Impact on the Quality of Life of Patients Hospitalized in Intensive Care Units: A Prospective Cohort Study in Colombia

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Abstract

Introduction: Since the 1980s, mortality rates in intensive care units (ICUs) have decreased, shifting the focus toward evaluating post-ICU quality of life. This is measured using instruments such as the SF-36 and EQ-5D, which assess physical, mental, and social well-being. Results are variable, and knowledge gaps persist regarding how to optimize early interventions that enhance comprehensive patient recovery.

Objective: To determine post-ICU quality of life and the risk factors associated with its deterioration.

Materials and methods: A prospective cohort study was conducted, including 448 patients in a high-complexity healthcare institution in Colombia. Quality of life was assessed using the SF-36 questionnaire, evaluating eight dimensions. Sociodemographic and clinical data were analyzed using STATA 14® software, applying statistical tests to compare pre- and post-ICU outcomes through logistic regression.

Results: A total of 85.5% of patients experienced a decline in quality of life 180 days after ICU discharge. The most affected domains were physical functioning and role-physical, with a higher incidence in women (89.4% vs.

82.7% in men). Patients with infections had a higher risk of deterioration in physical health (odds ratio [OR]: 2.23), while female sex was a protective factor in the physical health component (OR: 0.59; 95% confidence interval: 0.36–0.99; p = 0.046).

Conclusion: This study demonstrated a significant decline in post-ICU quality of life, particularly in the physical component.

Keywords: quality of life, infection, intensive care unit.

Resumen

Introducción: desde los años 80, la mortalidad en las unidades de cuidados intensivos (UCI) ha disminuido, así, la atención se ha desplazado hacia la evaluación de la calidad de vida post-UCI. Esta se mide mediante instrumentos como el SF-36 y el EQ-5D, que evalúan el bienestar físico, mental y social. Los resultados son variables, y persisten vacíos sobre cómo optimizar las intervenciones tempranas que mejoren la recuperación integral del paciente.

Objetivo: determinar la calidad de vida post-UCI y los factores de riesgo asociados a su deterioro.

Materiales y métodos: se llevó a cabo un estudio de cohorte prospectivo que incluyó a 448 pacientes en una institución de alta complejidad en Colombia. La calidad de vida se evaluó mediante el cuestionario SF-36, midiendo ocho dimensiones. Se analizaron datos sociodemográficos y clínicos utilizando el software STATA 14®, aplicando pruebas estadísticas para comparar resultados pre y post-UCI con regresión logística.

Resultados: el 85,5 % de los pacientes presentó un deterioro en la calidad de vida a los 180 días post-UCI. Los dominios más afectados fueron la función física y el rol físico, con mayor incidencia en mujeres (89,4 % frente a 82,7 % en hombres). Los pacientes con infecciones presentaron mayor riesgo de deterioro en la salud física (odds ratio [OR]: 2,23), mientras que el sexo femenino se comportó como un factor protector en el componente de salud física (OR: 0,59; intervalo de confianza del 95 %: 0,36-0,99; p = 0,046).

Conclusión: este estudio evidenció un deterioro significativo en la calidad de vida post-UCI, particularmente en el componente físico.

Palabras clave: calidad de vida, infección, unidad cuidados intensivos.

Introduction

Since the 1980s, a decrease in mortality has been observed in intensive care units (ICUs). During that period, the main causes of death were multiple organ failure, cardiovascular insufficiency, and sepsis. All of this resulted in an annual cost to the healthcare system, which, in 2010, represented 13.2% of hospital costs and 0.72% of the Gross Domestic Product of the United States (1).

According to data from the American Society of Critical Care Medicine, more than five million patients are admitted to ICUs in the United States each year to receive invasive monitoring, ventilatory and circulatory support, treatment for potentially life-threatening acute or chronic problems, and assistance with terminal diseases (1).

Individuals in the recovery process after ICU discharge may experience changes in their life conditions that affect their physical and mental functions, as well as their reintegration into social and work environments (2). However, there are still gaps in understanding the effectiveness of early interventions in the ICU (3).

Defining quality of life has not been a simple task, as many authors argue that, like health, this concept involves both objective components (physiological functioning) and subjective components (well-being, life satisfaction, and the fulfillment of expectations). However, it has been defined as "a general well-being that encompasses both objective descriptors and subjective evaluations of physical, material, social, and emotional well-being, along with the achievement of personal development and intentional activity, all weighted by a personal set of values" (4).

