



# The Application of Nutrition Care Service on Patient with Liver Cirrhosis

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**Abstract:** Objective: To assess the effect of nutrition care service on patient with liver cirrhosis. Methods: 72 participants was invited to join our study. They were diagnosed as liver cirrhosis from April 2018 to March 2020. We randomly assigned the participants to the control group (n = 37) and the intervention group (n = 37). For the intervention group and control group, on the one hand, control group patients received traditional nursing services. On another hand, the intervention group participants receive nutrition care service in the treatment process. We collect the data from test related equipment record and questionnaires of participants, the questionnaires include Self-Rating Anxiety Scale (SAS) and Self-rating depression scale (SDS). Another data from test related equipment record. Result: In nutritional status, the Albumin information shown intervention group have greater improvement after nursing that that of control group (from  $59.24 \pm 5.07$  to  $49.16 \pm 2.01$  vs from  $60.12 \pm 4.73$  to  $57.72 \pm 2.33$ ). In complications status, control group and intervention group have similar result, they have few different in different complications. In mental health, intervention group have greater change in anxiety status than that of control group (from  $58.6 \pm 7.4$  to  $47.2 \pm 7.1$ ). Conclusion: the nutrition care service provides great improvement to the treatment result. However, nutrition care service does not have a good effect on partial results.

**Keywords:** Nutrition Care, Nursing, Liver Cirrhosis

## 1. Introduction

Base on the report of World Health Organization, any kind of liver disease acts as a source for cirrhosis of the liver. Liver cirrhosis has become a significant health problem worldwide as it leads to 1.34 million deaths every year [1]. In liver cirrhosis, the patients' liver suffer chronic or long-lasting injury so that the liver ploddingly deteriorates, even the liver is unable to function normally in late period of cirrhosis [2]. In recent years, patients reported outcomes came to the fore, and several studies have demonstrated that health-related quality of life is impaired in patients with liver cirrhosis when compared to the healthy general population [3, 4]. Yang showed that cirrhosis was present in 94% of patients having hepatitis B and 97% of patients having hepatitis C in the study. However, each year viral hepatitis B and hepatitis C affect 325

million people causing 1.4 million deaths all over the world [5]. Moreover, advanced cirrhosis is a fatal condition where the treatment options are very limited [6]. So it is essential to find out control measures of this chronic liver disease. For this purpose, optimal control theory has been applied to discuss the optimal control strategy to prevent hepatitis B and hence consequently to reduce the chronic cirrhosis transmission.

The dietetic discipline has developed the Nutrition Care Process (NCP) as an organized framework to standardize the provision of high-quality nutrition care [7, 8]. The NCP is order to support communication about dietetics and increase acknowledgment of the value of dietetic care by other healthcare professionals [9]. The first Nutrition Care Process flowchart was published in 1994 to propose nutrition care indicators to the Joint Commission on Accreditation of Healthcare Organizations (now referred to as The Joint Commission) for patient care with paper-based workflows

[10]. In 2017, United States government spend \$1.3 trillion into nutrition care costs. The nutrition nursing services address inadequate or excessive food intake, that include nutrient deficiencies or nutrient excesses related to fluid, vitamins and/or minerals, alterations in gastrointestinal function from the mouth to the colon, malnutrition, and food insecurity; and education and counseling for nutrition and health issues [11, 12]. Aim of our study is assess the effect of nutrition care service on patient with liver cirrhosis.

## 2. Methods

### 2.1. Participants Enrollment and Survey Methods

We invited 74 patients who were diagnosed as liver cirrhosis were investigated join into our study. Their diagnose time is from April 2018 to March 2020. We randomly assigned the participants to the control group ( $n = 37$ ) and the intervention group ( $n = 37$ ). For the intervention group and control group, we provide different nursing services to them. The control group patients received traditional nursing services in the treatment process, the traditional nursing services is the standard of nursing measure by the hospital. In intervention group, the participants receive nutrition care service in the treatment process. we collect the data from test related equipment record and questionnaires of participants, the data contains nutrition status, complications status, anxiety information and depression information. In addition,

we collected data using the following questionnaires: Self-Rating Anxiety Scale (SAS) and Self-rating depression scale (SDS) [13, 14].

Their inclusion criteria were: (1) the patients were diagnosed as liver cirrhosis; (2) coagulation function was well; (3) Patients volunteered to participate in follow-up; Their withdraw criteria were: (1) patients had too many complications in treatment process; (2) The patient also had other stomach problems.

### 2.2. Statistical Analysis

Our data analyzer performed the statistical analysis by SPSS 22.0. The P value, t-test and chi-square test were associated with collection result were analyzed. Besides, the mean standard deviation for statistical description.

