

## Impact of Designing Nursing Instructions on Knowledge and Activity of Daily Living for Cirrhotic Patients With Ascites

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### Abstract

**Background and objectives:** Ascites is a condition of pathologic fluid collection within the abdominal cavity. The aim was to evaluate the impact of designing nursing instructions on knowledge and activity of daily living for cirrhotic patients with ascites. **Research design:** Quasi experimental (Pre / post-test). **Setting:** Tropical Medicine and Gastroenterology Department of Al-Rajhi Liver Hospital. **Sample:** A purposive sample of sixty male and female adult patients diagnosed with ascites due to liver cirrhosis. **Tools:** Tool (I): A structured interview questionnaire. Tool (II): Activity of daily living scale. **Results:** A statistically significant difference between pre, post 3 month and 6 month of implementing the designing nursing instruction regarding patient's knowledge and activity of daily living with p-value <0.01. **Conclusion:** A great improvement in patient's knowledge and independently in performing activity of daily living post the implementation of the designing nursing instructions than pre assessment. **Recommendation:** Patients should be provided with sufficient relevant written information to remind them about what they can do to cope with their disease.

**Key words:** *Designing Nursing Instructions, Activity of Daily Living, Cirrhotic Patients & Ascites.*

### Introduction

Ascites is the most common of the three major complications of cirrhosis; approximately 50% of patients with compensated cirrhosis develop ascites during 10 years of observation. The main mechanisms in the development of ascites are portal hypertension and sodium retention due to vasodilatation and activation of neurohumoral sodium- retaining systems. (Taso, 2017)

The most common presentation of ascites is; abdominal distension, weight gain as a result of water retention, discomfort, nausea, appetite suppression and increasing dyspnea, which can affect performance of activity of daily living. (Maruyama et al., 2015)

The Activities of Daily Living (ADLs) represent the domains of function that a person must be able to manage in order to live independently such as personal hygiene, dressing, continence, transferring and eating. Cirrhosis leads to sarcopenia and functional decline that can severely impact one's ability to function at home and in society. (Lai et al., 2014)

Cirrhotic patients often suffer from common geriatric conditions such as functional decline and cognitive impairment, all of which contribute to a high risk of physical disability. Chronic disease management

programs engaging in patient education and medication management have been effective at reducing the burden of disabling symptoms of chronic disease. (Orman et al., 2014)

Nursing instruction refers to the use of nursing staff teaching skills to provide patients with planned learning methods, and to subsequently expand patients' health knowledge and influence their self-care behaviour. Effective nursing instruction can be achieved through specific teaching skills and methods and the use of teaching aids such as slides, manuals, and videotapes, which lead to improve patient outcomes. (Tim, 2018)

Nurses play an important role in teaching patients how to use assistive devices to perform activity of daily living independently. Assistive devices is a specially designed device to assist people who have difficulty to perform activity of daily living. It can be applied in different situation, including dressing, feeding, toileting, bathing, grooming and mobility. (Fong et al., 2015)

### Significance of the Study

According to Al- Rajhi Liver Hospital records, the number of patients diagnosed with ascites admitted to Tropical Medicine and Gastroenterology Department in 2016-2017 about 700 patients. Also, according to

researcher's experience with cirrhotic ascites patients, it was noted that those patients have physical problems in addition to lack of knowledge about their disease, diet and drug that affects greatly their outcomes. So, there is a need for instructions regarding diet, drugs and how to perform activity of daily living independently such as personal hygiene, dressing, continence, transferring and eating.

### Aims of the Study

The aims of the study was to evaluate the impact of designing nursing instructions on knowledge and activity of daily living for cirrhotic patients with ascites.

### Research hypothesis

The post mean knowledge scores of cirrhotic patients who will be exposed to the designing nursing instructions will be higher than their pre mean knowledge scores and patients who will be exposed to the designing nursing instructions will be able to perform activity of daily living more independently.

### Patients & Methods

#### Research design

Quasi experimental research design (Pre / post- test) was utilized in this study.

#### Study variables

The independent variable in this study was the designing nursing instructions while the dependent variables were patient's knowledge and activity of daily living.

#### Study setting

The study was conducted in the Tropical Medicine and Gastroenterology Department in Al-Rajhi Liver Hospital.