Under this premise, quality of life has become an important indicator for health professionals, as "health policies aim not only to provide care from a scientific perspective but also to give importance to how the patient subjectively perceives their recovery and the possibility of fully reintegrating into their pre-disease routine" (3).

Traditionally, outcomes in ICU care have been limited to evaluating indicators such as mortality at 28 days post-discharge, hospital stays, and direct and indirect healthcare costs. Today, the measurement of health-related quality of life through composite indicators such as quality-adjusted life years (QALYs), disability-adjusted life years (DALYs), and post-ICU health-related quality of life (HRQoL) has gained relevance. These indicators seek to provide a comprehensive assessment of the benefits and risks associated with medical care, considering mental, physical, and social components (5).

So far, the assessment of post-ICU quality of life using validated questionnaires such as the SF-36, EQ-5D, and Activities of Daily Living (ADL) has shown very variable results.

At the international level, and more specifically in the national context, statistics are limited. Therefore, the aim of this study was to determine post-ICU quality of life and the risk factors associated with its deterioration.

Methods

Design: Prospective cohort study conducted in a high-complexity institution in the city of Bucaramanga, Colombia. The study protocol was approved by the Ethics Committee in Research (ECI #006-21) and followed the principles established in the Declaration of Helsinki. For the presentation of the results, the STROBE checklist was used to strengthen reports of observational studies in epidemiology.

Patients: A total of 448 patients who were admitted to the ICU between July 11, 2021, and July 3, 2022, were included. Of these, 52 died and 51 withdrew from the study, so the final population analyzed for quality of life consisted of 345 patients. The inclusion criteria considered patients over 18 years old who, prior to their admission to the ICU, had no neurocognitive or functional disorders. Pregnant patients and those who did not agree to participate in the study were excluded.

SF-36 Questionnaire: Developed in the 1990s in the United States, this instrument evaluates health-related quality of life (HRQOL). It consists of 36 items that measure eight dimensions: physical functioning, role physical, bodily pain, general health, social functioning, role emotional, vitality, and mental health. These dimensions are grouped into two global components: physical health and mental health. The SF-36 is administered to individuals aged 14 and older, with a recall period ranging from one to four weeks, and can be self-administered or administered through an interview. The score for each dimension ranges from 0 to 100, with higher scores indicating better health status. The questionnaire has been validated in various countries, including a Spanish version, and has proven to be reliable, acceptable, and valid, especially in critically ill patients, such as those admitted to intensive care units.

Data Collection: A physician affiliated with the institution, who was previously trained, was responsible for administering the SF-36 questionnaire and collecting sociodemographic variables, following a confidentiality agreement. The principal investigator organized meetings to explain the study

objectives and the data collection procedure. The participating institutions were visited to instruct on patient recruitment. The survey physician, with the support of the head nurse, identified new patients and contacted them. Inclusion and exclusion criteria were applied before informing the patient about the study and obtaining their informed consent. If the patient was unable to respond, a family member or caregiver completed the survey. To minimize recall bias, the collected information was validated by obtaining data from the four weeks before ICU admission and after discharge. The surveyor supervised the entire process, addressing any questions and ensuring the completeness of the data.

Analysis Plan: The data were processed using STATA 14®, calculating frequencies for nominal and ordinal variables, and measures of central tendency and dispersion for continuous variables. The information collected through the SF-36 was analyzed until the outcome (death), creating two groups based on sex. Descriptive statistical analysis included means, standard deviations, medians, interquartile ranges, and percentages. The chi-square test was used for categorical variables, and the Student's t-test was used for continuous variables, applying parametric or non-parametric tests depending on the distribution. The SF-36 dimensions were expressed as mean (standard deviation), and pre- and post-survey comparisons were made using the chi-square and Wilcoxon tests. The internal consistency of the questionnaire was evaluated using Cronbach's alpha coefficient (≥ 0.70). Means and medians were calculated for the physical health (PHC) and mental health (MHC) components. Significant variables for the deterioration of quality of life were analyzed using binary logistic regression, with a significance level of 5% ($p < 0.05$).

