

Meaning of Caring from Critical Care Nurses' Perspective: A Phenomenological Study

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Abstract

Background: Caring has been known as the inner core and the essence of nursing profession. It seems that critical condition of patients and presence of various and complex technological equipments in critical care units gives different meaning to caring and its priorities.

Aim: The present study was aimed at explaining lived experiences of critical care nurses from caring in a technological environment.

Method: In a hermeneutic phenomenological design, data was gathered using semi structured in-depth interviews which were conducted with 12 intensive care nurses working in the critical care units of hospitals of Kerman University of Medical Sciences. Interview texts transcribed and analysed using modified version of Dickelmanns' method.

Findings: Analysis of interviews revealed 4 relational themes: 1) technological environment as a web of paradoxes 2) vigilance in the challenging context: management of caring in a technological environment 3) behind the wires: management of communication in a technological environment; and 4) toward culmination: promoting the quality of technological care. The constitutional pattern which relate the relational themes was interpreted as "flying intelligently, with the wings of science and art, over the foggy sky" which was representative of the lived experiences of critical care nurses of caring in technological environment.

Conclusion: Caring in an intensive environment is a holistic process which needs nurses' vigilance regarding all aspects of patients' needs and striving to meet them, while at the same time, being competent and expert in working with advanced technical tools.

Keywords: Caring; Critical care unit; Intensive care unit; Phenomenology; Hermeneutic; Dickelmann

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Introduction

Caring has been acknowledged as the inner core and essence of nursing [1] and the main reason for existence of nursing as a scientific discipline and a profession [2].

It has been acknowledged that nursing is the art and science of caring [3]. Leininger believed that the nurses' ability to express self, perception and interpretation of subjective experiences of patients and creative application of nursing actions, are some requirements for the artistic aspect of nursing

Within a critical care environment, caring could take different

meaning and domains, which are different from caring in other nursing environments [4]. Various factors such as critical condition of the patient, high technology, level of staffing, mixture of skills and medical professions, may influence dynamics and potential of caring [5]. Critical care nurses are often faced with life-threatening situations which expose them to high levels of stress, due to difficulties in decision making [3]. Critical condition of patient in such environments makes nurse give the priority to meeting physical needs and saving patients' life [5]. Concentrating attention on diagnosis and treatment of the disease turns nurses to the followers of the medical model and caring values and attitudes might be neglected or even

missed [6]. A popular view in technological environments is that technical and mechanical aspects of work are considered real and more important than basic nursing care [7]. When one of the technological devices malfunctions, the nurse is ready to replace its' function quickly by hand, but in cases of patients' worries and emotional distresses the nurses are not ready to alleviate them by comforting touch or emotional support. In highly technological environments, there is no time or space for dealing with emotional needs of the patients [8]. Nurses' effort with the aim of mastering technology turns the patient to an object for observation, review, and control [9] and dehumanization of the patient occurs [10]. Once nurses take mastery over using technological devices, interpreting documented data, laboratory results and measured parameters, they start to focus attention on patients' stories, experiences, and psychological needs [11]. However, many authors viewed technology and caring as two inseparable elements in improving patients' outcomes [12-14]. Boström et al. [15] stated that although delivering advanced and standardized care to support patients' life is a basic element of a critical care nurse role, delivering an individualized nursing care for patients and their relatives is a necessity to improve the quality of care. This is considered as the artistic side of nursing [15]. Researchers defined caring as a complex phenomenon which comprised moral, cognitive and emotional aspects and originated from culture. Critical care nurses of the study explained that caring is influenced by contextual factors of the hospital ward, such as level of staffing and heavy workload. Considering the emphasis placed by the above researchers on the influence of culture on caring behaviours of nurses and with regard to differences in cultural and religious believers and values, the level of technological advances and nurse to patient ratio in critical care units of our region, the present study was done with the aim of understanding the meaning of caring from critical care nurses of educational hospital in a region in South East of Iran.

