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Hospital Malnutrition: Quality Indicator in the ICU of a Hospital in Huancavelica, Periods 2015-2017

Gennma Lucila Flores Yallico[1], Ofelia Carol Cernaque Miranda[2]

Abstract

The objective of the present investigation was to ascertain whether malnutrition in hospitalised patients is a quality indicator in the Intensive Care Unit of a hospital in Huancavelica, during the periods 2015-2017. The study employed an observational, analytical-relational, retrospective, and longitudinal approach. A total of 51 critically ill patients treated at the Hospital Departmental Huancavelica were analyzed. Clinical-epidemiological characteristics, nutritional status, and mortality were evaluated using anthropometric and biochemical parameters. A statistical analysis was conducted using the Chi-square test, with a significance level of 5%. The results demonstrated that the mean age of critically ill patients who received artisan formula was 60 ± 22.8 years. Of these patients, 54.9% were women, and 70.6% were admitted to the ICU due to septic shock. Additionally, the mean height, time in the ICU, and days of receipt of artisan formula were 1.54 ± 0.1 m, 13.6 ± 8.0 days, and 11.5 ± 7.9 days, respectively. In contrast, the anthropometric and biochemical parameters exhibited lower averages when the admission data were compared with those obtained seven days later, with the exception of lymphocyte levels, which demonstrated a slight increase. The nutritional variable albumin was found to be related to mortality in patients (p = 0.022). It was observed that 75% of patients who died suffered from moderate malnutrition, compared to 30.8% of survivors. It can be concluded that critically ill patients who received artisan enteral formula after seven days exhibited greater malnutrition associated with mortality. This was evidenced by a decline in the anthropometric parameters (weight and BMI) and biochemical parameters (albumin, hemoglobin, and lymphocytes) as observed in the laboratory analyses. It is noteworthy that albumin demonstrated the strongest correlation with mortality. This study demonstrates that hospital malnutrition is an indicator of quality and has a significant impact on morbidity and mortality in critical patients of the ICU of the Departmental Hospital of Huancavelica, between the years 2015 and 2017.

Keywords: *Hospital Malnutrition, Quality Indicator, Morbidity, Mortality, Enteral Nutrition*

INTRODUCTION

Malnutrition in hospitals represents a significant challenge in the healthcare sector. It is regarded as one of the most crucial links in the chain of approaches for critically ill patients, whose survival or death hinges on the dynamic equilibrium between the severity of the underlying pathology and the sufficiency of the protective physiological responses that maintain the internal environment and metabolic processes (Azcuy A, Miranda R, 2019). In light of the heightened susceptibility of patients in critical care to malnutrition in hospitals, it becomes pertinent to inquire as to the potential of malnutrition as an indicator of quality in the Intensive Care Unit (ICU) of the Departmental Hospital of Huancavelica during the period spanning 2015 to 2017.

Consequently, the assistance provided in intensive care units is of paramount importance (Cáceres D, Cristancho L, López L, 2019). This is because patients in this setting exhibit a set of metabolic disturbances that necessitate increased nutritional requirements and the risk of malnutrition (Savino P, Félix J, 2016). Malnutrition is defined as a condition encompassing these factors (Perman M, 2018). Malnutrition is a pervasive global concern, particularly in developing countries where it is frequently associated with underlying pathologies or injuries. Malnutrition is associated with a range of adverse clinical outcomes, including an increased risk of infection, prolonged mechanical ventilation, and higher mortality rates. (Barrita R, Villar A, Bordalejo A, Nadal M, 2019; Lobatón E, 2020).

