An investigation of the psychological experiences of patients under mechanical ventilation following open heart surgery

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Original Article

Abstract

BACKGROUND: Breathing and living on mechanical ventilation develops a different feeling in patients. Most of such feelings and experiences are not pleasant and can lead to psychiatric disorders in the patients after they are detached from the ventilator. The aim of this study is to explore the psychological experiences of patients under mechanical ventilation.

METHODS: This qualitative study was conducted according to an interpretive epistemological approach in 2016. Fifteen participants were selected according to purposive sampling. Data were drawn from the transcripts of in-depth, semi-structured interview that were not discontinued until data saturation was ensured. The participants were asked to share what they experienced when they were under mechanical ventilation and intubation. Data analysis was conducted according to Diekelmann method.

RESULTS: Altogether, 2 themes, 7 subthemes, and 27 sub-subthemes were drawn from the data. Two themes were dread (a horrible experience) and hope (an inspiring experience). Dread consisted of anxiety, hopelessness, and dependency. Hope consisted of spiritual connection as the only possible effort, the presence of health team the source of comfort, the family looking forward, and overcoming the illness (a step to life).

CONCLUSION: The psychological experiences of patients under mechanical ventilation are specific, and nurses can play an important role in decreasing tension and increasing hope among them through gaining knowledge about their experiences.

Keywords: Mechanical Ventilation, Psychology, Heart Surgery

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Introduction

It is necessary to use mechanical ventilation during major surgeries.[1] The main aim of mechanical ventilation is to assist gas exchanges until the patient's breathing problem is resolved. Different advanced devices, models, and techniques are used to conduct ventilation and oxygenation. Basically, these techniques are aimed to help patients initiate ventilation and support their breathing completely or partly. Despite the availability of such advanced devices, mechanical ventilation is associated with numerous physical and mental complications in patients.[2] Tsay et al. pinpoints that although the mortality rate has declined considerably among the patients under mechanical ventilation, the complications due to undergoing this device persist even after discharge.[3] Recent studies have indicated that the mechanical ventilation-associated complications decrease as the duration of ventilation is shortened and the patient is detached from the device sooner.[4] Such complications include damage to mouth, throat, and trachea, respiratory function, reducing the need for analgesics, mortality, and psychiatric complications

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such as stress, anxiety, sensory deprivation, length of hospital stay, and reducing costs.[5]

For early consciousness and sooner detachment of these patients, sedatives and sleep aids are less frequently used; and therefore, they need specialized nursing care.[6] Nurses play an important role in taking care of these patients and detaching them from mechanical ventilation and reducing their physical and psychiatric complications.[6-8] Holistic care contributes effectively to recovery and rehabilitation of the patients; therefore, nurses should pay special attention to these patients' psychological, in addition to physical, needs. Intubation causes certain psychological problems for the patients via limiting their verbal communication[9]. Therefore, a big challenge may be developed between physiological and psychosocial issues in taking care of these patients.[10] Elder et al.[11] reported that the disrupted process of communication and mistakes due to lack of understanding patients' needs in intensive care units (ICUs) cause increase in cost and mortality, and disruption in treatment course and also influence nurses' capabilities and even services delivered by other healthcare divisions.

Therefore, nurse and medical team members should take into account all the patients' needs from a holistic perspective and pave the way to detach them from mechanical ventilator as soon as possible.[11] Eckerblad et al.[12] argues that it is necessary for ICU nurses to be familiar with the patients' physiological and psychological states as they are under mechanical ventilation to detach them from the device appropriately and prevent associated physical and psychological complications after discharge.[12] Physiological and mental states are unique experiences that vary among different people depending on their backgrounds and individual differences.

Qualitative studies mainly have investigated the physiological and physical aspects of patients under mechanical ventilation, and few studies have already been conducted on these patients' psychological aspects as they are under mechanical ventilation. The experiences and psychological needs of these patients have not yet been sufficiently explained for ICU and especially cardiac care unit nurses, while emotional stress and psychological complications of this period persist in the patients even years after discharge that influence the health of the patients especially those undergoing heart surgery.