Methodology

Phenomenological research approach was the method used in conducting the present study. It has been acknowledged that caring for physical, psychological, emotional and spiritual well-being of persons, families and communities is a basic component of holistic nursing [16]. Healing and wholeness are two key concepts of holistic nursing [17]. Investigators, who aimed at developing the knowledge related to the area of holistic nursing, are usually faced with the challenge of understanding human experiences during health and illness. The research method which best illuminate these experiences, is the phenomenological approach [16]. Phenomenology is both a philosophical stand point and a research method which casts light on previous experiences of individuals from a certain phenomenon. Its' purpose is to gain a deeper understanding of the phenomenon. Perception that arises from this method of research can contribute to generating knowledge [18], which further guides the practice and research of nursing profession [16]. Considering the fact that our study aim was to understand the meaning of caring from critical care nurses' experiences, so phenomenology was used as the method of choice for conducting the study.

Ethics Committee of Kerman University of Medical Sciences approved the study (KMU EC 93/249) and hospitals' officials gave the permission for doing the interviews. The aim of the study was fully explained to the participants and they were informed that they could withdraw from the study at any time they wish and signed the informed consent. Confidentiality and anonymity of the participants were maintained by mentioning them by number (the study participant no. 1 to 9).

Participants and Setting

The present study was conducted in intensive care units of educational hospitals of Kerman University of Medical Sciences in South East of Iran. Participants were recruited from cardiac, neurologic and general surgery, liver transplantation and general intensive care units and they had the experience of caring for critical care patients in the intensive care units for at least one year. These units are fully computerized with cardiac and respiratory central monitoring systems and various technological equipments, such as ventilator, cardiac balloon pump, infusion pumps, etc. In these units, nurses often start working without preparation training courses for work with technological equipments, interpreting received data and maintaining instruments and their training takes place informally, during the first days of their work in the unit and through observation of experienced nurses' work and mentorship. The nurse to patient ratio ranged from 1/2 in cardiac and neurosurgery ICUs to 1/3 or 4 in general surgery and medical ICUs. All of these units have high admission rates, so heavy workload and staff shortage. Purposive sampling method was used to select the study participants. In this way, the participants were selected based on their experience of working in an intensive care unit and willingness to participate in the study. Previous history of the researcher in working in a general intensive care unit was helpful in selecting the eligible participants and to acquire their trust for participating in the study. Participants gave the permission to record their voice during the interview process.

Data Collection

Data was collected using individual, semi structured, in-depth interviews. All interviews took place in a quiet room, according to the participants' preferences. Due to heavy workload of the nurses in the studied setting, all interviews were conducted out of working time of interviewees. The interviews started with the question "what does the term caring mean to you, in a critical care setting?", "when do you actually feel cared for your patient as you would like?" Familiarity of the researcher with the critical care setting was a positive point which helped the researcher to ask timely and proper follow-up questions like "you mean that..." "Please explain more" "would you give me an example", "how did you feel then?" based on the immediate understanding of the participants' explanations. The interviews lasted for 40 to 90 min. Each interview was tape recorded and transcribed verbatim, in Microsoft word 2013 and analysed using MAXQDA software.

Data Analysis

Heidegerian hermeneutic approach was used according to modified version of Dickelmann et al. method, to analyze the study data. This method helped us to interpret the subjective data gathered in the form of texts, through hermeneutic analysis. Through this process, categories, relational themes and constitutional pattern emerged, illuminating the meaning of caring, from critical care nurses' perspective.

The original version of Harten et al. method contains 7 steps, which is manageable by a research team. Harten et al. modified this method to five step, to be applicable by the research student and supervisor [19]. The modified version contains the following steps:

Step 1: Each interview texts were read thoroughly, several times, as an individual whole, to gain an overall understanding of each nurse description of caring. Each transcript was summarized to record a brief overview of the interview. Words or phrases which described meaning of caring from critical care nurses' experiences were identified and highlighted.

Step 2: Words or phrases which represented similar meaning or idea were grouped together, to form categories. 22 broad categories were identified in this stage.

Step 3: The 22 categories were reviewed, refined, and condensed to 18 categories and these categories were examined and explored for "relational themes". Harten et al. defined a relational theme as one that cuts across all texts [19]. Reviewing the categories revealed common threads of information which linked the described meanings in all interview texts. These threads of information were 4 relational themes that happened amongst all texts. They were interpreted as: the essence of caring, caring alongside technology, ups and downs of caring and negligence in caring.