Results

Of the 448 patients, a categorization by sex was made: 50.45% were men, with a mean age of 63.54 ± 16.9 years, while 49.55% were women, with a mean age of 64.10 ± 17.4 years. Additionally, 69.64% of the general population belonged to socioeconomic strata three or lower (see Table 1).

Regarding clinical characteristics, 35.49% of the patients were admitted to the ICU due to circulatory system pathologies. Upon admission, the APACHE II severity scale was calculated, yielding an average score of 9.25 ± 4.50 for women and 9.58 ± 4.37 for men. The mortality probability was similar in both groups, with 9.18 ± 7.20 in women and 9.84 ± 7.42 in men, showing no statistically significant differences ($p > 0.05$).

The total hospital stay was also evaluated, where the male group had a longer average stay (22.3 ± 21.4 days) compared to the female group (17.89 ± 16.5 days), with a statistically significant difference ($p < 0.05$) (see Table 2).

Finally, there was a total mortality of 52 patients, representing 11.61% of the population. Although mortality was higher in females (13.06% versus 10.18% in men), this difference was not statistically significant ($p = 0.340$).

Table 2. General Clinical Characteristics

Variable	Female sex Mean ± SD	Male sex Mean ± SD	P
APACHE II Severity Score APACHE II Score Mortality Probability	9,25 ± 4,50 9,18 ± 7,20	9,58 ± 4,37 9,84 ± 7,42	0,4232
Days on Mechanical Ventilation	16,7 ± 18,9	16,86 ± 18,7	0,3299
ICU Length of Stay (days)	7,1 ± 10,5	9,9 ±13,9	0,0161
Post-ICU Days	10,8 ± 11,1	12,5 ± 15,2	0,2008
Total Length of Stay in the Institution	17,89 ± 16,5	22,3 ± 21,4	0,0147

Quality of Life

To assess quality of life, the SF-36 questionnaire was used, which is organized into two main components: the Physical Health Component (PHC) and the Mental Health Component (MHC), each comprising four domains. The questionnaire was administered at four time points: before ICU admission, and at 30, 90, and 180 days after ICU discharge.

The reliability of the SF-36 scale was evaluated using Cronbach's alpha, which demonstrated high reliability across all domains (view Table 3).

Table 3. Cronbach's Alpha for the SF-36 Questionnaire.

Questions	Components	Domain	Cronbach's Alpha	Inter-item Correlation
3 - 12	Physical Health Component	Physical function	0,9621	0,7173
13 - 16		Physical Role	0,9386	0,7925
21 - 22		Physical pain	0,8385	0,7220
1, 33 - 36		General Health	0,8506	0,5324
17 - 19	Mental Health Component	Emotional Role	0,9141	0,7801
20 - 32		Social function	0,8974	0,8094
23,27,29, 31		Vitality	0,8500	0,5862
24, 25, 26, 28, 30		Mental Health	0,8375	0,5075

PTo better interpret the questionnaire scores, it is important to under-

stand that a score between 0 and 24 indicates poor to fair quality of life, 25 to 50 fair to good, 51 to 75 good to very good, and 76 to 100 excellent. Based on this, it was observed that both in the Physical Health Component (PHC) and the Mental Health Component (MHC), prior to ICU admission, scores were associated with a good to very good quality of life, with an average of 64 ± 29 in the PHC and 75 ± 21 in the MHC. At 30 days, the lowest scores were recorded, with an average of 46 ± 28 for the PHC and 63 ± 21 for the MHC, falling into the fair to good category. It is worth noting that although by 180 days quality of life was in the good to very good range, the average remained lower than the values reported prior to ICU admission (view Table 4).

Table 4. Quality of Life Scores According to Physical Health and Mental Health Components.