Studies have indicated that despite extraordinary developments in mechanical ventilators technology and medical treatments pharmacotherapies, the process of detachment from the ventilator is still a stressful, frightening, and disappointing experience from the patients' perspectives.[13-17] In principle, 11% of the patients have been reported to experience certain psychological problems such as amnesia, difficulty concentrating, and delusion after detachment from mechanical ventilator. However, if the patient is better supported under the ventilator, these complications develop less frequently.[1] Despite many studies on mechanical ventilation, it seems necessary to conduct a study to exclusively investigate the psychological experiences of the patients under mechanical ventilation so that their psychological needs can be addressed to prevent subsequent associated problems. This study was conducted to investigate the psychological experiences of patients following open heart surgery as they are under ventilation.

Materials and Methods

This qualitative study was conducted according to the interpretive phenomenological approach. The phenomenological study refers to the close, systematic, and critical of phenomena.[18] This study was conducted to discover the lived psychological experiences of patients under mechanical ventilation and at detachment from the ventilator following open heart surgery in 2016. The study setting was three ICU of the Shahid Chamran Hospital, Isfahan, Iran, and 15 participants were selected purposively from patients undergoing open heart surgery. The participants were interviewed after full recovery and in the surgical ward. To conduct interviews, the participants were invited to the meeting room after their conditions became stable. To achieve this purpose, the patients were visited after recovery and asked to provide consent to participation in the study after an introductory conversation and giving explanations about the research purposes. Then, the patients were asked to describe their experiences from recovery until the tracheal tube was taken out from their mouths. Data collection was conducted through individual, in-depth, open, and semi-structured interviews. The interviews were started with this question: "May I ask you talk about your experiences from the time when you recovered and found out that you were under mechanical ventilator until you were detached from it."

The patients whose conditions did not become stable after the surgery, and needed other invasive interventions or re-intubation after extubation were excluded from the study. The interviews lasted for 25-40 minutes and were not discontinued until in-

depth data could be drawn. All interviews were recorded and transcribed. Meanwhile, the participants were observed from the development of the first recovery symptoms under mechanical ventilation until the extubation and as they were being interviewed. Moreover, field-notes was taken.

Data analysis was conducted by Diekelmann et al. method that is used to analyze the data of qualitative, hermeneutic phenomenology epistemological studies.[19] First; the interviews transcripts were read several times to achieve a general perception of the phenomenon in question. After the researcher achieved such perception and felt comfortable with the data, the transcripts were separately examined according to text interpretation method. Explicit and implicit meanings offered by the participants drawn from the transcripts, coded and categorized. The categories were coined. The summary of the codes and categories was reviewed by other researchers to reach a common understanding of the participants' descriptions. Then, the contradictions in the interpretations were resolved after all researchers shared their viewpoints. To achieve this purpose, the original transcripts were reviewed or if necessary, the participant in question was called for further explanations. At this step of the study, two participants were called, the categories were determined and described by comparison and contrasting of the texts. Finally, the data were drawn and categorized accompanied by a selection of the transcripts and examined by the researcher to develop the final scheme of the findings.

To enhance the internal consistency, in-depth questions and semi-structured interviews were used. Participants enrolled in this study had a comprehensive range of ages and educational levels and were from both sexes. In addition, a number of the participants were re-interviewed, the data confirmed by continuous comparison and exploring into negative meanings, and categorization conducted appropriately. Besides, the interviews were continued until saturation of the data was ensured the participants selected according to purposive sampling, and maximum diversity of the samples sought out to provide external reliability.

In addition, a number of the participants were asked to review the data to investigate their reliability and acceptability. To do this, a sample of the data was offered to five participants and they were asked to share their viewpoints on the compatibility between the data and their experiences. To determine whether the data are generalizable or not, the participants' situations were completely and elaborately described so that others could judge and assess the findings. In addition, the researchers did their best to remain neutral in reporting the data through conducting an open interview and narrating the participants' experiences, reflecting and being present for the long-term, working in the study setting, and keeping and reporting the evidence tactfully.

To observe research ethics, researchers then achieving authorization from the Ethics Committee of Nursing and Midwifery University, Faculty of Medical Sciences, Isfahan, Iran (Number: 312-1-1394) approved the study protocol and the authorities of Shahid Chamran Hospital provided consent to conduction of this study. In addition, the patients were informed about the anonymity and confidentiality of the data drawn from the transcripts as well as voluntary withdrawal from the study at any step of the study without any penalty. Then, they were asked to provide consent to participate in the study if they were willing to do it.