#### Sample

Sixty male and female adult patients diagnosed with ascites due to liver cirrhosis, with their mean of age  $\pm$  SD was  $50.650.60 \pm 10.30$ , who willing to participate in the study. Patients had refractory ascites or encephalopathy that prevents ability to participate were be excluded.

The sample was calculated by using power analysis according to the patients flow with precision levels 5% at confidence levels 95% and  $p < 0.05$ .

#### Tools

**Tool I:** A structured interview questionnaire for patients, this questionnaire was developed by the researcher based on literature review –to assess demographic data, clinical data and patient's knowledge: It included three parts:

**Part (1):** Socio-demographic data about the patients, such as: name, age, sex, level of education, marital status, occupational status and residence.

**Part (2):** Clinical data, including medical diagnosis, length of hospital stay, duration of liver cirrhosis and duration of ascites.

**Part (3):** Pre/Post Knowledge Assessment Questionnaire: It was constructed by the researcher based on current literature, it used prior to the implementation of the designing nursing instructions to assess patients knowledge level, the same tool used after 3 months and again after 6 months to evaluate patient's level of knowledge after implementation of the designing nursing instructions, it included:

Questions about the disease as general, which included 13 questions, about diet and fluid allowed, which included 14 questions, and about diuretic medication used, which included 5 questions.

#### Scoring system

The total score of interview questionnaire for patient's knowledge was 80 degrees:

- Less than 50% poor.
- 50% to 70% fair.
- More than 70% good.

▪ The total score of questions about the disease was 34 degrees.

▪ The total score of questions about diet and fluid was 33 degrees.

▪ The total score of questions about diuretic medication was 13 degrees.

**Tool II:** Activity of daily living scale:

This part assessed by: Katz index of independence in activities of daily living: is a self- reported scale developed by Katz et al., (1970) to assess daily activity level.

#### Scoring system

▪ The index ranks adequacy of performance in six functions of bathing, dressing, toileting, transferring, continence, and feeding.

▪ Patients are scored yes/ no for independence in each of six functions.

▪ The scores of Katz index of independence in activities of daily living range from 0 to 6.

• A score of 6 indicates full function.

• A score of 4 indicates moderate impairment.

• A score of 2 or less indicates severe functional impairment.

#### Operational definitions

**Activity of daily living:** A set of activities necessary for normal self-care. The activities are bathing, dressing, toileting, transferring, continence and feeding.

**Cirrhotic ascites:** The accumulation of fluid in the peritoneal cavity. It is a common clinical finding, resulting from liver cirrhosis among patients with advanced liver cirrhosis.

#### Content validity and reliability

Content validity was established by a panel of seven

experts (2 Lecturer of Medical Surgical Nursing, Faculty of Nursing, Medical Surgical Nursing Department, Assiut University and 5 physician in Tropical Medicine and Gastroenterology Department at Assiut University Hospital) Who reviewed the tools for clarity, relevance, comprehensiveness, understanding, applicability and easiness for administrative, minor modifications were required, and then the tools were designed in their final format and tested for reliability using internal consistency for all of the tools which was measured using Cronbach test. The tools proved to be reliable (0.827 and 0.825 respectively).

### **Pilot study**

A pilot study was carried out in March 2018 on 10% of the study sample (6 patients) in the selected setting to evaluate the applicability, clarity of the tools and identify any difficulties; it was 6 patients who added to the study group later. It had also provided to estimate the time needed to fill out the tools.

### **Procedure**

The study proceeded using the following phases:

#### **Assessment phase**

- At initial interview: the researcher introduced herself to initiate communication, explained the nature and purpose of the study for patients, and the patient's agreement was obtained.
- The researcher collected the needed data from patients by applying tool I (part 1 and part 2).
- Each patient involved in the study was assessed for his or her knowledge's (part 3) and activity of daily living (tool II), the pre assessment.

#### **Implementation phase**

##### **Designing nursing instructions (DNI)**

The content of it developed by the researcher after passing through an extensive and relevant literature review and contained the following: Information about cirrhotic ascites as (definition, causes, symptoms & signs, and investigations), Instructions for patients with ascites on positive diet habit, accurate fluid intake, medication and activity of daily living. As the DNI developed based on identified of need assessment after the pre assessment.