Stage 4: After identifying 4 relational themes, a constitutive pattern emerged which expressed the relationship between the themes clearly. This constitutive pattern described the perception of caring from our critical care nurses' study viewpoint. Perception of our study participants from caring was interpreted as "vigilance in the challenging context".

Stage 5: In the final stage, the finding was prepared and written using sufficient exemplars from the study participants, for evaluation by readers.

Rigour

Gubba and Lincoln criteria were used to establish trustworthiness of the finding which was included credibility, fittingness, dependability and confirmability. Long-term involvement with the research subject is one of the best methods for establishing credibility. Previous experience of the researcher in nursing in critical care unit (9 year experience) has led to prolong engagement of the researcher with real life context of intensive care unit and interaction of the researcher with the study participants. It was also helpful in selecting participants which provided rich descriptions of their experiences of working in an

intensive care environment and challenges of working in such an environment and also in establishing a mutual and trustful relationship with the study participants. Parts of the interview text along with assigned codes and emergent categories was sent to a number of the study participants (member check) and to the research team (which were familiar with qualitative analysis) to check for accuracy of assigned codes and categories (peer check). In this stage, disagreements between the researcher and the research team modified by referring back to the interview texts. To establishing fittingness, the study findings were sent to a number of critical care nurses which were not participate in the study and they confirm the accuracy of them. We used maximum variability sampling and selected our study participants from the various types of adult intensive care units (neurosurgery, general and open heart surgery, medical, obstetric, trauma, and neurology ICUs) to achieve transferability of our findings. Finally, the researcher recorded the process of the study precisely and in detail, to make it possible for others to follow-up and audit the research project.

Findings

Totally, 9 ICU nurses (one male and 8 female) participated in the study. They were between 31 and 49 years old (mean=38.5) and had 2 to 20 years of ICU work experience. Majority of them (7 nurses) were married, 5 participants were MSc and the rest of them were bachelor. Analysis of interviews revealed 4 relational themes. These themes were: the essence of caring, caring alongside technology, negligence in caring, and ups and downs of caring. The constitutional pattern which related these themes and described the meaning of caring from critical care nurses' perspective interpreted as "vigilance in the challenging context".

The essence of caring

The present theme included the study participants' definition of the meaning of caring which comprised three categories of comprehensive caring, caring as a pleasant feeling and family participation in care.

Comprehensive caring: the participant nurses described caring from different aspects, yet, mostly stressed the comprehensive nature of caring. The necessity for a wide view adopted by a critical nurse, the all-inclusive attention of the nurse to the functioning of various body systems and considering the patient as a whole, are among the items frequently stated by the participants.

In my opinion we should consider the patient as a system, a human being with a mental and psychological aspect and also a physical aspect, when admitted into the ICU, his or her first issue is this physical aspect, stabilizing the vital signs and stabilizing the critical condition he or she has been through, this is the priority, and then comes the mental and psychological caring.

For a number of the participant nurses, caring was the awareness concerning the patient's needs and the attempts towards fulfilling them and doing one's best to provide comfort for the patient. Most of the participants believed that caring goes beyond the mere daily tasks of a nurse. A technology-dependent patient is in a dire need of emotional support. Establishing a good relationship

with the patient, explaining his/her condition, earning his/her trust, listening to what he/she has to say and alleviating his/her worries, giving him/her hope and providing good instructions, are just as important as and at times even more important than, physical caring. Yet another group considered addressing the spirit and spiritual needs of the patients as another component of adequate caring.

If I'm gonna give a good care, I also need to pay attention to the spirit of my patient, to his mental needs, emotional needs, spiritual needs. If my patient wanna say prayers, I make it possible, if she wants to wash up for prayers, I make it happen; if possible, help him connect with family members, for example let him talk to them on the phone; if I have managed to attend to all of my patient needs, whether mental, spiritual, social, and physical, that's when I can claim that I have provided good care...

