitals. In addition, it has spread to more than 20 countries as a result of the need to redesign ICUs around the world; it operates on eight linked main aspects of care with a human being–centred care model (Humanisation of intensive care units, 2015).

This inclusion of the family in care is increasing in health care systems on the basis of benefits of involving both health care providers and families in decision-making and patient care (Alvarez & Kirby, 2006).

Multiple studies have quantitatively and qualitatively assessed the concerns and needs of the families of patients admitted to the ICU and have shown that one of their main needs is to receive adequate information, in addition to receiving confidence, support, comfort and closeness from professionals (Auerbach et al., 2005; Chien et al., 2006; Maxwell et al., 2007; Omari, 2009; Pardavila Belio & Vivar, 2012). Kirchhoff et al., 2004) affirm that the satisfaction of families is related to communication and decision making, while uncertainty and a lack of information are considered very important factors in the development of anxiety and depression (Kloos & Daly, 2008).

Currently, information in 75% of Spanish ICUs is communicated exclusively by the intensivist (Escudero et al., 2015), and informal requests for information from the family to the nursing staff at the bedside, in the corridors or by calling the unit are frequently observed. In addition, a recent study (Velasco Bueno et al., 2018) revealed family members' beliefs that 63% of their questions could be answered by either physicians or nurses, 27% preferred that their questions be answered only by physicians and 10% of the families felt that their questions should be answered by nurses.

Therefore, several studies have highlighted the importance of complementary medical and nursing information as well as the need for adequate coordination so that family members can receive the best possible information (Lee & Lau, 2003; Leung, Chien, & Mackenzie, 2000). In recent years, different studies have been carried out in Spain to evaluate the information relayed to family members of critical patients and to determine their satisfaction with the care provided in the ICU. In general, there is an absence of formal information from nursing professionals in Spain (Gómez-Carretero et al., 2009; Santana Cabrera et al., 2007; Santana Cabrera et al., 2009).

Currently, in the so-called technological age, we have useful tools to facilitate communication. Information and communication technologies (ICTs) represent a great advance; particularly in the health sciences, there is scientific evidence of ICTs' effects on nurses' processes, practice environment, professional satisfaction, time and efficiency, among other factors (Rouleau et al., 2017).

The use of appropriate digital technologies for public health has been reinforced by the World Health Organization in the recent years, considering the use of SMS or more complex applications as an integral part of eHealth, which refers to the cost-effective and secure use of information and communication technologies in support of health-related fields (World Health Organization, 2018).

Against this background, this study is based on the hypothesis that improving the information provided by nurses to families of patients in ICUs will be beneficial by helping families cope with the difficult health situation in which they find themselves and will increase their satisfaction with care in a way that will improve the user's perception of quality.

Aim

The aim of this study was to evaluate whether an informative intervention by nursing professionals through Short Message Service (SMS) improved patients' family members' satisfaction with the ICU experience.

Secondary aims were as follows:

- To explore how the participants who received the intervention valued it by analysing points for improvement.
- To evaluate the information requested by users outside of established hours as a consequence of the intervention.

Methods

Design/methodology

An exploratory, two-armed, randomised, non-pharmacological, prospective study was conducted. The investigator who conducted the interviews was blinded to the participants, who were the named contact persons of patients admitted to the ICU of University Hospital La Princesa (Madrid), in region of Madrid (Spain) who met the inclusion criteria. A contact person was defined as someone with a social or emotional relationship to the patient, not necessarily a family member or relative and this designated person could be different from the person receiving the medical information. This ICU has 20 beds for adult patients receiving medical specialty, cardiology, cardiac surgery and neurosurgery service, with an annual occupancy rate of 86%.

Inclusion criteria: The participants were named contact persons of patients admitted to the ICU of any clinical specialty with a likely stay longer than 72 hours who agreed to participate and signed the informed consent form prepared for the study. The patient was required to give consent if his or her medical condition allowed it (by written signature, verbally before witnesses, or via their guardian or primary caregiver); if the patient was sedated or unconscious, consent was sought directly from the named contact person.

