Influence of Teaching Lectures on Improving Nurses' Knowledge and Patients Outcomes Regarding Gastrointestinal Disorders during Hemodialysis Sessions

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Abstract: Gastrointestinal disorders (GIDs) are most common in patients with end-stage kidney failure who undergoing dialysis. Aim: to evaluate the influence of teaching lectures on improving nurses' knowledge and patients outcomes regarding gastrointestinal disorders during hemodialysis sessions. Subject and methods: Design: A quasi-experimental design was used for the present study. Setting: The study was carried out at the hemodialysis unit at Benha University .Subjects: A convenient sample of (40 nurses) working in the hemodialysis unit at Benha University Hospital, with (45 adult patients) included. Tools: interview questionnaire sheet and GI disorder teaching lectures to evaluate nurses, and observation checklist to evaluate patients. Results: the present study showed that nearly half of studied patients were in the age group from 50 years to less than 60 years, males, and about three fourth of the patients lived in rural areas, less than half of the participants were illiterate, more than one-third of them were not work or retired and more than one fourth are housewives. Concerning income, slightly more than two-third of studied subjects had insufficient income, and their family number ranged from 4-6 members. There was a highly statistically improvement in the total level of nursing knowledge regarding gastrointestinal symptoms, post-implementation of teaching guidelines when comparing with pre, and immediate implementation of teaching lectures, also when comparing with pre and 3 months after implementation of teaching lectures at (p≤ 0.01). Conclusion: implementation of teaching guidelines knowledge regarding gastrointestinal disorders was effective in improving the level of nursing knowledge and patients' outcome. Recommendations: there is a requirement for continued education for both new and current nursing staff in dialysis unit about prevention of gastrointestinal disorders with periodic evaluation for their knowledge to assess what needs and appraisals.

Keywords: End-stage renal failure, gastrointestinal symptoms, hemodialysis, Nurses' knowledge, Outcomes and Teaching lectures.

I. INTRODUCTION

End-stage renal failure (ESRF) has become a public health issue across the world, including Egypt. Most of these patients need to alternative renal therapy for survival. Despite the great progress that has been made in the renal replacement devices; it is still concomitant with several risks. Hypertension and DM are still the most common leading causes of ESRF in addition to, other causes such as glomerulonephritis, obstructive nephropathy, polycystic kidney, unknown and SLE [18].

The patients with end-stage renal failure undergo a complex treatment regimen including not only RRT such as (hemodialysis or peritoneal dialysis) or kidney transplantation in order to survive; but also drastic changes in the diet and drugs. Patients on hemodialysis account for nearly ninety-two percent of the total dialysis patients. Definitely, hemodialysis led to increase longevity and survival in patients with chronic renal failure, but it can have serious risks if the patients′ and their healthcare providers didn't follow and recognized the concept of its safety. These risks increase the morbidity and mortality of hemodialysis patients. About four hundred thousand people globally are suffering from end-stage renal failure ; more than three hundred thousand are under dialysis treatment [13& 32] by 2030, this number will more than doubles to 5439 million , with the greatest growth in Asia and Africa. In Egypt and according to annual reports of the Egyptian renal registry (2008), the numbers of hemodialysis recipients has rose from 225 pmp in 1996 to 483 pmp in 2004, the prevalence rate of hemodialysis (HD) was 414 patients per million populations [1].

Dialysis causes many various complications, from these complications gastrointestinal disorders and is highly prevalent among patients with end-stage renal disease (ESRD), and on dialysis [35], and is responsible for the major morbidity and mortality among these patients in developing nations [29]. Gastrointestinal disorders in patients with ESRF are one of the most important factors compromising the dialysis technique. The prevalence of these disorders is very high among these patients [25]. The gastrointestinal disorders(GIDs) back to the level of uremic toxin, medications, lifestyle change, immune system morbidity, and other comorbidities they are commonly reported. The most common disorders among these patients are nausea, vomiting, hiccups, diarrhea, constipation, abdominal pain, bloating, dyspepsia, and reflux they have been associated patient comfort, also decrease somatic and cognitive well-being ,in addition; anorexia which followed by the risk of malnutrition [6&12]. The incidence of gastrointestinal disorders can mainly be related to multifactorial conditions. Among them is the increased level of uremic toxin, the effect of hemodialysis, lifestyle alteration, or the drugs needed for treatment most commonly include those of indigestion, gastro esophageal reflux, and eating disorders [31] ,eating dysfunction could also be partly due to local or systemic circulatory impairment, higher levels of ammonia ,hyper gastrocnemii and inflammation. And all of them not only causes deleterious in the digestive system but also effects on several organs and system [8].

As uremia progresses and the waste products building up in the blood due to chronic renal failure, other organ systems become affected as the GI system without medical intervention; coma and death may occur. The severity of these signs and symptoms depends in part on degree of renal morbidity, other underlying conditions, and the patients′ age [30] .