As viewed by some of the participants, caring in technological environments is keeping under control the patient's condition and accurate functioning of the technological devices.

When my patient is doing ok, like when I look at the monitor and see that everything's fine, I look at him and see that he's fine, the equipment is working alright, there's no alarms, the tracheal tube is ok, the chest tubes are working properly, the fact that everything is going normally, I am relieved, and say to myself, this one is doing ok.

For a number of our participants the definition of caring altered proportional to the priority of patient needs.

In case of very sick patients who are facing death, it's definitely after they have passed a life-threatening condition when I feel that the caring has been enough.

Caring as a pleasant inner feeling: some of our participants mentioned the pleasant inner feeling of the nurse after delivering a good care. They believed that referring to his/her inner feeling, a nurse can ensure good caring. The nurse's peace of mind from addressing all the patient needs, the feeling of doing a beneficial work for the patient, seeing the patient in peace and comfort as a result of the measures taken by the nurse, and no sense of guilt due to possible negligence in caring, all ensure that the nurse has provided a good care.

I believe that there are aspects to care that can't be expressed in words, aspects like an inner feeling, with the things that can't be seen; have I given good care today? Have I been a good nurse? I am the one who can decide if I have provided good care or not. There are times when you do everything for a patient, yet the patient's not satisfied; well, why aren't you satisfied? You took your medicine, the doctor has visited you and everything has been done for you, why are you upset? Then she says that there was one small thing that was important to her that you forgot about; for example a woman wanted a head scarf, you did everything but disregarded this one task; or the spiritual caring of the patient; there is no one unified definition to caring, so that I can define it in just one line, no, in my opinion, there are many sides to caring, meaning that we have to consider the body of the patient, also her soul, also her family, which incorporates all the aspects of the patient.

Yet another group maintained that caring is a feeling of inner satisfaction, a good and invisible feeling with aspects which cannot be expressed in words.

I think that caring is an inner sort of thing and this is only us who know that whether our caring of the patient has been good today or not. An external evaluator can only monitor a number of observable items and the inner feeling and the sense of calm one gives to the patient cannot be measured.

Family participation in care: Meanwhile, some of the participants pointed out the positive impact of help and assistance of one of the close relatives of the patient in his/her care and introduced by phrases like miraculous caring, motherly caring and compassionate caring.

Once in the Cardiac ICU, there was the kid who was brought in after PDA operation. The moment the kid woke up he started crying. Despite all the advanced equipment we had in the ICU, we couldn't manage to calm him down. We gave him a Pethidine shot, he didn't calm down. We picked him up, with all the tubes attached, and walked him about, as far as the wires allowed, calming him down, yet it was no use. Eventually we called for the baby's mother, as soon as the mother picked him up, the crying stopped. The baby remained calm through the night and didn't cry or anything at all. That night, we emptied a room for the baby and his mother to be transferred there so that the mother could stay for the night.

Caring alongside technology

Surrounding this theme, the participant nurses claimed that the presence of technology does not diminish the importance of nursing care. Actually, in order for the technology to play an effective role in the treatment, a quality nursing care is essential. According to our participants, the data provided by technological equipment requires accurate interpretation by the nurse to initiate timely and appropriate measures. While a quality nursing care complements technology, facilitating the recovery process of technology-dependent patients, the opposite is also true, as negligence in nursing care renders technology useless.

In my opinion, technology alone cannot have that much of an effect, not so as to rely on it completely; you have to check the vital signs of your patient, it's true he's being monitored, it's true you have set the device, but the device may crash all of a sudden; for example you've attached the blood and put on the warmer and it's flowing, the blood may incompatible with your patient blood group and cause an allergic reaction, it's true that your patient is unconscious and can't say things like 'I have chest pain' or 'I have shortness of breath', but you have to pay attention all the other things, to the patients' appearance, if the patient has grown blue in the face or not, you shouldn't just rely on the instrument.

According to our participants, the clinical condition of the patient is the main verifier of the accuracy of the received data from technological equipment, it is deemed careless to solely rely on the equipment.