Exclusion criteria: Cases were excluded if any of the following conditions were met: a) a probability of the patient's stay being shorter than 72 hours (this was considered an optimal period to allow the named contact person to adapt to the new situation and environment and allow the patient to attain a certain degree of stability), b) patients were unable to communicate without a contact person present within the first 48 hours of admission to the unit, c) named contact persons were under 18 years of age, d) participants who, for different reasons, were not able to answer the questionnaire and e) cases in which the patient required police custody or the patient's income was immersed in a judicial situation, for any reason.

Ethical considerations

The study was approved by the Ethics Committee of Medical Research of the University Hospital La Princesa, with registration

number 3339. Each participant was assigned a code to protect his or her data and affiliation, thus fulfilling the Organic Law 15/1999 of 13 December, Protection of Personal Data. Given the sensitivity of the information that was collected through an unsecured medium, the contents were encoded, and the key to the codes that appeared in the SMS were delivered to the recipient along with the informed consent (IC) for the intervention. IC was obtained, and the ethical principles of the Declaration of Helsinki and the Oviedo Convention on Human Rights and Biomedicine were followed.

Study variables and measurements

Primary result

The main outcome was the satisfaction levels of named contact persons of ICU patients regarding whether their needs were met during the patients' admission in the ICU, evaluated with the Critical Care Family Needs Inventory Questionnaire (CCFNI) on Family Needs in the ICU. After different available measuring instruments were evaluated, the CCFNI questionnaire was chosen because, according to Van den Broek et al., it is one of the most reliable and valid measures in terms of its psychometric properties, along with the Family Satisfaction in the Intensive Unit Care questionnaire (FS-ICU) (van den Broek et al., 2015).

The CCFNI is a self-report questionnaire that includes 45 need-based questions regarding the needs of the family divided into five domains: support, comfort, information, proximity and assurance (Molter, 1979). The questions on these domains are answered on a four-point Likert scale (1-not important, 4-very important). A short, 14-item version was validated with the intention of measuring the ability of professionals to meet the needs of the ICU patient's family members (Harvey, 1993; Johnson et al., 1998).

For the present study, we used the short version of Harvey's CCFNI (1993) (Gómez-Martíinez et al., 2011), adapted and validated for the Spanish population by Gómez, Ballester and Gil (2011).***

The short version of the CCFNI showed a good internal consistency for the global questionnaire, with a Cronbach's alpha of 0.655, and obtained a structure of four components corresponding to 1) medical attention to the patient, 2) personal attention to the family member, 3) medical staff-patient information and communication and 4) perceived areas for possible improvements.

Question 6 of the questionnaire was adapted for nurses instead of "team members" because nurses were the professionals who performed the intervention in the present study. To facilitate data analysis, questions 10 and 11 were reversed coded, with the worst situation being assigned the highest score and the best situation the lowest score, similar to the rest of the questions on the CCFNI (Supporting information 1).

Independent variables (Table 1):

a) For the patient: sociodemographic data, Acute Physiology and Chronic Health Evaluation II (APACHE II) score (Knaus et al., 1985), type of pathology, type of discharge, limitations of the therapeutic effort (LET), authorisation modality.

b) For the named contact person: sociodemographic data, relationship to the patient, level of professional education, habitual location, previous experience in ICUs, frequency of visits to the patient, number of requests for information outside the established hours in the unit (the usual information is given once a day at 11 a. m. during the week and at 18 p.m. on weekends, exclusively from the intensivist).

Secondary results

Participants in the intervention group were asked an open question about the intervention and a closed question about the degree

Table 1
Characteristics of the study sample.