LITERATURE REVIEW

In light of the aforementioned considerations, it is imperative to employ alternative feeding routes, such as enteral nutrition, which can be conceptualized as a form of nutritional support wherein nutrients are delivered

[1] César Vallejo University. Peru; E-mail: gfloresya74@ucvvirtual.edu.pe. https://orcid.org/ 0000-0002-0133-5588

[2] César Vallejo University. Peru; https://orcid.org/0000-0001-9354-7045

through probes to the gastrointestinal tract. This practice, which is commonly referred to as enteral nutrition, encompasses a range of techniques employed to supply nutrients to patients through probes. The distal termination of these probes is in the stomach, duodenum, or jejunum (Lobo G, Pérez A, Fernández L, 2016), with the purpose of supplying the protein-energy deficit of the critical patient (Kutz N, De Souza V, 2018).

For this type of nutrition, there are currently available on the market enteral formulas. However, prior to this, in various health institutions, artisanal or culinary diets were prepared, consisting of liquefied and/or sieved foods, to be administered by probes. Currently, these artisanal enteral formulas have established themselves as a cost-effective and nutritionally optimal option for this patient population. In-nature foods (rice, egg, milk, vegetable oil, among others) and nutritional supplements liquefied and sifted in the kitchen of the nosocomial setting can completely supply their needs (Ruiz S, 2018). It is crucial to recognize that the dietary regimen should be customized to the specific characteristics of the individual patient, including sex, age, and underlying medical conditions. The quantity of grams consumed is of paramount importance for the maintenance and preservation of the nutritional status of hospitalized patients (Thomas D, 2021).

Nevertheless, numerous studies have refuted this hypothesis, demonstrating that the preparation of this diet results in a significant loss of nutrients due to concurrent use of in natura and industrial enteral foods. Furthermore, the difficulty in determining the nutritional composition (viscosity or osmolarity) and in preserving its microbiological quality has been demonstrated (Kutz N, De Souza V, 2018). The aforementioned circumstances, when coupled with the discrepancies between administered, programmed, and required enteral nutrition, significantly increases the vulnerability of patients and the risk of death. This is due to the fact that the volume of nutrition infused rarely exceeds 60 to 80% of the prescribed amount, with such low levels being attributed to frequent events in intensive care units, such as procedural interruptions or gastrointestinal intolerances (Roque J, Miranda M, 2015).

With regard to the Department of Huancavelica, it can be stated that approximately 51.8% of families are vulnerable to poverty, while 47.7% are in total poverty and 14.6% are in extreme poverty. The province and district with the highest rates of poverty are Tayacaja-Pichos, with 77.1% (Tejidor D, Iglesias, 2016). This social indicator is related to the health status of the population. In 2014, the presence of the diagnosis of malnutrition and nutritional deficiencies was demonstrated to be within the top five morbidities affecting the Huancavelican population. This was despite a considerable reduction (3.87%) in relation to previous years (7.27%), as reported by the Ministry of Health of Peru (2016).

These figures illustrate that the majority of patients presenting to the Huancavelica Departmental Hospital exhibit signs of malnutrition or are at risk of developing it. Among those hospitalized in critical condition and fed an enteral artisanal formula, there is a notable increase in catabolism, which is attributed to the high consumption of protein. Consequently, this increases the risk of adverse events, including a fatal outcome. In light of the aforementioned considerations, the principal objective of this study is to ascertain whether hospital malnutrition constitutes a quality indicator in the Intensive Care Unit of the Departmental Hospital Huancavelica during the periods 2015-2017. Finally, this study will analyze the impact of hospital malnutrition as a quality indicator, which represents a specific objective within the context of this review article.

METHODOLOGY

The research approach is quantitative, as it will be supported by the numerical data obtained and statistical data of the results. The objective of this study is to verify the variable of quality of service in the Critical Care Unit of the Departmental Hospital of Huancavelica. As cited by Hernandez, Fernandez, and Baptista (2014), this approach is determined by the information, which allows corroboration of the hypothesis, taking into account the numerical and statistical factors (p. 4). It is anticipated that this approach will enable the measurement of variables' behavior and the verification of the theories based on the numerical and statistical data provided.