When we visit a case, the patient's bedside condition is really

important, when for example we see that the monitor is showing that the patient is tachypneic, now, is it actually the case? Do you actually see that the patient is tachypneic? Or the pulse; do you feel tachycardia? At the end, it has always been the case: first the patient's bedside, then the monitor; and this is really important, and no doubt, when the staff see such a complication, first, they go see the patient to make sure everything is alright. If they actually see a problem, that's when they take proper measures.

Ups and downs of caring

Despite the presence of different technological equipment and the critical condition of the admitted patient, the participant nurses experienced difficult, stressful, and at times, peaceful moments, while caring at the ICU. This theme has addressed these ups and downs in three levels: difficult caring, anxiety in caring, and caring in peace of mind.

Difficult caring the precarious and critical conditions of patients admitted to the ICU, whose lives may be dependent on different technological equipment, necessitates the simultaneous use of numerous devices and equipment. Besides monitoring of the patient's bedside conditions, the designated nurse is required to control the accurate functioning of the equipment as well, the point that enables immediate troubleshooting any problem arise, so that it does not impose a risk on the patient. The sum of the foregone renders caring at such environments as highly sensitive.

In the Cardiac ICU, the first-day patient demands the most tasks, the most caring; he is attached to the ventilator, has balloon pump, takes different drugs through infusion pump; we have to watch out for the clinical condition too, for example for a possible hemorrhage, for the outputs be up and running, the blood pressure to be in the normal range, the heart rate to stay down and normal; we have to consider all of this, also we must check the patient's ABG every 2 h to prevent acidosis or alkalosis, well, you have to know all of this, as a whole, at all times.

Moreover, the inability of most patients in carrying out daily activities, communicating and expressing their problems, needs and preferences, due to unconsciousness or otherwise, caused by the equipment, like the tracheal tube, make understanding the patient needs and obviating them difficult or even overwhelming, at times. Presence of invasive equipment installed for maintaining life or controlling the functioning of vital organs, cause discomfort and restlessness for the patient, the monitoring of whom is a major problem of caring according to the participant nurses.

When a patient in the ICU is not under the ventilator, the patient surely becomes a bit agitated, because there's no one around him, all he sees is these devices, there's the noise of the instruments, each nurse is doing her own thing; there were cases of patients who weren't on ventilator but still agitated. These patients were the worst, controlling them, you suddenly saw them disconnecting everything and letting them loose, how about that?

Anxiety in caring: this class addresses aspects of caring that have been associated with much psychological stress and pressure for the study nurses. Participant one defined stressful caring as follows:

When it is said 'stressful', it means the care that needs to be taken much more seriously, because if it isn't done well enough, the patient gets stuck in a phase which will be irreparable.

According to the participants, the particular sensitivity of accurate performance of some tasks, unstable physical condition of most patients and lack of timely access to maintenance facilities in some work shifts, imposes a lot of stress on nurses working at the ICU.

One thing we need to constantly watch out for is the patient's GCS and controlling his pupillary reflex. The hardest parts are for the night shifts, not that day shifts aren't hard, but during days the patient transporter is at hand; at nights, since such things are not available, if the patient's GCS falls down, there comes a huge load of stress as to how do I manage this condition to quickly restore him.

Location of some pieces of technological equipment, like arterial line, endotracheal tubes, chest tubes and so on, in the patient's body is such that their unintentional and sudden removal may put the patient at the serious risk of death. As held by our participants, caring of patients with the mentioned instruments is also considered as sensitive and stressful caring.

One stressful thing for us is replacing the gauze around the endotracheal tube, every shift, because it gets really dirty; some of the guys tie this gauze really bad, such that it gets mixed up with the cuff, so when you try removing it you need to be very careful. One time I distinctly remember I cut the cuff, meaning that the patient needed to be intubated all over again. It was a really bad day. It's true we had a resident physician who came down quickly and replaced the tube, but we always have this stress, especially when the cuff is not attached properly.

Due to issues like nurse shortage, ICU nurses receive no specialized trainings regarding how to work with technological equipment and how to manage critical conditions of patients. During their duty shifts, by watching expert nurses, they gradually learn how to work in a technological environment. According to our study participants, one significant source of stress for the newcomer nurses was facing numerous complex technological equipment and lack of pertinent operating know-how.