##### **Ethical considerations**

An official letter was issued from the Dean of the Faculty of Nursing to the Head of Tropical Medicine and Gastroenterology Department in Al-Rajhi Liver Hospital soliciting the necessary approval to conduct the present research. Each patient was informed with the purpose of the study. The researcher emphasized that the participation is voluntary and confidentially and anonymity of subjects was assured through coding of all data, and protection of the patient from hazard. Verbal consent was obtained from each

patient prior to his/her contribution in the present study. Confidentiality of any obtained information was secured.

- The researcher explained to the patients in a simplified way the nursing instruction, each patient was met for one session. The session took about 30-40 min. The study was carried out in the morning and evening shift. 3 days per week for 3 hours.
- Designing nursing instructions were applied on an individual basis. One of the family members attended the session to confirm patient support and increasing their sense of responsibility.
- After each session there was 5-10 minute for discussion and feedback. The researcher used pictures and diagram to help them retained the learned material.
- Each patient in the study group took a copy of the designing nursing instruction in clear Arabic Language.
- The researcher arranged with the patients the time and place for follow up.
- The study was carried out through the period from March 2018 to December 2018.

#### **Evaluation phase**

- The first evaluation was done after three months and the second evaluation after six months of implementing the designing nursing instructions, the study group had been evaluated by the researchers for knowledge through filling the tool I (part 3) and activity of daily living (tool II).
- Studied patients attended the follow up session in the Tropical Medicine and Gastroenterology Department in Al-Rajhi Liver Hospital and out patient's clinic. The session took about 30 minutes. The researcher went to the hospital 3 days per week for 3 hours.

#### **Administrative design**

An official permission to carry out the study was obtained from the responsible hospital authorities of Tropical Medicine and Gastroenterology Department in Al-Rajhi Liver Hospital at Assiut University Hospital.

#### **Statistical analysis**

Data entry was done using a compatible personal computer by the researcher. All data were entered into statistical packages for the social sciences (SPSS) version 20.0 (Chicago, Illinois, USA) software for analysis and Excel for figures. The content of each tool was analyzed, categorized and then coded by the researcher. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables.

Relationship analysis was used for assessment of the inter-relationships among quantitative variables. The statistical significance difference was considered

when statistical significance was considered at p-value < 0.05.