Nephrology nurses are directly responsible for patients undergoing hemodialysis and the dialysis device constantly from the starting to the end of the hemodialysis session, so that different potential complications can be detected [33] .Therefore, the dialysis nurses should always be updating the knowledge and skills to offer safety and quality nursing care during hemodialysis procedures, which enable them to intervene in the changes occurrence during dialysis, among them is hypertension or hypotension, muscular spasms, nausea, vomiting, headache, pruritus, fever, chills and dialysis imbalance syndrome [9] . Several studies have been done all over the world regarding the gastrointestinal disorders in hemodialysis patients. However, the studies done on the impact of teaching lectures on improving nurses' knowledge and patients outcomes regarding GIDs are not enough. One of these is a study conducted in China by Dong et al., (2014) [16]to assess the GIDs in patients undergoing peritoneal dialysis and hemodialysis, and reported that the majority of end-stage renal failure patients undergoing dialysis frequently suffering from gastrointestinal disorders such as abdominal pain, diarrhea and severe constipation. Another study was done in Iran [6]to assess the incidence and severity of GI disorders among hemodialysis patients, who pointed that the high incidence of nausea and vomiting in patients undergoing hemodialysis. In a study conducted in Egypt regarding the efficacy of the empowerment program in enhancing adherence among patients with chronic renal failure and they undergoing hemodialysis in reducing symptom burden and improving QoL,

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (14-29), Month: May - August 2020, Available at: www.noveltyjournals.com

and who found that the empowerment program have a positive effect on patient compliance, burden of disorders and quality of life [10].

Significance of the study: Dialysis is one of the methods of treating kidney failure patients, but there are certain complications commonly report by patients who are on regular hemodialysis treatment, which may be caused by either by renal disease itself or by side-effects of medications, from these complications of kidney failure is a GI disorder. Thus, increasing the awareness of nurses about these possible disorders is important because many of them can be avoided or minimized in in addition to enhancing the nurses' attitudes and performances. So, the present study is conducted to evaluate the influence of teaching lectures on improving nurses' knowledge and patients' outcomes regarding gastrointestinal disorders during receiving dialysis. Hopefully, these teaching guidelines will contribute to improving nurses' knowledge and patients' outcomes regarding gastrointestinal disorders during receiving dialysis.

1.1 The aim of the study:-

The study aimed to assess the influence of teaching lectures on improving nurses' knowledge and patients' outcomes regarding gastrointestinal disorders during hemodialysis sessions.

Through the following objectives:

1- Assess nurses' knowledge regarding patient gastrointestinal disorders during receiving hemodialysis pre lectures

2- Planning and implementation of the teaching lectures regarding gastrointestinal disorders during receiving hemodialysis.

3- Evaluate the teaching lectures on nurse's knowledge

4- Evaluate the effect of teaching lectures on patients' outcomes regarding gastrointestinal disorders during receiving hemodialysis.

1.2 Research hypothesis:-

1. Nurses will have better knowledge regarding patient gastrointestinal disorders during receiving hemodialysis after the implementation of teaching guidelines.

2. After implement teaching guidelines lectures, the patients' sign and disorders regarding patient gastrointestinal during receiving hemodialysis will be decline.

II. MATERIALS AND METHODS

2.1 Research design setting: Quasi- experimental study design was used.

2.2 Setting: This study was carried out in dialysis unit at Benha University Hospital at the period of the first of June 2018 till the end of July 2019.

2.3 Subjects and sample:-

Subjects: The subjects of the study compromised of; **1-** all the available nurses working in dialysis unit at Benha University Hospital those providing care for patients undergoing dialysis procedure. Their total number of the studies nurses was 40 nurses.

2-All patients who receiving a regular hemodialysis treatment as a long treatment for six months before the implementation of the developed teaching lectures were involved in the study. Total number of patients was after exclusion criteria were 45 patients before and after teaching guidelines implementation were 41 patients. The criteria for inclusion were as follows: adult (male & female) patients and on maintenance hemodialysis not less than 6 months, patients with an active file in hospital, able to give the consent, willing to participate in the study, and no history of GI diseases before HD.

2.4 Tools of data collection:

Three tools were used for data collection;

a. Nurse′ tools: There are two tools were used for data collection from dialysis nurse, which include:

Tool: Interview questionnaire sheet : It was developed and written in Arabic language by researchers after reviewing relevant scientific literatures [5&7] agreed upon by a panel of medical surgical nursing and nursing administration experts to assess nurses knowledge (pre-posttest). It was divided into two major parts:

Part I: It involved seven (7) questions related to socio-demographic characteristics of nurses such as age, education, occupation, experience in the dialysis unit, and training course regarding dialysis …. etc.

Part II: It involved forty-six (46) open & closed- ended questions to assess hemodialysis nurses' knowledge about renal failure, dialysis, GI disorders, disorders related dialysis, and the supplies and equipment. It included:

1. Nurses′ knowledge about renal failure and dialysis such as (the function of the kidney, definition of chronic renal failure, treatment of chronic renal failure, definition dialysis, and nursing care, etc……. (8 questions).

2. Nurses′ knowledge about GI disorders such as definition, types, important causes, factors enhancing, patient prone to get it, non- pharmacological strategies, and pharmacologic interventions (14 questions).

3. Nurses′ knowledge about prevention or decrease GI disorders such as (hydro-electrolytic monitoring, checking vital signs, administering medications and instructing the patients) (9 questions).

4. Nurses' knowledge about the presence of supplies and equipment needed to apply prevention or decrease of disorders in hemodialysis unit as availability of basins, soap for hand washing, alcohol, etc.. (15 questions).

Scoring System:

According to scoring system of the nursing knowledge, the rating scale of nursing knowledge was graded as follows: each correct and complete answer took (2) grades, the incomplete answer took (1) grade and uncorrected answer took (zero). Rating scale of all questions was collected. The total score was 92 grades. Total score represented 100%. It was categorized as follows:

- Satisfied > 75% of the maximum score.

- Unsatisfied ≤ 75%.

According to the scoring system of the availability of supplies and equipment needed, (two score) was given for presence and enough of supplies and equipment,(one score) in presence but not enough, while (zero) for not present.

Tool II: GI disorder teaching lectures:

Nursing lectures were developed by the researchers based on the results of the nurses' knowledge in simple Arabic language. The content of the teaching lectures included five sessions:

1st session: pretest to identify nurses′ knowledge regarding GIDs in the hemodialysis unit and give an introduction.