When I first started my committed services program, because of staff shortage, though I spent no training course for working in ICU, I was assigned to work in ICU₂. Generally the ICUs are wards where there are more technological machines, like monitors, infusion pumps, ventilators, etc. and they are also used more compared to other wards, so, it was really stressful for me, just after graduation, they sent me right over to the ICU, without any special trainings.

Caring in peace of mind: This level portrays the situations in which delivering care was associated with peace of mind, for the study nurses. Items including familiarity with the functions of the equipment, presence of the resident anesthesiologist who is available in critical situations, knowledge of the patient's clinical background status, age and prognosis and the technological instruments, in terms of the degree of patient dependence, are

all determining factors that facilitate caring and bring peace of mind to the nurse.

For ventilator settings, I asked my more expert colleagues and presence of the resident anesthesiologist was very helpful, anytime I had a question, I could ask, that's why the setting of the ventilator was not stressful to me.

Negligence in caring

This theme is concerned with those aspects of caring that, as viewed by the participant nurses, are sometimes forgotten unintentionally. This includes two classes of 'Negligence in Physical Caring' and 'Negligence in Mental Caring', described as follows:

Negligence in physical caring: despite the fact that the pivot of caring at the intensive care units, according to our participants, was the physical caring of the patient and addressing patient needs or preventing the physical adverse effects of the disease, yet, there comes sometimes when negligence may arise. One case pointed out by the participants was the affliction of patients with pressure ulcers, in spite of measures like pneumatic mattresses, back rubs, and changing the patient's position:

A patient's bed sores are more related to the technical caring than the equipment, it's technical. Lots of patients get bed sores here. I think this is not managed well, even though we got pneumatic mattresses here. Of course these mattresses have certain settings; you must know how to operate it, set it according to the patient's weight to be inflated; in my opinion, the guys here don't know it well enough, to set it to inflate once every few minutes.

One of the participants introduced the cause of this negligence as to be the inattention and disregard of the nurses themselves.

There's nothing wrong in caring, by nature, if there's any faults it arises from our way of caring.

Negligence in mental caring: Our participants maintained that the critical condition of a patient admitted to the ICU highlights the physical needs of the patient, and preventing his/her death and obviating such needs is prioritized in the nursing care.

When admitted to the ICU, his first issue is this physical aspect, you know, stabilizing his vital signs and stabilizing the critical condition he has been into, these are the priorities; only then the mental issues enter the caring.

Another group thought that unconscious patients don't need mental (emotional and spiritual) caring, or otherwise, were not aware of the mental and psychological needs of such patients, while others considered high workload and lack of time hindering the provision of mental caring or study on the mental needs of unconscious patients and attempting to fulfill them.

ICU patients are mostly low-GCS patients, moreover, the workload is too much and there's no time at all for us to go and study to know if patients in this stage have any perceptions mentally and psychologically; I, for one, still don't know how a low-GCS patient would feel, I just know that the last sense to go is the auditory, but what it actually is we can do for the patient,

mentally or psychologically, I still don't know.

A number of the participants introduced the absence of role models for providing mental care as one reason for the unawareness of nurses concerning this aspect of caring, and consequently, the cause of its disregard.

We received no training at all on what to do for a patient on ventilator, mentally, how to communicate him, what to do spiritually, and no one in this ward provides such caring for patient, to learn from whom and consider as a role model.

Some participants reported the fear of being ridiculed by peers as a hindrance to providing caring services including speaking to unconscious patients, explaining their condition to them, and touching them, among others.

I, myself, always speak to my patients a little; well, it's true I don't get any feedbacks, but I have grown this belief that I have to speak to my patients, even if it is calling their names, or talking a few words, I communicate them, which could be seen as ridiculous in the ward or at least, in my mind, I think that it may be regarded as ridiculous, so I try and talk to my patients when the ward is not too crowded and nobody's looking, so I don't get a lot of attention.

