

Nursing Diagnosis in Patients with Liver Cirrhosis in Use of Feeding Tube

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Abstract

The objective was to identify the most frequent nursing diagnoses labels in patients with liver cirrhosis in use of feeding tube. A descriptive research was carried out in a Brazilian Hospital with 20 adult patients. Systematic data collection utilized the Conceptual Model of Wanda Horta, the first nurse to introduce the concept of Nursing Process in Brazil. The six phases of the nursing diagnostic reasoning proposed by Risner were used; nursing diagnoses were described according to NANDA-I taxonomy II. Patients were mainly male; half of them were middle age adults; they had an average of 12.8 nursing diagnoses labels; and the most frequent were: risk for aspiration and risk for infection. Nurses needed to develop effective skills to properly diagnose in order to provide safe care and improve patient outcomes.

Keywords

Nursing Diagnosis, Enteral Nutrition, Liver Cirrhosis

1. Introduction

Liver cirrhosis is the leading cause of chronic liver disease in developed countries. In the United States of America, liver cirrhosis results in more than 400,000 hospitalizations and in 27,000 deaths annually. In Taiwan,

liver cirrhosis and other chronic liver diseases together are the eighth-leading cause of death overall [1]. This patient group also accounts for 75% of unplanned readmissions to the Gastroenterology and Hepatology unit in an Australian hospital [2]. In Brazil, liver cirrhosis was also the eighth-leading cause of death among men and accounted for almost 9% of hospital admissions in 2010 [3]-[6].

The prevalence of malnutrition in these patients is also a challenge, representing 20% to 90%. Malnutrition is an independent risk factor for morbidity and mortality, because it may result in several complications [7]. Therefore, patients who are unable to meet nutrient needs should be considered candidates for enteral feeding tube in order to ensure daily nutritional requirements [8]-[10].

However, the need for a feeding tube may pose patients at great risk for adverse events due to higher probability of bleeding, especially in the presence of esophageal varices, thrombocytopenia or coagulopathy [11]. Thus, it is a concern for health care team to make an accurate and timely diagnosis of such complications and the delivery of the correct treatment to safe management of patients.

Assisting people with liver cirrhosis can be a challenge for all health care professionals, especially for nurses, because these patients are frequently admitted to hospitals due to the evolution of the disease, and they can deteriorate very quickly requiring constant monitoring and surveillance [4]. Nurses need to apply appropriate clinical judgments and clinical decision-making to reduce the frequency of hospital readmissions and to give safe and qualified care. Clinical reasoning enables nurses to make complex decisions in order to improve patients' outcomes [12]. Therefore, the proper management of patients with liver cirrhosis in use of feeding tube should be the focus of all nursing care plan in order to improve symptom management, to reduce the risks associated with further decompensation, and to enhance patient safety.

Background

The constant changes in clinical status of patients with liver cirrhosis require quick and assertive decision-making. With the aim of providing qualified care, nurses have joined forces to build a body of knowledge focused on evidence-based practices to provide competent and safe care to patients with chronic conditions.

The Nursing Process (NP) is the main methodological framework for the systematic performance of professional practice, or a technological method that nurses use to foster care, and to help in documenting professional practice. Therefore, the deliberate application of NP may contribute to the quality of care, thus improving nurses visibility and professional recognition [13].

Wanda de Aguiar Horta [14], the first nurse to introduce the concept of NP in Brazil, developed a Nursing Conceptual Model based on Maslow's Theory Human Motivation [15]. This theory is based on Basic Human Needs (BHN), which is classified in five levels: physiological needs, safety, love, esteem and self-realization. In addition to Maslow's BHN, Horta adopted the classification proposed by John Mohana. Therefore, the BHN model proposed by Horta is classified into three levels: psychobiological, psychosocial, and psycho spiritual.

The Conceptual Model of Wanda Horta was used in this study because it may help nurses to collect relevant data within the framework of nursing rather than medicine. Thus, the model may assist nurses in critical thinking and give support to practitioners in outcome identification and development of nursing care plans.

Nursing diagnosis is a process of data analysis that uses clinical reasoning to determine whether nursing interventions are indicated, contributing to the quality of care and patient safety through an evidence-based practice [16] [17]. For each nursing diagnosis, nurses select the appropriate interventions suggested by the nursing intervention classification system [17] [18].

Therefore, the present study is justified by the lack of publications addressing the nursing diagnoses in clinical patients with liver cirrhosis in Brazil and worldwide. Several studies identified the most frequent nursing diagnoses in different populations [19]-[21], but none inpatients with liver cirrhosis. Thus the purpose of this study was to identify the most frequent nursing diagnoses labels in patients with liver cirrhosis in use of feeding tube.