With regard to the level of research to be employed, it is of an explanatory nature, as it will permit the identification of factors affecting hospital malnutrition as an indicator of quality in the critical care unit. Moreover, the influence of service quality on efficiency management will be elucidated. As outlined by

Hernández, Fernández, and Baptista (2014), the objective of this research is to identify the degree of association between two variables, commencing with a sample (p. 93).

The research methodology to be employed will be descriptive, which will permit the description of the relationship between the variables of hospital malnutrition and the quality of service in the critical care unit. The author Hernández, Fernández, and Sampieri (2014) refers to descriptive research, which entails a detailed description of the characteristics and properties of the variables under study (p. 92).

Finally, the design for this research will be non-experimental. This is because the variables will not be manipulated; rather, the objective is to obtain results that are related to both variables.

The systematic review article will draw upon information from a literature review of scientific articles in the ProQuest, Scopus, Web of Science, SciELO, and academic Google databases (in English and Spanish). In addition, review articles were selected based on pre-established inclusion and exclusion criteria.

The study population consisted of 51 critically ill patients who received enteral artesian formula at the Huancavelica Departmental Hospital between January 2015 and December 2017. The non-probabilistic sampling technique employed was the census, as the population was readily accessible. The sample size was 51 patients.

The data were collected using a documentary technique, as all information was obtained from medical records. The instrument utilized was a collection form, prepared by the researcher, which included the following variables:

The clinical and epidemiological characteristics of the subjects were recorded, including age, sex, pathologies present at the time of admission to the ICU, the number of days spent in the ICU, and the number of days on which the subjects received a handmade formula.

Nutritional status was evaluated using anthropometric parameters, including body mass index (BMI), weight, and height. Data were collected on the first day of admission to the ICU and seven days later, serving as a reference point but not as assessment variables. This approach was selected to circumvent potential bias in critical patients, as previously discussed by Lira, Contreras, and Galarza (2015). Biochemical parameters were also evaluated, specifically hemoglobin. Values greater than 12 g/dl and 13 g/dl were considered within the normal range for women and men, respectively. Values between 11 and 11.9 g/dl and 10 and 12.9 g/dl were considered to indicate mild anemia in women and men, respectively. Values between 8 and 10.9 g/dl were classified as moderate anemia for women and men, while values below 8 g/dl were classified as severe anemia (Ministerial Resolution N°028-2015/MINSA). In 2016, total lymphocyte count was identified as an indicator of severe malnutrition, with values below 800 mm3. Additionally, albumin levels were evaluated, with values between 3.5 g/dl and 5 g/dl considered normal, between 2.8 g/dl and 3.4 g/dl indicating mild malnutrition, between 2.1 g/dl and 2.7 g/dl indicating moderate malnutrition, and below 2.1 g/dl indicating severe malnutrition (Lira H, Contreras C, Galarza C, 2015). A serum albumin concentration of 4 g/dl is indicative of mild malnutrition, while a concentration of 2.1 g/dl to 2.7 g/dl is indicative of moderate malnutrition, and a concentration of less than 2.1 g/dl is indicative of severe malnutrition (Clinical Practice Guideline Hospital Nacional Dos de Mayo, 2021). The data were evaluated from the first day of admission to the ICU to seven days later. The outcome was dichotomized as mortality (yes/no). The statistical analysis will be performed using the Chi-square test, with a significance level of 5%. Only those p-values lower than 0.05 will be considered significant.

RESULT AND FINDINGS

The results demonstrated average age of the critical patients who received the artesian formula was 60 ± 22.8 years. Of these patients, 54.9% were women and 70.6% were admitted to the ICU for septic shock. Additionally, the average time in the ICU and days of receiving the artesian formula were 13.6 ± 8.0 days and 11.5 ± 7.9 days, respectively (Table 1).

Table 1: Clinical-epidemiological characteristics of patients who received artisanal formula Huancavelica Departmental Hospital, 2015-2017.