**Results**

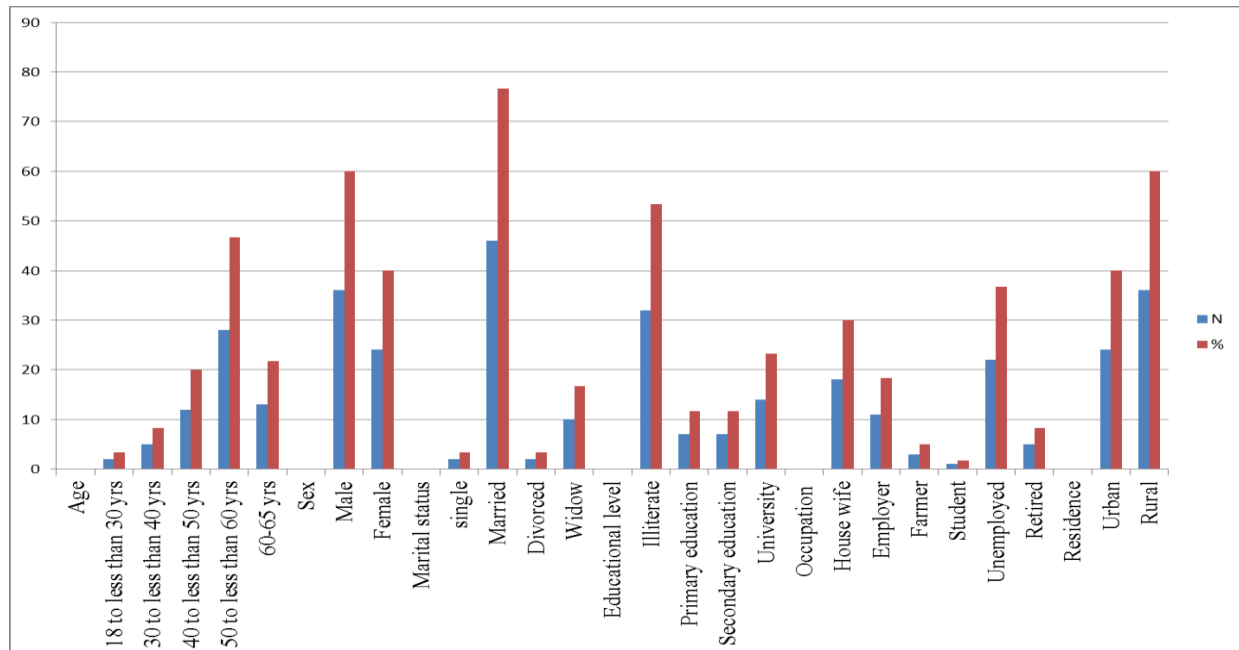


Figure (1): Distribution of socio- demographic data of studied patient (n=60).

Table (1): Percentage distribution of studied patients regarding their medical data (n=60).

Variables	No	%
	<b>Diagnosis:</b>	
LC, ascites without co-morbid disease	49	81.7
LC, ascites with co-morbid disease*	11	18.3
<b>Duration of liver cirrhosis.</b>		
1month to less one years	6	10.0
1 years to less than 3 years	23	38.3
3 years to 5 years	20	33.3
More than five years	11	18.3
<b>Duration of ascites:</b>		
1month to less one years	38	63.3
1year to less than 3rd years	18	30.0
3years to 5 years	2	3.3
more than five years	2	3.3
<b>Duration of hospital stay</b>		
Mean±SD	7.23±5.26	
* Associated Co-morbid diseases included Diabetes mellitus in 7 cases, Hypertension in 3 cases and both in 1 case		

**Table (2): Comparison between total Knowledge score of studied patient pre, post 3month and 6 month of implementing the designing nursing instruction.**

Variables	Pretest (n=60)	post 3 months(n=59)	post 6 months(n=59)	*P. value
Question about ascites	14.07±4.46	32.25±2.18	30.51±3.4	<0.001**
Question about diet and fluid	18.57±5.05	31.64±2.04	30.39±3.22	<0.001**
Question about diuretic medication	5.15±1.71	12.92±0.34	12.83±0.46	<0.001**
<b>Total knowledge</b>	<b>37.78±8.7</b>	<b>76.81±4.32</b>	<b>73.73±6.45</b>	<b>&lt;0.001**</b>

Oneway Anova - Anova with LCD Method –

\*\*statistically significant difference at P. value &lt;0.01.

**Table (3): Comparison between categories of activity of daily living pre, post 3months and 6 months of implementing designing nursing instructions for studied patients.**

activity of daily living	Pretest(n=60)		post 3 months (n=59)		post 6 months (n=59)		*P. value
	N	%	N	%	N	%	
Severe functional impairment	17	28.3	12	20.3	9	15.3	0.001**
Moderate impairment.	28	46.7	12	20.3	18	30.5	
Full function.	15	25.0	35	59.3	32	54.2	
<b>Mean±SD of activity of daily living</b>	3.48±1.86		4.67±1.79		4.67±1.73		<0.001**

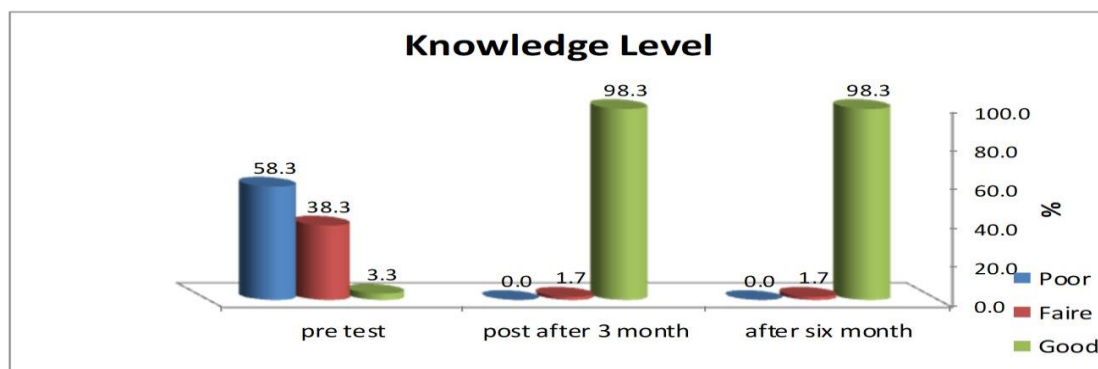
Chi-Square Tests

\*\*statistically significant difference at P. value &lt;0.01

**Table (4): Correlation Co-efficient between total Knowledge score and activity of daily living of studied patient pre, post 3months and 6 months of implementing designing nursing instructions.**

