

Post Intensive Care Unit Follow-up General Health Survey: A Cross-Sectional Study in a Tertiary Academic Hospital

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Abstract

Background: Despite the tremendous efforts regarding post hospital discharge services, the literature regarding health status, social and medical support of ICU survivors in Saudi Arabia is very limited. This study aimed to involve pharmacists to conduct a general survey to assess health, medical and social status of ICU survivors.

Methods: This was a cross-sectional study conducted at a tertiary academic center in Saudi Arabia. The phone survey has been conducted by the study investigators after getting a verbal consent for participation.

Results: Majority of our participants have no issues in concentration and only small percentage reported that they experience one or more of anxiety, depression, despair, and blue mood. A larger percentage of our subjects were satisfied by the support they received from their relatives, social support, and access to medical services.

Conclusion: ICU survivors discharged from one center in Saudi Arabia reported great general health and satisfied by social and medical support but functional and mental status and multidisciplinary team approach worth further investigations.

Background

The main goal of providing critical care services to ICU patients is to save their lives and to ensure better health related outcomes. This includes patient return to the pre-admission level of function and normal health status¹. During ICU stay, critically ill patients are at high risk of deterioration of their physical condition because of high level of stress, urgent treatments, and disability to communicate. Additionally, ICU survivors are suffering from medical, physical, and social limitations². Majority of ICU survivors develop anxiety, depression, and Post Traumatic Stress Syndrome (PTSS) which affect their quality of life significantly after hospital discharge³. In comparison with normal individuals, these patients often developed physical, functional, and psychological deterioration which affect their Health-Related Quality of Life (HRQoL)⁴.

Prior studies have concluded that the length of ICU stay, age and severity of illness before ICU admission were the most important factors in HRQoL deterioration after ICU discharge. These studies state that the recovery is incomplete for physical function, general health, and social function when compared to the normal people after ICU discharge. A systematic review concluded that improvements in quality of life occurred in the first year after discharge in four domains: physical function; physical role; vitality and social function⁵. Additional study has concluded that patients have poor QoL and showed a better status at 18 months after discharge but worse compared to admission level. This study has determined that age, ICU LoS, and male sex were the strongest factors impacted the QoL on admission and at 18 months after ICU period⁶. Another trial suggested that patients regain their age specific HRQoL five years after

their ICU discharge⁷. Few other studies investigate the influence of family and social support on HRQoL. One study recommended that institutions should implement a post ICU support programs targeting both patients and relatives to help in the need for social support and to improve the patient status⁸.

Traditionally, the main outcome for successful critical care has focused largely on mortality and assessment of the health of survivors in terms of physiological, radiological, and biochemical measurements. Recently, there has been a global move toward outcomes that take in consideration patient's QoL. In Saudi Arabia, Ministry of Health (MOH) has placed particular emphasis on expanding the critical care services and promoted the accessibility and feasibility of the critical care services in KSA. According to *Al-Omari et al* MOH has embraced several projects and redirected the necessary funds for these programs, such as establishing and developing of new general hospitals, medical cities, and specialist hospitals⁹. Recently, MOH in Saudi Arabia has initiated a home visit program for people who need long term care after hospital discharge aiming to improve health related outcomes.

There is very limited research regarding assessment of post ICU survivor's health status. One study aimed to determine the functional status among survivors of severe sepsis and septic shock a year after hospital discharge from a tertiary hospital in Saudi Arabia. The study found that only one-third of the survivors of severe sepsis and septic shock had good functional status one-year post-discharge¹⁰. Another study concluded that Middle Eastern Respiratory Syndrome (MERS) survivors of critical illness reported lower quality of life than survivors of less severe illness¹¹. However, when it comes to studies that measured the effect of family, social, and hospital support for patients after ICU discharge, most of them have been done outside Saudi Arabia with limited pharmacist involvement showing a significant gap in literatures on ICU survivors in Saudi Arabia.

Study Aims

The main aim of our study is to conduct a general survey to describe health, medical and social status of ICU survivors. Additionally, to assess the effect of ICU Los on general wellbeing of ICU survivors post discharge.