Vigilance in the challenging contexts: according to the participants of the present study, the requisite for caring in a technologically complex and sensitive environment is that, besides basic nursing skills, the ICU nurse needs to maintain a comprehensive view regarding all aspects of a patients' needs in critical condition, and attempt towards obviating them; he/she must also be proficient at operating technological equipment, interpreting the output data, and at providing proper equipment maintenance.

Discussion

The present study captured the meaning of caring from a sample of critical care nurses' perspective. These nurses believed that the meaning of caring in a critical care environment, which is characterized by abundance of technological devices, is openness and comprehensive view of the nurse. The nurse working in such environments should consider the patient as a whole person with bio-psycho-social and spiritual needs. A complex system, which failure in one part will affect other components and the whole system. Although, because of the critical situation of these patients, their physical needs take precedence over psychosocial and emotional needs, however, the nurses stated that when they were able to address all of the physical, mental, social, and spiritual needs of their patient, then they feel they have provided a real care for the patient. Actions like establishing a trustful relationship with patients, giving hope to the patient regarding improvement of health condition, listening to the patient, alleviating their worries, and addressing religious and spiritual needs of patients, have been described as caring by our study participants. Participants in the study of Yam and Rossiter [3] described caring as nurses' efforts to address physical, psychosocial and spiritual needs of patients and explaining nursing action to the patient and family. In the study of Wilkin and Slevin

[14], critical care nurses described comforting care as a holistic concept which comprised of providing physical and psychological care for patient, establishing a therapeutic relationship, and giving hope to patient and family and involving family members in the patient care and participants of the study of Beeby [20] defined caring as having hope to the patients' recovery. These descriptions support our study findings regarding holistic caring.

Our study participants explained that performing actions which will result in patients' satisfaction create a pleasant inner sense which goes beyond objective and measurable criteria and they described this sense as caring. Caring has been known as the act of love. It is an interaction between provider and receiver of the care, who share love and gain desirable results [21]. Nascimento and Erdmann [2] stated that caring makes a sense of harmony between self and the environment, in care provider and the person who received it. Fingfeld-Connett [22] argued that creating an intimate atmosphere which facilitates exchange of feelings and emotions between nurse, patient, and family, makes a sense of calm and comfort in the nurse and patient and stated that nurses' 'mental well-being is an outcome for caring. These findings are consistent with our study participants' explanations.

In the present study, majority of the participants emphasized that nursing care and technology have the same role in gaining desirable patient outcomes and sometime nursing care is more important and takes precedence over using technology. Tunlind et al. [23] asserted that high technological equipment and basal nursing skills are two key components for feasibility and effectiveness of advanced care which is delivered in an intensive care environment. Greger [24] suggested that to be a proficient nurse in a critical care environment, the nurses should focus their attention on the person being cared for, while appropriately interpret and use the information they received from technological tools. These explanations confirm our study findings.

Some of the study participants pointed out to a compassionate care delivered by one of the patients' family member and used terms such as miraculous or compassionate care to describe this type of caring. Beeby [20] acknowledged that involving family members in physical care of the patient could provide emotional care for patient. Nascimento and Erdmann [2] described an informal care which was delivered by the patients' family members and was full of warmth, comfort, attention, and affection. These statements support our study participants' descriptions of family caring.

Critical care nurses of our study stated that because of the precarious condition of patients' life, presence of various technical tools needed for control and maintenance and difficulties in communication and understanding patients' preferences and needs, caring in a technological environment, sometimes is laborious and difficult. Critical location of many of the technological devices in relation to the patients' body, frequency, and sensitivity of doing some procedures in critical care units, lack of knowledge regarding use of different technological tools or new devices which introduced currently to the ward, makes caring stressful for some of our study nurses. Participants in the

study of Alasad [7] stated that technological caring is demanding and time consuming, because of physical activity and time the nurse needed to care for technology. In the study of Tunlind et al. [23], participants stated that the presence of advanced technical tools and conducting invasive procedures which need more attention than caring for patient and unfamiliarity of nurses with the function of many of the technological devices, were the main source of creating stress for them. These statements are in line with the presents study's finding.