	Intervention Group (n = 34)	Control Group (n = 36)	P-value
Patients			
Male	21 (61.8%)	21 (58.3%)	0.811
Age (years)	68.3 ± 16.3	62.6 ± 14.2	0.119
Type of pathology			
General medical	15 (44.1%)	15 (41.7%)	
Cardiac surgery	12 (35.3%)	6 (16.7%)	0.136
Neurosurgery	6 (17.6%)	14 (38.9%)	
Other types of surgery	1 (2.9%)	1 (2.8%)	
Type of discharge			
Discharged from ICU (but still in hospital)	19 (55.9%)	22 (61.1%)	0.716
Deceased	1 (2.9%)	0 (0.0%)	
Still admitted to the ICU	14 (41.2%)	14 (38.9%)	
LTE	2 (5.9%)	0 (0.0%)	0.109
%mortality APACHE ROD	37.5 ± 26.4	38.6 ± 25.1	0.854
Days admitted prior to inclusion in the study	5.5 ± 8.8	4.8 ± 8.6	0.750
Days from admission to date of survey	13.6 ± 9.8	12.7 ± 9.7	0.694
Named contact person			
Male	17 (50.0%)	13 (36.1%)	0.334
Age (years)	47.74 ± 10.9	45.44 ± 11.9	0.405
Relationship to the patient			
Spouse/partner	5 (14.7%)	8 (22.2%)	
Child/parent	24 (70.6%)	19 (52.8%)	0.416
Second-degree relative	5 (14.7%)	8 (22.2%)	
Caregiver	0 (0.0%)	1 (2.8%)	
Education level			
Primary	9 (26.5%)	8 (22.2%)	
Secondary	8 (23.5%)	13 (36.1%)	0.557
University studies	17 (50.0%)	15 (41.7%)	
Habitual location			
Madrid city	20 (58.8%)	15 (41.7%)	
Region of Madrid	14 (41.2%)	17 (47.2%)	0.086
Outside the region	0 (0.0%)	4 (11.1)	
Previous experience in ICUs	18 (52.9%)	19 (52.8%)	1.000

Data are presented by frequency (percentage) or mean ± standard deviation. Abbreviations: ICU = Intensive Care Unit; LTE = Limitation of the therapeutic effort; ROD = Risk of death.

of usefulness they would attribute to the intervention (very useful, useful, not very useful or not useful at all).

Description of the intervention

Intervention group: information based on the patient's nursing assessment was provided using the nursing criteria and taxonomy standardised by the international North American Nursing Diagnosis Association (NANDA) as a reference (NANDA International, 2016) and based on the Virginia Henderson model for informing the named contact person about the nursing interventions the patient received. The contact person chosen by the patient was informed daily at approximately 12:00 pm of the patient's situation, for a minimum of three days and a maximum of eight, through an SMS. The information was provided by nurses on the research team, who first consulted with the nurse responsible for the patient to agree on the information that would be given. Eight closed-answer items that defined the main characteristics corresponding to the patient's global situation were prepared and agreed upon by the research team so that there was no heterogeneity in the information provided and so that the greatest possible objectivity could be achieved; the informant selected the item that best suited the patient's situation (Supporting information 2).

Because the information communicated could be sensitive, and because the means of dissemination were extrapolated from the network of the Ministry of Health, the contents were coded, and the recipient received a decoding key at the time of inclusion. If the time frame for sending the SMS coincided with an episode of

serious instability of the patient, that is, if the patient was being treated at that time or if the unit's workload made it impossible to prepare the information, no informative message was sent because the resolution of the problem was unknown. In such cases, the SMS reported that information was not available, and this possible situation was explained to the named contact person at the moment of inclusion in the study.

Control group: This group received the same attention and care that was provided to members of the intervention group, consistent with standard procedures on the unit, except that the informative SMS was not provided.

Intervention procedure and evaluation

Participation in the study was requested between 24 and 48 hours after admission by any member of the research team once the patient (if conscious and able to make decisions) or the named contact person (if the patient was unconscious or unable to make decisions) was informed verbally and in writing. The telephone number of the contact person who was selected to receive the information was provided to the research team.

Then, the participants were allocated to either the intervention or the control group by pre-defined randomisation, and information began being sent that same day by a nurse on the research team. The intervention was performed for a maximum of eight days for users in the intervention group who were admitted for more than 10 days.

If the patient became conscious in the ICU during or after the intervention period, he or she was informed of what has been done by the research team and by the named contact person. Since the participation in the study was subject to informed consent signature and could be revoked in any moment, if the patient did not agree to continue the intervention or denied the use of the information collected for research purposes, the intervention automatically stopped and the collected data was deleted.