2. Method

2.1. Design

A descriptive research design.

2.2. Setting and Sample

The study was carried out in a Brazilian University Hospital, in São Paulo state, from January 2013 to December

2013. Participants consisted of a convenient sample of 20 adult patients with liver cirrhosis in use of feeding tube. Patients in use of percutaneous enteral feeding tubes were excluded. Unconscious patients or patients with cognitive impairment were included in the study after their family's written consent.

The study was approved by the appropriate ethics committee. Patients and/or their families were assured that their identity would remain confidential and they signed a consent form voluntarily.

2.3. Data Collection

A systematic data collection was conducted and it included interaction, observation, and measurement. Data was also collected from other resources, including family and significant others, medical records, results of diagnostic tests, nursing notes, change of shift reports, and health team members. The tool used for data collection was developed by the investigators and it was based on the Conceptual Model of Wanda Horta [22].

2.4. Data Analysis and Rigor

The guidelines proposed by Risner [23] was followed for the diagnostic reasoning, which included six phases for analysis and synthesis of data:

- 1) Relevant patients' data were categorized. In this study the Conceptual Model of Wanda Horta [14] was used with the aim of revealing relationships among cues, thus making missing data more obvious;
- 2) Missing information and incongruence were identified to indicate areas for further assessment;
- 3) Related cues were clustered into patterns to combine patients' elements into a whole, with the aim of constructing patterns containing information about patients' response to an actual or potential health problem, and the factors related to the response;
- 4) Patients' patterns were then compared with normal ranges, values, expectations, and patient baseline information to identify their health-related responses;
- 5) Based on patients' responses, inferences were made about their health status, condition, or situation in each of the assessment categories;
- 6) Finally, etiological relationships were proposed to identify factors influencing or contributing to the patients' responses.

After analysis and synthesis of all patients' relevant data, the nursing diagnosis was described according to NANDA-I taxonomy II [17], that has three levels: domains, classes, and diagnoses. All nursing diagnoses were analyzed and discussed with a panel of three nurses with experience on the Conceptual Model of Wanda Horta and on NANDA-I taxonomy II. The domains and classes of each nursing diagnosis label were also identified.

3. Results

The study sample consisted of 20 hospitalized patients with liver cirrhosis in use of feeding tube. From those, 6 (30%) were females and 14 (70%) were males, with an average age of 56.3 and 59.7, respectively. The age range was from 28 to 81 years, and almost half ($n = 11$) of the patients were middle age adults (from 41 to 64 years). The most common causes of liver cirrhosis were chronic alcoholism (10, 50%), followed by other etiologies (6, 30%), and viral infection (4, 20%). All patients had other comorbidities, including arterial hypertension, diabetes mellitus, or renal disease.

At hospital admission, patients presented common complications related to liver cirrhosis: hepatic encephalopathy (7, 35%); previous gastrointestinal hemorrhage and spontaneous bacterial peritonitis (6, 30% each); severe weight loss (5, 25%); ascites, esophageal varices, and hepatopulmonary syndrome (3, 15% each); and portal hypertension (2, 10%) (**Table 1**).

From the analysis and synthesis of patients' relevant data, there were 255 nursing diagnoses labels identified. Each patient had an average of 12.8 nursing diagnoses with a minimum of 9 to maximum of 16; 36 different nursing diagnoses labels were identified in the sample and 12 nursing diagnoses labels showed percentage equal to or greater than 50%.

The most frequent domains for these patients were: Domain 4—Activity/Rest (11, 30.6%) and Domain 11—Safety/Protection (10, 27.8%), followed by Domain 3—Elimination and Exchange (5, 13.9%) and Domain 2—Nutrition (4, 11.1%). No diagnoses were identified from Domain 1—Health Promotion, Domain 6—Self Perception, Domain 7—Role Relationships, Domain 8—Sexuality, and Domain 10—Life Principles.

Table 1. Sample and characteristics, according to gender (N = 20).