Methods

Study design and setting

This was a cross-sectional study conducted at a tertiary academic center in Saudi Arabia. The hospital has a bed capacity of 1067 beds and ICUs admit medical, surgical, and cardiac patients, and operates as a closed unit with 24/7 onsite coverage by critical care intensivists. After 24 hours of ICU transfer an intensivist can follow up the patient care while admitted in the hospital, however there is no specific process on following ICU survivors beyond hospital discharge. The University's Institutional Review Board (Ethics Committee, approval number: 422 – 18) approved the study, and verbal consent was obtained from all patients in the study before survey participation.

Patient selection and study procedure

Adult patients 18 years or older who were discharged from the hospital following an ICU admission were included. We selected patients who were discharged from the hospital within one year after their ICU admission by retrieving their information from the electronic medical records. Patients who have language barriers or those who changed their contact information were excluded. There were no other inclusion or exclusion criteria. A list of patients who were discharged from the hospital after an ICU admission from January 2018 to December 2018 was obtained. Two investigators reviewed the list and contacted the patients for possible survey participation. Enrollment was based on patient's willingness to participate and the availability of accurate contact information, there were approximately 361 potential patients eligible for participation. Of these, 124 patients met the inclusion criteria, and 50 of them completed the survey.

The investigators of this study contacted the eligible patient to perform the follow up phone survey. Verbal consent and agreement to participate in the phone survey were taken from the participants before conducting the survey. The survey was extracted from a validated survey WHO-BREF for health-related quality of life¹². The abbreviated survey has been tested and validated on small subset of participants before utilizing it to whole group. The investigator read each question to the patient directly from the survey using the same script. The following data were collected from the electronic health records for all patients includes age, gender, reasons of ICU admission, type of ICU services, and length of ICU stay.

Outcome measures and data analysis

In our study the survey was used to assess the general health status of ICU patient following hospital discharge. Since WHO-BREF measures health related quality of life, it was well-suited to describe the general health status of our participants based on utilizing an abbreviated form of it. The final abbreviated survey contains 10 questions that are related to the general quality of life domains which included questions about physical health, medical services, mental/ psychological status, social and family support. Each question is rated based on a-5 point scale e.g. (1 = Not much, 2 = Not at all, 3 = Moderately, 4 = Completely, 5 = Great deal) Each response was analyzed using descriptive statistical analysis with numbers and percentages by utilizing IBM SPSS Statistics for Macintosh, Version 25.0 (IBM Corp., Armonk, NY). All data were analyzed using descriptive analysis tools and presented as percentage. Linear regression test was used to identify the relationship between ICU length of stay and level of quality of life.

Results

Participants Baseline characteristics

A total of 50 patients were consented for participation in the study. The average age was 54.4 years and 58% (29) were female. Most patients were admitted to surgical ICU 54% (27), 22% (11) were admitted because of cardiovascular reasons and the remaining were admitted due to oncology 19% (9) and

pulmonary and infectious disease 14% (7) of each. The average length of the participant stay in the ICU was 8.1 days. (Table 1)

Table 1
Baseline Characteristics

Baseline Variables	N = 50 (%), Average
Gender	
Male	21 (42)
Female	29 (58)
Age (years)	54.4
ICU Types	
MICU ^a	23 (46)
SICU ^b	27 (54)
Reason of ICU Admission	
Cardiovascular	11 (22)
Oncology	9 (19)
Infection	7 (14)
Pulmonary	7 (14)
Neurology	5 (10)
Trauma	3 (6)
Obstetrics/gynecology	3 (6)
Renal	2 (4)
Others	3 (6)
ICU LoS^c (days)	8.1
a: Medical intensive care unit, b: Surgical intensive care unit, c: Length of stay	

Main Results

Post ICU general health status

At the time of the survey ICU survivors ($n = 50$) had reported a great deal related to the rating of their quality-of-life 38 (76%) after hospital discharge. More than half of the participants were satisfied about

their health status and they reported that they were enjoying their life. Twenty-two of the subjects agreed that the physical pain was preventing them from their daily activities, a similar number reported that they need medical treatment to help them functioning. Majority of our participants have no issues in concentration and only 12 (24%) agreed that they experience one or more of anxiety, depression, despair, and blue mood. A larger percentage of our subjects more than 60% were satisfied by the support they received from relatives (82%), access to medical services (66%) and their environment (66%). (Table 2)