Survey	Physical health component				PHC score	Mental Health component				MHC Score
	Physical function	Physical Role	Physical pain	General health		Emotional role	Vitality	Mental health	Social function	
Basal	66 ± 35	59 ± 45	69 ± 30	62 ± 26	64 ± 29	77 ± 39	68 ± 22	73 ± 20	82 ± 27	75 ± 21
30 days	43 ± 37	29 ± 42	58 ± 30	52 ± 25	46 ± 28	59 ± 46	58 ± 24	66 ± 20	67 ± 31	63 ± 26
90 days	51 ± 35	26 ±40	61 ± 30	59 ± 27	49 ± 27	58 ± 43	60 ± 28	68 ± 25	67 ± 30	63 ± 26
180 days	55 ± 36	29 ± 40	62 ± 31	62 ± 27	52 ± 28	60 ± 42	62 ± 30	70 ± 26	66 ± 32	65 ± 27

To facilitate better the analysis and interpretation, and following the guidelines of the 'Health Survey Manual and Interpretation Guide,' a decline in quality of life is considered any decrease of five or more points in any of the eight domains. Taking into account that the average best recovery was observed at 180 days, a comparison was made between the baseline scores and those obtained at 180 days to determine the deterioration of quality of life according to the domains.

The analysis showed that the domains with the greatest deterioration were physical function and physical role, while the domain with the lowest proportion of patients with deterioration was general health (see Table 5). Additionally, deterioration was evaluated in both the Physical Health Component (PHC) and the Mental Health Component (MHC), finding that the overall incidence of deterioration in one or both components at 180 days was 85.5%. This proportion was higher in women (89.4%) compared to men (82.7%). Only 14.2% of patients did not show deterioration in either of the two components. Overall, significant deterioration was observed in both the PHC and MHC at 180 days.

Table 5. Deterioration of quality of life according to the domains.

Component	Domain	Deterioration of the quality of life		p
		Female sex % (n	Male sex % (n)	
Physical Health	Physical function	57,50% (92)	52,97% (98)	0,399
	Physical role	53,75(86)	45,41(84)	0,122
	Physical pain	49,38 (79)	46,49 (86)	0,592
	General health	35,62 (57)	36,76 (68)	0,827
Mental Health	Emotional Role	40,62(65)	36,76(68)	0,462
	Social function	51,25 (82)	43,24 (80)	0,137
	Vitality	49,38(79)	40,00 (74)	0,080
	Mental health	53,75 (86)	41,08 (76)	0,019

Finally, a multiple regression analysis was conducted to evaluate and propose a model that could explain the possible associations with the deterioration of quality of life after hospitalization in the ICU. An analysis of the statistically significant variables or those with biological plausibility was carried out.

The results of the logistic regression analysis for the PHC indicate that the presence of infection is significantly associated with an increased risk of deterioration in quality of life, with an Odds Ratio (OR) of 2.23 (95% CI: 1.23–4.03; p = 0.008), suggesting that patients with infection have more than twice the likelihood of experiencing deterioration compared to those without infection. In contrast, female sex behaves as a protective factor for the PHC, with an OR of 0.59 (95% CI: 0.36–0.99; p = 0.046), indicating that women have a lower likelihood of deterioration compared to men. For the MHC, female sex also shows a protective effect with an OR of 0.59 (95% CI: 0.36–0.95; p = 0.031), implying that women have a lower probability of deterioration in this area compared to men (Table 6).

Table 6. Factors associated with the deterioration of quality of life after ICU stay.

Variable	Odds Ratio	IC 95%	p
Physical health component	2,2297	1,2333 – 4,0311	0,008
Infection			
Female sex	0,5947	0,3569 – 0,9908	0,046
Mental Health component Female sex	0,5901	0,3647 – 0,9549	0,031

Our study is the first conducted in Colombia that evaluates the quality of life after ICU stay with a follow-up up to 180 days. We used the SF-36 questionnaire, which has demonstrated good acceptability, reliability, and validity in critically ill patients, and is also validated in Spanish (6–9).

The deterioration of quality of life after an ICU stay is a frequently mentioned topic, but poorly studied, mainly due to the difficulty in measuring qualitative variables that depend on each patient's individual perception (10,11). Evaluating the quality of life before and after ICU stay allows not only describing the overall deterioration after a critical event but also assessing its usefulness as a parameter to evaluate hospital discharge, comorbidities, and patient mortality (12–18).

In our study, during the six-month follow-up, we observed similar trends in the physical health component (PHC) and the mental health component (MHC). At 30 days, the greatest deterioration in quality of life (DCV) was detected, with a 28% decrease in PHC and a 16% decrease in MHC. Subsequently, a trend toward recovery was observed in both components. At 90 days, DCV was 23% for PHC and 16% for MHC compared to baseline values, maintaining the improvement trend. However, at 6 months, values did not reach baseline levels. Only 14.2% of patients did not experience deterioration in either component, highlighting the severity of the situation for most of the individuals analyzed.