On the 10th day from the beginning of the intervention for the intervention group or from inclusion in the study for the control group, a member of the research team outside the unit conducted the telephone interviews. These surveys were conducted anonymously using the participant's identification code and thus were blinded to the researcher. For those patients in both groups whose stay was less than 10 days, the surveys were carried out 48 h after the patient left the ICU.

Two SIM cards and two mobile devices were used exclusively for the study by the researchers: one for sending the SMS and receiving requests from the participants, which was locked inside the ICU and another for conducting the questionnaire survey. The second mobile was used only for the interviews, and the researcher who conducted them kept the mobile device outside the ICU for the duration of the interviews because she was not a member of the hospital staff.

A registration book for reversible anonymisation was kept under lock and key in the ICU and is available along with the other documents generated during the study: individual data collection notebooks, individual surveys, telephone data, research team activity calendars, randomisation envelopes, and information and consent sheets.

Sample size calculation

The sample size required to detect a difference equal to or greater than two units in the total score of the CCFNI questionnaire between the intervention and the control group after the intervention was determined. Accepting an alpha risk of 0.05 and a beta risk of 0.2 in a bilateral contrast, 31 subjects were required for each group. It was assumed that the common standard deviation (SD) was 2.5 and a tracking loss rate of 20% was estimated. The sample size was calculated with EPIDAT 4.1 software, sample size calculation module.

Patient randomisation

After signing the informed consent, subjects who met the inclusion criteria received a sealed opaque envelope with a card inside specifying their assigned participant code (computer generated) and study group. Patients were included in order of their arrival in the ICU in blocks of 10 subjects.

Because a 20% loss was considered, 12 more envelopes (6 for the intervention group + 6 for the control group) were added at the end of the study to complete the sample. The researcher requesting participation in the study did not know until the envelopes were opened which group the participant was assigned to.

Blinding

Participants were enrolled in the study by University Hospital La Princesa ICU nurses who were members of the research team. The type of intervention did not allow blinding of the reporting professionals or the subjects included in the study; however, the individual questionnaires were administered by a researcher outside the University Hospital La Princesa in a blinded manner who did not know a priori the group to which the interviewee belonged.

Statistical analysis

The participants' characteristics are presented as the mean ± standard deviation (SD). Both absolute and relative frequencies were used in cases of qualitative variables. Proportions were calculated, and group comparisons were made with EPIDAT 4.1 software. Mean score differences by question, total score on the CCFNI questionnaire, and type of answers concerning communication with the named contact person by study group were assessed by independent t-tests. Statistical analyses were performed with SPSS-IBM (Software, v.25.0 SPSS, Inc., Chicago, IL, USA), and the level of significance was set at $p \leq 0.05$.

Six researchers from the team individually analysed the answers to the open-ended questions addressed to the intervention group and then triangulated the results among researchers to codify the data and group them into aspects. Finally, three topics were identified: "utility/benefit", "Format of the SMS" and "emotional effects". Then, we described what the respondents expressed as the positive and negative aspects of the intervention in relation to each topic.

Results

The inclusion of participants took place between 1st March and 28th June 2018. Of the 280 patients admitted during this period, 90 met the inclusion criteria. Fig. 1 shows the participants' flow chart.

Table 1 describes the characteristics of the sample. A total of 85.3% and 75% of the intervention and control group contact persons, respectively, were family members (considering as spouse/ partner or child/parent), and the rest were caregivers or close relatives (second-degree relative). No statistically or clinically significant differences were observed between the study groups in terms of demographic variables or factors that could influence the perceptions of the named contact person, such as the severity of the patient's condition, whether the patient died or was discharged or the relationship between the named contact person and the patient.