Variables	Female		Male		Total	
	n	%	n	%	n	%
<i>Age Range</i>						
28 - 40	1	5%	1	5%	2	10%
41 - 64	4	20%	7	35%	11	55%
65 - 74	0	0%	5	25%	5	25%
75 - 81	1	5%	1	5%	2	10%
<i>Causes of cirrhosis</i>						
Chronic alcoholism	1	5%	9	45%	10	50%
Other etiologies	3	15%	3	15%	6	30%
Viral infection	2	10%	2	10%	4	20%
<i>Complications</i>						
Encephalopathy	2	10%	5	25%	7	35%
Hemorrhage	1	5%	5	25%	6	30%
Peritonitis	1	5%	5	25%	6	30%
Severe weight loss	1	5%	4	20%	5	25%
Ascites	0	0%	3	15%	3	15%
Esophageal varices	1	5%	2	10%	3	15%
Hepatopulmonary syndrome	0	0%	3	15%	3	15%
Portal hypertension	0	0%	2	10%	2	10%

Analysis of the class level of the nursing diagnosis identified in the sample, Physical injury (7, 19.4%), Self-care (4, 11.1%), and Gastrointestinal function (4, 11.1%) were the most frequent. **Table 2** shows the domains, classes, and NANDA-I diagnoses labels for patients hospitalized with liver cirrhosis in use of feeding tube.

4. Discussion

Results showed a total of 255 nursing diagnoses labels, with an average of 12.8 nursing diagnoses labels per patient, and 36 different nursing diagnoses labels. The results differ from previous study conducted in an intensive care unit where 1.087 nursing diagnoses were formulated for 44 critical patients, with a mean of 8.5 diagnoses per patient, and 28 different nursing diagnoses labels [24]. Differences may be due to the methodology used in both studies for data collection and analysis.

Risk for aspiration (00039) and Risk for infection (00004) were the most frequent NANDA-I diagnoses labels found in this study. They were presented in 100% of patients. Similar findings were detected by other authors in critical patients [25] [26].

Risk for aspiration (00039) is common in patients in use of feeding tube, especially in those with chronic liver disease and portal hypertension because they have delayed gastric emptying for both the liquid and solid components [27]. In addition, the cirrhosis of the liver does not allow the free passage of blood that accumulates in the gastrointestinal tract and in the spleen, resulting in chronic congestion in this area. Consequently, indigestion due to intra-abdominal pressure and altered bowel function occur [28].

According to Opilla [29], the presence of a feeding tube also increases secretions from tube irritation, impairment of laryngeal function, and disruption of the esophageal sphincters during intubation, thus contributing to the risk for aspiration. It is worth to note that many patients in this study (25%) also had liver encephalopathy. The decreased level of consciousness in these patients and the altered coordination between breathing and swallowing interferes with the patient's ability to protect the airway [30].

Risk for infection (00004) was also presented in all patients in this study. Bacterial infections are a major complication of liver cirrhosis and a serious burden among patients because they may be a triggering factor for the occurrence of gastrointestinal bleeding, hepatic encephalopathy, kidney failure, and further deteriorate liver

Table 2. Domain, classes and NANDA-I diagnosis labels for hospitalized patients in use of feeding tube.

Domain	n	%	Class	n	%	NANDA-I label	n	%			
2 - Nutrition	4	11.1	1 - Ingestion	1	2.8	Imbalanced nutrition: less than body requirements (00002)	12	60			
			4 - Metabolism	1	2.8	Risk for unstable blood glucose level (00179)	3	15			
			5 - Hydration	2	5.5	Excess fluid volume (00026)	12	60			
3 - Elimination and exchange	5	13.9	2 - Gastrointestinal function	4	11.1	Risk for imbalanced fluid volume (00025)	1	5			
						Risk for constipation (00015)	11	55			
						Dysfunctional gastrointestinal motility (00196)	11	55			
						Diarrhea (00013)	3	15			
						Constipation (00011)	1	5			
			4 - Respiratory function	1	2.8	Impaired gas exchange (00030)	2	10			
4 - Activity/rest	11	30.6	1 - Sleep/rest	1	2.8	Disturbed sleep pattern (00198)	5	25			
						Impaired bed mobility (00091)	8	40			
			2 - Activity/exercise	3	8.3	Impaired physical mobility (00085)	3	15	Impaired walking (00088)	2	10
									Fatigue (00093)	6	30
			3 - Energy balance	1	2.8	Activity intolerance (00092)	1	5			
			4 - Cardiovascular/pulmonary response	2	5.5	Impaired spontaneous ventilation (00033)	1	5	Bathing self-care deficit (00108)	18	90
									Dressing self-care deficit (00109)	17	85.5
Toileting self-care deficit (00110)	7	35.5									
			Feeding self-care deficit (00102)	5	25.5						
5 - Perception/cognition	2	5.5	4 - Cognition	2	5.5	Risk for acute confusion (00173)	15	75			
						Acute confusion (00128)	5	25			
9 - Coping/stress tolerance	2	5.5	2 - Coping responses	2	5.5	Ineffective coping (00069)	2	10			
						Anxiety (00146)	2	10			
11 - Safety/protection	10	27.8	1 - Infection	1	2.8	Risk for infection (00004)	20	100			
						Risk for aspiration (00039)	20	100			
			2 - Physical injury	7	19.4	Risk for bleeding (00206)	17	85			
						Risk for impaired skin integrity (00047)	16	80			
						Risk for falls (00155)	14	70			
						Impaired skin integrity (00046)	3	15			
						Ineffective airway clearance (00031)	3	15			
			Impaired oral mucous membrane (00045)	2	10						
12 - Comfort	2	5.5	3 - Violence	1	2.8	Risk for suicide (00150)	1	5			
						6 - Thermoregulation	1	2.8	Hyperthermia (00007)	1	5
			1 - Physical comfort	2	5.6	Acute pain (00132)	1	5			
			Chronic pain (00133)	1	5						