2nd and 3rd sessions: start to explain lectures by using PowerPoint presentation (kidney function, renal failure and its types, S&S, treatment, complications including digestive disorders (definition, causes, types, signs & symptoms, prevention, treatment and nursing care of GI disorder).

4th session: researchers explain how to make the assessment of the signs and symptoms of GI disorders (abdominal pain, abdominal cramp, reflux, acidic eructation, nausea, vomiting, indigestion, constipation diarrhea, emptying, anorexia, bloating, sickness, early satiety. And prevention or decrease GI disorders such as (hydro-electrolytic monitoring, checking vital signs, administering medications and instructing the patients).

The 5th session: give nurses knowledge about equipment and supplies for care of GIDs in hemodialysis unit as pravan between patient, equipment of infection control, medical investigation, equipment, medication, kidney basin, soap for hand washing, towel or tissue- paper, alcohol for disinfection disinfectant solution. After that, post-assessment to evaluate the effectiveness and present thanks to them.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (14-29), Month: May - August 2020, Available at: **www.noveltyjournals.com**

b. Patient tools:

There was one tool was developed by the researchers for data collection from patients. It comprised of two parts:

Part I: interview questionnaire sheet: Was developed and used by the researchers to collect necessary data about patients in this study as age, gender, marital status, educational level, residence area, occupation, monthly income, family members, and housing condition. It includes 9 items.

Part II Observational checklist:

It was developed and used by the researchers after reviewing the current and relevant related literature and theoretical knowledge of the various related aspects using books, articles, internet, and periodical magazines, to assess sign and symptoms of GI disorders through physical examination. It included observation of items as signs and symptoms of GIDs such as abdominal pain, constipation, diarrhea, indigestion, bloating, nausea, vomiting, loss of appetite, acidic eructation, dyspepsia anorexia, emptying and gastroesophageal reflux(GERD).

Scoring System: (one score) was given for the presence of signs and symptoms of GI disorders and (zero) for the absence of GI disorder.

Face & Content Validity:

Validity of tools was done by a group of five professions and experts (2 medical surgical nursing, 2 nursing administration and 1 nephrology consultants) who checked the tools for relevancy, clarity, comprehensiveness, applicability, and easiness for administration. According to their opinions, minor modifications were done and the final form was developed. The reliability of developed tools was estimated using Chronbach's Alpha test to measure the internal consistency of the tools. It was found that the reliability questionnaire using Chronbach's Alpha equation was (r =0 .972).

Field Work: Data collection passes throughout four stages as the following:

Stage I: Pre-implementation phase (Initial assessment)

During the initial phase, the questionnaire (pre- test) was administered to each nurse individually using (tool I) during the personal interview to collect basic nursing data, assessment existing nurses' knowledge regarding the research topic, and also for further comparison after application of the teaching lectures. The interview was carried out in the separate space at the unit during free time. The questions were directed in simple Arabic language and the answers were recorded immediately. The data were collected over a period of four weeks. The total number of sessions was five for each group. Also, during this phase the patient date was collected using (tool I & tool II), to collect baseline patient data, patient condition and observe and measure any signs and symptoms of GI disorders.

Stage II: Planning Phase:

Teaching lectures was development by the researchers based on the opinions of experts, assessment phase, and the conclusion and recommendations of relevant studies. Detected needs, requirements, deficiencies were translated to the aim and objectives of teaching lectures. Objectives were categorized into general and specific objectives. The general objectives of the teaching lectures were to upgrade nurses' knowledge, regarding GIDs in the hemodialysis unit and prevent any signs and symptoms for patient. The content of teaching lectures was prepared according to a feasible learning sequence from easy to difficult, to improve nurses′ understanding.

Stage III: Implementation phase (Intervention):

-In this phase, nurses were divided into small groups (3-5 nurses/session) each group perceived the same program content using the same teaching strategies and handout.

- the total number of sessions was five sessions for each group. It divided as following: total time for achieving the teaching lectures was (10) hours for each group under the study.

- Each session lasted for not less than two hours.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (14-29), Month: May - August 2020, Available at: www.noveltyjournals.com

-Explanation of the lectures using PowerPoint presentation, diagram, videotapes, handouts, and discussion, was also conducted during each session.

-Implementation of GI disorders teaching lectures content

-During each knowledge sessions, the researchers used simple, brief and clear words. At the end of each session, a brief summary was given by the researcher, emphasizing the most important points included in each session.

-Before the start of each session, nurses were asked questions related to the topics discussed in the previous session to ensure that they remember the instruction given and to reinforce the knowledge. Missed or unclear points were re-emphasized by the researcher. Small presents were offered by the researchers as an incentive for correct answers.

-Gastrointestinal disorders teaching lecture handout was given to each nurse in the study group to grasp her attention motivate her, help for reviewing at home and support teaching.

-Each nurse in the study group was seen continuously by the researcher to be sure that the instructions were followed correctly. Correction, reinstructions were offered.

Stage VI: Evaluation phase:

-Evaluation of the effect of the lectures intervention was done immediately after implementing teaching lecture sessions and after three months of implementation to evaluate the retention of knowledge, using the same tools. The findings of each nurse were compared in three phases.

-Monitoring signs and symptoms of GI disorders on patients after the implementing of teaching lectures was done after 1 month from the first patient assessment using the same tools.

