



Quality of Life and Related Factors Among Patients Discharged from Critical Care Units

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Abstract

Background: Quality of life is considered as the sense of well-being and life satisfaction. The healthcare professionals' final mission is health amelioration to increase the patients' life quality. The aim of the present study was to examine the effect of different factors on the quality of life in patients discharged from critical care units.

Methods: This cross-sectional study was performed in 325 patients admitted to critical care units of Kashan Shahid Beheshti hospital using a convenience sampling method in 2015. Data were gathered one month after patients' discharge through a demographic questionnaire, the quality of life standardized ShortForm-36 (SF-36) questionnaire, and the post-traumatic stress disorder checklist (PCL). The obtained data were analyzed using statistical tests such as t-test and (one-way) ANOVA test.

Results: The enrolled sample consisted of 185 (56.9%) males and 140 (43.1%) females with a mean age of 54 ± 16.15 . The mean total score of life quality in the study sample was 54.32 ± 27.52 and the total score of PCL was 43.99 ± 19.94 . The mean score of the life quality was lower among patients with features including over 60 years, unemployed, a long-term hospitalization, more than five children, drug abuse, using mechanical ventilation, and post-traumatic stress disorder; however, the mean score was higher in employed and highly educated people. This analysis indicated no relationship between quality of life and patient's gender, type of critical care unit, marital status, and admission for trauma reason.

Conclusion: The mean score of the quality of life of patients discharged from intensive care units is low. Some of the individual and medical features such as age, drug abuse, a long-term hospitalization, using mechanical ventilation, and post-traumatic stress disorder are risk factors that decrease the quality of life. Nurses can identify and control the risk factors in intensive care units.

Keywords: Quality of Life, Related Factors, Critical Care Unit, Post-Traumatic Stress Disorder (PTSD)

1. Background

The quality of life is the sense of well-being and life satisfaction. The healthcare professionals' final mission is health amelioration to increase the quality of patients' life. As there is a mutual relationship between disease and quality of life, physical and mental disorders have a direct impact on the quality of life (1). The different severity of psychological and physical symptoms on the quality of life in terms of patients' condition is obvious. Patients, who suffer from critical conditions and are catered in intensive care units (ICUs), have more sensitive conditions than other patients (2, 3).

Nowadays, as technology and medical equipment have

extensively been advanced, the rate of patients' death has reduced. However, patients discharged from critical care units may experience different psychological and physical complications (4, 5). Previous studies have shown that those patients who are catered in intensive care units may possibly be involved in severe psychological and physical problems due to aggressive medical interventions and the use of protective devices such as Ventilators, Dialysis, and Electroschock. Hospitalization in an intensive care unit can cause dangerous complications in vital organs such as organ dysfunction, kidney or renal failure, and heart-cardiovascular diseases. Sometimes improving physical and psychological complications takes several years (6-8).

One of the most prevalent psychological disorders is post-traumatic stress disorder (PTSD) which is an acute anxiety disorder, and it is a critical condition of past traumatic events (9, 10). PTSD is known as a cause of disability that can lead to psychological problems, physical disability, and an increase in the risk of heart disease and vascular diseases. Thus, physical and psychological disabilities resulted from post-traumatic stress disorder (PTSD) reduce the quality of life in patients discharged from intensive care units (11, 12).

According to Dowdy et al. (2005), in comparison with other people, patients discharged from intensive care units have a low quality of life (13). It is clear to see that the weakness in doing routine activities declines the quality of life of patients discharged from intensive care units in comparison with patients hospitalized in medical and surgical units (14). A reduction in the quality of life of these patients can cause disorders in their social-individual life and sexual relation or cause impotency, disappointment, fear, neurological disorders, malnutrition, and a sense of possible death (15-17). A reduction in the quality of life may affect physical, economic, social, psychological, and family scopes that can drive patients and society to economic damage (15, 18, 19).

Cuthbertson et al. (2005) have reported that the severity of disease and experiencing aggressive events during the hospitalization period are connected with the reduction of the quality of life in patients discharged from intensive care units (20). In 2013, Vainiola et al. voiced the idea that the quality of life in patients who need to undergo surgical procedures is lower than in other patients. Whereas, Tereran et al. (2012) reported that there is no significant association between the patients' life quality, type of critical care unit, and their diagnosis as traumatically and non-traumatically (21).