Correlations	Total knowledge score					
	Pretest (n=60)		Post 3 month(N=59)		Post 6 month(N=59)	
	R	P	R	P	R	P
Activity of daily living	0.116	0.376	0.168	0.204	0.373	0.004**

\*\*statistically significant Correlation at P. value &lt;0.001\*\*

**Figure (2): Distribution of total Knowledge of studied patient pre, post 3months and 6 months of implementing designing nursing instructions.**

**Figure (1):** Showed that the studied patients their age ranged between 50<60 and more than third were unemployed. As regard to sex, the educational level and residence more than half of the studied patients were male, illiterate and live in rural region. As regard to marital status, the majority of the studied patients were married.

**Table (1):** Clarifies that the majority of the studied patients had liver cirrhosis and ascites only (81.7%). As regards the duration of liver cirrhosis, the highest percentage of the studied patients their duration ranged between 1 year to less than 3 years and another third from 3 years to less than 5 years. As regard the duration of ascites more than 60% of the studied patients their duration ranged between 1 month to less one year.

**Table (2):** Showed that there was statistically significant difference between pre, post 3 month and 6 month of implementing designing nursing instruction in relation to patient knowledge score in all domain of questions with p-value <0.01.

**Table (3):** Present that there was a statistically significant difference between pre, post 3 months and 6 months of implementing the designing nursing instruction in relation to categories of activity of daily living.

**Table (4):** Illustrate that there was a statistically significant difference between total knowledge and activity of daily living post six month of implementing the designing nursing instruction.

**Figure (2):** Show that the majority of studied patients had good level in knowledge post 3 months and 6 months of implementing the designing nursing instruction.

## Discussion

People with liver cirrhosis and ascites required on average to be admitted on a hospital for a 10 day-stays per month. The development of ascites is associated with a poor prognosis, with a mortality of 15% after around one-year and 44% at five-year follow-up, respectively. (Fagan et al., 2014)

In the present study; the majority of studied patients their diagnosis were liver cirrhosis and ascites only. This result disagree with Ahmed et al., (2018) who conducted a study in Internal Medicine department at Assiut University Hospital, entitled “Clinical outcome of sarcopenia in patients with liver cirrhosis” who reported that; Diabetes mellitus and hypertension were the most comorbidities in cirrhotic patients, because this study excluded the patients with encephalopathy. While Oris et al., (2017) & Wiazio et al., (2013) reported that; diabetes mellitus is associated with hepatic encephalopathy, variceal

hemorrhage, infection, spontaneous bacterial peritonitis and renal impairment.

As regard duration of liver cirrhosis and ascites, the result of the present study show that; less than half of studied patients their duration of liver cirrhosis is ranged between one year to less than three year, and more than half of studied patients their duration is ranged between one month to less than one year. This result supported by Reham & Mohamed (2017) who conducted a study in Internal Medicine Department and Intermediate Critical Care Unit at Minia General Hospital, entitled “ Knowledge of patients with liver cirrhosis regarding ascites self-management: instructional nursing guidelines” They reported that; the total study sample were had ascites from less than five years.

Also, Udell, (2012) reported that; cirrhosis is frequently indolent, asymptomatic and unsuspected until complications of liver disease present, and the most common complication are ascites.

As regard duration of hospital stay, the result of the present study illustrated that; the mean of hospital stay are 7.23 days. Baharith et al., (2016) reported that; ascites is the most common cause of hospital admission in patients with cirrhosis with a mean length of stay was 8.3 days.