Clinical-epidemiological characteristics	N	%
Age (x±DS)	60±22.8	
15-44 years	14	27.5%
45-64 years old	10	19.6%
65 and over	27	52.9%
Gender		
Male	23	45.1%
Female	28	54.9%
Pathology of admission to ICU	N	%
Cardiovascular disease	8	15.7%
Septic shock	36	70.6%
Others	7	13.7%
Time in ICU (x±DS)	13.6±8.0	
Days of receiving home-made formula (x±DS)	11.5±7.9	

x±SD: Mean ± Standard deviation

The nutritional status of the patients was evaluated using two parameters: anthropometric and biochemical. The anthropometric parameters, weight and IMS, were assessed at ICU admission and seven days later. The weight was found to be 61.3±9.6 kg at admission, with an average reduction of 1.5 kg seven days later. The IMS was 25.7±3.9 at admission, with an average reduction of 0.6 kg seven days later. When biochemical parameters were analyzed, a reduction in values was identified in albumin and hemoglobin biomarkers when comparing admission levels (3.2±0.5 and 12.8±3.2, respectively) and 7-day levels (2.9±0.5 and 11.6±1.8, respectively). In contrast, a slight increase was identified in lymphocytes (8.54%±5.89% vs 8.58%±6.1%). Table 2 presents the results of the study.

Table 2: Nutritional status of patients who received handmade formula Huancavelica Departmental Hospital, 2015-2017.

Nutritional status	On admission to ICU (x±DS)	7 days after ICU admission (x±DS)

Anthropometric Parameters		
Weight	61.3±9.6	59.8±10.8
Size	1.54±0.1	
BMI	25.7±3.9	25.1±4.6
Biochemical Parameters		
Albumin	3.2±0.5	2.9±0.5
Hemoglobin	12.8±3.2	11.6±1.8
Lymphocytes	8.54%±5.89%	8.58%±6.1%

x±SD: Mean ± Standard deviation

Subsequently, 23.5% of patients died, with septic shock due to respiratory failure being most common cause of death. In contrast, 76.5% of patients survived (Figure 1).

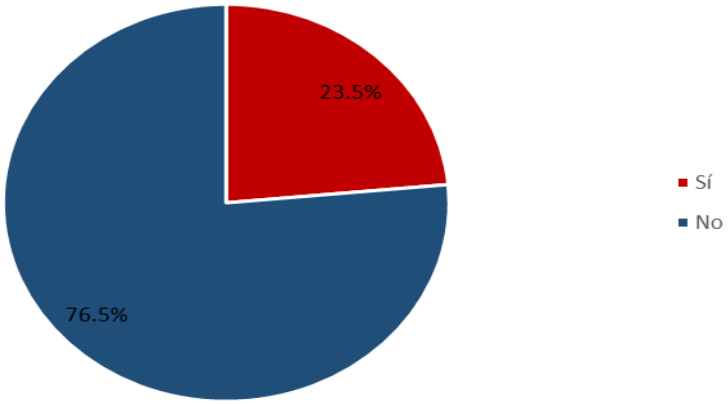

Figure 1: Mortality in patients who received handmade formula Huancavelica Departmental Hospital, 2015-2017

Finally, an analysis of the relationship between the two variables revealed a correlation between nutritional status and mortality, with a specific association observed between biochemical parameters and albumin levels. Patients with albumin levels indicating moderate malnutrition exhibited a higher mortality rate (75%) compared to those who survived (30.8%). (Table 3).

Table 3: Nutritional status and mortality of patients who received artisanal formula Huancavelica Departmental Hospital, 2015-2017.