function [31]. Most of the infections in cirrhotic patients are caused by enteric bacteria, accounting for approximately 32% - 34%. This suggests that the defense mechanisms of patients with chronic liver disease fail to prevent the microorganisms present in the intestinal lumen from reaching the systemic circulation, contributing to the risk of spontaneous bacterial peritonitis [4] [28] [32] [33]. Thus, nurses need to act towards the reduction of the negative clinical impact of infections in these patients to reduce repeated hospitalizations and impaired health-related quality of life.

Another nursing diagnoses were frequent in these patients, including: Bathing self-care deficit (00108), Dressing self-care deficit (00109), Risk for bleeding (00206), Risk for impaired skin integrity (00047), Risk for acute confusion (00173), Risk for falls (00155), Imbalanced nutrition: less than body requirements (00002), and Excess fluid volume (00026). Similar results were identified in previous studies involving critical care patients and patients in chronic conditions [25] [34]. In Taiwan, physical symptoms and psychological distress, including abdominal symptoms, fatigue, fluid retention, loss of appetite, systemic symptoms, decreased attention, and bleeding, were common among patients with liver cirrhosis [35]. These NANDA-I diagnoses require from nurses the ability and skills to identify the patients' health status in order to deliver an individualized nursing care plan focused on patient safety.

Self-care deficits related to activities of daily living (eg. Bathing, dressing, feeding, and toileting) were also frequent in patients because they usually suffer from moderate-to-severe fatigue. In this study, 30% of patients presented with fatigue (00093) that can result in decreased motivation, depression, reduced physical activity, and constraints on daily life [1] [36]. Nursing interventions should focus on the maintenance of physical and psychological comfort for these patients to improve their quality of life and to reduce the risks for other injuries, such as falls.

Another potential risk for patients living with liver cirrhosis is the clinical bleeding, most frequently caused by esophageal varices, gastric varices or portal hypertensive gastropathy. In this study, 15% of patients presented esophageal varices and 10% presented portal hypertension at the hospital admission. In chronic liver disease, vitamin K absorption by the liver is decreased. Therefore, the production of coagulation factors (such as II, VII, IX, and X) does not happen, resulting in prolonged time required for a blood sample to clot [4]. Moreover, hospitalized patients with liver cirrhosis require frequent invasive procedures (e.g., peripheral venous catheter for transfusions and the administration of medications and other solutions; venous and arterial puncture for blood samplings; and paracentesis), which may cause complications such as bleeding.

Thrombocytopenia is also a common and persistent problem in cirrhotic patients [7]. In this study, 30% of patients had previous gastrointestinal hemorrhage at the hospital admission, thus the risk for another hemorrhage is real. Variceal bleeding may cause upper gastrointestinal hemorrhage due to portal hypertension. It remains one of the most important complications of chronic liver disease and one of the largest causes of mortality in this group [2] [37]. These patients have a permanent state of hyperdynamic circulation, with pronounced splanchnic vasodilatation. Further bleeding can occur in 60% of patients, with a mortality of up to 33%. Prevention of bleeding is therefore an essential part of the management of these patients [38]. However, the management of patients with acute gastrointestinal bleeding includes not only treatment and control of active bleeding but also the prevention of further bleeding, infections, and renal failure [39].