In the present study, the results revealed that; more than half of the study patients had poor level of total knowledge pre implementing of designing nursing instructions. This result in line with Reham & Mohamed, (2017) who reported that; most of study group had unsatisfactory level of knowledge regarding ascites management before implementing of the nursing guidelines.

After three and six months of implementing designing nursing instructions, the results of the present study revealed that; The majority of study patients had good level of total knowledge. This result was in the same line with Mohamed et al., (2013), who conducted a study in El manial University Hospital, entitled “Impact of a designed nursing intervention protocol about preoperative liver transplantation care on patients’ outcomes at a university hospital in Egypt” in which; the majority of the study patients had good level of knowledge after implementing of the designed nursing intervention.

The result of the present study revealed a great improvement in patient’s knowledge score after implementing of the designing nursing instructions than pre. This result in line with Mohamed et al., (2018), who conducted a study in Assiut university student’s hospital, entitled “Effect of lifestyle modification on epileptic patients outcomes” in

which they reported that; after application of the teaching booklet, there is a great improvement in patient's knowledge score.

The result of the present study represented that, there was statistically significant difference between pre, post three month and six month of implementing the designing nursing instruction in relation to patient level of knowledge in all item. This result is in agreement with **Taha et al., (2015) & Abd Elmonem et al., (2017)** who reported that, there was highly statistical significant difference between patients level of knowledge after implementation of the nursing intervention than before its implementation among the study group who have liver cirrhosis and ascites.

In this respect **Bergh et al., (2014)** who documented that; nurses' patient education is important for building patient's knowledge, understanding, preparedness for self-management and improve health outcomes

The result of the present study represented that; the majority of the study patients had moderate impairment in performing activity of daily living, except for toileting, continence and feeding, the study patients had the ability to perform it independently pre implementing of the designing nursing instruction. This may due to culture and attitude of participants which induce feeling of shame if any one assisting him during defecation or urination even if they feel tired.

This result in agree with **Rehaim & Mohamed, (2017)** who reported that; more than half of the study patients were highly and partially independent in functional status. Also **Majeed & Atiyah, (2015)** who reported that the activity of daily living of patients with liver cirrhosis is moderately decline in all domains of activities of daily livings.

Also **Wu et al., (2012)** who reported that; patients with liver cirrhosis can experience severe fatigue which may reduce their level of physical activity. From researcher view; this because the majority of patients their age more than fifty beside to pressure of ascites which make them in need for help.

After three month and six month of implementing the designing nursing instruction, more than half of study patients had full function in performing activity of daily living with statistical significant difference than in the pre assessment, this result in agree with **Mohamed et al., (2013)** who reported that there was statistical significant difference in both group in relation to activity of daily living items after nursing intervention.

The result of the present study revealed that; there was statistical significant relation between total knowledge score and activity of daily living post six

month of implementing the designing nursing instruction, from the researcher point of view this may be due to that the majority of study patients are old and need long time to learn how to use assistive devices. **Latham (2012)** stated that; Patients who are provided with education about assistive devices are less likely to rely on others for help.

So we can finally conclude that, results from this study and other studies strongly suggest that patient education is an important part of patient treatment that lead to improve patient's knowledge and activity of daily living, and should be approached in an organized manner.

### Conclusion

Based on the results of this study, it can be concluded that: designing nursing instructions achieve its objectives by improving the patient's knowledge and perform activity of daily living independently post the implementation of the designing nursing instruction than pre its assessment.

### Recommendations

- 1- Patients should be provided with sufficient relevant nursing instructions to remind them about what they can do to cope with their disease.
- 2- The Nurse should be aware by the instructions that must be given to patients before discharge.

### References

1. **Abd Elmonem N., Mahmoud S., Mehany M., & Mahgoup A., (2017):** Effect of nursing intervention on the outcome among patients receiving direct acting antiviral drugs for treatment of chronic hepatitis C, submitted for partial fulfillment of Doctoral Degree- Assiut University Hospital, 173.
2. **Ahmed A., Reda E., Mekawy A., & Youssef H., (2018):** Clinical outcome of sarcopenia in patients with liver cirrhosis, submitted for partial fulfillment of Doctoral Degree- Assiut University, 150.
3. **Baharith H., Yuan Y., & Puglia M., (2016):** Are Patients Hospitalized with Cirrhosis and Ascites Receiving Appropriate Diagnostic Paracentesis?. *J Clin Gastroenterol.* 2(1), 2.
4. **Bergh A., Persson E., Karlsson J., & Friberg F., (2014):** Registered nurses's perceptions of conditions for patient education focusing on aspects of competence. *Scandinavian journal of caring science,* 28(3), 523.
5. **Fagan K., Zhao E., Horsfall L., Ruffin B., Kruger M., & McPhail S., (2014):** Burden of decompensated cirrhosis and ascites on hospital