2.5 Ethical consideration:

- Prior to data collection, ethical approval was obtained from the hospital director to carry out the study after the explanation of the purpose and nature of the study. Verbal informed consent from all nurses was obtained to participate in this study. They were given an opportunity to withdraw from the study without giving a reason and they were assured that anonymity and confidentiality of information were protected. Ethics, values, culture, and beliefs were respected. Also, oral consent was taken from the patient to reassuring.

2.6 Pilot study

-The questionnaire was pilot tested with a group of (10%) of nurses and (10%) from patients in order to evaluate the developed tools for the visibility, clarity, and applicability of the designed form in providing the required data and the necessary modification was done, and they excluded from the original data

2.7 Fieldwork

-The study was conducted after obtaining official permission to conduct this study was obtained from the head of the hemodialysis unit at Benha University Hospitals. The researchers explained the purpose of the study to heads of departments and nurses; to obtain their cooperation. Ethical consideration explained and ensured confidentiality after that nurses' oral informed consent obtained. Data were collected via interview questionnaires and the availability of the capabilities and needs of preventing infection. Collection of data for this study was carried out in the period the first of June 2018 till the end of July 2019. A convenient sample according to the previous criteria was selected. The researchers developed tools after reviewing of related literature and were tested for content validity by experts' in Nursing.

2.8 Statistical analysis:

-Data entry and analysis were done using the Statistical Package for Social Sciences (SPSS), version 23. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. Qualitative categorical variables were compared using the chi-square test and Wilcoxon sign-rank test was used for comparison within the group. Pearson's correlation coefficient was used to test the correlation between variables. Statistical significance was considered at p-value ≤ 0.05 at confidence interval 95% and the non-significant difference was considered at $P > 0.05$. Collected data were statistically analyzed, presented in tables and used appropriate reliable, valid statistical methods & tests.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (14-29), Month: May - August 2020, Available at: www.noveltyjournals.com

2.9 Limitation of the study

-The researcher met a lot of barriers to get responses from the nurses. Some nurses refused to participate in the study at this time as they were busy and had a lot of work. So, the researcher conducted more than one session to collect data and also in implementing sessions of teaching guidelines. Lack of equipment and supplies needed for precaution.

III. RESULTS

Table (1) and Figure (1): Illustrated that less than one-third (32.5%) of studied nurses were in the age group 30 to less than 35 years, with mean 30.87 ± 5.59, the majority of them (92.5%) were married,. As well as, three-fourth of the studied subjects (75.0%) not attended the training program. Less than two-thirds of them (62.5%) had diploma of nursing secondary school, (27.5% & 10.0%) were professional nurses and technical nurses respectively. In relation to years of experience, more than half of the studied subjects (55.0%) had 10 years and more experience in the dialysis unit. Table (2) and Figure (2): revealed that more than one-third (42.2%) of studied patients were in the age group from 50 years to less than 60 years, with mean 50.04 ± 13.06, three fourth of them (75.6%) were lived in rural area, and less than two-third (60.0%) were male. less than half of the them (48.9%) were illiterate. Regarding to occupation, more than one third (35.6%) of the them were not work or retired and (28.9%) are housewives. Concerning to income, (68.9%) had insufficient income for living expenses, and their family number ranged from (4-6) members. Table (3): Showed that there was a highly statistically improvement in knowledge regarding GI disorders when compared with pre, immediate implementation of teaching lectures, also when compared with pre and 3 months after the implementation of teaching lectures at ($p\leq 0.01$**).

It was clear from the same table that there were no statistically significant differences between immediately and 3 months after implementation of teaching lectures regarding items of knowledge except in relation to signs and nursing care for GI disorders. Table (4): Showed that there was a highly statistically improvement in knowledge regarding all items except in vomiting item when compared with pre, immediate implementation of teaching lectures, at ($p\leq 0.01$**). a highly statistically improvement in knowledge regarding GI disorders S&S, post- implementation of teaching lectures when compared with pre, and immediate implementation of teaching lectures, also when compared with pre and 3 months after the implementation of teaching lectures at ($p\leq 0.01$**) Table (5). It was found that the equipment and supplies were present but not enough (Table,6). There was a highly statistically significant difference between studied subjects pre and 1 month post-implementation of teaching lectures regarding signs and symptoms of GI disorders including and pre and 1 month post- implementation of teaching lectures regarding signs and symptoms of GI disorders ($p\leq 0.01$**&$p\leq 0.05$*) Table (7).

As revealed in Table (8) there were no statistically significant relationships between improvement of knowledge and socio-demographic characteristics of studied subjects in dialysis pre, immediate, and post- implementation phases of lectures regarding GI disorders.
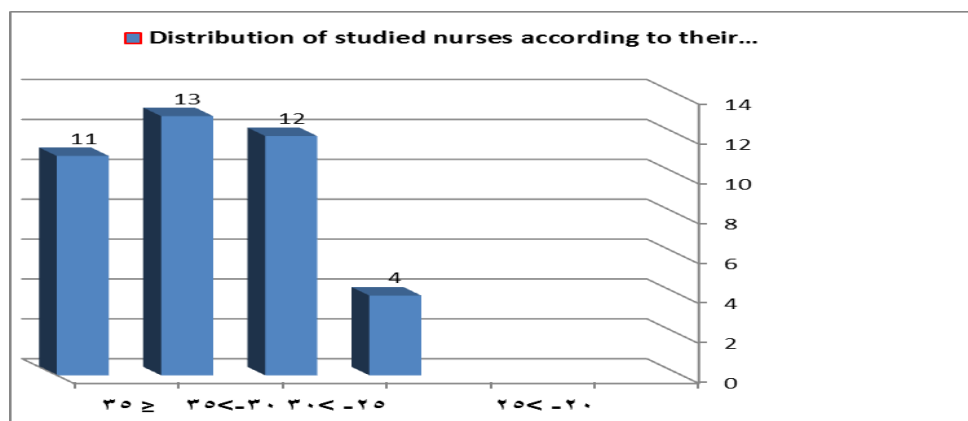