Table 2 shows that the CCFNI total score was significantly better in the intervention group (16.6 ± 3.3) compared to the control group (19.1 ± 4.7) (p = 0.012), which indicates that the named
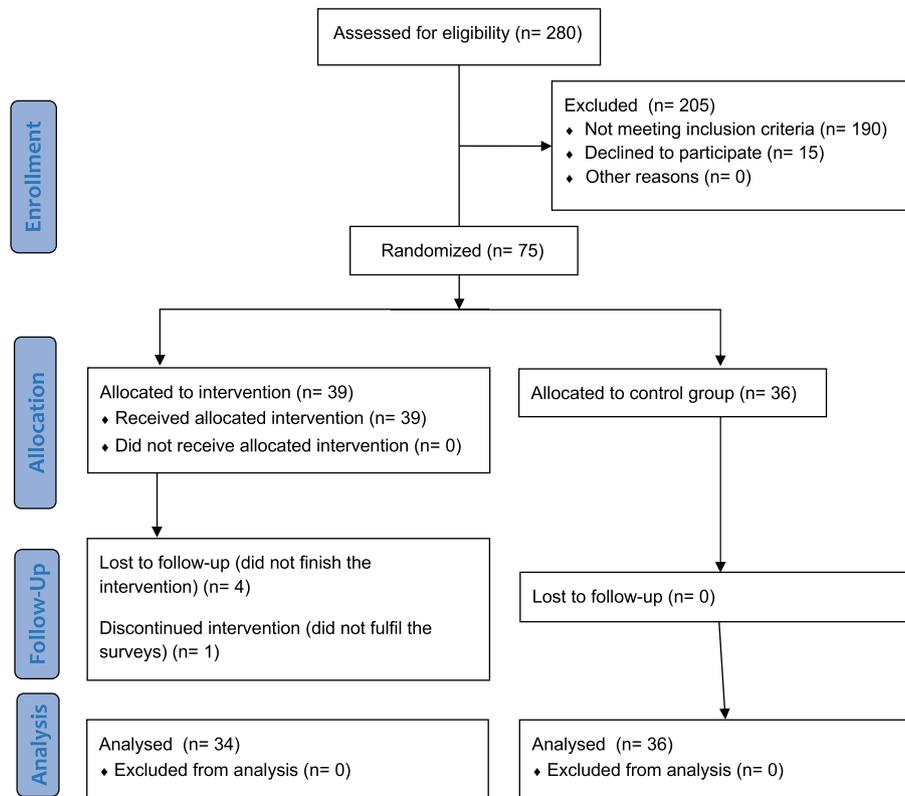
Fig. 1. Diagram describing the flow of participants in the INFOUCI study.

Table 2
Mean score differences for each question and the total score on the CCFNI questionnaire by study group.

	Intervention group n = 34	Control group n = 36	p-value
1. Do you feel that the best possible care is being given to the patient?	1.29 ± 0.46	1.33 ± 0.48	0.729
2. Do you feel that the hospital personnel care about the patient?	1.26 ± 0.45	1.36 ± 0.48	0.393
3. Have the explanations given to you about the patient's condition been in terms you can understand?	1.35 ± 0.49	1.56 ± 0.65	0.147
4. Do you feel that you have been given honest information about the patient's condition?	1.24 ± 0.43	1.50 ± 0.61	**0.041**
5. Do you understand what is happening to the patient and why things are being done?	1.41 ± 0.61	1.58 ± 0.73	0.292
6. Have the nursing staff been courteous to you?	1.24 ± 0.43	1.36 ± 0.64	0.340
7. Have any of the staff members shown interest in how you are doing?	2.09 ± 1.03	2.50 ± 1.00	0.094
8. Have the hospital personnel explained the equipment being used?	2.21 ± 0.80	2.58 ± 0.87	0.065
9. I am very satisfied with the medical care the patient is receiving.	1.29 ± 0.52	1.33 ± 0.54	0.758
10. Do you feel alone and isolated in the waiting room?	1.79 ± 0.95	2.17 ± 1.08	0.131
11. There are some things about the medical care the patient is receiving that could be better.	1.44 ± 0.50	1.83 ± 0.65	**0.007**
CCFNI total score	16.6 ± 3.3	19.1 ± 4.7	**0.012**

Data are presented as the mean ± standard deviation. Abbreviation: CCFNI = Critical Care Family Needs Inventory Questionnaire. Bold type indicates p-value <0.05.

contact persons who received the SMS reported greater level of satisfaction than those who did not.