Results

15 patients undergoing open heart surgery in Shahid Chamran Hospital participated in this study. Table 1 shows the participants' demographic characteristics.

Overall, 2 themes, 7 subthemes, and 27 sub-subthemes were drawn from the data. The two themes were dread (a horrible experience) and hope (an inspiring experience) (Table 2). Dread consisted of three subthemes, namely anxiety and fear, despair, and dependency. The participants reported that anxiety and fear occurred following the transition from unconsciousness to consciousness. Two patients described the stressful environment of the ICU as follows:

"... When I woke up, I did not know where I was. First, I thought I slept on the furniture of our home. Gradually, I realized that here is somewhere else. I could not move at all. I thought I had a myocardial infarction (MI) because my tongue got numb and I could not talk. I realized that a tube had been put in my mouth. I had got so worried ..." (p3-i1).

"... To be honest, everyone who wakes up and does not know where he is and once sees all these devices hooked to him and cannot do anything, is definitely going to have another MI from fear. I could not move at all. The nurse told never move at all because this tube would be taken out and you could not breathe. I had been more scared. I was afraid that this tube would be taken out and I could not breathe..." (p7-i1).

Table 1. Participants' demographic characteristics and frequency distribution

Variable		Frequency (%)
Sex	Man	7 (46.7)
	Woman	8 (53.3)
Marital status	Married	10 (66.7)
	Divorced	1 (6.7)
	Widow/widower	4 (26.6)
Age	< 40 years	3 (20.0)
	40-60 years	7 (46.7)
	> 60 years	5 (33.3)
The number of children	≤ 2	5 (33.3)
	> 3	10 (66.7)
Education level	Elementary and lower	5 (33.3)
	Secondary	6 (40.0)
	Higher than high school completion	4 (26.6)
Type of surgery	Coronary grafting	8 (53.3)
	Heart valve replacement	4 (26.6)
	Atrial and ventricular wall repair	3 (20.0)

As a vital sign of living, breathing is not only important for the treatment team, but also critical for the patient's perspective. The participants in this study were clearly worried about the possibility of discontinuing breathing and being dependent on mechanical ventilator such that a patient said:

"... To be honest, I gradually got disappointed. I wondered maybe I would be breathing with this device until the end of [my] life, maybe I would not be able to get rid of here once again..." (p4-i1).

Table 2. Sub-subthemes, subthemes, and themes of psychological experiences of patients under mechanical ventilation following open heart surgery

Theme	Subtheme	Sub-subtheme
Dread: A horrible experience	Anxiety and phobia	Ambiguous condition
		Fear of connections and devices
		Unsafety
		Respiratory illness
		Understanding error
		Fear of death
		Environmental risks
	Despair	Sense of loneliness
		Inability to communicate
		Inability to move
		Distracting thoughts
	Dependency	Dependency on device
		Dependency on personnel
Hope: An inspiring experience	Spiritual connection as the only possible effort	Praying recital
		Cordial resort to God
		Trust in God
	The presence of treatment team, the source of comfort	Sense of attracting others' attention
		Access to treatment team
		Communication with treatment team
	Family looking forward	Praying family
		Worried family
		The presence of family
	Overcoming illness: One step to life	Family, pursuing the patient's state
		Comfort after receiving care
		Becoming free from dependency
		Stable state
		Treatment team insurance

Stressful environment of the coronary care unit (CCU), the type of the staff's treatments with the patients, and everything that occurs in the CCU is interpreted differently by the patients. More clearly, each patient perceives the CCU environment depending on his own circumstances. These perceptions occasionally lead to the horrible experiences of despair and disappointment or the recovering experiences of understanding the staff's presence and their attention to the patients.

In this regard, a participant said:

"... I was terrified by the personnel's talks. They said that old man was very critically ill and there was no hope [for his survival] and we did not think that he would be detached from the device once again. I thought they were talking about me, my heart palpitations increased; two other nurses in the station were talking with each other and did not pay any attention to me at all. I wondered if this device did not give [me] puff, what would happen, if this tube was taken out, what would happen. there was not anyone else to help…" (p11-i1).

Inadequate interactions and lack of providing necessary explanations for the patients as they are under circumstances in which the situation is difficult to be understood by them lead to certain horrible state ambiguities such that a participant said:

"... My nurse told [me] to be calm, [as] your test result was received, we would take out that tube, and they did not give me water. I did not know what this test was [for], maybe its result would take several more days to come ..." (p6-i1).