It is worth to note that 70% of patients had Risk for falls (00155), 35% were elderly, and 25% had Acute confusion (00128). The liver's inability to detoxify the blood results in increased blood circulation of ammonia and other toxic metabolites [4]. The increased concentration of ammonia in the blood causes brain dysfunction and injury, contributing to the hepatic encephalopathy. In the first stage of the hepatic encephalopathy, patients may experience discrete mental changes, as well as motor disorders. As the problem persists, patients may demonstrate mental confusion, mood swings, and sleep pattern changes. All these manifestations, when present, increase the risk for falling. In addition, the incidence of falls in patients over 60 years is almost three times higher than in older adults [40].

Imbalanced nutrition: less than body requirements (00002) was also frequent in these patients (60%). These results differ from those found by Park [41] in patients with heart failure. According to the author, Imbalanced nutrition: less than body requirements (00002) was detected only in 2.7% of patients. Researchers [26] [24] also found different results in intensive care units. In both studies, Imbalanced nutrition: less than body requirements (00002) was detected in 5% of patients. The results differ from the others, perhaps because of patients profile comprising the samples. It is worth to consider that malnutrition is prevalent in patients with liver cirrhosis because the evolution of the disease. According to Tai *et al.* [9] malnutrition was present in 50% of Malaysian pa-

tients and the mean caloric intake was low at 15.2 kcal/kg/day. Thus, patients with end stage hepatic failure will present with muscle wasting, decreased fat stores, and overt cachexia [42].

Excess fluid volume (00026) is another common complication in patients with liver cirrhosis because the synthesis of proteins, such as albumin, is impaired. This nursing diagnosis was detected in 60% of all patients. Vargas and França [43] found Excess fluid volume (00026) in a case study conducted in a Brazilian hospital with a patient with liver cirrhosis. Hypoalbuminemia decreases the plasma oncotic pressure deflecting the balance of hemodynamic forces to the accumulation of fluid in interstitial spaces, thus resulting in peripheral edema and ascites. In addition, the liver failure to metabolize aldosterone resulting in increased retention of sodium and water by the kidneys, and in increased potassium excretion [44]. As the problem persists, the retention of sodium and water contributes to the increased blood volume that may cause cardiac overload and hence pulmonary edema.

In relation to the most prevalent NANDA-I domain found in this study, the results were similar to those identified by Park [41] in patients with heart failure. The author also found Physical injury as the most frequently used NANDA-I class in this population. In one study conducted with liver transplant patients, researchers [45] found that the domains mostly affected by patients were activity/rest, safety/protection, elimination and exchange, and comfort. Thus, it is important to identify the specific interventions commonly delivered for specified groups of patients [46] in order to improve patient outcomes and deliver safe care.

Liver cirrhosis is a progressive illness that may culminate in multiple system organ failure and death [47], requiring appropriate health care management, especially from nurses that should act in order to prevent further complications and to improve patient outcomes.

The results of this study sustain that nursing diagnoses should be seen as the basis for independent and collaborative actions because they provide direction for nursing interventions. Thus, nurses need to list nursing diagnoses during the process of care to reflect patients' changing condition and responses in order to individualize patient care.

Limitations

This study presented limitations. Nursing diagnoses labels were identified only in hospitalized patients. In addition, only 20 patients participated in this research, thus future studies should be conducted in multiple healthcare settings, such as ambulatory care, and with larger samples.

5. Conclusion

The most frequent nursing diagnoses labels identified in patients with liver cirrhosis in use of feeding tube were Risk for aspiration (00039) and Risk for infection (00004), requiring from nurses appropriate management of complications. This was the first research conducted in a practice setting with patients with liver cirrhosis. These findings supported that the identification of the most frequent nursing diagnoses in specific population helped nurses to identify the focus of care in patients with complex health problems and to prevent future complications associated with the evolution of disease.

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Authors' Contribution

Gimenes F.R.E. contributed to the project design, development of research, data collection, analysis and interpretation of data, writing, critical review of the relevant intellectual content and final approval of the version to be published. Silva P.C.S., Lopes A.R., and Reis R.K. contributed to data analysis, writing, critical review of the relevant intellectual content and final approval of the version to be published. Shasanmi R. made contributions to revisions of article for intellectual content and English language. Campos E.C. made substantial contributions to drafting of the article, and revised the article for important intellectual content.