Furthermore, the intervention group had a higher proportion of positive answers to each individual question of the questionnaire, but a statistically significant difference was found only for questions 4 (1.24 ± 0.43 vs 1.50 ± 0.61; p = 0.041) and 11 (1.44 ± 0.50 for the intervention group and 1.83 ± 0.65 for the control group; p = 0.007), which were related to information and improvements, respectively. The percentage of each response to the questions on the CCFNI questionnaire by study group is detailed in Supporting information 3.

The results of the evaluation of the items referring to communication with the named contact person (questions 3, 4 and 5) are shown in Table 3. No differences were found between the groups in any of the response options for any communication-related question.

Secondary results

In the study, the demand for information outside established hours was included as a possible adverse effect of the intervention and a reason for an increase in the concern of the named contact person when he or she received negative information. To this end, all ICU staff were asked to record any request for information outside of designated hours, whether by telephone or in person, in a document located in the unit for this purpose; there were no cases to record during the study.

Qualitative analysis of the intervention

The participants' responses to the open-ended question about the intervention yielded the following results (Fig. 2):

Table 3
Percentage of responses to each type of answer for CCFNI questionnaire items concerning communication with named contact persons.

	Intervention group (n = 34)	Control group (n = 36)	p-value
3. Have the explanations given to you about the patient's condition been in terms you can understand?			
Almost all the time	22 (64.7%)	19 (52.8%)	0.311
Most of the time	12 (35.3%)	14 (38.9%)	0.756
Only some of the time	0	2 (8.3%)	–
None of the time	0	0	–
4. Do you feel that you have been given honest information about the patient's condition?			
Almost all the time	26 (76.5%)	20 (55.6%)	0.065
Most of the time	8 (23.5%)	14 (38.9%)	0.167
Only some of the time	0	2 (5.6%)	–
None of the time	0	0	–
5. Do you understand what is happening to the patient and why things are being done?			
Almost all the time	22 (64.7%)	20 (55.6%)	0.435
Most of the time	10 (29.4%)	11 (30.6%)	0.917
Only some of the time	2 (5.9%)	5 (13.9%)	0.264
None of the time	0	0	–

Data are presented as frequencies (percentages).
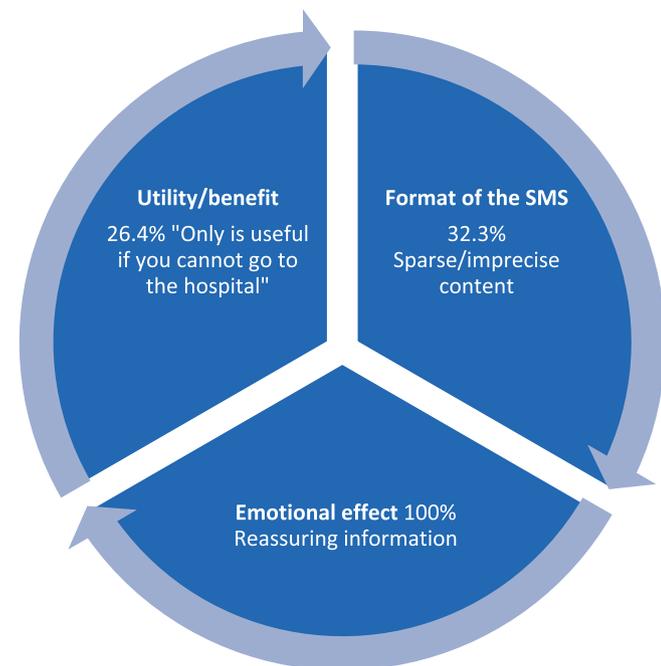
Fig. 2. Topics identified in the intervention group's answers to the open-ended questions.

Utility/benefit

Most of the named contact persons considered the information received as helpful; although 88% visited the patient daily during the two shifts for which visits were permitted, they valued the SMS information as "very beneficial" for someone who could not go to the hospital. In this topic, we collected testimonies from different participants, such as the followings: "*It helps me a lot to be informed, whether the information is negative or positive*" (Participant 5529I), "*I was lucky to receive the information*" (Participant 1954J), "*It is positive to be informed*" (Participant 8777J). Only 26.4% (9 participants) reported that it was only useful for those who could not go to the hospital.

