



Impact of designing nursing instructions on compliance to diuretic drugs among cirrhotic patients with ascites

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Abstract

Background and objectives: Compliance to medication is one of the critical determinants of successful management of ascites. The aim was to evaluate the impact of designing nursing instructions on compliance to diuretic drugs among cirrhotic patients with ascites.

Methods: 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: a) Patient assessment sheet. b) Drug compliance scale.

Results: a statistically significant difference between pre, post 3 months and 6 months of implementing the designing nursing instruction regarding drug compliance and grade of ascites with p-value <0.01.

Conclusion: designing nursing instructions had statistical significant effects on compliance to diuretic drugs and on minimizing of ascites.

Recommendation: Replication of the study on a larger probability sample to discover causes of poor drug compliance.

Keywords: ascites, cirrhotic patients, compliance, diuretic drugs, nursing instructions.

1. Introduction

Liver cirrhosis is an advanced, diffuse stage of liver injury, which is characterized by replacement of the normal liver parenchyma by collagenous scar. Viral hepatitis C, which is one of Egypt's most significant public health challenges, with an estimated 8–10 million persons, or 10% of the population, living with the disease. (World Health Organization., (2019) [24]. It is a primary cause for liver fibrosis and cirrhosis. (Mohd *et al.*, (2013) [16].

Sixty percent of the patients with liver cirrhosis develop ascites (accumulation of fluid in the abdominal cavity) at 10 years from diagnosis if cause of liver cirrhosis untreated. The appearance of ascites heralds the onset of decompensation, and the survival of the patients change from 80% at 5 years to 50% at 5 years without liver transplantation. (Leung and Wong., 2011) [13].

Ascites has three grades: grade 1 ascites does not require any specific treatment; grade 2 requires salt- restricted diet and diuretics; grade 3 requires large volume paracentesis (removal of several litres of ascitic fluid) along with salt- restricted diet and diuretics. (Sundaram *et al.*, 2014) [23].

Diuretics remain the standard treatment of cirrhotic ascites. Diuretics block sodium reabsorption along the various nephron sites, it increases renal sodium excretion, and water excretion then follows passively. Spironolactone and thiazide are the most common diuretics used for patients with ascites. (Perri., 2013) [18].

The effect of the diuretics should in the beginning of treatment be assessed with daily control of body weight and close monitoring of creatinine and electrolytes to avoid

serious electrolyte disturbances and to reduce the risk of diuretic-induced renal failure. (Tsochatzis and Gerbes., 2017) [23].

Medication adherence refers to the extent to which patient's medication-taking behavior is consistent with the prescribed regimen. Excellent medication adherences contribute to decreases in morbidity, mortality, health care costs and improve patient's outcomes. (Conn and Rupp., 2017) [6].

Nurse is the provider of direct care to patients; nurses are also responsible for teaching patients about their medical conditions and the potential impact on their lives. Nurses offer a unique perspective in the early education of patients with ascites. As a part of the health- care team, the nurse plays an important role in providing comprehensive patient education. (Fall *et al.*, 2015) [9].

1.1 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. According to researcher's experience with cirrhotic ascites patients, it was noted that patients's knowledge about the importance of adherence to diuretic drugs are inadequate and need for improvement. So, there is a need for instructions to help patients improving their adherence to diuretic drugs and minimize of ascites.

1.2 Aim of the study

The aim of the study was to evaluate the impact of designing nursing instructions on compliance to diuretic drugs among cirrhotic patients with ascites.

Research hypothesis

After applying designing nursing instructions, the studied patients will show more compliance to diuretic drugs and minimize of ascites among cirrhotic patients than before applying designing nursing instructions.

2. Patients and methods

2.1 Research design

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

2.2 Study variables

The independent variable in this study was the designing nursing instructions while the dependent variable was compliance to diuretic drugs among cirrhotic patients with ascites.

2.3 Setting of the study

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

2.4 Sample

Sixty male and female adult patients diagnosed with ascites due to liver cirrhosis, with their mean of age was 50.6, 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 patient flow with precision levels 5% at confidence levels 95% and $p < 0.05$.

2.5 Tools

Tool I: Patient assessment sheet, this sheet developed by the researcher based on literature review –to assess demographic data, clinical data: It included two 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, grade of ascites, body weight, duration of liver cirrhosis and duration of ascites.

Tool II: Drug compliance scale.

This part assessed by Morisky Medication Adherence The MMAS-8 is a self-reported scale developed by Morisky *et al.*, (2008) to assess adherence level to drugs.