Table 2
Survey Results for General Health Status

Abbreviated WHO BREF Components		N = 50 (%)		
		Not much/not at all	Moderately	Completely/great deal
1	How would you rate your quality of life?	5 (10%)	7 (14%)	38 (76%)
2	How satisfied are you with your health?	8 (16%)	16 (32%)	26 (52%)
3	How much do you enjoy life?	10 (20%)	13 (26%)	27 (54%)
4	To what extent do you feel that physical pain prevents you from doing what you need to do?	13 (26%)	9 (18%)	22 (44%)
5	How much do you need any medical treatment to function in your daily life?	20 (40%)	8 (16%)	22 (44%)
6	How well are you able to concentrate?	10 (20%)	6 (12%)	34 (68%)
7	How often do you have negative feelings such as blue mood, despair, anxiety or depression?	21 (42%)	17 (34%)	12 (24%)
8	How healthy is your physical environment?	11 (22%)	6 (12%)	33 (66%)
9	How satisfied are you with the support you get from your friends?	4 (8%)	5 (10%)	41 (82%)
10	How satisfied are you with your access to health services?	7 (14%)	10 (20%)	33 (66%)

4.2.2 Correlation between Los ICU and overall health status post ICU

We were interested to assess the effect of ICU LoS on ICU survivor's general health. A simple linear regression was conducted to predict the association between ICU LoS and the general health status, P value = 0.22 suggests that changes in ICU length of stay is not predictable for changing in health status post ICU discharge.

Discussion

This cross-sectional study is focused on conducting post ICU discharge general health survey. Our study illustrates that ICU survivors within one year following ICU discharge have report good wellbeing and they are satisfied with the level of their quality of life. Our study findings are different than the findings of one study that reported lower quality of life of MERS survivors following critical illness in Saudi Arabia¹¹. QoL understanding and acceptance of general health measures in our population is different compared to low health wellbeing internationally. A justification to this, might be cultural and religious believe of our participants especially being thankful to survive the critical illness. Also, we conducted the survey on mixed ICU population, surgical ICU survivors who admitted for close observation after operation might have better general health and quality of life due to better baseline condition and less comorbidities.

Nonetheless, conducting an early post hospital discharge to assess overall health survey is important to be conducted by multidisciplinary team of health care providers to identify early health related issues. Nurses, physicians, and pharmacists can work with together to assure the wellbeing of ICU survivors and to optimize their QoL and drugs related problems. There are several services can be provided to ICU survivors, included but not limited to conduct phone surveys following ICU discharge to early identify health issues, perform comprehensive medication management services, counsel ICU survivors and their relatives, and address health preventive measures. A recent opinion paper identified and described services for the management of ICU survivors and support of their caregivers in intensive care unit recovery clinics (ICU-RCs). The paper concluded that an interprofessional team in ICU-RCs can play a vital role to promote education on as post-intensive care syndrome (PICS), improve medication adherence, ensure comprehensive medication management and medication reconciliation, provide assessment of inappropriate and appropriate medications after hospitalization, and address adverse drug events (ADEs)¹³.

Our findings related to ICU survivors' pain and requirement of medical treatment to perform daily functional activities is similar to those reported in ICU follow up studies. A prospective study conducted to assess functional status of ICU survivors three months after discharge, has concluded a fall in the physical activities following ICU discharge¹⁴. An important aspect that needs to be addressed for ICU survivors in Saudi Arabia is which patients are at higher risk of functional status decline following ICU discharge. A prospective multicenter trial conducted in Canada reported that the level of frailty of ICU survivors was linked with greater impairment in health-related quality of life, functional dependence, and disability compared with those not frail¹⁵.