According to the data, the theme hope represents an inspiring experience consisting of the subthemes spiritual connection as the only possible effort, the presence of health team the source of comfort, the family looking forward, and overcoming the illness (one step to life). Regarding the promising effect of nurses' presence and communication with them, a participant said:

"... A woman nurse came to me and told me where I was and I had undergone a heart surgery and my surgery had been done well. At that moment, I just realized where I was and why I had come here ..." (p3-i1).

Spiritual connection is one of the promising factors that the patients establish when they are alone and have no other ways out. The patients seek to restore the lost hope through spiritual connection. In this regard, a participant said:

"... I was so alone. Sometimes I closed my eyes [and] mentioned and I asked God to help me and sought for God's assistance…" (p15-i1).

Knowing the outcome of treatment and giving hope for recovery and overcoming the illness represents a path to hope among the patients under mechanical ventilation:

"... My nurse came and told me [that] I was well and to be calm for the moment until your test result would be received and if it was good, we would gradually take out the tube from your mouth ..." (p10-i1).

The patients who perceive themselves to be completely dependent on others' assistance achieve calmness after receiving physical care, which is one of their expectations from the healthcare system such that a patient said:

"... When the tube was in my mouth, my mouth got too dry and the end of my throat burned so much, a man [nurse] and a woman nurse came over my head. I pointed them with my head that I was thirsty, I took out my tongue, but that woman told [me] to be calm. After some minutes, that man nurse came and poured a few drops of water into my mouth, my mouth got wet, with difficulty I gulped the water, the burning of the end of my throat was diminished, I got very comfortable ..." (p8-i1).

Family's role, looking forward, and presence, and the special attention paid by the patient's spouse and children contribute greatly to restore lost hopes. In this regard, a patient said:

... At that time when I was disappointed by anything and anyone, I did not know how my son realized that I needed him. Through much insistence, he finally got the permission of the nurses and came over my head, I got much glad as if they had given me the world, I became relieved [when I realized that] the kids kept a close eye on me and did not abandon me and I became relieved [when I realized that] they realized that I was getting better and they did not need to be worried about me…" (p2-i1).

Discussion

The aim of this study was to gain an in-depth perception of the psychological experiences of patients undergoing open heart surgery as they are under mechanical ventilation. Although it is not conventional to generalize the findings of qualitative studies rather these studies are aimed to generate and describe important experiences correctly to increase insight, certain findings of the present study may lead to further understanding of the concept of care with reference to the evidence of other studies. In this study, fear and hope were

derived to be two explicit experiences in the conscious patients hooked to the mechanical ventilator, because the patients under mechanical ventilation need to expend a great deal of energy to survive and have reached a stage in which they feel dreadfully frustrated and that they need assistance. Such needs make them turn to spiritual sources. Meanwhile, caregivers and therapists seek to provide material and spiritual welfare for the patients through understanding such frustration, being present and displaying effective spiritual and physical reactions. In the light of the findings of the present study, these patients' psychological experiences represent that there are certain issues in such situation, some of which enhance spirit and hope and some of which cause fear and intensify worries among them. According to Loghmani et al.[20] study, the experiences of nurses and families of patients in ICUs were categorized into five themes, namely spiritual attention, emotional reaction, recruitment of participants, interactive education, and counseling and guidance. Loghmani et al. reported that giving hope, directing attention toward God, and resorting to religious rituals were drawn as the subthemes of spiritual attention,[20] which is in agreement with the current study. Inducing hope is, therefore, one of the most important care-related needs of the patients under mechanical ventilation.

Rezaee et al.[21] study on hope for the patients' recovery among ICU nurses demonstrated that the nurses' knowledge about hope themes can lead to taking care of the patients (the most important responsibility of the nurses) peacefully and in the best possible manner. The current study indicated that although hope concept has many applications in nursing dialogue, its specific domains are taken into account in different people. Through detecting these four themes, we can argue that increasing nurses' (professional) knowledge, as well as their knowledge about hope-related themes, can contribute to promoting the quality of effective care and developing intrinsic pleasant emotions, optimistic attitude, and sensible expectations (recovery, death with dignity, and gaining experience).[21] This argument is consistent with the present study as hope was derived to be an important experience among the studied patients.