References

- [1] Wu, L.-J., Wu, M.-S., Lien, G.I.S., Chen, F.-C. and Tsai, J.-C. (2012) Fatigue and Physical Activity Levels in Patients

- with Liver Cirrhosis. *Journal of Clinical Nursing*, **21**, 129-138. <http://dx.doi.org/10.1111/j.1365-2702.2011.03900.x>
- [2] Wigg, A.J., McCormick, R., Wundke, R. and Woodman, R.J. (2013) Efficacy of a Chronic Disease Management Model for Patients with Chronic Liver Failure. *Clinical Gastroenterology and Hepatology*, **11**, 850-858. <http://dx.doi.org/10.1016/j.cgh.2013.01.014>
- [3] Ministry of Health (2008) [Brazil's Health 2007: An Analysis of the Health Situation]. Ministry of Health, Brasília, 641 p.
- [4] Kelso, L.A. (2008) Cirrhosis: Caring for Patients with End-Stage Liver Failure. *The Nurse Practitioner*, **33**, 24-30. <http://dx.doi.org/10.1097/01.NPR.0000325976.85753.dd>
- [5] Silva, I.S.S. (2010) [Liver Cirrhosis]. *Revista Brasileira de Medicina*, **67**, 9.
- [6] Barros, M.B.A., Francisco, P.M.S.B., Zanchetta, L.M. and César, C.L.G. (2011) [Trends in Social and Demographic Inequalities in the Prevalence of Chronic Diseases in Brazil. PNAD: 2003-2008]. *Ciência & Saúde Coletiva*, **16**, 3755-3768. <http://dx.doi.org/10.1590/S1413-81232011001000012>
- [7] Marsano, L.S., Mendez, C., Hill, D., Barve, S. and McClain, C.J. (2003) Diagnosis and Treatment of Alcoholic Liver Disease and Its Complications. *Alcohol Research and Health*, **27**, 247-256.
- [8] Saunders, J., Brian, A., Wright, M. and Stroud, M. (2010) Malnutrition and Nutrition Support in Patients with Liver Disease. *Frontline Gastroenterology*, **1**, 105-111. <http://dx.doi.org/10.1136/fg.2009.000414>
- [9] Tai, M.-L., Goh, K.-L., Mohd-Taib, S., Rampal, S. and Mahadeva, S. (2010) Anthropometric, Biochemical and Clinical Assessment of Malnutrition in Malaysian Patients with Advanced Cirrhosis. *Nutrition Journal*, **9**, 27. <http://dx.doi.org/10.1186/1475-2891-9-27>
- [10] O'Brien, A. and Williams, R. (2008) Nutrition in End-Stage Liver Disease: Principles and Practice. *Gastroenterology*, **134**, 1729-1740. <http://dx.doi.org/10.1053/j.gastro.2008.02.001>
- [11] Andus, T. (2007) ESPEN Guidelines on Enteral Nutrition: Liver Disease—Tube Feeding (TF) in Patients with Esophageal Varices Is Not Proven to Be Safe. *Clinical Nutrition*, **26**, 272. <http://dx.doi.org/10.1016/j.clnu.2006.12.005>
- [12] Simmons, B. (2010) Clinical Reasoning: Concept Analysis. *Journal of Advanced Nursing*, **66**, 1151-1158. <http://dx.doi.org/10.1111/j.1365-2648.2010.05262.x>
- [13] Garcia, T.R. and Nóbrega, M.M.L. (2009) [Nursing Process: From Theory to the Practice of Care and Research]. *Escola Anna Nery Revista de Enfermagem*, **13**, 188-193.
- [14] Horta, W.A. (1979) [Nursing Process]. EPU, São Paulo.
- [15] Maslow, A.H. (1943) A Theory of Human Motivation. *Psychological Review*, **50**, 370-396. <http://dx.doi.org/10.1037/h0054346>
- [16] Doenges, M.E. and Moorhouse, M.F. (2012) Application of Nursing Process and Nursing Diagnosis: An Interactive Text for Diagnostic Reasoning. F.A. Davis, Philadelphia.
- [17] NANDA International Inc (2012) Nursing Diagnoses: Definitions and Classification. Wiley-Blackwell, Oxford.
- [18] Bakken, S., Silveira, D., Gerhardt, L., Dal Sasso, G. and Barbosa, S. (2011) [Systems Decision Support and Patient Safety]. In: Cometto, M., Gómez, P., Dal Sasso, G., Grajales, R., Cassiani, S. and Morales, C., Eds., *Nursing and Patient Safety*, Organização Panamericana de Saúde, Washington, 387-397.
- [19] Scherb, C.A., Head, B.J., Maas, M.L., Swanson, E.A., Moorhead, S., Reed, D., Conley, D.M. and Kozel, M. (2011) Frequent Nursing Diagnoses, Nursing Interventions, and Nursing-Sensitive Patient Outcomes of Hospitalized Older Adults with Heart Failure: Part 1. *International Journal of Nursing Terminologies and Classifications*, **22**, 13-22. <http://dx.doi.org/10.1111/j.1744-618X.2010.01164.x>
- [20] Ouslander, J.G., Diaz, S., Hain, D. and Tappen, R. (2011) Frequency and Diagnoses Associated with 7- and 30-Day Readmission of Skilled Nursing Facility Patients to a Nonteaching Community Hospital. *Journal of the American Medical Directors Association*, **12**, 195-203. <http://dx.doi.org/10.1016/j.jamda.2010.02.015>
- [21] Souza, C.C., Mata, L.R.F., Carvalho, E.C. and Chianca, T.C.M. (2013) [Nursing Diagnoses in Patients Classified as Priority Level I and II according to the Manchester Protocol]. *Revista da Escola de Enfermagem da USP*, **47**, 1318-1324. <http://dx.doi.org/10.1590/S0080-623420130000600010>
- [22] Gimenes, F.R.E., Reis, R.K., Silva, P.C.S., Silva, A.E.B.C. and Atila, E. (2015) Nursing Assessment Tool for People with Liver Cirrhosis. *Gastroenterology Nursing*, Publish Ahead of Print.
- [23] Risner, P. (1986) Diagnosis: Analysis and Synthesis of Data. In: Griffith-Kenney, J. and Christensen, P., Eds., *Nursing Process Application of Theories, Frameworks, and Models*, 2nd Edition, Mosby, St. Louis, 124-151.
- [24] Salgado, P.O. and Chianca, T.C. (2011) Identification and Mapping of the Nursing Diagnoses and Actions in an Intensive Care Unit. *Revista Latino-Americana de Enfermagem*, **19**, 928-935. <http://dx.doi.org/10.1590/S0104-11692011000400011>