Mean ± SD   30.87± 5.59

Figure 1: Distribution of studied nurses according to their socio-demographic characteristics.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (14-29), Month: May - August 2020, Available at: www.noveltyjournals.com

Table (1): Frequency and percentage distribution of the studied nurses according to their socio- demographic characteristics (n=40)

Items	No.	%	Items	No.	%	Items	No.	%
Academic qualification			Attending training			Duration of training course (no=10)		
Professional nurse	11	27.5	Yes	10	25.0	One day	6	**60.0**
Technical nurse	4	10.0	No	30	75.0	Two days	1	**10.0**
Staff nurse	25	62.5				Three days	3	**30.0**
Years of experience			Marital status			Need of more training		
> 10 years	22	55.0	Married	37	92.5	Yes	33	82.5
≤ 10 years	18	45.0	**Single**	**3**	**7.5**	**No**	**7**	**17.5**
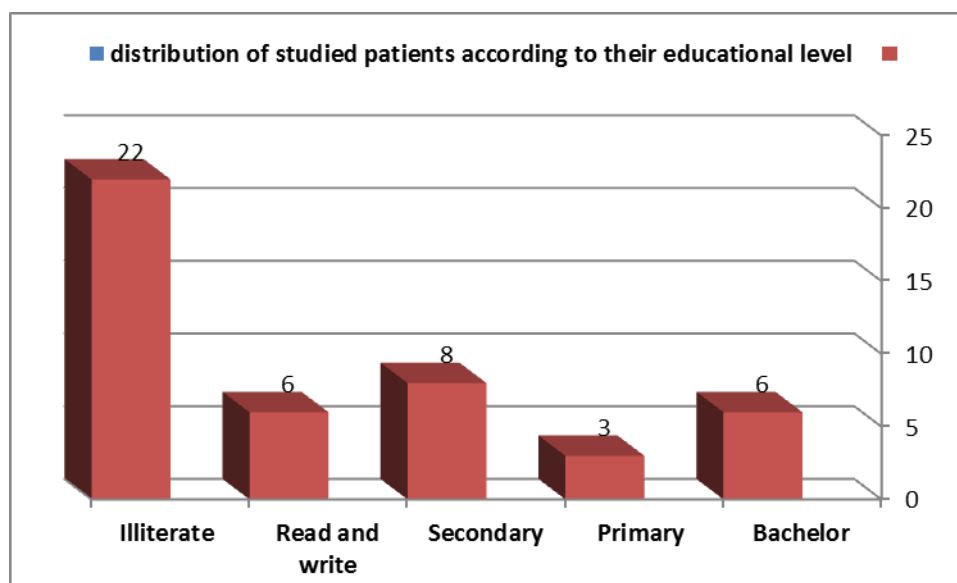
Figure 2: Distribution of studied patients according to their educational level

Table (2): Frequency and percentage distribution of the studied subjects (patients) according to their socio-demographic characteristics (n=45)

Items	No.	%	Items	No.	%	Items	No.	%
Occupation			Marital status			Gender		
Employer	6	13.3	Single	5	11.1	Male	27	**60.0**
Literal	8	17.8	Married	34	75.6	Female	30	**40.0**
Farmer	2	4.4	Widow/ divorced	6	62.5	Age		
						Mean ±SD	50.04 ±13.06	
Housewife	13	28.9	**Family number**			**Income**		
Not work /retired	16	35.6	3	9	20.0	Sufficient	9	**20.0**
Housing condition			4-6	26	57.8	Barely sufficient	5	**11.1**
Good	41	9.1.1	6>	10	22.2	Insufficient	31	**68.9**
Bad	4	8.9	**Residence area**					
			Urban	11	24.4			
			Rural	**34**	**75.6**			

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (14-29), Month: May - August 2020, Available at: www.noveltyjournals.com

ISSN 2394-7330

Table (3): Frequency distribution of studied nurses' correct knowledge regarding GI disorders pre, immediate, and 3 month post implementation of teaching lectures (N=40).

Items of Knowledge	Pre- Implement.		Immediate Implement.		3 month Post-Implement.		P1	P2	P3
	No.	%	No.	%	No.	%			
Difinition of GI disorder	36	90.0	40	100.0	40	100.0	0.046*	0.046*	1.000
Cause of GI disorder	25	62.5	39	97.5	39	97.5	0.000**	0.000**	1.000
Type of GI disorder	9	22.5	38	95.0	38	95.0	0.000**	0.000**	1.000
Signs GI disorder.	7	17.5	40	100.0	35	87.5	0.000**	0.000**	0.025*
Symptoms of GI disorder	13	32.5	35	87.5	38	95.0	0.000**	0.000**	0.083
Prevention of GI disorder	36	90.0	40	100.0	40	100.0	0.046*	0.046*	1.000
Nursing care GI disorder	12	30.0	39	97.5	34	85.0	0.000**	0.000**	0.059*
Treatment of GI disorder	5	12.5	34	85.0	36	90.0	0.000**	0.000**	0.317

P1= between pre & immediately after; P2 =between pre & after 3 months; P3= between immediately

& after 3 months *Significant at   P≤ 0.05 level; **Highly significant at P ≤ 0.01 level

Table (4): Frequency distribution of studied nurses' correct knowledge regarding GI disorders S&S in dialysis unit pre, immediate, and 3 month post implementation of teaching lectures (N=40)

