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Effect of A Clinical Pathway Application on Outcome of Children having Diarrheal Diseases

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Abstract: **Clinical Pathways (CP), are one of the main tools used to manage the quality in healthcare concerning the standardization of care processes. It is proven that their implementation reduces the variability in clinical practice and improves outcomes. Aim of the study: This study aimed to assess the effect of clinical pathway application on outcome of children having diarrheal diseases. Research Design: A quasi experimental designed was utilized in this study. Research settings: This study was conducted at Pediatric Department affiliated to Beni Suef University Hospital and General Beni Suef Hospital. Research subjects: A purposive sample included (90) children admitted to the Pediatric Department who having diarrheal disease was selected from previous mentioned settings. Tools of data collection: Five tools were involved; A Pre-designed Questionnaire Sheet; Medical record; Patient assessment data sheet; Complication monitor sheet; A clinical pathway design to implement and evaluate the study group only. Results: The study revealed that there was a statistically significant differences between study and control group after the implementation of the clinical pathway for the study compared with routine hospital policy care for the control group manifested by less hospital stay, fewer complications and less readmission. Recommendation: It was recommended that application of clinical pathway for children having diarrheal disease was essential for reducing complications, less hospital stay and less readmission and it should be applied as a routine nursing care in the hospitals.**

Keywords: **Clinical Pathway, Children and Diarrhea Diseases.**

I. INTRODUCTION

Diarrheal diseases are major public health problems, especially in children in developing countries. Globally, diarrhea remains the second most common cause of death among children under five years of age. Every year there are about two billion cases of diarrheal disease worldwide, and 1.9 million children younger than 5 years of age. Children less than five years are more liable to diseases that impair the ability of the immune system to fight off germs are at higher risk of getting infections that lead to acute diarrhea, including some viruses and parasites that would not cause diarrhea in healthier children ***(*World Gastroenterology Organization Global Guidelines [WGOGG], 2012; Sayed et.al., 2014 & *AI Mohammed & Li Zungu, 2016*)**.

Diarrhea is derived from a Greek word, meaning 'flowing through'. Diarrhea is either an increase in the frequency or a decrease in the consistency of stool . It is a symptoms that results from disorders digestive, absorptive, and secretary functions. Diarrhea in children can either be acute or chronic. It may be mild, moderate, or severe. Moderate diarrhea is usually self-limiting, resolving without treatment within 1 or 2 days. In severe diarrhea, watery stools are continuous. The child exhibits symptoms of fluid and electrolyte imbalance, has cramping, and is extremely irritable and difficult to console. In the developed world, viruses account for most diarrhea cases leading to more than 1.5 million office visits and 200.000 hospitalizations each year ***(Sharma, 2013; Fleisher, 2014; Hockenberry &Wilson, 2015 & Carman, 2016).***

The predispose factors of diarrhea are age, impaired health, environmental factors and seasonal factors. It occurs with greater frequency where there is crowding, substandard sanitation, poor facilities for preparation and refrigeration of food, and generally inadequate health care education. Primary prevention of diarrhea is to control fecal-oral transmission of pathogens through water sanitation and hygiene. Effective interventions include rotavirus vaccinations, breast-feeding and oral rehydration therapy as well as community education on safe water, sanitation and hygiene practices ***[World Health Organization (WHO) and The United Nations Children Emergency Fund recommend (UNICEF), 2011;*** **Ball et al., 2015 & Hockenberry &Wilson, 2015*].***

The major goals in the management of acute diarrhea including assessment of fluid and electrolyte imbalance, rehydration inform of Oral Rehydration Solution (ORS) is one of the major worldwide health care advances. It is more effective, safer, less painful, and less costly than intravenous (I.V) rehydration. Treat infants and children with acute diarrhea and dehydration first with Oral Rehydration Solution (ORS), maintenance fluid therapy and reintroduction of an adequate diet. Treatment of diarrhea including replacing fluid, continuing feeding and close monitoring of infants and children ***(Hockenberry et al., 2017).***