	Mortality				
Nutritional status	**Yes**		**No**		**p**
	N	**%**	**N**	**%**	

Anthropometric parameters					
BMI					
Underweight	0	0.0%	4	10.3%	
Normal	7	58.3%	17	43.6%	0.423
Overweight	2	16.7%	12	30.8%	
Obesity	3	25.0%	6	15.4%	
Biochemical parameters					
Albumin					
Normal	0	0.0%	4	10.3%	
Mild malnutrition	3	25.0%	23	59.0%	0.022
Moderate malnutrition	9	75.0%	12	30.8%	
Hemoglobin					
Moderate anemia	5	41.7%	12	30.8%	
Mild anemia	5	41.7%	16	41.0%	0.668
Normal	2	16.7%	11	28.2%	
Lymphocytes					
Decreased	12	100.0%	33	84.6%	0.148
Normal	0	0.0%	6	15.4%	
Total	12	100%	39	100%	

Note: Own elaboration based on results of Chi-square test

Discussion

The study population consisted of patients aged 65 years or older (52.9%), female (54.9%), who were admitted to the ICU for septic shock (70.6%), with a mean hospital stay of approximately 13.6 days and who received an average of 11.5 days of artificial formula. In this context, studies have been identified that are aligned with this research area. One such study was conducted by Lira et al. (2015), which was conducted in a local setting and focused on patients hospitalized in the ICU. The mean age of patients in this study was 50.63 years, with a prevalence of patients over the age of 65 (28%) and male patients (54.295%). In contrast, Baltazar et al. (2013) observed a higher prevalence of female patients (52.1%) among those hospitalized in a Mexican hospital service, with an average age of 46 to 80 years. Moreover, Páez et al. (2013) conducted an evaluation of critically ill patients hospitalized in the ICU of a Cuban hospital. The findings revealed that the most prevalent patient groups were those aged 65 years and older (38.2%), male (55.9%), and diagnosed with ischemic cerebrovascular

disease (42.3%). These findings, including the present one, indicate that the majority of patients admitted to the ICU are female and older adults. This may be attributed to the physiological decline that occurs during this stage of life.

Upon evaluation of the nutritional status of patients, a reduction in anthropometric parameters was observed, as measured from admission to seven days of hospitalization in the ICU. Specifically, the weight decreased from 61.3 kg to 59.8 kg, representing a reduction of 1.5 kg, while the BMI decreased from 25.7 to 25.1, representing a reduction of 0.6. In addition, biochemical parameters were evaluated, and a reduction in levels was observed during the study interval. The albumin levels decreased from 3.2 g/dL to 2.9 g/dL, representing a reduction of 0.3 g/dL, while the hemoglobin levels decreased from 12.8 g/dL to 11.6 g/dL, representing a reduction of 1.2 g/dL. However, lymphocyte levels increased from 8.54% to 8.58% (0.04%). In their 2015 analysis of severe malnutrition in patients hospitalized in the ICU over three consecutive years (2010 to 2012), Lira and colleagues found that 27.97% of patients presented with malnutrition, as evidenced by low albumin levels (below 2.5 g/dl) and lymphocyte counts (below 800/mm³). Similarly, Paez et al. (2013) evaluated the albumin level and found that the nutritional status of patients on hospital admission was malnourished in those with hemorrhagic cerebrovascular disease (50%) and in ischemic and hemorrhagic (37.5%). This finding indicates that, within the biochemical parameters, albumin is the serum marker most commonly utilized to assess nutritional status in critically ill patients.

Moreover, studies were identified in which nutritional indices or scales were employed to assess this variable. For example, the study by Baltazar et al. (2018) evaluated anthropometric and biochemical parameters and found that the average weight was 68.4 kg, height 1.61 m, albumin 2.9 g/dl, and lymphocytes 34.4 mm³. A slight decrease in serum albumin concentration was observed in 31.1% of patients, a moderate decrease in 32.8%, and a severe decrease in 15.1%. Furthermore, it was observed that patients with suspected malnutrition or moderate malnutrition according to the EGS-GP (Subjective Global Patient-Generated Global Assessment) exhibited a moderate decrease in albumin concentration (51.3%), while those with severe malnutrition exhibited a severe decrease in albumin concentration (38.9%). In a similar vein, Quesada et al. (2019) identified the nutritional variables most commonly altered in ICU patients to be lymphocytes (50.6%) and albumin (45.9%), namely biochemical parameters. After applying the CONUT to assess nutritional status, it was determined that 56.5% of the patients were undernourished, with a higher prevalence of mild malnutrition (31.8%). These cases illustrate the value of instruments for assessing nutritional status in this specific population, as anthropometric parameters are not reliable due to the reduction of weight (lean and muscular) and BMI over time, which introduces bias.