Items of Knowledge	Pre- Implement.		Immediate Implement.		3 month Post-Implement.		Wilcoxon signed rank test		
	No.	**%**	**No.**	**%**	**No.**	**%**	Z1	Z2	Z3
Abdominal pain	11	27.5	38	95.0	38	95.0	**0.000****	**0.000****	**1.000**
Abdominal cramp	5	12.5	38	95.0	34	85.0	**0.000****	**0.000****	**0.046***
Reflux	9	22.5	33	82.5	32	80.0	**0.000****	**0.000****	**0.317**
Acidic eructation	13	32.5	33	82.5	36	90.0	**0.000****	**0.000****	**0.180**
Nausea	32	80.0	40	100.0	40	100.0	**0.005****	**0.005****	**1.000**
Vomiting	35	87.5	38	95.0	38	95.0	**0.257**	**0.257**	**1.000**
Indigestion	1	2.5	37	92.5	36	90.0	**0.000****	**0.000****	**0.317**

Z1= between before & immediately after; Z2 =between before & after 3 months;

Z3= between immediately & after 3 months *Significant at   P≤ 0.05 level;

**Highly significant at P ≤ 0.01 level

Table (5): Frequency distribution of nurses' correct knowledge regarding S&S of GI disorders pre, immediate, and 3 month post implementation of teaching lectures (N=40).

Items of Knowledge	Pre-implement.		Immediate – implement		3 months post implement.		Wilcoxon signed rank test		
	No.	**%**	**No.**	**%**	**No.**	**%**	Z1	Z2	Z3
Constipation	36	90.0	40	100.0	40	100.0	0.025*	0.025*	1.000
Diarrhea	35	87.5	40	100.0	40	100.0	0.000**	0.000**	0.137
Emptying	21	52.5	40	100.0	39	97.5	0.157	0.157	1.000
Anorexia	38	95.0	40	100.0	40	100.0	0.000**	0.005**	0.025*
Bloating	25	62.5	38	95.0	33	82.5	0.014**	0.059*	0.137
Sickness	33	82.2	39	97.5	38	95.0	0.014**	0.059*	0.317
Early satiety	34	85.0	40	100.0	39	97.5	0.046*	0.046*	1.000

Z1= between before & immediately after; Z2 =between before & after 3 months; Z3= between immediately & after 3 months *Significant at P≤ 0.05 level; **Highly significant at P ≤ 0.01 level

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (14-29), Month: May - August 2020, Available at: www.noveltyjournals.com

Table (6): Frequency distribution of studied nurses by their knowledge about availability of equipment and supplies for care of GI in dialysis unit (N=40)

Equipment and supplies	Present and enough		Present and not enough		Not present	
	No.	%	No.	%	No.	%
1-Provan between patient	5	12.5	22	55.0	13	32.5
2- Equipment of care	0	0.0	3	7.5	37	92.5
3- Medical investigation equipment	0	0.0	21	52.5	19	47.5
4- Medication	0	0.0	0	0.0	40	100.0
5- Kidney basin	7	17.5	32	80.0	1	2.5
6- Soap for hand washing	5	12.5	25	62.5	10	25.0
7- Towel or tissue paper	0	0.0	16	40.0	24	60.0
8- Alcohol for disinfection	35	87.5	5	12.5	0	0.0
9- Disinfectant solution	32	80.0	8	20.0	0	0.0

Table (7): Frequency distribution of studied patients regarding S&S (outcomes) of GI disorders pre and 3 month post lectures implementation

Sign and symptoms of GI disorders		Pre-implementation N=(45)		3 months post implementation N=(41)		P. value
		No.	%	No.	%	
Abdominal pain	Not present	35	77.8	38	92.7	0.058*
Abdominal cramp	Present	10	22.2	3	7.3	
Reflux	Not present	26	57.8	35	85.4	0.074
	Present	19	42.2	6	14.6	
Acidic eructation	Not present	21	46.7	29	70.7	0.050*
	Present	24	53.3	12	29.3	
Nausea	Not present	35	77.8	38	92.7	0.058*
	Present	10	22.2	3	7.3	
Vomiting	Not present	26	57.8	32	78.0	0.008**
	Present	19	42.2	9	22.0	
Indigestion	Not present	42	93.3	41	100.0	0.157
	Present	3	6.7	0	0.0	
Constipation	Not present	35	77.8	41	100.0	0.005**
	Present	10	22.2	0	0.0	
Diarrhea	Not present	35	77.8	41	100.0	0.005**
	Present	10	22.2	0	0.0	
Emptying	Not present	35	77.8	39	95.1	0.003**
	Present	10	22.2	2	4.9	
Anorexia	Not present	43	95.6	41	100.0	0.317
	Present	2	4.4	0	0.0	
Bloating	Not present	36	80.0	40	97.6	0.014**
	Present	9	20.0	1	2.4	
Sickness	Not present	34	75.6	41	100.0	0.003**
	Present	11	24.4	0	0.0	
Early satiety	Not present	43	95.6	41	100.0	0.317
	Present	2	4.4	0	0.0	
Eating dysfunction	Not present	35	77.8	37	90.2	0.046*
	Present	10	22.2	4	9.8	
Dyspepsia	Not present	19	42.2	26	63.4	0.002**

Significant at P≤ 0.05 level   **Highly significant at P 0.01 level

IV.   DISCUSSION

End-stage renal disease (ESRD) is a health problem that requires not only long-term and highly expensive care but also a competent nurse with a substantial knowledge base and technical skills due to the intensity of care required. Regarding socio-demographic characteristic of studied subjects (nurses): The finding of the current study displayed that less than one-third of participants were in the age group 30 to less than 35 years, and the vast majority of them were married. Their level of education revealed that less than two-third of the studied subjects had diploma of nursing secondary school, more than one-fourth of them had a bachelor degree and the minority of the nurses were technical nursing institute graduates. In relation to years of experience, more than half of the studied subjects had 10 years and more experience in the dialysis unit. These findings were in similarity with *Soliman (2013),* who found that, less than one-third of the nurses were within age 25-35 years, and all of them were married. Slightly more than one-fifth of the nurses had a bachelor degree in nursing and two-third of them had a diploma of nursing. Also more than half of the nurses had more than 10 years of experience in the hemodialysis unit, and more than half of them had secondary school education.