It can be noted that other related factors may include the period of hospitalization, the severity of disease, mechanical ventilation, and natural history and underlying diseases. Some of the individual factors can decline the quality of life, as well. Fildissis et al. conducted a retrospective study in 2007 on 242 patients in Athena and founded that there was a significant relationship between the quality of life and gender so that males had a lower life quality than females (22). However, Oeyen et al. (2010) did not report any noticeable relationship between the quality of patients' life and gender (23). According to Oeyen et al.'s research, high education, appropriate occupation, race, and geographical situation increased the quality of life; however, Granja and Carr believed that the mentioned factors are irrelevant (24, 25).

Different studies have revealed that the quality of life is affected by health-medical care professionals' interven-

tions (26, 27). In the medical group, nurses play a remarkable role in intensive care. They can improve the results of medical treatment by identifying and controlling the risk factors and thus, they serve as a significant aid in increasing the quality of patients' life. The critical role of nurses is to promote QOL by improving care during and after discharge (28). Considering the available differences in the related factors and performing little research in this scope, the authors attempted to investigate the quality of patients' life discharged from intensive care units of Shahid Beheshti hospital.

2. Methods

This cross-sectional analysis was conducted on hospitalized patients in the post cardiac surgery unit (PCSU), intensive care unit (ICU), and cardiac care unit (CCU) at Shahid Beheshti hospital. The convenience sampling method was selected to recruit patients from July to November 2014. To determine the sample size, the standard deviation of life quality ($\delta = 34$) used in the Cuthbertson's research was applied (20). Regarding the equation

$$n = \frac{\delta^2 z^2}{d^2} \quad (1)$$

$z = 1.96$, and $d = 0.04$, the sample size was estimated at 310 subjects that was increased to 342 subjects considering a 10% attrition rate.

The inclusion criteria included the hospitalization period more than 24 hours in the intensive care unit, accepting participation in this research, living in Kashan one month after being discharged from the hospital, being conscious, having physical ability to cooperate in filling out a questionnaire one month after discharge, and not having mental diseases. Moreover, the exclusion criteria consisted of failure to access the patient one month after discharge, being unconscious one month after discharge, and refusing to participate in the study process.

This study was approved by the ethics committee of Medical Faculty with research code 9365. After achieving patients' informed consent, observing ethical issues based on the Helsinki declaration, and considering the inclusion criteria to the study, the questionnaires were completed. The questionnaires included a demographic questionnaire, the SF-36 quality of life questionnaire, and the post-traumatic disorder checklist (PCL). The demographic questionnaire and clinical information included age, gender, occupation, marital status, number of children, education, the period of hospitalization daily, type of critical care unit, being hospitalized due to trauma, mechanical ventilation, history of drug abuse, and history of the underlying

disease. These questionnaires were filled out by interviewing the patients or their companies in case of patients' failure in responding or by referring to the patients' medical records in their hospitalization period at the hospital.

As researchers urged patients to fill out SF-36 and PCL questionnaires at the hospital one month after discharge, their phone number was taken to remind them. In case of failure in presenting at the hospital after one month, the researchers or a trained college visited patients in order to fill out the SF-36 quality of life questionnaire by them after taking permissions, while the questionnaires were completed through interviews if the patients were illiterate.

Quality of life questionnaire short form health survey (SF-36) is a standard questionnaire that surveys and measures patients health and their quality of life. This questionnaire contains 36 questions in 8 sections to measure two dimensions including physical dimension (general health perceptions, physical role functioning, physical functioning, and bodily pain), and psychic dimension (social role functioning, emotional role functioning, mental health, energy and vitality). The score of each question ranges 0 - 100 so that a zero score refers to the maximum disability and a 100 score to no disability. To calculate the scores of each section, the sum of the questions' scores was divided by their number (29, 30). The validity and reliability of this questionnaire in an Iranian population were approved in another study, in 2014. Alpha coefficients were reported as 0.90, 0.85, 0.71, 0.65, 0.77, 0.84, and 0.77, respectively, that indicated a good internal consistency of these dimensions (31).