Sometimes, connection of the patient to life support technologies such as ventilator, made nurses of our study feel calm when caring. Moreover, Presence of an expert individual, such as an anesthetist or an experienced colleague and familiarity with operation of devices, made caring comfortable and without any tension or difficulties, for them. This finding is evident in the study of Tunlind et al. [23], whom the participants stated that performing nursing interventions for the patients connected to advance monitoring devices is more comfortable for them.

The relational theme "negligence in caring" reflects those aspects of caring which may be ignored in the present study setting. Although, in our study, the priority was given to physical needs of patients, however, this aspect of care sometimes were neglected. Price [25], Andersson et al. [1] and Fingfeld-Connett [22] found out that caring grounded in its context and affected by culture of the unit and work pressures on the staff, so, the default is attributable to heavy workload, staff shortage, and lack of knowledge regarding proper use of some technological tools, in the specific context of the present study.

Ignoring psychological, emotional and spiritual aspects of care, which were reported by our study participants, is evident in many other research findings [1-3,20]. Patients who participated in the study of Nascimento and Erdmann [2] stated that because of the presence of advance technological devices, intensive care environment is cold and heartless. This impersonal environment influences caregivers' behavior and they also delivered an impersonal care which does not consider individuality and human dignity of patients. Yam et al. [3], described some negative attitudes of nurses such as caring is just about addressing some basic needs of patients and not communicating them and mentioned them as barriers to providing proper care by nurses.

The constitutional pattern "Vigilance in the challenging context" reflects the meaning of caring from the present study critical care nurses' perspective. They believed that to be a caring nurse in a technological environment, the nurse should be open regarding patients' bio-psycho-social and spiritual needs, have caring knowledge and skills, be master in application of medical technologies and have professional experience to harmonize basic nursing care with advanced technology, in order to improve the outcomes of critically ill patients. This interpretation is similar to the "crafting process" in the study of Price [25], whom the study participants described caring in a critical care environment as a multi-faceted process which is affected by various factors and the crafting process enables the nurse to combine all these factors to deliver high quality care. Participants in the study of Wilkin and Slevin [14] believed that critical care nurses should

deliver a humanistic care which comprised providing physical care and addressing emotional needs of patients, to bridge the gap between advanced technology and humane nursing care. These explanations are in line with the constitutional pattern of the present study.

Conclusion

Participants of the present study believed that caring in an intensive environment is a holistic process which needs nurses' vigilance regarding all aspects of patients' needs and striving to meet them with both artistic and scientific parts of nursing, while at the same time, being an expert in working with advanced technical tools. They stated that psychological aspects of care are neglected in these environments. This finding needs further research to find out whether the negligence is related to the presence of technology or lack of consciousness of most of the patients, or is due to lack of education or emphasis on addressing these types of needs in the present setting.

Study Limitations

This study provides some insights regarding the understanding of critical care nurses from the meaning of caring, however, qualitative design of the study and small sample size may limit its' generalisability.

Implications

This study has implication for education, practice, management and research. It is suggested that training the meaning of caring and its importance and centrality to nursing profession, with more emphasis on psychological and emotional aspects of care, should be included in the curriculum of nursing education. In continuing

education programs of workplace, it is also recommended that addressing physical and psychological needs of critically ill patients, along with acquisition of knowledge and skills to work with and interpret information received from technological equipment should be emphasized. For decreasing newcomer nurses' stress when start working in a technological environment, it is recommended that training of these nurses is done by clinical instructors and experienced nurses which take preceptor role, to ensure adequacy of the training. For nurse administrators, it is suggested that they enhance their knowledge regarding patients' and nurses' needs in a technological environments. By allocating adequate staff to work in such environments, valuing their performance, assigning time for nurses' distance and vacation, and financial incentives could improve nurses' job satisfaction and motivation which is followed by improved performance in delivering a more holistic care, in such complex environments.

Further research is needed regarding psychosocial and emotional needs of critical care nurse, patients, and family members. Moreover, due to critical condition and lack of consciousness of most of the patients in technological environments, it seems that spiritual needs of these patients are neglected which need to be further researched. Exploring the meaning of caring from general ward nurses' perspective is also recommended, to illuminate the technology's effect on perception of nurses from the meaning of caring.

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