At 180 days, 85.8% of the patients experienced clinically significant deterioration in quality of life, slightly higher in men (51.7%, n = 153) than in women (48.3%, n = 143). The physical health component (PHC) was the most affected in both groups, with average scores below baseline values by 19% and 13% for the mental health component (MHC), with the latter being more affected in women (77.5%, n = 124) than in men (67.03%, n = 124).

Our findings are consistent with international studies (19,20). In a prospective observational study, factors influencing the deterioration of health-related quality of life (HRQoL) in ICU trauma patients were analyzed. At 12 months, significant deterioration was reported across all dimensions, with physical role being the most affected. Similarly, another study evaluated 300 patients in a teaching hospital in Scotland, finding that physical quality of life significantly decreased at 3 months, partially recovering at 12 months, though still remaining below that of the general population.

In our study, the domains of physical function and physical role presented the greatest deterioration, highlighting the need for effective therapeutic

interventions, such as early physiotherapy, rehabilitation, and occupational therapy. Without proper treatment, physical deterioration hinders the return to daily and work activities, reducing productivity. This result aligns with other findings that identified significant reductions in energy, sleep, and emotional reactions, along with increases in work absenteeism (10).

In contrast, the mental health domain showed limited deterioration (4% compared to baseline), significantly lower than that of physical role (49%). Multiple emotional disturbances such as anxiety, stress, and depression are common in these patients and are influenced by factors such as noise, pain, and difficulty in communication (11). A multidisciplinary approach is recommended to address both the physical and psychological needs of patients.

A greater deterioration was identified in women (89.4%) compared to men (82.7%), suggesting greater female vulnerability. A recent meta-analysis reviewed 21 studies with 505,138 participants and found greater disease severity and adjusted mortality in women (21).

A secondary analysis in our study showed that the presence of infection was associated with an increased risk of deterioration in the PHC (OR: 2.23; 95% CI: 1.23–4.03; p = 0.008). Interestingly, female sex acted as a protective factor in both PHC and MHC, even though women experienced greater initial deterioration and showed more resilience at 180 days.

Finally, the overall mortality rate was 11.61%. At 30 days, 6.92% of patients had died, and by 90 days, 10.94% had passed. These figures are lower than those reported in other studies that documented 14.6% mortality at 90 days and 17.6% at 180 days (24,25). Differences were also observed compared to other studies that described 17.1% mortality at 28 days and 25% at 6 months (26,27).

Conclusion

The study revealed significant deterioration in the quality of life of patients after their stay in the ICU, with a greater impact on the physical component compared to the mental one, and incomplete recovery at 180 days. Women showed greater initial deterioration but exhibited greater long-term resilience compared to men, highlighting the importance of designing personalized approaches based on sex. These findings emphasize the need for a multidisciplinary treatment plan that integrates early physiotherapy, rehabilitation, and psychological support, with the aim of optimizing recovery and facilitating reintegration into daily and work activities, thereby improving post-ICU health outcomes.