- [25] Melo, E., Albuquerque, M. and Aragão, R. (2012) Nursing Diagnosis Prevalence in Patients at an Intensive Care Unit of a Public Hospital. *Journal of Nursing UFPE Online*, **6**, 1361-1368.
- [26] Chianca, T.C., Lima, A.P. and Salgado, P.O. (2012) [Nursing Diagnoses Identified in Inpatients of an Adult Intensive Care Unit]. *Revista da Escola de Enfermagem USP*, **46**, 1102-1108.
<http://dx.doi.org/10.1590/S0080-62342012000500010>
- [27] Galati, J.S., Holdeman, K.P., Dalrymple, G.V., Harrison, K.A. and Quigley, E.M. (1994) Delayed Gastric Emptying of Both the Liquid and Solid Components of a Meal in Chronic Liver Disease. *The American Journal of Gastroenterology*, **89**, 708-711.
- [28] Carrola, P., Militão, I. and Presa, J. (2013) [Bacterial Infections in Patients with Liver Cirrhosis]. *GE Jornal Português de Gastreterologia*, **20**, 58-65. <http://dx.doi.org/10.1016/j.jpg.2012.09.008>
- [29] Opilla, M. (2003) Aspiration Risk and Enteral Feeding: A Clinical Approach. *Practical Gastroenterology*, **27**, 89-96.
- [30] Metheny, N.A. (2002) Risk Factors for Aspiration. *Journal of Parenteral and Enteral Nutrition*, **26**, S26-S33.
<http://dx.doi.org/10.1177/014860710202600605>
- [31] Jalan, R., Fernandez, J., Wiest, R., Schnabl, B., Moreau, R., Angeli, P., Stadlbauer, V., Thierry, G.T., Bernardi, M., Canton, R., Agustín Albillos, A., Lammert, F., Wilmer, A., Mookerjee, R., Vila, J., Garcia-Martinez, R., Wendon, J., Such, J., Cordoba, J., Sanyal, A., Garcia-Tsao, G., Arroyo, V., Burroughs, A. and Gines, P. (2014) Bacterial Infections in Cirrhosis. A Position Statement Based on the EASL Special Conference 2013, *Journal of Hepatology*, **60**, 1310-1324. <http://dx.doi.org/10.1016/j.jhep.2014.01.024>
- [32] Merli, M., Lucidi, C., Giannelli, V., Giusto, M., Riggio, O., Falcone, M., Ridola, L., Attili, A.F. and Venditti, M. (2010) Cirrhotic Patients Are at Risk for Health Care-Associated Bacterial Infections. *Clinical Gastroenterology and Hepatology*, **8**, 979.e1-985.e1. <http://dx.doi.org/10.1016/j.cgh.2010.06.024>
- [33] Wong, F., Bernardi, M., Balk, R., Christman, B., Moreau, R., Garcia-Tsao, G., Patch, D., Soriano, G., Hoefs, J. and Navasa, M. (2005) Sepsis in Cirrhosis: Report on the 7th Meeting of the International Ascites Club. *Gut*, **54**, 718-725.
<http://dx.doi.org/10.1136/gut.2004.038679>
- [34] Almeida, M.A., Aliti, G.B., Franzen, E., Thomé, E.G.R., Unicovsky, M.R., Rabelo, E.R., Ludwig, M.L.M. and Moraes, M.A. (2008) Prevalent Nursing Diagnoses and Interventions in the Hospitalized Elder Care. *Revista Latino-Americana de Enfermagem*, **16**, 707-711. <http://dx.doi.org/10.1590/S0104-11692008000400009>
- [35] Tsai, L.-H., Lin, C.-M., Chiang, S.-C., Chen, C.-L., Lan, S.-J. and See, L.-C. (2014) Symptoms and Distress among Patients with Liver Cirrhosis but without Hepatocellular Carcinoma in Taiwan. *Gastroenterology Nursing*, **37**, 49-59.