Table (8): Relation between total nurses' knowledge and their demographic characteristics about gastrointestinal disorders pre, immediate, and 3 months post guidelines implementation (n=40)

Items	Level of Nurse's Knowledge						P. value		
	Satisfactory								
	Pre-Implement.		Immediate Implement.		3 months post implement.		P1	P2	P3
	No.	%	No.	%	No.	%			
1-Age (years):									
20>25	0	0.0	4	10.0	4	10.0			
25>30	0	0.0	12	30.0	12	30.0			
30>35	0	0.0	10	25.0	10	25.0	-	0.235	0.268
≤ 35	0	0.0	10	25.0	9	22.5			
Total	0	0.0	36	90.0	35	87.5			
3- Years of experience:									
<2 years	0	0.0	1	2.5	1	2.5			
2 < 6 years	0	0.0	9	22.5	9	22.5			
6 <10 years	0	0.0	7	17.5	7	17.5	-	0.685	0.557
>10 years	0	0.0	19	47.5	18	45.0			
Total	0	0.0	36	90.0	35	87.5			
4- Academic qualification:									
Professional nurse	0	0.0	11	27.5	11	27.5			
Technical nurse	0	0.0	3	7.5	3	7.5	-	0.311	0.298
Staff nurse	0	0.0	22	55.0	21	52.5			
Total	0	0.0	36	90.0	35	87.5			
5-Attending training:									
Attend	0	0.0	17	42.5	16	40.0			
Not attend	0	0.0	19	47.5	19	47.5	-	0.070	0.227
Total	**0**	**0.0**	**36**	**90.0**	**35**	**87.5**			

P1 between demographic and total knowledge, pre p2 between demographic and immediate implementation, p3 between demographic and 3 month.

In relation to attending the training programs, the current study revealed that three fourth of the studied subjects had not attended any training programs. The finding of the current study can be explained in the light of the belief that the training within the unit is not enough or due to a lack of nurses' interest in the GI training. This result was in line with [2], who found that the highest percentage of the nurses surveyed didn't receive any training program related to adverse events of hemodialysis. While the current results of the study conflict with [5], who found that about forty percent of studied nurses completed hemodialysis training courses.

As regards to socio-demographic characteristics of studied subjects (patients): The study exposed that more than one-third of studied subjects were in the age group from 50 years to less than 60 years. This finding was in agreement with [34], who found that the mean age of the studied patients were 50.2± 12.5 years and the mean duration of hemodialysis was 40.1±31.5 months. Related to their gender, the result of the present study showed that about two-third of study subjects were male and about forty percent were female. This was in agreement with [6] as their study revealed that males were more affected than females. Furthermore, a study done in Egypt (2019) [18]found that about two-third of the study subjects were males, while nearly forty percent were females. This result was consistent with [11], who found that most of the subjects surveyed were married. Regarding to the residence, the finding of the present study illustrated that three fourth of the studied subjects lived in rural areas. This result is in line with study finding by *Atalla, (2019),* reported that the majority of the subjects were from rural area and that a significant proportion of the patients were housewives[7]. Regarding the educational level, the present study revealed that, nearly half of the studied subjects were illiterate, while the minority of the studied subjects had basic education. This finding was in agreement with [4] found that about half of the studied were illiterate patients; quarter of patients had secondary school education and university education.

Regarding to occupation, more than one- third of the studied subjects were not work or retired and more than one-fourth were housewives. This may be due to the impact of ESRF on patients' physical condition, the time spent on hemodialysis and the difficulties to be recruited after the initiation of treatment. This finding was in line with [4] revealed that the majority of hemodialysis patients had no works. Concerning the income, the finding of the present study showed that slightly more than two-third of studied subjects had insufficient income for living expenses, and their family number ranged from (4-6) members. This could be due to the low socio-economic status of the majority of Egyptians. On the same line this findings goes in contrast with *Elmoghazy (2016)* [19]found that most of studied subjects had sufficient income.

Nursing education is a groundwork stone for enhancing the nurses′ knowledge and skills, which reflected on patients′ outcomes. The goal of continuous education in nursing is to enhance knowledge to promote the quality of health care delivery to the patients. Education alters perception, increases knowledge, and in turn, changes work practice especially in vital areas such as hemodialysis [20]. In additional, all health staff requires initial on-hire education and should receive annual education, at the minimum, on infection prevention. Required content should be established and reviewed/updated each year [22].