Clinical Pathway have been developed collaboratively by nurses, physicians, physical and occupational therapists, technicians, pharmacists, and other staff members involved in patients care. Clinical pathway is a tool for multidisciplinary care plan which describe the essential steps, needed for care patients with a specific diagnoses. It describe patient treatment .It is based on guidelines. Pathways optimize clinical outcomes whilst maximizing clinical efficiency. It has been demonstrated that the use pathway decreases duration of patient stay, increases interdisciplinary communication, enhances patient knowledge and self awareness. It represents a new approach to patient care, fulfilling many of the demands of clinical practice and its improvement. It allow for the continuous evaluation and help to stimulate research, leads to significant better coordination of care and reduces costs ***(Chungyang, 2011*; Hollak et al., 2013*; Adiong, 2014; Hinkle et al., 2014; Leigh & Resnick, 2014; Pirog et al., 2015; Piazza, 2015& El Baz, 2017).***

The aim of clinical pathway: "to enhance the quality of care by improving patient outcomes, promoting patient safety, increasing patient satisfaction, and optimizing the use of resources". The facilitation of the communication among the team members and with patients and families. Reduction of unnecessary variation in care and reduction in hospital length of stay. The coordination of the care process by coordinating the roles and sequencing the activities of the multidisciplinary care team, patients and their relatives. The documentation, monitoring, and evaluation of variances and outcomes, and The identification of the appropriate resources **(Huiskes et al., 2012; Lux, 2012 & Aarnoutse, 2015).**

Nursing staff should be included in the development, implementation, and continual evaluation of any pathway. The nurses need to understand their roles in helping ensure that best practices and good patient care are incorporated into critical pathways. Education about the disease state and the critical pathway is imperative at all levels, from the beginning of the development process through the piloting stage, organization or hospital wide implementation, and the continuous monitoring process. It is important to use and adapt the current systems in place in the development of the clinical pathway. Information needs to be easily obtained and followed on a daily, ongoing basis ***(Paul & Barbara, 2014).***

Nurses have a key role in all aspects of clinical pathway use. Participating in the development of the pathway is the first step. Because the nurses begin and the chain of staff involved in delivering care, nurses possess a unique perspective in how health care systems work to enhance or impede the delivery of care. Nurses are also responsible for initiating the pathway on appropriate patients and ensuring that the various events occur as planned ***(Bare & smelter, 2011).***

Significance of the study:

In Egypt, deaths among children under 5 years due to diarrheal diseases accounted to 3% of all causes of death. Although it might kill millions in the developing countries, it considered to be a problem in the developed Countries. In developing countries, diarrheal diseases, as a group, remain the leading cause of illness and the second leading cause of death among young children, particularly during the first two years of their lives. Diarrheal diseases accounted for 11% of the estimated 7.6 million under-five deaths in 2010 and 9% in 2013, globally ***(Sayed et al., 2014).***

In recent years, intense pressures to reduce the costs of health care have led many health care organizations to seek strategies that reduce resource utilization while maintaining the quality of care. Among the most popular of the methods intended to meet this challenge are clinical pathways. Clinical pathways are management plans that display goals for patients and provide the corresponding ideal sequence and timing of staff actions to achieve those goals with optimal efficiency ***(Annie & Justin, 2017).***

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A clinical pathway is a complex intervention for the mutual decision-making and organization of care processes for a well-defined group of patients during a well-defined period. It has been widely used by care managers to create evidence-based care plans for individual patients with specific clinical conditions in order to improve care quality ***(European Federation for Medical Informatics [EFMI], 2015; Morris & Arone, 2017).***

Aim of the study: This study aimed to assess the effect of clinical pathway application on outcome of children having diarrheal diseases.

Research hypothesis: Children with diarrheal disease to whom clinical pathway is applied have fewer complications, less hospital stay and less readmission.

II. SUBJECTS AND METHODS

The subjects and methods for this study were categorized under four main designs as the following:

I. Technical design

II. Operational design

III. Administrative design

IV. Statistical design

I. Technical design:

Research Design: A quasi experimental designed was utilized in this study.