References

1. Critical Care Statistics | SCCM [Internet]. [cited 2024 Aug 16]. Available from: https://www.sccm.org/Communications/Critical-Care-Statistics
2. Niittyvuopio M, Liisanantti JH, Pikkupeura J, Spalding MB, Sälkiö S, Ala-Kokko TI. Factors associated with impaired physical functioning and mental health in working-age patients attending a post–intensive care follow-up clinic three months after hospital discharge. Anaesth Intensive Care [Internet]. 2019 Mar 1 [cited 2024 Aug 16];47(2):160. Available from: https://openurl.ebsco.com/contentitem/doi:10.1177%2F0310057X19838910?sid=ebsco:plink:crawler&id=ebsco:doi:10.1177%2F0310057X19838910
3. Lewis SR, Pritchard MW, Schofield-Robinson OJ, Evans DJW, Alderson P, Smith AF. Information or education interventions for adult intensive care unit (ICU) patients and their carers. Cochrane Database Syst Rev [Internet]. 2018 Oct 13 [cited 2024 Aug 16];10(10). Available from: https://pubmed.ncbi.nlm.nih.gov/30316199/
4. Karimi M, Brazier J. Health, Health-Related Quality of Life, and Quality of Life: What is the Difference? Pharmacoeconomics [Internet]. 2016 Jul 1 [cited 2024 Aug 16];34(7):645–9. Available from: https://pubmed.ncbi.nlm.nih.gov/26892973/
5. Oliveros H, Martínez FH, Lobelo R, Pablo Velásquez J, Gómez M, Granados M, et al. TRABAJOS ORIGINALES Recursos utilizados y calidad de vida de los pacientes críticamente enfermos egresados de la unidad de cuidados intensivos Expenditure of resources and quality of life in critically ill patients discharged from the intensive care unit. Vol. 33. 2008.
6. Chaboyer W, Elliott D. Health-related quality of life of ICU survivors: review of the literature. Intensive Crit Care Nurs [Internet]. 2000 [cited 2024 Oct 9];16(2):88–97. Available from: https://pubmed.ncbi.nlm.nih.gov/11868593/
7. Dowdy DW, Eid MP, Sedrakyan A, Mendez-Tellez PA, Pronovost PJ, Herridge MS, et al. Quality of life in adult survivors of critical illness: a systematic review of the literature. Intensive Care Med [Internet]. 2005 [cited 2024 Oct 9];31(5):611–20. Available from: https://pubmed.ncbi.nlm.nih.gov/15803303/
8. Angus DC, Carlet J. Surviving intensive care: a report from the 2002 Brussels Roundtable. Intensive Care Med [Internet]. 2003 Mar 1 [cited 2024 Oct 9];29(3):368–77. Available from: https://pubmed.ncbi.nlm.nih.gov/12536269/
9. Vilagut G, Ferrer M, Rajmil L, Rebollo P, Permanyer-Miralda G, Quintana JM, et al. El Cuestionario de Salud SF-36 español: una década de experiencia y nuevos desarrollos. Gac Sanit [Internet]. 2005 [cited 2024 Oct 9];19(2):135–50. Available from: https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0213-91112005000200007&lng=es&nrm=iso&tlng=es
10. Hurel D, Loirat P, Saulnier F, Nicolas F, Brivet F. Quality of life 6 months after intensive care: results of a prospective multicenter study using a generic health status scale and a satisfaction scale. Intensive Care Med [Internet]. 1997 [cited 2024 Oct 9];23(3):331–7. Available from: https://pubmed.ncbi.nlm.nih.gov/9083237/
11. Gómez-Carretero P, Monsalve V, Soriano J, de Andrés J. Alteraciones emocionales y necesidades psicológicas de pacientes en una Unidad de Cuidados Intensivos. Med Intensiva [Internet]. 2007 [cited 2024 Oct 9];31(6):318–25. Available from: https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0210-56912007000600006&lng=es&nrm=iso&tlng=es
12. Fröhlich M, Lefering R, Probst C, Paffrath T, Schneider MM, Maegele M, et al. Epidemiology and risk factors of multiple-organ failure after multiple trauma: an analysis of 31,154 patients from the TraumaRegister DGU. J Trauma Acute Care Surg [Internet]. 2014 [cited 2024 Oct 9];76(4):921–7. Available from: https://pubmed.ncbi.nlm.nih.gov/24662853/

13. Chaboyer W, Elliott D. Health-related quality of life of ICU survivors: review of the literature. Intensive Crit Care Nurs [Internet]. 2000 [cited 2024 Oct 9];16(2):88–97. Available from: https://pubmed.ncbi.nlm.nih.gov/11868593/

14. Cuthbertson BH, Scott J, Strachan M, Kilonzo M, Vale L. Quality of life before and after intensive care. Anaesthesia [Internet]. 2005 Apr [cited 2024 Oct 9];60(4):332–9. Available from: https://pubmed.ncbi.nlm.nih.gov/15766335/

15. Ulvik A, Kvåle R, Wentzel-Larsen T, Flaatten H. Quality of life 2-7 years after major trauma. Acta Anaesthesiol Scand [Internet]. 2008 Feb [cited 2024 Oct 9];52(2):195–201. Available from: https://pubmed.ncbi.nlm.nih.gov/18005377/

16. Fildissis G, Zidianakis V, Tsigou E, Koulenti D, Katostaras T, Economou A, et al. Quality of Life Outcome of Critical Care Survivors Eighteen Months after Discharge from Intensive Care. Croat Med J [Internet]. 2007 Dec [cited 2024 Oct 9];48(6):814. Available from: /pmc/articles/PMC2213799/