According to knowledge of nurses regarding GI disorders. The finding of the current study shows that there was a highly statistically improvement in knowledge concerning GIDs knowledge after implementation of teaching lectures when compared with pre, immediate implementation, and also when compared with pre and 3 months after application. This result was in agreement with a study conducted by *Saleh et al., (2018)* about the compliance of nurses by the standards of nursing care for dialysis patients, and stated that there was a noticeable statistical improvement in the mean of nurses knowledge immediately post and follow-up intervention after application of the program. In addition, most of the nurses achieved very well and excellent in the total knowledge score in the post and follow-up test as compared with the pre-test[27]. The finding of the current study showed that there was a highly statistically improvement in knowledge regarding S&S post implementation of teaching lectures when compared with pre, immediate implementation of teaching lectures, also when compared with pre and 1 month after the implementation of teaching lectures. Also, there were no statistically significant differences between immediately after and 3 months after implementation of teaching guidelines regarding the items of knowledge except nursing care. In the same line and in a study done about the complications during hemodialysis sessions and nursing interventions, who reported that knowledge of the major complications and the identification of nursing interventions during the sessions of HD is essential to quality nursing care, safely and grounded not only on reducing the toxic effect of uremia, but in minimizing complications and mortality-rates[14].

The findings of the present study were also supported by a study carried out by *Ahamed & Sallam (2018),* who found that, only the minority of the studied nurses knew before receiving the educational program [2].This was in the same line with, *Dawood, et al., (2016),* who stated that, there was a statistically significant difference between nurses′ knowledge before and after attending the training program, and this may be connected to nurses' wish to improve their knowledge level as well as the simplicity of the received nursing care training. In addition, the enhancement in nursing knowledge and skills about the hemodialysis patients′ care improves patients′ outcomes and makes the work environment better and easier [15]. Also, in a study done at El-Menia University Hospital Egypt, who pointed out that there was a notable improvement in the

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (14-29), Month: May - August 2020, Available at: www.noveltyjournals.com

knowledge and skills of nurses after the implementation of the training program, and that nurses were able to solve most of the problems faced by patients during hemodialysis session[27].

As regard to signs and symptoms of GI disorders among hemodialysis patients, the current study revealed that there was a highly statistically significant difference between the studied patients pre and 1 month post- implementation of teaching lectures regarding signs and symptoms of GI disorders such as abdominal pain, nausea, ……..etc., besides, there was a statistically significant differences between the studied subjects pre and 1 month post-implementation of teaching lectures regarding signs and symptoms of GI disorders. The finding of the present study was supported by a study carried out by *Dawood, et al (2016)* who mentioned that after implementation of the teaching protocol of nursing care, there was a statistically significant difference between pre and post- implementation of the protocol of nursing care in all complications which occur during intra-dialysis[15]. This finding was also consistent with the results of a similar recent study [2].

Also, a study about the effect of application of the protocol of nursing care on patients′ outcomes, who stated that, nursing interventions had a great influence on minimizing the risk for complications and promote ESRF patient's health. Nursing interventions should be based on evidence- based clinical practice guidelines[24]. In this context, *Dawood, et al (2016)* added that the percentage of complications among dialysis patients was decreased after implementation of the protocol of nursing care. Additionally, a study about functional GI disorders and related factors in dialysis patients in Turkey showed that the effective dialysis works to reduce the serum Phosphorus levels that may be useful in suppressing functional bowel disorder symptoms[15]. Therefore, the caregiver should be aware with the changes based on uremia, treatment regimen, diet changes and drugs used [21].

According to the knowledge of the studied nurses about the availability of equipment and supplies for the care of GI in the hemodialysis unit. It was found in relation to availability of GI care, equipment were present but not enough. This result was consistent with a study done by *Al Qahtani et al.,(2017)* who stated that the majority of studied nurses reported inadequate supplies and equipment[3]. In the same context, the Egyptian Ministry of Health and Population (2016) stressed that personal protective equipment should be accessible to dialysis workers, and visitors in the appropriate sizes and should be monitored and obligated. Also, the finding of the present study was supported by [26] as they stated that changing practice is not easy and can be costly, but it will cost healthcare organizations more financially without adequately educating nurses about best practices. In addition, lack of prevention strategies knowledge jeopardizes patient safety and the quality of care. These came also in agreement with [6] stated that a relatively high incidence of GI disorders was noticed in patients undergoing hemodialysis, hence nurses must consider these complications by appropriate measures to avoid the occurrence of the undesirable feelings in patients during hemodialysis.

According to the relation between total nurses' knowledge and their socio- demographic characteristics about GI disorder pre, immediate, and 3 months post-guidelines implementation. The current study found that there were no statistically significant relation between improvement of knowledge and personal data of studied nurses in pre, immediate, and post-implementation phases of lectures regarding gastrointestinal disorders. The current study was in agreement with *El-Karmalawy et al., (2015)* and *Ibrahim et al., (2019)* who stated that there were no statistically significant relations between total knowledge and demographic characteristics of the nurses[2]. This finding was contradicted with *Besely et al.,(2018)* who conducted a study about the effect of health education for nurses on level of hemodialysis patients satisfaction, reporting that, there was a statistically significant correlation between nurses' knowledge scores and their educational level, years of experience and training courses at the pre-program phase. In a recent study conducted by *Saleh et al. (2018),* they concluded that educational and training interventions were effective methods for progressively improving the knowledge and skills of nurses towards the implementation of the standard of dialysis patient nursing care.

V.   CONCLUSION

We concluded from the current study that nurses who received evidence-based guidelines regarding infection prevention showed statistically significant improvement in their performance after the implementation of evidence-based guidelines compared with before implementation. There was a highly significant correlation between before the implementation of evidence-based guidelines but after the implementation of evidence- based practice guidelines; there was non- significant correlation occurred.

VI. RECOMMENDATION

1-The need for involving the current EB guidelines in educational curricula and providing continuous educational programs for healthcare workers to help them in improving their knowledge.

2-Nursing managers and the infection control team should plan for periodic educational and training programs based on EBP.

3-Enhances hospital needs and capabilities to meet infection control.

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