In evaluating mortality among the study patients, 23.5% of them died, with respiratory failure identified as the primary cause. In the study by Baltazar et al. (2013), it was found that 30% of patients analyzed died. Of the patients in question, 37.1% were suspected of having moderate malnutrition, 30.8% were suspected of having severe malnutrition, and 32% were suspected of having mild malnutrition. Nevertheless, Quesada et al. (2019) observed a lower mortality rate, with only 11.8% of patients admitted to the ICU dying, primarily due to cardiovascular complications.

The data indicate that hospital malnutrition is a quality indicator in the ICU, specifically related to biochemical parameters such as albumin. This is related to higher mortality ($p=0.022$), as those patients with low albumin levels, categorized as moderate malnutrition, were identified mainly in those patients who died (75%), compared to those patients in whom albumin levels categorized as mild malnutrition were identified in those who survived (59%). The findings of the study by Baltazar et al. (2018) yielded comparable results, indicating that mortality was significantly associated with serum albumin concentration ($p = 0.005$). As the severity of malnutrition increased, the number of deaths also increased. This statistical analysis demonstrates the relevance of this biochemical marker in the assessment of nutritional status and its relationship with mortality. In contrast, the study by Quesada et al. (2019) found no association between nutritional status as determined by CONUT and hospital discharge. Nevertheless, among malnourished patients, 9.5% had succumbed to their illness. This evidence indicates that the conventional indexes, scores, or instruments typically employed to assess nutritional status are not a viable option in this specific population. This is due to a number of factors, including immobilization and the absence of oral feeding.

CONCLUSION

It can be concluded that patients who received enteral formula after seven days exhibited greater hospital malnutrition, which was associated with mortality. This was corroborated by a reduction in anthropometric parameters (weight and BMI) and biochemical parameters (albumin, hemoglobin, and lymphocytes) as evidenced by laboratory analysis. It is notable that albumin was the factor most closely associated with mortality. In conclusion, the results demonstrate that hospital malnutrition is a quality indicator and has a significant impact on morbidity and mortality in critical patients in the Intensive Care Unit of the Departmental Hospital of Huancavelica, periods 2015-2017. Consequently, it is imperative to reinforce health systems that prioritize the provision of quality hospital nutrition. The study's principal limitations include a dearth of studies that are specifically related to the subject matter, particularly within the national context. This research will be useful for the development of future research on the subject, generating more evidence in various institutional contexts.

REFERENCES

Aguilar C, Martínez C. La realidad de la unidad de cuidados intensivos. Med Crit. 2017; 31(3): 171-173. Available: <http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2448-89092017000300171&lng=es&nrm=iso>. Available 27 sept. 2021.

Lara B, Cataldo A, Castro R, Aguilera P, Ruiz C, Andrensen M. Medicina de urgencia y unidades de cuidados intensivos. Una alianza necesaria en busca de la mejoría de la atención de pacientes críticos. Rev méd Chile. 2016; 144(7): 917-924. DOI: 10.4067/S0034-98872016000700014.

Azcuy A, Miranda R. Mortalidad en unidad de cuidados intensivos en hospital provincial pinareño. Univ Méd Pinareña. 2019; 15(2): p. 176-183. Available: http://www.revgaleno.sld.cu/index.php/ump/article/view/338

Cáceres D, Cristancho L, López L. Actitudes de las enfermeras frente a la muerte de los pacientes en una unidad de cuidados intensivos. Rev Cienc Salud. 2019; 17(3): 98-110. DOI: 10.12804/revistas.urosarioedu.co/revsalud/a.8368.