PCL questionnaire is a valid and reliable measurement for determining post-traumatic stress disorders. The Persian version of PCL was previously validated by Goudarzi et al., showing appropriate psychometric properties. However, we reassessed the reliability of PCL through the split-half method and its Cronbach's alpha was 0.87 (31, 32). This measurement has 17 questions in 3 sections. The first section consists of 5 questions related to the signs and symptoms of re-experiencing traumatic events. The second section refers to seven questions on the signs and symptoms of emotional numbing and avoidance. The third section comprises 5 questions to measure the signs and symptoms of severe hyper-arousal. Each question is scored from 1 to 5, so that the maximum and minimum scores are 85 and 17, respectively. The score 45 or above is intended to screen the presence of PTSD in patients who suffer from a traumatic event; however, the score 45 or less shows no PTSD (33).

Data were inserted into SPSS version 16 software. Then, their normality was measured using Kolmogorov-Smirnov test. A t-test was used to assess factors related to the life quality which have considered in two cases (gender, age, marital status, number of children, education, type of

hospitalization units, hospitalization due to trauma, drug abuse, post-traumatic stress disorder). Moreover, ANOVA was applied to measure variables related to the life quality (the period of hospitalization and occupation).

3. Results

According to the exclusion criteria, 17 subjects were excluded and the research was conducted in 325 out of 342 subjects. The participated subjects included 185 (56.9%) males and 140 (43.1%) females with a mean age of 54 ± 16.15 years. The total mean score of life quality in the study population was 54.32 ± 27 . The maximum mean score was related to the mental health (61.42 ± 27.26) and social role functioning dimensions (61.60 ± 31.74), and the minimum mean score was related to physical health (51.73 ± 27.43). The life quality in different dimensions and its relationship with participants' other characteristics are presented in Tables 1 and 2. There was an inverse relationship between the mean score of life quality and age, unemployment, disability, the prolonged hospitalization period, the number of children, drug abuse, mechanical ventilation, and post-traumatic stress disorder. In addition, there was a direct relationship between the mean score of life quality and employment, education and literacy. There was no noticeable relationship between life quality and patients' gender, type of critical care unit, marital status, and hospitalization cause. What is more, the total score of life quality and its dimensions in patients who suffered from PTSD and those who did not have PTSD were assayed as shown in Table 3.

Table 1. Dimensions of SF-36 HRQL Scores Among the Groups in This Study

SF-36 Health Dimension	Mean Score	Standard Deviation
Physical health	40.79	18.50
Physical functioning	51.73	27.43
Physical role functioning	47.65	42.46
Bodily pain	56.52	31.99
General health perceptions	52.68	24.25
Psychological health	58.44	30.57
Mental health	61.41	27.26
Energy and vitality	56.44	32.30
Emotional role functioning	54.30	41.03
Social role functioning	61.60	31.74
The mean total score	54.32	27.52

Table 2. Association Between Demographic and Clinical Characteristics and Health-Related Quality of Life

Factors	No.	%	Scores of Life Quality		P Value
			Mean	SD	
Gender	185	56.9	54.64	25.99	0.811 ^a
Male	140	43.1	53.90	29.51	
Female					
Age, y					< 0.001 ^a
Less than 60 years old	199	61.2	62.24	26.88	
60 years or older	126	38.8	41.82	23.69	
Occupation					< 0.001 ^a
Technical and simple worker	109	33.53	52.36	27.24	
Employee	99	30.47	76.89	21.08	
Unemployed and Housekeeper	91	28	34.97	16.53	
Retired	26	8	44.38	19.66	
Marital status					0.990 ^a
Single	20	6.1	44.47	24.52	
Married	305	93.9	54.97	27.62	
Sibling					< 0.001 ^a
< 5	220	67.7	60.89	27.82	
≥ 5	105	32.3	40.37	20.97	
Education level					< 0.001 ^a
Elementary	152	46.7	35.08	17.72	
≥ High school	173	53.3	71.31	23.28	
Hospital stay per day, days					< 0.001 ^b
5	153	47.08	71.18	26.34	
5 - 10	99	30.46	42.02	19.46	
10 - 15	45	13.84	35.56	16.56	
More than 15	28	8.62	35.87	16.04	
Type of critical care unit					0.216 ^a
ICU (ICU + PCSU)	150	46.15	56.37	29.03	
CCU	175	53.85	52.57	26.11	
Admission for trauma reason					0.747 ^a
Yes	17	5.23	52.22	31.06	
No	308	94.77	54.44	27.37	
Mechanical ventilation					< 0.001 ^a
Yes	109	46.38	37.66	27.51	
No	216	53.62	62.73	18.56	
Drug abuse					< 0.001 ^a
Yes	39	12	37.24	13.45	
No	286	88	56.65	28.14	
Post-traumatic stress disorder					< 0.001 ^a
Yes	154	47.3	33.59	15.59	
No	171	52.7	73.23	21.90	