17. Buckley TA, Cheng AYC, Gomersall CD. Quality of life in long-term survivors of intensive care. Ann Acad Med Singap [Internet]. 2001 [cited 2024 Oct 9];30(3):287–92. Available from: https://pubmed.ncbi.nlm.nih.gov/11455744/

18. Hollinger A, Gayat E, Féliot E, Paugam-Burtz C, Fournier MC, Duranteau J, et al. Gender and survival of critically ill patients: results from the FROG-ICU study. Ann Intensive Care [Internet]. 2019 Dec 1 [cited 2024 Oct 9];9(1). Available from: /pmc/articles/PMC6441070/

19. Serviá Goixart L, Badia Castelló M, Montserrat Ortiz N, Bello Rodriguez G, Vicario Izquierdo E, Vilanova Corselles J, et al. Factores de riesgo de deterioro de calidad de vida en pacientes traumáticos críticos. Valoración a los 6 y 12 meses del alta de la unidad de cuidados intensivos. Med Intensiva [Internet]. 2014 Jan 1 [cited 2024 Oct 9];38(1):1–10. Available from: http://www.medintensiva.org/es-factores-riesgo-deterioro-calidad-vida-articulo-S0210569112003178

20. Cuthbertson BH, Scott J, Strachan M, Kilonzo M, Vale L. Quality of life before and after intensive care. Anaesthesia [Internet]. 2005 Apr [cited 2024 Oct 9];60(4):332–9. Available from: https://pubmed.ncbi.nlm.nih.gov/15766335/

21. Modra L, Higgins A, Vithanage R, Abeygunawardana V, Bailey M, Bellomo R. Sex differences in illness severity and mortality among adult intensive care patients: A systematic review and meta-analysis. J Crit Care [Internet]. 2021 Oct 1 [cited 2024 Oct 9];65:116–23. Available from: https://pubmed.ncbi.nlm.nih.gov/34118502/

22. Badia Castelló M, Trujillano Cabello J, Serviá Goixart L, Marcha Llanes J, Rodríguez-Pozo A. Cambios en la calidad de vida tras UCI según grupo diagnóstico: Comparación de dos instrumentos de medida. Med Intensiva [Internet]. 2008 [cited 2024 Oct 9];32(5):203–15. Available from: https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0210-56912008000500001&lng=es&nrm=iso&tlng=es

23. Peckham H, de Gruijter NM, Raine C, Radziszewska A, Ciurtin C, Wedderburn LR, et al. Male sex identified by global COVID-19 meta-analysis as a risk factor for death and ITU admission. Nat Commun [Internet]. 2020 Dec 1 [cited 2024 Oct 9];11(1). Available from: https://pubmed.ncbi.nlm.nih.gov/33298944/

24. Cuthbertson BH, Scott J, Strachan M, Kilonzo M, Vale L. Quality of life before and after intensive care. Anaesthesia [Internet]. 2005 Apr [cited 2024 Aug 16];60(4):332–9. Available from: https://pubmed.ncbi.nlm.nih.gov/15766335/

25. Oliveros H, Martínez FH, Lobelo R, Pablo Velásquez J, Gómez M, Granados M, et al. TRABAJOS ORIGINALES Recursos utilizados y calidad de vida de los pacientes críticamente enfermos egresados de la unidad de cuidados intensivos Expenditure of resources and quality of life in critically ill patients discharged from the intensive care unit. Vol. 33. 2008.

26. Robinson KA, Davis WE, Dinglas VD, Mendez-Tellez PA, Rabiee A, Sukrithan V, et al. A systematic review finds limited data on measurement properties of instruments measuring outcomes in adult intensive care unit survivors. J Clin Epidemiol. 2017 Feb 1;82:37–46.

27. Fröhlich M, Lefering R, Probst C, Paffrath T, Schneider MM, Maegele M, et al. Epidemiology and risk factors of multiple-organ failure after multiple trauma: an analysis of 31,154 patients from the TraumaRegister DGU. J Trauma Acute Care Surg [Internet]. 2014 [cited 2024 Oct 9];76(4):921–7. Available from: https://pubmed.ncbi.nlm.nih.gov/24662853/