Savino P, Félix J. Metabolismo y nutrición del paciente en estado crítico. Rev Colomb Cir. 2016;(31): 108-127. Available: https://www.redalyc.org/articulo.oa?id=355545923006.

Perman M, Ciapponi A, Franco J, Loudet C, Crivelli A, Garrote V, et al. Prescribed hypocaloric nutrition support for critically-ill adults. Cochrane Database Syst Rev. 2018; 6: p. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6513548/.

Organización Mundial de la Salud. Malnutrición. [Online].; 2021. [Citado el 2 de setiembre de 2021]. Available: https://www.who.int/es/news-room/fact-sheets/detail/malnutrition.

Lobatón E. Malnutrición hospitalaria: etiología y criterios para su diagnóstico y clasificación. Rev. Nutr. Clin. Metab. 2020; 3(1): 121-127. DOI: https://doi.org/10.35454/rncm.v3n1.019

Barrita R, Villar A, Bordalejo A, Nadal M. Nutrición enteral en el paciente crítico: ¿cuánto se administra realmente? RATI. 2019; 36(2): 11-18. Disponible en: //revista.sati.org.ar/index.php/MI/article/view/564

Pupo J, González J, Cabrera J, Martí G. Pronóstico de muerte en los pacientes criticamente enfermos según el índice Nutric de riesgo nutricional. Rev Cubana Aliment Nutr. 2018; 28(2): 341-355. Available: https://www.medigraphic.com/pdfs/revcubalnut/can-2018/can182h.pdf

Lobo G, Pérez A, Fernández L. Dietas específicas en nutrición enteral. Análisis de la evidencia. Nutr Clin Med. 2016; X(3): 123-139. DOI: 10.7400/NCM.2016.10.3.5042

Brown A, Carpenter D, Keller G, Morgan S, Irving S. Enteral Nutrition in the PICU: Current Status and Ongoing Challenges. J Pediatr Intensive Care. 2015; 4(2): 111-120. DOI: 10.1055/s-0035-1559806.

Gordillo-Rodriguez, M. T., Pineda, A., & Gómez, J. D. F. (2023). Brand Community and Symbolic Interactionism: A Literature Review. Review of Communication Research, Vol.11, pp.1-32.

Kutz N, De Souza V, Lopes A, Barbosa M, Da Silva N, Hernandes M. Estandarización de las dietas enterales hechas a mano para uso doméstico en la Atención Primaria. Nutrición en Salud Pública. 2018;(1): 298-305. DOI: 10.18554/refacs.v6i0.2900.

Rojas A, Cáceres M, Joy L, Marínigo M. Complicaciones durante el soporte enteral en adultos mayores en un hospital de referencia. Mem. Inst. Investig. Cienc. Salud. 2017; 15(3): 35-40. DOI: 10.18004/Mem.iics/1812-9528/2017.015(03)35-040.

Zermeño P. Nutrición enteral. Nutr Clin Pract. 2019: Available: http://colegiodenutricionclinica.mx/nutricion-enteral/.

Silva V, Paiva J, das Chagas F, Ozaki L. Composição nutricional de dieta enteral artesanal a partir de alimentos convencionais do Município de Coari, Estado do Amazonas, Brasil. Rev Pan-Amaz Saud. 2015; 6(2): 29-36. DOI: 10.5123/S2176-62232015000200004

Ruiz S. Nutrición enteral del paciente crítico en el siglo XXI. Nutr Hosp. 2018; 35(2): 27-33. DOI: http://dx.doi.org/10.20960/nh.1957

Thomas D. Alimentación por sonda. [Online].; 2020. [Citado el 2 de setiembre de 2021]. Available https://www.msdmanuals.com/es-pe/hogar/trastornos-nutricionales/apoyo-nutricional/alimentaci%C3%B3n-por-sonda.