^aIndependent t-test.^bOne-way ANOVA.

4. Discussion

This study investigated the patients discharged from critical care units based on the scaled scores of short form health survey (SF-36) and its relationship with the relevant factors. The minimum mean score of life quality was devoted to physical problems that is in agreement with the findings of Cuthbertson (2010) and Kyle studies (2003).

However, Kinley (2016), Elliott (2006), and Qafari et al. (2014) reported that the minimum score was related to the energy and vitality dimension. In addition, it should be noted that their study was not parallel with this paper (1, 34-36).

In the present research, the maximum score was related to the social functional dimension. Kinley reported

Table 3. Comparison of Life Quality in Patients Suffering from PTSD and Those Who Did Not Have PTSD

PTSD	Yes (N = 154)		No (N = 171)		P Value ^a
	Mean Score	Standard Deviation	Mean Score	Standard Deviation	
The quality of life					
Physical health	27.19	11.60	53.18	14.49	< 0.001
Physical functioning	34.87	24.73	67.10	19.67	< 0.001
Physical role functioning	18.95	25.85	73.82	37.46	< 0.001
Bodily pain dimension	35.22	20.36	75.85	28.20	< 0.001
General health perceptions	35.49	19.46	68.35	18.93	< 0.001
Psychological health	35.92	17.78	78.96	24.81	< 0.001
Mental health	41.23	13.76	79.80	23.21	< 0.001
Energy and vitality dimension	34.38	17.98	76.55	29.21	< 0.001
Emotional role functioning	25.59	33.29	80.49	33.03	< 0.001
Social role functioning	42.50	23.83	79.02	27.83	< 0.001
The total life quality	33.59	15.59	73.23	21.90	< 0.001

^aIndependent t-test.

mental health as the dimension with the highest mean score, which is parallel with this paper. However, according to Cuthbertson, the highest score was devoted to the limited scope of the emotional role functioning dimension. In contrast, Kvale reported that the maximum score was related to mental health. Studies conducted by Cuthbertson, Kvale, and Kinley were limited to ICU whereas the present study assayed CCU and PCSU. In the three mentioned studies, samples were selected using cluster sampling while the convenience-sampling technique was used in this study.

The mean score of life quality in terms of physical dimensions was less than that of psychological dimensions. Hence, physical dimensions hampered the patients' life quality. According to Wiseman and Myhren, patients hospitalized in intensive care units suffered from mental diseases such as PTSD 64%, anxiety 40%, depression 30%, and severe stress 45%. However, the present study proved that the reduction in life quality was highly influenced by physical problems, in spite of the high presence of mental problems (36, 37).

The data analysis revealed that age, occupation, the period of hospitalization, number of children, drug abuse, mechanical ventilation, and post-traumatic stress disorder declined life quality. Obviously, there is often an inverse relationship between life quality and age so that an increase in age will decrease patients' quality of life ($P < 0.001$). In 2001, Stoll et al. reported that aging would reduce the quality of life (38). Tabah et al. found in 2010 that life quality in old patients hospitalized in intensive care units is similar to that of old people in the public population (39). How-

ever, in both studies mentioned above, the sample size was not large (the Stoll's study selected 80 and Tabah's study selected 115 subjects). Moreover, the participants' average age in Tabah's paper was about 84 years greater than in Stoll's paper (66 years in CABG, and 61.5 in AVR), while the participants' mean age in the present study was about 54 years.