Within one-year post ICU discharge, most of participants in our study have reported mental health related issues such as depression, anxiety and/or blue mood, this findings in agreement with one of the well-known major health related problems post ICU discharge. Most patients who survive an ICU admission develop health-related issues which are defined as post-intensive care syndrome (PICS) that start in the ICU and persist after discharge. This syndrome can affect the patient's physical, mental, and emotional well-being. PICS is considered one of the challenges for ICU survivors and their families because half of

patients never return to their baseline status^{2,3,16,17}. One meta-analysis conducted to evaluate anxiety symptoms one year following ICU discharge and found that one third of ICU survivors experience anxiety symptoms that are persistent during their first year of recovery¹⁸. Post ICU anxiety and other psychiatric related issues for ICU survivors deserve national efforts in to standardize their management and follow up.

ICU survivors in our study reported satisfaction with family, social and medical support within one year following discharge. Family support has been reported in several studies as a key factor in improving ICU survivorship. According to one study, social support has a direct proportion with QoL improvement, showing that subjects who have good support have a better HRQoL⁸. Identifying patients' support needs following critical illness is another aspect worth further investigation to help organizations and decision makers to understand the needs at different transition periods.

ICU LoS were not correlated with the general health status following ICU discharge within one year. Our study is not intended to assess the determinants of QoL, but it helps to bring attention to this aspect in ICU survivor for more investigation on determinants of HRQoL after ICU.

Our study is subject to several limitations. First, selection bias may be present, this small study sample in one center may not represent all ICU survivor health status in Saudi Arabia. Second, due to limited medical documentation, specifically information related to severity of illness, dependence on ventilator and exposure to sedatives or neuromuscular blocking agents which might be an important factor in HRQoL outcomes assessment. Third, we conducted the abbreviated survey via phone and not in person so validation of phone versus self-administered survey and accuracy of participant understanding is questionable. Lastly, our findings are limited to be generalized outside Saudi Arabia especially the family support part as this is an obligatory part of the family structure, also is limited to generalize the results, due to having a mixed SICU and MICU patients, a future study that take in consideration specific ICU survivors is needed.

This cross-sectional study has provided some preliminary information regarding the general health status and support for ICU survivors in Saudi Arabia. Prospective longitudinal multicenter studies to assess the correlation between ICU admission and Post ICU health related outcomes are highly needed. Information from these studies will help in services provision and will stimulate different initiatives related to improvement of ICU survivor's quality of life.

Conclusions

Within one-year ICU survivors discharged from one academic tertiary care center reported great general health and satisfied by social and medical support. Further attention is needed to assess determinants of functional and psychological wellbeing of ICU survivors. Future efforts should be directed to long term outcomes and initiatives to support this population in a multidisciplinary approach.

Declarations

- Ethics approval and consent to participate: The University's Institutional Review Board (Ethics Committee, approval number: 422-18) approved the study, and verbal consent was obtained from all patients in the study before survey participation.
- Consent for publication: All listed authors have contributed equally to the research idea, conceptual design, data collection, data analysis, manuscript writing, manuscript reviewing, and references search and agree for publication.
- Availability of data and materials: All data generated or analyzed during this study are included in this published article and its supplementary information files.
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References

1. Tabah, A., Philippart, F., Timsit, J.F. et al. Quality of life in patients aged 80 or over after ICU discharge. *Crit Care* 14, R2 (2010). <https://doi.org/10.1186/cc8231>
2. Steenbergen, S., Rijkenberg, S., Adonis, T. et al. Long-term treated intensive care patients outcomes: the one-year mortality rate, quality of life, health care use and long-term complications as reported by general practitioners. *BMC Anesthesiol* 15, 142 (2015). <https://doi.org/10.1186/s12871-015-0121-x>
3. Myhren H, Ekeberg O, Tøien K, Karlsson S, Stokland O. Posttraumatic stress, anxiety and depression symptoms in patients during the first year post intensive care unit discharge. *Crit Care*. 2010;14(1):R14. doi: 10.1186/cc8870.
4. Hill, A.D., Fowler, R.A., Pinto, R. et al. Long-term outcomes and healthcare utilization following critical illness – a population-based study. *Crit Care* 20, 76 (2016). <https://doi.org/10.1186/s13054-016-1248-y>
5. Gerth AMJ, Hatch RA, Young JD, Watkinson PJ. Changes in health-related quality of life after discharge from an intensive care unit: a systematic review. *Anaesthesia*. 2019 Jan;74(1):100-108. doi: 10.1111/anae.14444.