Research Settings: This study was conducted at Pediatric Departments affiliated to Beni Suef University Hospital and General Beni Suef Hospital. The two settings are having the highest capacity of children having diarrheal diseases.

Research Subjects: A purposive sample composed of (90) children admitted to the Pediatric Departments who having diarrheal diseases, in the previously mentioned settings. Divided into two identical group one group (Experimental group) those who received clinical pathway and another group (Control group) exposed to routine hospital care. Under the following **inclusion criteria**:

- Diarrhea and/or vomiting with or without accompanying nausea, fever or abdominal pain.

Data collection tools : Data were collected through using 5 tools as the following:

1-Pre-designed questionnaire sheet:

It was designed by the researcher after reviewing relevant literature and revised by supervisors. Written in simple Arabic Language, it includes the following:

Part I : Characteristics of children having diarrheal disease admitted to the previously mentioned settings such as: Age, sex, diagnosis and residence.

2- Medical data sheet:

It was designed by the hospital policy (child file), to identify eligible criteria for clinical pathway implementation. As recorded by gastrological staff consultant and physician. Such as present diagnosis, main complain, past medical history and treatment.

3- Patient assessment data sheet:

It was designed by the researcher guided by **WHO (2014),** and used to assess data related to condition of diarrheal disease, diagnostic tests and physical assessment for the children.

4- Complication monitor sheet:

It was designed by the researcher guided by **Spiro (2012) &WHO (2014)** to monitoring the presence of complications such as dehydration.

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5- A Clinical pathway design:

It was designed by the researcher guided by **Jones (2010); WHO (2014) and Seattle Childrens hospital protocol (2015),** It was designed after reviewing relevant literature and revised by supervisors, implemented and evaluate its outcome on studied children. Design clinical pathway included: Assessment, diagnostic tests, blood test, physical and physiological assessment, intervention, treatments, nutritional status and activity while control exposed to routine hospital care.

Content Validity & Reliability:

Tools was revised by 5 experts in the field of Pediatric Nursing to ascertain relevance and completeness of the study as well as test retest for reliability.

II. Operational Design:

Preparatory phase

The researcher reviewed current local and international related literature to be more acquainted with the problem, to design the study tools, and also to finalize them by using books, articles, magazines and internet.

- **Ethical considerations:**

According to the Faculty of Nursing Staff Committee for ethical issues in research, the researcher was got the children consent and their caregiver before conducting of the study. Assured them about confidentiality, safety and privacy data obtained.

- **A pilot study:**

The pilot study was conducted on 10% (9 children) from the total sample in order ensure the clarity, applicability of the tools and the time needed to be completed. According to the results obtained of the pilot study, the requirement modification were performed. The sample of pilot study were excluded from the main study sample.

- **Field work:**

The actual field work was carried out from beginning of December, 2016 up to the end of December, 2017 for data collection. The researcher were available in the study settings three days/week, at the morning shift from 8.00 a.m to 2.00 p.m in Beni Suef University Hospital and at the afternoon in General Beni Suef Hospital from 2.00 p.m to 8.00 p.m, the researcher will introduce herself to medical and nursing staff members in the previously mentioned settings. The researcher explained the nature and the aim of the study and ask for co-operation. Children having diarrheal disease were divided into two equal groups (study and control group). The researcher explain the clinical pathway step by step for the gastrological staff consultant and nurse, physician, pharmacist, technician those responsible for providing clinical pathway for the experimental group (1). The researcher performs the research in the following phase:

1- **Assessment phase:**

- Baseline assessed of children having diarrheal disease by the researcher. Assessment the study and control group of children's having diarrheal disease according to admission and duration visit.

- Assessment of both study and control group for diagnostic test, physical and physiological examination pre-implementation of clinical pathway.

2- Planning phase:

The researcher develop Clinical Pathway design covering the phases of care which introduced to children having diarrheal diseases which include: admission phase (first 4 hours of care), recovery phase (after first 4hours to 24 hours) and discharge phase. Clinical Pathway included assessment, physical and physiological examination, blood tests, degree of dehydration, treatment (hydration), medications, activity, nutrition, education and discharge planning.