- It consists of 7 items answered with (Yes) or (No) and 1 item with a 5-point Likert scale.
- Each “no” response is rated as “1” and each “yes” is rated as “0” except for item 5, in which each response “yes” is rated as “1” and each “no” is rated as “0”.
- For item 8, a score of one was given for ‘Never/ Rarely’ while a score of zero was given for ‘Once in a while/ Sometimes/ Usually/ All the time’. The scores of the MMAS-8 range from 0 to 8.
 - A score below 6 indicates low adherence.
 - A score between $6 < 8$ indicates medium adherence.
 - A score of 8 indicates high adherence.

2.6 Designing nursing instructions

The content of it developed by the researcher after passing through an extensive and relevant literature review and contained the following: Information about the name of

diuretic drugs, its color, shape and strength, the therapeutic effect, dosage, precautions, and possible unwanted effects. Instructions about how to improve adherence to diuretic drugs, such as; each patient connecting the intention of taking medication with a specific time each day, use a weekly fill box, use calendar or remember the chart, have a family member or friend remind patient. Experts in fields of Tropical Medicine and Gastroenterology checked the content for comprehensiveness, clarity, relevance and applicability and corrections were carried out accordingly.

2.8 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 researchers emphasized that the participation is voluntary and confidentially and anonymity of subjects were 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.

2.9 Content validity and reliability

It was established by panel of seven experts (2 Lecturer of Medical Surgical Nursing, Faculty of Nursing, Medical Surgical Nursing Department, Assiut University and 5 doctors in Tropical Medicine and Gastroenterology Department at Al-Rajhi Liver 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).

2.10 Pilot study

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

2.11 Procedure

The study proceeded using the following phases:

1. 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.
- Socio-demographic and clinical data was obtained using the tool I (part 1, 2).
- Drug adherence was assessed using tool II.

2. Implementation phase

- The researcher explained to the patients simplified 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.
- 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.

3. Evaluation phase

- The first evaluation 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 clinical data through filling the tool 1 (part 2) and drug compliance (tool II).
- Studied patients attended the follow up session in the Tropical Medicine and Gastroenterology Department at Al-Rajhi Liver Hospital (readmission). The session took about 30 minutes.

2.12 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.

Table1: Percentage distribution of studied patients regarding their medical data (n=60).

Variables	N %	
Diagnosis		
Liver cirrhosis, ascites without co-morbid disease	49	81.7
Liver cirrhosis, ascites with co-morbid disease*	11	18.3
Duration of liver cirrhosis		
1month > 1 years	6	10.0
1 years > 3 years	23	38.3
3 years to 5 years	20	33.3
< five years	11	18.3
Duration of ascites		
1month > 1 years	38	63.3
1 years > 3 years	18	30.0
3 years to 5 years	2	3.3
< five years	2	3.3
Duration of hospital stay		
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

Results

The studied patients, their age ranged between 50<60 and more than third were unemployed. As regards sex, educational level and residence more than half of the studied patients were male, illiterate and live in rural regions. As regards marital status, the majority of the studied patients were married.

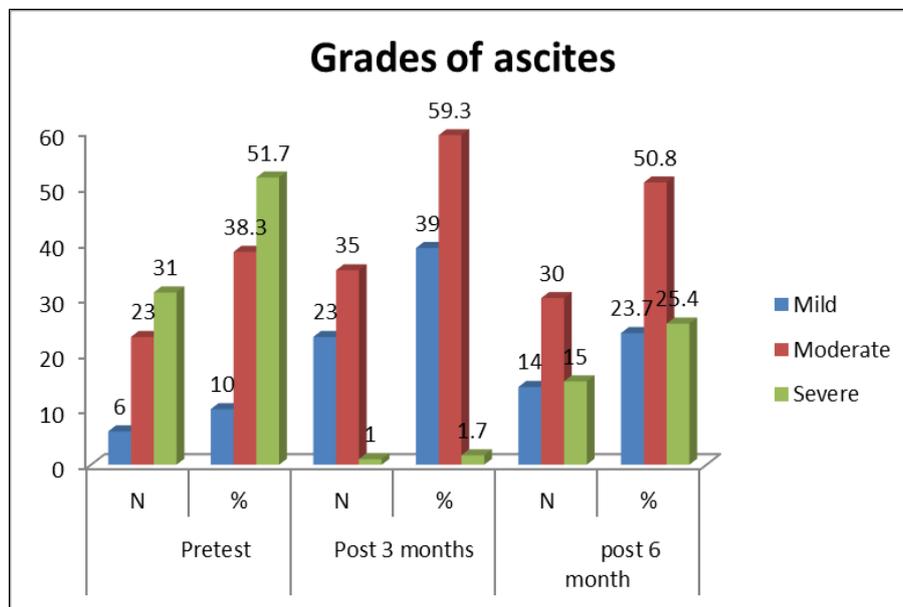


Fig 1: The grade of ascites pre, post 3months and 6 months of implementing designing nursing instruction for the studied patients (n=60).