Although the transplantation of cardiac vessels is a treatment that causes increase in hope for outliving and quality of life among the patients, these patients are faced with numerous mental problems that may remain unresolved even many years after discharge.[22] As the present study demonstrated, one of the main needs of these patients was the need for peace as most of them reported the need for mental peace in this period.

In the current study, fear (a horrible experience) was another theme drawn from the data. The patients under mechanical ventilation have to experience stressful moments. Being worried about the understanding of the risk of disease and its consequences, sense of being neglected and paid inadequate attention as well as being worried about one's own conditions in the future are some of the specifications of this theme. The patients' experiences in this study demonstrated that physical problems, fears and tensions related to breathing and discomfort have caused the perception of risk of the disease and its consequences among the patients. This fear or worry can be due to the equipment hooked to the patient.

Schou and Egerod[14] demonstrated lived experiences of the patients undergoing open heart surgery during detachment from ventilator consisted of three themes as general phenomena such as discomfort and disrupted communication, psychological phenomena including reduced control and loneliness, and existential phenomena such as transient interactions and human interactions. Regarding the psychological study, that study is consistent with the current study. The psychological findings of that study represented the experience of losing control as unawareness of time and location, losing self-confidence, being dependent on others, and feeling lonely reported by a large number of the patients.[14] As studies have indicated, this experience is completely dependent on the environment and nurses' communication with the patients. It seems that the nurses can help reduce this negative experience to a large extent through expending more time to be with the patients and communicating with them via speech, touching, and even eye contact.

In a study of Foster[23] on patients undergoing tracheostomy in a hospital in England, it has been reported six themes of the principal domains of the experiences, namely need for communication, achieving normal state, psychiatric disorders, painful procedures, unknown fears, and communicating with personnel. The researcher in that study arrived at this conclusion that this domain of the patients' experiences should be completely taught to the nurses so that the patients can pass this period more comfortably. Foster recommended conducting larger studies on psychiatric disorders and associated

causes.[23] In the current study, the patients who were under mechanical ventilation described their psychological experiences. Consistent findings were obtained with different conceptualization.

Arslanian-Engoren and Scott investigated the lived experiences of the patients under mechanical ventilation using the phenomenological methodology, and reported fear, stress, feeling dependent on the device, and pain to be the experiences of these patients as they were under long-term mechanical ventilation.[24] In the current study, the patients were under mechanical ventilation for the short-term, and if the patients knew the psychological problems associated with this period, they could detach the patients from the ventilator even sooner and with fewer complications such that the patients would pass this period pleasantly.

Wang et al. studied the lived experiences of the patients under mechanical ventilation in the ICU and reported five themes consisting of being in a new environment, physical suffering, mental suffering, self-encouragement, and self-reflection. Furthermore, four subthemes were drawn from mental suffering theme, consisting of experienced nightmares and delusions, fluctuation of consciousness level, and dependency on technology and others to survive,[25] which is consistent with the subthemes, namely dependency on the personnel and device and distracting thoughts, drawn in the current study.

As several studies on cultural and educative issues have indicated, both positive and negative psychological issues may occur among the patients under mechanical ventilation. These issues, in the current study, were explained in a specific cultural and educative context in Iran, i.e. Isfahan subculture, characterized by extensive interpersonal interactions, religious beliefs. Therefore, the findings of the current study cannot be generalized to other contexts but can serve as a guideline for the health team to satisfy the patients' expectations in similar circumstances in different sociocultural context, which can be considered a limitation of the present study. According to the findings of this study and other studies, psychological factors play an important role in healing and disease.[26]

This study had some limitations. The golden time to interview with the participants was immediately after detachment from the mechanical ventilation because they can remember those moments very well and can express their feelings more accurately. However, the participants in this study were not sufficiently conscious at those moments and we had to wait for them to recover fully and then interview them.

Conclusion

Irrespective of diagnosis and severity of disease, patients have fundamental needs. They expect specialized staff in the hospital to deliver full and early healthcare services continuously and kindly. This requirement is considerably more urgent for patients under mechanical ventilation. The findings of the current study and other studies indicated the ICU personnel should take into account the psychological, in addition to physical issues of the patients so that they can address the psychological needs of these patients more than ever, and therefore, deliver the best and highest quality care to them and prevent subsequent problems.

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Conflict of Interests

Authors have no conflict of interests.

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