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3- Implementation phase:

The researcher implement the clinical pathway step by step for the gastrological staff consultant and nurse, physician, pharmacist, technician those responsible for providing clinical pathway. The researcher and the gastrological staff consultant, nurse, physician, pharmacist and technician apply the all steps of clinical pathway for study group of children having diarrheal disease.

4- Evaluation phase:

Evaluate outcome of clinical pathway on studied group and compare them with control group who received routine care.

III. Administrative design:

An official letter requesting permission to conduct the study were obtained before embarking the study from the Dean of the Faculty of Nursing, Ain Shams University to the Director of each study setting. This letter was included the aim of the study in order to get the permission and help for collection of data.

IV. Statistics:

The collected data was organized, reviewed, coded, tabulated, analyzed and presented using descriptive statistic in the form of frequencies and percentages for qualitative variables; Means, standard deviations and z-score, for quantitative data. Test of significance was used for comparison between the study and control groups.

Where:

- P>0.05, no statistically significant difference.
- P<0.05, statistically significant difference.
- P<0.01, highly statistically significant difference.
- P<0.001, very highly statistically significant difference.

III. RESULTS

TABLE 1: Shows that there was no statistically significant difference between study and control group of children having diarrheal disease in relation to their age, sex and residence as x2 = 2.91, 1.62, at P >0.05 respectively.

TABLE 2: Shows that there was highly statistically significant difference between the study and control groups in relation to hospital stay period as x^2= 55.79 at P level <0.001.

TABLE 3: Illustrates that there was a highly statistically significant difference between the study and control groups in relation to readmission at hospital after discharge as x2= 25.74 at P < 0.000003.

Table 4: displays that there was a highly statistically significant difference between study and control groups regarding to physical examination of diarrhea for children having diarrheal disease post - implementation of clinical pathway at P level < 0.001.

TABLE 5: Shows that there was a highly statistically significant difference between study and control groups regarding to complication of diarrhea for children having diarrheal disease post - implementation of clinical pathway at P level < 0.001.

TABLE 6: illustrates that there was a highly statistically significant difference between study and control groups regarding to education of diarrhea for children having diarrheal disease post - implementation of clinical pathway at P level < 0.001.

TABLE 7: displays that there was a highly statistically significant difference between studied group pre and post implementation of clinical pathway regarding to physical examination of diarrhea for children having diarrheal disease, at P level < 0.001.

TABLE 8: Illustrates that there was a highly statistically significant difference between studied group pre and post implementation of clinical pathway regarding to degree of dehydration and treatment of diarrhea for children having diarrheal disease, at P level < 0.001.

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TABLE 9: shows that there was a highly statistically significant difference between studied group pre and post implementation of clinical pathway regarding to complications of diarrhea for children having diarrheal disease, at P level < 0.001.

TABLE I: Characteristics of the studied children both study and control group (45).

Items	Study Group (45)		Control Group (45)		Chi-squared x^2	P- Value
	NO.	%	NO.	%		
Age in Months					Equal	
< 6	10	22.2%	10	22.2%		
6 < 12	13	28.9%	13	28.9%		
12 <18	16	35.6%	16	35.6%		
18 < 24	6	13.3%	6	13.3%		
Mean ± SD	10.84 ± 5.2		10.91 ± 5.18			
Sex					2.91	0.087761
Male	30	66.7%	22	48.9%		
Female	15	33.3%	23	51.1%		
Residence					1.62	0.203092
Urban	28	62.2%	22	48.9%		
Rural	17	37.8%	23	51.1%		

TABLE: II: Distribution of both the study and control group of children having diarrheal disease according to their hospital stay period.

Items	Study Group (45)		Control Group(45)		Chi-squared x^2	P-Value
	NO.	%	NO.	%		
Hospital stay period					55.79	0.001
One day	- -	- -	- -	- -		
Two days	32	71.1%	- -	- -		
Three days	13	28.9%	25	55.6%		
Four days	- -	- -	15	33.3%		
Five days	- -	- -	5	11.1%		

TABLE: III: Distribution of both study and control group of children having diarrheal disease according to their readmission after discharge.