Table 2: The body weight pre, post 3 months and 6 months of implementing the designing nursing instructions for the studied patients (n=60).

Body weight	Study patients			*P.value
	Pretest (n=60)	Post 3 months (n=59)	Post 6 months (n=59)	
Mean±SD	79.68±16.06	69.86±15.92	75.27±15.59	0.004**

- One-way Anova with LCD method **statistically significant difference at P. value <0.01.

Table 3: Comparison between compliance level pre, post 3months and 6 months of implementing the designing nursing instructions for the studied patients (n=60).

Variables	Study patients						*P. value
	Pretest (n=60)		Post 3months (n=59)		Post 6 months (n=59)		
Drug compliance level	n	%	n	%	n	%	<0.001**
Less than 6 (low)	35	58.3	2	3.4	4	6.8	
6 to less than 8 (moderate)	19	31.7	18	30.5	15	25.4	
8 (high)	6	10.0	39	66.1	40	67.8	
Mean±SD	5.35±1.83		7.49±.817		7.36±1.08		<0.001**

Chi-Square Tests *statistically significant difference at P. value <0.05 **statistically significant difference at P. value <0.01

Table 4: Relation between drug compliance and the grade of ascites of the studied patients pre, post 3 months and 6 months of implementing designing nursing instructions (n=60).

Grade of ascites	Drug compliance												P.value									
	Pretest (n=60)						P. value	Post 3 months (n=59)						P. value	Post 6 months (n=59)						P.value	
	Less than 6		6 less than 8		8			Less than 6		6 less than 8		8			Less than 6		6 less than 8		8			
n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%					
Mild	0	0.0	0	0.0	6	10.0	<0.001**	2	3.4	1	1.7	20	33.9	0.003**	0	0.0	0	0.0	14	23.7	<0.001**	
Moderate	4	6.7	11	18.3	8	13.3		10	16.9	10	16.9	15	25.4		3	5.1	10	16.9	17	28.8		
Severe	13	21.7	17	28.3	1	1.7		0	0.0	1	1.7	0	0.0		6	10.2	8	13.6	1	1.7		

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 regards the duration of ascites more than 60% of the studied patients, their duration ranged between 1 month to less one year.

Figure (1) shows that there was a statistically significant difference between pre, post 3 months and 6 months of implementing of designing nursing instruction in relation to grade of ascites with p-value <0.001. The percent of cases with mild ascites was significantly higher post (after 3 months) and post (after six months) of implementing of designing nursing instruction when compared to pretest. However, the percent of cases with severe ascites was significantly lower post (after 3 months) and post (after six months) of implementing the designing nursing instruction when compared to pretest.

Table (2) 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 mean and standard deviation of body weight. The mean value of body weight was significantly lower at post after 3 months of implementing the designing nursing instruction when compared to pretest (p value = 0.001). In addition, the mean value of body weight was lower at post after 6 months when compared to pretest but the difference did not reach the statistical significance (p value > 0.05). Also, the mean value of body weight was lower at post after 3 months when compared to post after 6 months, but the difference did not reach the statistical significance (p value > 0.05).

Table (3) illustrate that the more than half of the study group have score less than 6 pre implementing of designing nursing instruction, while the majority of the study group have score 8 post 3 months and 6 months of implementing the designing nursing instruction with a statistically significant difference (p-value <0.001).

Table (4) shows that there was a statistically significant

difference between the grade of ascites and the drug compliance pre, post 3 months and post 6 months of implementing the designing nursing instruction with p-value <0.001. Less than one third of the studied patients had severe ascites with moderate compliance, one third of the studied patients had mild ascites with high compliance and about less than one third of the studied patients had moderate ascites with high compliance, pre, post 3 month and 6 month of implementing the designing nursing instruction respectively.

Discussion

Ascites is the accumulation of free fluid in the abdomen (peritoneal cavity). Ascites is the first sign of liver decompensation in about a third of people with compensated liver cirrhosis. Approximately 1% to 4% of people with cirrhosis develop ascites each year. (D'Amico *et al.*, 2014) [7].

The mainstays treatment for patients with cirrhosis and ascites include: education regarding dietary sodium restriction (2000 mg per day [88 mmol per day]) and oral diuretics, which can speed mobilization of ascites and weight loss. (Samoylova *et al.*, 2017) [20].