## 3. Result

We collected the data of nutritional status from Medical equipment testing, the domain include transferrin and albumin. Overall, every domain is changed to better status in the result. Between the control group and intervention group, they have different result of improvement as they receive different nursing services. In particular, the Albumin information shown intervention group have greater improvement after nursing that that of control group (from  $59.24 \pm 5.07$  to  $49.16 \pm 2.01$  vs from  $60.12 \pm 4.73$  to  $57.72 \pm 2.33$ ).

**Table 1.** Nutritional Status [albumin (g/L) & transferrin (g/L)].

Projects	Transferrin (g/L) (Mean $\pm$ SD)				Albumin (g/L) (Mean $\pm$ SD)			
	BN	FN	T-text	P Value	BN	FN	T-text	P Value
Intervention Group ( $n = 37$ )	$2.25 \pm 0.17$	$1.61 \pm 0.20$	7.212	$< 0.005$	$59.24 \pm 5.07$	$49.16 \pm 2.01$	12.314	0.024
Control Group ( $n = 37$ )	$2.12 \pm 0.26$	$1.97 \pm 0.24$	4.510	$< 0.005$	$60.12 \pm 4.73$	$57.72 \pm 2.33$	4.448	$< 0.005$
T-text	0.551	6.219	-	-	0.164	14.389	-	-
P Value	0.573	0.031	-	-	0.144	$< 0.005$	-	-

BN = before the nursing

FN = after the nursing

In Tables 2, 3 domains of complications status have similar result in our research. In two different group, intervention group have less complications in the participants, the number is half as many as the control group (2 vs 4, 3 vs 6, 3 vs 7).

**Table 2.** Complications Status.

Projects	Upper gastrointestinal hemorrhage	Functional renal failure	Cirrhotic infection
Control Group ( $n = 37$ )	4 (10.8%)	6 (16.2%)	7 (18.9%)
Intervention Group ( $n = 37$ )	2 (5.4%)	3 (8.1%)	3 (8.1%)
$X^2$	5.210	0.047	3.326
P Value	$< 0.005$	0.738	$< 0.005$

Table 3 shown the change of mental health in the treatment process. The participants finish the SDS and SAS questionnaires in before and after nursing so that they report the change of mental health. Base on mental health change, intervention group have greater change in anxiety status than that of control group (from  $58.6 \pm 7.4$  to  $47.2 \pm 7.1$ ). In depression status, two groups have similar improvement in nursing service result.

**Table 3.** The score of anxiety and depression from SDS and SAS (Mean  $\pm$  SD).

Projects		SAS	SDS
Intervention group ( $n = 91$ )	BN	$58.6 \pm 7.4$	$59.7 \pm 6.7$
	FN	$47.2 \pm 7.1$	$51.6 \pm 6.5$
Control group ( $n = 91$ )	BN	$62.5 \pm 7.4$	$59.7 \pm 5.7$
	FN	$56.3 \pm 7.2$	$53.6 \pm 5.5$

BN = before the nursing

FN = after the nursing

## 4. Discussion

Liver cirrhosis is the final outcome of various liver disorders associated with hepatic encephalopathy, ascites, peritonitis and gastrointestinal bleeding [15]. Some researcher thinks the cirrhosis has become more prevalent in recent decades and it is a common cause of mortality all over the world [16]. As a result, when hepatic disorders occur, they are often accompanied by varying degrees of malnutrition [17]. Previous studies have shown that patients with liver cirrhosis generally suffer from varying degrees of malnutrition which is closely associated with poor quality of life and poor prognosis [18]. Furthermore, more attention has been paid to the nutritional status of patients with liver diseases. Malnutrition is a potentially modifiable condition, and it is very important to identify malnourished patients to ensure timely nutritional intervention. But the assessment methods is a challenge for nutritional status. Because decompensated patients with cirrhosis often experience varying degrees of edema and ascites as a result of portal hypertension and hypoproteinemia. Due to the presence of ascites and edema, these traditional anthropometric assessment methods cannot accurately assess nutritional status in patients with cirrhosis [19].

Based on the research result described above, the nutrition care service provides great improvement to the treatment result. However, nutrition care service does not have a good effect on partial results, such as transferrin, complications status and depression status. In nutritional status research, albumin index and transferrin index are reduced after nursing service, it indicated liver function of patient is continuing to recover. Compare with the data of control group and intervention group, albumin index change of two groups have great different. It show nutrition care service provide different result in result, nutrition care service provide better improvement result than that of control group. Additionally, complications status show all patients have few complications after treatment, the reason is that the simple size is limit the effective result so that the complications status result have not great different between control group and intervention group. In mental health of patient, all patients has severe anxiety and depression as liver cirrhosis and treatment bring pressure, pain and inconvenience to patient. The nutrition care service has good function to ease patient's anxiety in result. Our study also has some deficiencies to assess nutrition care service on patient with liver cirrhosis, that include the simple size limit the result of research and there were significant differences in postoperative behavior so that research result is effected in mental health.

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