Emotional effect

The reassuring effect of the information on all the participants was highlighted, especially when the information was received after the night shift: "*All the information received is reassuring, I*

am very happy with this initiative" (Participant 8466L), "*Receiving a message is the best thing; even if it was a negative message, at least you are already prepared*" (Participant 5529I), "*The truth is that I found it very useful because some afternoons I could not go, and if there was improvement, then you are more relaxed…*" (Participant 8777J). Specifically, 70% received positive news every day, bearing in mind that code INFOUCI 01, which reported that there were no changes in the patient's situation (although it was a very serious situation) was considered positive information in the analysis of the data. None of the participants talked about anxiety, worry or other feelings in relation to the SMS information.

Format of the SMS

Although the type of content (nursing information) was useful to the named contact persons, some participants noted a negative aspect in terms of the time the messages were sent and the length of the message. The messages were described as sparse and not very concrete by 32.3% of the subjects. The most relevant testimonials from several participants are detailed as follows: "*The information seems correct but sparse; anyway, it has reassured me*" (Participant 7604U), "*Very schematic*" (Participant 2972A), "*I liked to receive the information, but it seemed very sparse; I wish there were more variety of codes*" (Participant 8627F). In terms of hours, the contact persons were more satisfied on weekends and holidays, when the SMS reflected the situation for the whole night, approximately 12 hours since the named contact person's visit.

In contrast, on weekdays, the messages were sent shortly after visiting times, so they were not very useful (11.7%): "*……. in my*
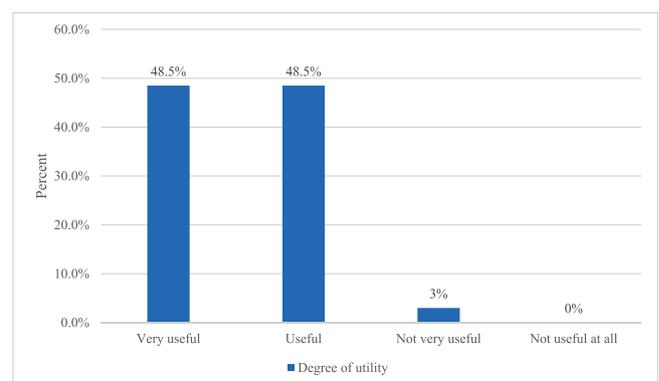
Fig. 3. Distribution of responses regarding the degree of usefulness of the intervention.

case, it was to reaffirm what I had just seen; there was not much change" (Participant 5058E), "*The worst thing is that I received the SMS just when I left; in my case, I already knew how the patient was*" (Participant 1714T), "*When the message was sent on the weekend, it was truly appreciated, but during the week, as the SMS arrived just when I left, it did not reveal new information because I had just seen him*" (Participant 0999M).

All the participants considered the intervention useful; the degree of usefulness attributed to the information received is described in Fig. 3.

Discussion

In the present study, we determined whether the satisfaction of the needs of the named contact persons of patients admitted to the ICU was greater among those who received nursing information via SMS in addition to the usual medical information compared with those who did not receive SMS information.

Although both study groups showed good quality of care, the participants in the intervention group indicated greater satisfaction than those in the control group; there was a statistically significant difference in the overall survey score and in the responses to individual items regarding the need for possible improvements in the unit.

In an attempt to focus the results of the study on nursing information as a factor related to perceived quality, the answers to questions referring to information/communication with the named contact persons (questions 3, 4 and 5) showed that the contact person who received the information had greater satisfaction than those who did not receive it. The variables that a priori could affect this perception were analysed; these included the severity and evolution of the patient, the age of both the named contact person and the patient and the relationship between the named contact person and the patient, and there were no differences in any of these characteristics between groups. Given that care at all levels was the same for the entire study population and was provided at the same time, the greater satisfaction by the families that received the added information may be related to this intervention.