- services in a tertiary care facility: time for change. *Internal Medicine Journal*, 44(9):865-72.
6. **Fong J., Mitchell O., & Koh B., (2015):** Disaggregating activities of daily living limitations for predicting nursing home admission. *Health Service Research*, 50(2), 560-578.
  7. **Katz S., Down T., Cash H., & Grotz R., (1970):** Progress in the development of the index of ADL. *The Gerontologist*; 10(1): 20-30.
  8. **Lai J., Feng S., Terrault N., Lizaola B., Hayssen H., & Covinsky K., (2014):** Frailty predicts waitlist mortality in liver transplant candidates. *Am J Transplant Off J Am Soc Transplant Am Soc Transpl surg*. 14(8): 1870-9.
  9. **Latham K., (2012):** Progressive and accelerated disability onset by race/ethnicity and education among late midlife and older adults. *Journal of aging and health*, 24(8), 1320-1345.
  10. **Majeed H., & Atiyah H., (2015):** Impact of Liver Cirrhosis upon Adult Patients' Daily Living Activities at Baghdad Teaching Hospitals. *Kufa journal for Nursing Science*. Abstract. 5(3); 5.
  11. **Maruyama H., Kondo T., & Sekimoto T., (2015):** Differential Clinical Impact of Ascites in Cirrhosis and Idiopathic Portal Hypertension. *Medicine (Baltimore)*. 94(26): 1056.
  12. **Mohamed F., Abo Zead S., Shehata G., & Abd- Almageed A., (2018):** Effect of lifestyle modification on epileptic patients outcomes, submitted for partial fulfillment of Doctoral Degree- Assiut University, 67.
  13. **Mohamed S., Mohamede W., Ismail M., & El-Shazly M., (2013):** Impact of a designed nursing intervention protocol about preoperative liver transplantation care on patients' outcomes at a university hospital in Egypt. *Journal of education and practice*. 4 (19), 111.
  14. **Orman E., Hayashi P., & Bataller R., (2014):** Paracentesis is associated with reduced mortality in patients hospitalized with cirrhosis and ascites, *Clin Gastroenterol Hepatol*, 12(3), 496–503.
  15. **Orsi E., Grancini V., Menini S., Aghemo A., & Pugliese G., (2017):** Hepatogenous diabetes: Is it time to separate it from type 2 diabetes? *Liver Int*, 37:950-62.
  16. **Rehaim J., & Mohamed I., (2017):** Knowledge of patients with liver cirrhosis regarding ascites self- management: instructions nursing guidelines, *journal of nursing and health science*, 6(4): 88.
  17. **Taha S., Mohamed W., & Sayed F., (2015):** Impact of a designing nursing intervention protocol on quality of life for liver cirrhosis patients, submitted for partial fulfillment of Doctoral Degree- Minia University Hospital. 150.
  18. **Taso G., (2017):** Liver pathophysiology, ascites. *Academic press*. 36; 475.
  19. **Tim K., (2018):** What Are Patient Outcomes? We Need To Know, *health*, 20(3), 82.
  20. **Udell J., (2012):** Does this patient with liver disease have cirrhosis? *JAMA*. 307(8):832-42.
  21. **Wlazlo N., Van Greevenbroek M., Curvers J., Schoon E., Friederich P., & Twisk J., (2013):** Diabetes mellitus at the time of diagnosis of cirrhosis is associated with higher incidence of spontaneous bacterial peritonitis, but not with increased mortality. *Clin Sci (Lond)*, 125:341-8
  22. **Wu L., Wu M., Lien G., Chen F., & Tsai J., (2012):** Fatigue and physical activity levels in patients with liver cirrhosis. *Journal of clinical nursing*, 21 (1-2): 129-138.