<http://dx.doi.org/10.1097/SGA.0000000000000020>
- [36] Swain, M.G. (2006) Fatigue in Liver Disease: Pathophysiology and Clinical Management. *Canadian Journal of Gastroenterology*, **20**, 181-188. <http://dx.doi.org/10.1155/2006/624832>
- [37] Hearnshaw, S.A., Logan, R.F., Lowe, D., Travis, S.P., Murphy, M.F. and Palmer, K.R. (2011) Acute Upper Gastrointestinal Bleeding in the UK: Patient Characteristics, Diagnoses and Outcomes in the 2007 UK Audit. *Gut*, **60**, 1327-1335. <http://dx.doi.org/10.1136/gut.2010.228437>
- [38] Bari, K. and Garcia-Tsao, G. (2012) Treatment of Portal Hypertension. *World Journal of Gastroenterology*, **18**, 1166-1175. <http://dx.doi.org/10.3748/wjg.v18.i11.1166>
- [39] Biecker, E. (2013) Gastrointestinal Bleeding in Cirrhotic Patients with Portal Hypertension. *ISRN Hepatology*, **2013**, Article ID: 541836. <http://dx.doi.org/10.1155/2013/541836>
- [40] Sales, M.V.C., Silva, T.J.A., Gil Jr., L.A. and Filho, W.J. (2010) Adverse Events of Hospitalization for the Elderly Patient. *Geriatrics & Gerontology*, **4**, 238-246.
- [41] Park, H. (2014) Identifying Core NANDA-I Nursing Diagnoses, NIC Interventions, NOC Outcomes, and NNN Linkages for Heart Failure. *International Journal of Nursing Knowledge*, **25**, 30-38.
<http://dx.doi.org/10.1111/2047-3095.12010>
- [42] Krenitsky, J. (2003) Nutrition for Patients with Hepatic. Nutrition Issues in Gastroenterology, *Practical Gastroenterology*, **6**, 23-42.
- [43] Vargas, R.S. and França, F.C.V. (2007) [Implementation of the Nursing Process in a Patient with Hepatic Cirrhosis Using the Standardized Terminologies NANDA, NIC and NOC]. *Revista Brasileira de Enfermagem*, **60**, 348-352.
<http://dx.doi.org/10.1590/S0034-71672007000300020>
- [44] Brunner, L.S., Smeltzer, S.C.O.C., Bare, B.G., Hinkle, J.L. and Cheever, K.H. (2010) Brunner & Suddarth's Textbook of Medical-surgical Nursing. Wolters Kluwer Health/Lippincott Williams & Wilkins, Philadelphia.
- [45] Carvalho, D.V., Salviano, M.E.M., Carneiro, R.A. and Santos, F.M.M. (2007) [Nursing Diagnosis of Post Surgical Patients of Liver Transplantation by Alcoholic and Non Alcoholic Cirrhosis]. *Escola Anna Nery*, **11**, 682-687.
<http://dx.doi.org/10.1590/S1414-81452007000400020>

- [46] Park, H. (2010) NANDA-I, NOC, and NIC Linkages in Nursing Care Plans for Hospitalized Patients with Congestive Heart Failure. PhD Dissertation, University of Iowa, Iowa.
- [47] Olson, J.C. and Kamath, P.S. (2012) Acute-On-Chronic Liver Failure: What Are the Implications? *Current Gastroenterology Report*, **14**, 63-66. <http://dx.doi.org/10.1007/s11894-011-0228-2>



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