Furthermore, the results of the evaluation of the items referring to personal attention to the named contact person (questions 6, 7 and 8) suggest the need to improve the current situation because both groups gave negative answers to these questions. The need for emotional support and empathy on the part of families was observed in previous studies (Bailey et al., 2010; Sheaffer, 2010), as was a need for increased presence and availability of nursing professionals (Gaeeni et al., 2014).

A descriptive study that specifically assessed the satisfaction of family members of patients in the ICU with the nursing information they received after the implementation of an information protocol showed improved knowledge of the patient-care process due to information from nurses, according to 87% of respondents. Moreover, 92.4% indicated that this information reassured them, and 95.7% rated it very useful (Alfonso Pérez et al., 2007).

Several previous studies have shown that the information that nursing professionals can provide, such as presenting the care daily plan/schedule, global situation, and comfort of the patient; sharing ways for family to participate in care; or descriptions of patient's appearance (Wilson et al., 2015) and not only clinical information about the pathology is very important for families. Furthermore, other studies focusing on novel nursing interventions have also revealed an improvement in the perceived quality of ICU care (Torke et al., 2016; van Mol et al., 2017) and in family's well-being, depression and anxiety (Torke et al., 2016) in relation to the provision of information and communication with family members.

Second, the opinion of the participating named contact persons was analysed to evaluate the effect of the intervention on them and possible points for improvement. This analysis revealed that the intervention had a beneficial effect and did not cause the participants greater concern that led them to request information after hours. The areas for improvement were first, the time when the message is sent because when messages were sent close to visiting hours, they did not contribute much. Second, the content was described as concise and very general; however, it must be borne in mind that the amount and type of information provided was limited by the legal need to protect sensitive information being delivered through an unsecured medium such as SMS. This coding of the information led to the creation of standard items that encompassed different general situations that might occur in patients; this made it impossible to provide more explicit nursing information, as was originally intended, although information was given on the patients' overall situation, for which the participants were grateful.

Finally, the use of this simple but feasible SMS technology instead of a phone call or other communication channel is gaining acceptance among both professionals, patients and family members, with an easier interaction and general increased information, which of course is not lack of factors that health services should take into account to ensure a safe and quality service (Globus et al., 2016; World Health Organization, 2018).

Strengths and limitations

To date, no evidence has been reported regarding interventions that provide nursing information through a SMS communication system, which is already being used by the health system for other purposes. As such, its implementation would not entail a sizable economic cost, which constitutes one of the main strengths of this project.

Additionally, the intervention would not require a significant workload increase for professionals because 1) it would be integrated into the current electronic history system in the unit and could be provided by the same nursing professionals who work in the unit every day; 2) none of the participants demanded additional information outside of designated hours or referred to an increase in concern or anxiety as a result of the SMS messages, confirming that this intervention did not increase the workload of the nursing staff.

Among the limitations that should be mentioned, it is worth noting that although the nursing professionals could have potentially provided abundant information, the sensitive nature of the information and the fact that it was being communicated through an unsecured system required that the contents be codified and grouped into eight item types, which may have resulted in insufficient and poorly individualised information. Second, there may have been a greater effort to send SMS because the members of the research team and not the staff on duty were the ones who sent the messages. Third, the study was presented to the hospital directors as an attempt to evaluate the feasibility and acceptance of the intervention in the unit in addition to the main measure of interest, so a larger sample was not recruited. Finally, the characteristics of the intervention could not be masked, although the researcher who conducted the surveys of the contact persons was blinded.

Conclusion

The support provided by additional information from nursing staff to the families of patients admitted to the critical care unit increased the satisfaction of their needs and, by extension, the perceived quality of ICU care. It also produced a reassuring and

beneficial effect, thus improving the participants' quality of life. Finally, this study provided a feasible and effective resource with which nursing professionals can keep named contact persons of patients admitted to intensive care units informed because this method did not involve a significant workload increase.

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Ethical approval details

Approved by the Ethics Committee of the Medical Research of the University Hospital of La Princesa, with registration number 3339 (25th January 2018).

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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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.iccn.2019.102755.

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