Items	Study Group (45)		Control Group (45)		Chi-squared x^2	P- Value
	NO.	%	NO.	%		
Hospital Readmission					25.74	0.000003
N O	38	84.4%	15	33.3%		
The same week	- -	- -	8	17.8%		
After a week	7	15.6%	22	48.9%		

TABLE: IV: Distribution of both study and control group of children's according to their physical examination post - implementation of clinical pathway.

Physical examination	Study Group (45)		Control Group (45)		Z	P- Value
	NO.	%	NO.	%		
Thirst sensation	45	100.0%	44	97.8%	1.01	0.31461
Weight loss	- -	- -	28	62.2%	6.38	0.00000
Depressed fontanel	- -	- -	- -	- -	- -	
Sunken eye	- -	- -	- -	- -	- -	

Dry mucus membrane	- -	- -	- -	- -	- -	
Loss of skin elasticity	- -	- -	- -	- -	- -	
Vomiting	- -	- -	- -	- -	- -	
Tachycardia	- -	- -	- -	- -	- -	
Decrease of blood	- -	- -	- -	- -	- -	
pressure	- -	- -	- -	- -	- -	
Oliguria	- -	- -	- -	- -	- -	
Loss of consciousness						

TABLE: V: Distribution of both study and control group of children having diarrheal disease according to their complication post - implementation of clinical pathway.

Complication	Study Group (45)		Control Group (45)		Chi-squared x^2	P- Value
	NO.	%	NO.	%		
Dehydration						
Mild	45	100.0%	45	100.0%	Equal	
Moderate	- -	- -	- -	- -		
Severe	- -	- -	- -	- -		
Sodium					15.91	0.00050
Not Done	- -	- -	12	26.7%		
Normal	45	100.0%	32	71.1%		
Hyponatremia	- -	- -	1	2.2%		
Hypernatremia	- -	- -	- -	- -		
Potassium					15.19	0.00050
Not Done	- -	- -	10	22.2%		
Normal	45	100.0%	32	71.1%		
Hypokalaemia	- -	- -	3	6.7%		
Hyperkalaemia	- -	- -	- -	- -		
Temperature					Equal	
Normal	45	100.0%	45	100.0%		
Hyperthermia	- -	- -	- -	- -		
Diaper rash						
NO	44	97.8%	27	60.0%	19.28	0.00001
Yes	1	2.2%	18	40.0%		

TABLE: VI: Distribution of both group study and control group of children's according to their health education of nursing staff post - implementation of clinical pathway.

Education	Study Group (45)		Control Group (45)		Z	P- Value
	NO.	%	NO.	%		
Preparation of ORS.	45	100.0%	43	95.6%	1.43	0.15266
Administration of ORS.	45	100.0%	42	93.3%	1.76	0.07813
Meaning and causes of diarrhea.	45	100.0%	- -	- -	9.49	0.00000
Assessment of mild and	45	100.0%	- -	- -	9.49	0.00000
moderate dehydration.	45	100.0%	- -	- -	9.49	0.00000
Hygiene (Diaper care).	45	100.0%	- -	- -	9.49	0.00000
Hand washing.	45	100.0%	- -	- -	9.49	0.00000
Breast feeding.	45	100.0%	- -	- -	9.49	0.00000
Overcome about (prevention of dehydration).						

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TABLE: VII: Significant difference in Physical examination of studied children pre and post implementation of clinical pathway.

Physical examination	Pre- implementation		Post implementation		Z	P- Value
	NO.	%	NO.	%		
Thirst sensation	45	100.0%	45	100.0%	Equal	
Weight loss	45	100.0%	- -	- -	9.49	0.001
Depressed fontanel	42	93.3%	- -	- -	8.87	0.001
Sunken eye	45	100.0%	- -	- -	9.49	0.001
Dry mucus membrane	45	100.0%	- -	- -	9.49	0.001
Loss of skin elasticity	45	100.0%	- -	- -	9.49	0.001
Vomiting	33	73.3%	- -	- -	7.22	0.001
Tachycardia	2	4.4%	- -	- -	1.43	0.15266
Decrease of blood pressure	- -	- -	- -	- -	Equal	
Oliguria	- -	- -	- -	- -	Equal	
Loss of consciousness	- -	- -	- -	- -	Equal	

TABLE VIII: Significant difference in degree of dehydration and treatment of studied children pre and post implementation of clinical pathway.