In the present study, the majority of the studied patients (81.7%) had liver cirrhosis and ascites without co-morbid disease. This result disagrees with Ahmed *et al.* (2018) [3], who conducted a study in Internal Medicine Department at Assiut University Hospital, entitled “Clinical outcome of sarcopenia in patients with liver cirrhosis” and reported that the majority of their studied patients had comorbidities including Diabetes mellitus and hypertension.

As regards 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 was ranged between one year to less than three year, and more than half of studied patients their duration was ranged between one month to less than one year. This result was supported by Reham and Mohamed (2017) [19], 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” who reported

that: the total study sample had ascites from less than five years. Farrell and Larter (2006) ^[10] reported that: cirrhosis is frequently indolent, asymptomatic and unsuspected until complications of liver disease present; the most common complication was ascites.

As regards duration of hospital stay, the result of the present study illustrated that: the mean of hospital stay was 7.23. Baharith *et al.* (2016) ^[5] reported that; ascites was the most common cause of hospital admission in patients with cirrhosis with a mean length of stay was 8.3.

The result of the present study shows that, more than half of the study patients had severe ascites pre implementing of designing nursing instructions. These results disagree with El-Deeb *et al.* (2015) ^[8]; who conducted a study on one hundred- ten patients in Internal Medicine Department at Alexandria University Hospital, entitled “Evaluation of cardiac and adrenal functions in cirrhotic patients with different grades of ascites and spontaneous bacterial peritonitis”, which revealed that less than half of the patients had severe ascites, this due to different locations and different size of the sample.

After implementation of the designing nursing instruction three months and six months, the result of the present study showed that about half of the study patients had moderate ascites with statistically significant difference. This result was in agreement with Mohamed *et al.* (2013) ^[15], who reported that: more than half of study patients had moderate ascites after implementing of designed nursing protocol.

Regarding body weight, the result of the present study show that; less than half of the study patients their weight range from 70 kg to less than 80 kg pre implementing of designing nursing instruction, while after three month and six month from follow up their weight ranged from 60 kg to less than 70 kg with a statistical significant difference. This result supported by Helmy *et al.* (2010) ^[11], who conducted a study in Gastroenterology Department at Ain-Shams University Hospital, entitled “Effectiveness of dietary counseling on improvement of some complications of chronic liver disease” reported that: dietary counseling was significantly associated with an improvement in the degree of ascites as well as decrease body weight over the follow up period.

As regards drug compliance, the result of the present study revealed that, more than half of study patients were low adheres and reported forgetting to take their medication pre implementing of designing nursing instruction. This result supported by Kuo *et al.* (2017) ^[12] reported that, the majority of study patients show low adherence to medication and the main reason is forgetting to take medication. Also, Serper *et al.* (2015) ^[21] reported that, poor adherence to medication regimen adversely impacts health outcomes in many chronic diseases.

After implementation of the designing nursing instruction by three month and six month, the result of the present study showed that, the majority of the patients show high adherence to medication with statistically significant difference. In this respect, Adams (2010) ^[2] reported that, patient education significantly improves compliance with medication across a broad range of condition and disease severity.

Similar with the current study, a study done in Neurological and psychiatric Assiut University Hospital by Abd-Almageed and Almasry., (2019) ^[1], entitled “Effect of teaching strategies on adherence to antiepileptic drugs and

recurrence of seizures among epileptic patients” who reported that all of the patients had poor adherence to drug pre application of teaching strategies, but after application of it, the majority of the patients had good adherence.

But Atya *et al.*, (2019) ^[4], who conducted a study in Tropical Medicine and Gastroenterology Department at Al-Rajhi Liver Hospital, entitled “Effect of patient’s compliance with nursing instructions on minimizing hepatic encephalopathy” who reported that the majority of the patient had moderate compliance to medications.

The results of the present study revealed that, there was a statistical significant relation between drug compliance and grade of ascites pre, post three months and six months of implementing the designing nursing instruction. This result was in agreement with Liebert (2014) ^[14] who reported that, taking medicine as prescribed or medication adherence was important for controlling chronic conditions, treating temporary conditions and overall long term health and well being.

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 outcomes, and should be approached in an organized manner.

Conclusion

Designing nursing instructions had statistical significant effects on adherence to diuretic drugs and on minimizing of ascites.

Recommendations

1. Simple illustration booklets should be available for illiterate patients to provide them with simple explanations about diet that allowed, not allowed and the importance of drug adherence.
2. Tell the patients about the importance of regular follow-up at regular times to check progress of liver disease.

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