6. Fildissis G, Zidianakis V, Tsigou E, Koulenti D, Katostaras T, Economou A, Baltopoulos G. Quality of life outcome of critical care survivors eighteen months after discharge from intensive care. *Croat Med J*. 2007 Dec;48(6):814-21. doi: 10.3325/cmj.2007.6.814.
7. Hofhuis JG, van Stel HF, Schrijvers AJ, Rommes JH, Spronk PE. ICU survivors show no decline in health-related quality of life after 5 years. *Intensive Care Med*. 2015 Mar;41(3):495-504. doi: 10.1007/s00134-015-3669-5.
8. Tilburgs B, Nijkamp MD, Bakker EC, van der Hoeven H. The influence of social support on patients' quality of life after an intensive care unit discharge: A cross-sectional survey. *Intensive Crit Care Nurs*. 2015 Dec;31(6):336-42. doi: 10.1016/j.iccn.2015.07.002.
9. Al-Omari A, Abdelwahed HS, Alansari MA. Critical care service in Saudi Arabia. *Saudi Med J*. 2015 Jun;36(6):759-61. doi: 10.15537/smj.2015.6.11204.
10. Al Khalaf MS, Al Ehnidi FH, Al-Dorzi HM, Tamim HM, Abd-Aziz N, Tangiisuran B, Hassan Y, Arabi YM. Determinants of functional status among survivors of severe sepsis and septic shock: One-year follow-up. *Ann Thorac Med*. 2015 Apr-Jun;10(2):132-6. doi: 10.4103/1817-1737.150731.
11. Batawi, S., Tarazan, N., Al-Raddadi, R. et al. Quality of life reported by survivors after hospitalization for Middle East respiratory syndrome (MERS). *Health Qual Life Outcomes* 17, 101 (2019). <https://doi.org/10.1186/s12955-019-1165-2>
12. WHOQOL group(1996, December). WHOQOL-BREF Introduction, Administration, Scoring and Generic Version of The Assessment, Retrieved from http://www.who.int/mental_health/media/en/76.pdf on February 2018
13. Mohammad, RA, Betthausen, KD, Korona, RB, et al. Clinical pharmacist services within intensive care unit recovery clinics: An opinion of the critical care practice and research network of the American College of Clinical Pharmacy. *J Am Coll Clin Pharm*. 2020; 3: 1369–1379. <https://doi.org/10.1002/jac5.1311>
14. Zeggwagh Z, Abidi K, Kettani MN, Iraqi A, Dendane T, Zeggwagh AA. Health-related Quality of Life Evaluated by MOS SF-36 in the Elderly Patients 1 Month before ICU Admission and 3 Months after ICU Discharge. *Indian J Crit Care Med*. 2020 Jul;24(7):531-538. doi: 10.5005/jp-journals-10071-23489.
15. Bagshaw SM, Stelfox HT, Johnson JA, McDermid RC, Rolfson DB, Tsuyuki RT, Ibrahim Q, Majumdar SR. Long-term association between frailty and health-related quality of life among survivors of critical illness: a prospective multicenter cohort study. *Crit Care Med*. 2015 May;43(5):973-82. doi: 10.1097/CCM.0000000000000860.
16. Rawal G, Yadav S, Kumar R. Post-intensive Care Syndrome: an Overview. *J Transl Int Med*. 2017 Jun 30;5(2):90-92. doi: 10.1515/jtim-2016-0016.
17. Eddleston JM, White P, Guthrie E. Survival, morbidity, and quality of life after discharge from intensive care. *Crit Care Med*. 2000 Jul;28(7):2293-9. doi: 10.1097/00003246-200007000-00018.
18. Nikayin S, Rabiee A, Hashem MD, Huang M, Bienvenu OJ, Turnbull AE, Needham DM. Anxiety symptoms in survivors of critical illness: a systematic review and meta-analysis. *Gen Hosp*