The participants included 140 females and 185 males, but there was no significant relationship between life quality and gender ($P = 0.811$). In 2010, Oeyen et al. did not figure out a considerable association between life quality and gender. However, Fildissis et al. revealed that males had a lower life quality ($P = 0.002$). Fildissis' study included just patients undergoing open-heart surgery and used a questionnaire that was not similar to the present study questionnaire; in addition, Fildissis's analysis was done six months after discharge. By assessing these studies, it is revealed that the relationship between life quality and gender in cross-sectional studies is different from that in longitudinal studies. In cross-sectional studies, females experienced lower life quality than males, while longitudinal studies have shown no difference between genders (22, 23).

The mean score of quality of life in patients undergoing and not undergoing mechanical ventilation was also measured. The results showed the life quality of patients undergoing mechanical ventilation was low ($P < 0.001$). In Taiwan, Toffart et al., Douglass, and Zilberberg reported mechanical ventilation as a risk factor for reducing patients' quality of life (40-42). The sample size in these studies was low and their studies were limited to ICUs. Toffart and Zilberberg's studies emphasized on an increase in the

period of using a ventilator (over 96 hours) so that patients experienced devastating physical and psychological outcomes after using mechanical ventilation for 24 - 48 hours (43). Thus, all patients influenced by mechanical ventilation more than 24 hours have been compared with those who have not been influenced by mechanical ventilation.

In this paper, there was no significant relationship between the life quality of patients discharged from the intensive care unit and type of critical care unit and diagnosis (in terms of having trauma or not having trauma). Toein et al.'s study conducted in 2012 is parallel with this research, whereas Tereran's study is not (21, 44). In Tereran's study, patients hospitalized in ICU were assessed based on internal, surgical, and general conditions, while they were not checked out based on having trauma or not having trauma, as well as the devastating mechanism. Moreover, the study was not included CCU and PCSU. Toein preferred to compare traumatic patients in ICU and non-traumatic patients with public population rather than to compare intensive unit patients with each other (48).

The period of hospitalization had an inverse relationship with life quality so that patients with prolonged hospitalization had a lower life quality ($P < 0.001$). According to the Ong et al.'s prospective study (2009), it is reported that increasing the period of hospitalization reduces life quality (45). Regarding Tereran et al.'s study (2012), no significant relationship was found between life quality and the period of hospitalization (21). Both studies were limited to ICU.

The life quality in two groups with PTSD and without PTSD was analyzed, and the results revealed a lower score in all dimensions of life quality. Whereas, there was no between-group difference in the energy and vitality dimension ($P = 0.06$) and emotional role functioning ($P = 0.07$) in Kapfhammer et al.'s research (46). However, according to the Deja et al.'s study, there was a significant difference in all life quality dimensions between the two mentioned groups ($P < 0.001$) (19). This difference may be related to the different methodologies of the research. Han and Deja's study was limited to ICU, while other units such as CCU and CVS were not considered.

In summary, life quality is influenced by risk factors, including age, occupation, number of children, education, hospitalization period, drug abuse, mechanical ventilation, and aggressive events, as well as several mental and physical diseases during the hospitalization period. It seems that determining risk factors and preventing post-traumatic stress disorder by critical care nurses may increase the life quality. It is recommended that training programs and care patterns be planned for hospital professionals namely nurses, doctors, and other staff in order to improve patients' life quality, and the effects of these pro-

grams be assessed to select better patterns. Moreover, various training programs such as consulting, physical, and psychological protection after discharge should be provided for patients and their companions and they need to learn about protecting and insurance networks. In addition, the life quality of patients should be studied in different periods in further research, after performing necessary cares.

4.1. Limitation

To conduct this study, there were some limitations including the short time interval between checking patients and the discharge (one month), failure in studying the initial life quality of patients during the hospitalization period, failure in studying patients' condition during 6 months, one and five years, and failure in having intensive care units specific for burn patients in Shahid Beheshti hospital in Kashan.

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Footnotes

Authors' Contribution: Mohamad Abdi and Zohre Sadat planned the study, prepared the first draft, and critically revised the manuscript. Zohre Sadat supervised the study and conducted the data analysis. Mohamad Abdi involved in data collection. Leila Ghanbari Afra contributed to the study conception and design, supervised the study, and helped in critical revision of the manuscript.

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