Rendón R, Torres A, Uresti I. Nutrición enteral en el paciente crítico con inestabilidad hemodinámica. Nutr Clin Med. 2019; XIII(2): 73-88. DOI: 10.7400/NCM.2019.13.2.5074

Roque J, Miranda M. Estado nutricional en pacientes críticos como predictor de morbimortalidad en un Hospital Nacional de EsSalud de Lima-Perú. Revista Científica de Ciencias de la Salud. 2015; 1(1): 29-35. DOI: https://doi.org/10.17162/rccs.v8i1.979

Tejidor D, Iglesias N, López Y, Tejidor J, Guerra J. Evaluación nutricional de los pacientes críticos ingresados en la Unidad de Cuidados Intensivos del Hospital Provincial de Ciego de Ávila. MEDICIEGO. 2016; 22(1): 37-44. Available: https://www.medigraphic.com/pdfs/mediciego/mdc-2016/mdc161f.pdf

Rebagliati V, Rios F. Aporte proteico en el paciente crítico: ¿estamos dando lo suficiente? Rev Arg de Ter Int.. 2017; 34(2): 7-10. Disponible en: //revista.sati.org.ar/index.php/MI/article/view/532

Ministerio de Desarrollo e Inclusión Social. Reporte Regional de Indicadores Sociales del Departamento de Huancavelica. [Online].; 2021. [Citado el 2 de setiembre de 2021]. Available: https://sdv.midis.gob.pe/redinforma/Upload/regional/Huancavelica.pdf.

Ministerio de Salud del Perú. Análisis de situación de salud del departamento de Huancavelica. [Online].; 2016. [Citado el 3 de setiembre de 2021]. Available: http://www.dge.gob.pe/portal/Asis/indreg/asis_huancavelica.pdf.

Lira H, Contreras C, Galarza C. Demanda insatisfecha de nutrición clínica en pacientes críticos del Hospital Nacional Dos de Mayo, 2010-2012. Acta Med Per. 2015; 32(3): 146-150. Available: http://www.scielo.org.pe/pdf/amp/v32n3/a03v32n3.pdf.

Ministerio de Salud del Perú. Guía de práctica clínica para el diagnóstico y tratamiento de la anemia por deficiencia de hierro en niñas, niños y adolescentes en establecimientos de salud del primer nivel de atención. Resolución Ministerial N°028-2015/MINSA. 2016. Available: http://bvs.minsa.gob.pe/local/MINSA/3932.pdf

Hospital Nacional "Dos de Mayo". Guía técnica: Guía de práctica clínica en el Manejo Médico Nutricional en Pacientes Críticos. Unidad Funcional de Soporte Merabólico Farmaconutricional Especializado. 2021: 1-65 Available: http://nuevaweb.hdosdemayo.gob.pe/instrumentos_de_gestion/normas_emitidas/r_dir/2021/03%20Marzo/RD_069_2021_D_HNDM.pdf.

Baltazar E, Omaña L, Ortiz L, Ñamendis S, De Nicola L. Estado nutricio en pacientes de primer ingreso a hospitalización del Servicio de hematología del Instituto Nacional de Cancerología. Nutr Hosp. 2013; 28(3): 1259-1265. DOI:10.3305/nh.2013.28.4.6484

Paez Y, Gondres K, Bacardí P, Romero L, Legró G, Jones O. Evaluación nutricional de pacientes graves portadores de enfermedades neurológicas. Panorama Cuba y Salud. 2018; 13(1): 13-20. Available: https://www.medigraphic.com/pdfs/cubaysalud/pcs-2018/pcs181c.pdf

Quesada Y, León D, Rosales J, Palacios D. Estado nutricional de pacientes ingresados en una unidad de cuidados intensivos. Revista Cubana de Anestesiología y Reanimación. 2019; 19(1): 498. Available: http://scielo.sld.cu/pdf/scar/v19n1/1726-6718-scar-19-01-e498.pdf