Item	Pre-implementation		Post-implementation		Chi-squared x^2	P- Value
	NO.	%	NO.	%		
Degree of dehydration					90.00	0.001
Minimal (<5%) to no dehydration	- -	- -	45	100.0%		
Moderate dehydration (5-10%).	45	100.0%	- -	- -		
Severe dehydration (> 10%)	- -	- -	- -	- -		
Treatments Hydration					90.00	0.001
Oral Rehydrate Salts (ORS)	- -	- -	45	100.0%		
Intravenous Fluid (IVF)	45	100.0%	- -	- -		

TABLE IX: Significant difference in complications of studied children pre and post implementation of clinical pathway.

Complication	Pre-implementation		Post-implementation		Chi-squared x^2	P- Value
	NO.	%	NO.	%		
Dehydration					90.00	0.001
Mild	- -	- -	45	100.0%		
Moderate	45	100.0%	- -	- -		
Severe	- -	- -	- -	- -		
Sodium					45.00	0.001
Not Done	- -	- -	- -	- -		
Normal	15	33.3%	45	100.0%		
Hyponatremia	30	66.7%	- -	- -		
Hypernatremia	- -	- -	- -	- -		
Potassium					54.64	0.001
Not Done	- -	- -	- -	- -		
Normal	11	24.4%	45	100.0%		
Hypokalaemia	34	75.6%	- -	- -		
Hyperkalaemia	- -	- -	- -	- -		
Temperature					27.39	0.001
Normal	24	53.3%	45	100.0%		
Hyperthermia	21	46.7%	- -	- -		
Diaper rash					14.90	0.00011
NO	30	66.7%	44	97.8.0%		
Yes	15	33.3%	1	2.2%		

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IV. DISCUSSION

The study was a quasi experimental design two group study and control group was carried out to design clinical pathway for children having diarrheal disease, implement the designed clinical pathway for children having diarrheal disease and to evaluate the effectiveness of clinical pathway technique on outcome of children having diarrheal disease.

In the present study the characteristics of the studied children revealed that the study children are equal in age and nearly two thirds of the study children were male lived in urban and more than half of the control children were female lived in rural as recorded in each child medical record. This finding is congruent with that of the study done by **Nasser, (2014)** who studying effect of clinical pathway on outcome of children with hemolytic anemia, who stated that male exceeded female however no statistical significant was detected between study and control groups of children regarding to sex.

Regarding to the length of stay to the hospital, the present study finding revealed that, less than three quarters of study children for two days, compared with more than half in the control group for three days, there were a highly statistical difference between study and control group according their length stay period in the hospital. This findings is supported by **Sanad, (2011)** who mentioned that significant improvement in length of stay was found among patients in the study group. Also this finding agree with **Doan et al., (2010)** who found the implementation of clinical pathway in the emergency department led to reduction of length of stay.

In the present study, concerning hospital readmission **,** the present result revealed that, the most of the study group not admitted after discharge , compared with less than half in control group were admitted to the hospital after week from discharge. There were a highly statistical difference between study and control group according to their hospital readmission. This result is accordance with the **Hollak et al., (2013)** who stated that use of clinical pathways decreases duration of inpatient care, increases interdisciplinary communication, enhances patient knowledge and self awareness, leads to significant better coordination of care, reduces costs and readmission for hospitals.

The physical examination revealed that there was a highly statistical significant difference between the studied and controlled group as all of the studied children free from weight loss, depressed fontanel, sunken eye, Dry mucus membrane, Loss of skin elasticity, Vomiting, Tachycardia, Decrease of blood pressure, Oliguria and Loss of consciousness.

The previous Findings were agree with **Miller, (2013),** who state that clinical manifestation of children having moderate dehydration were thirst sensation, weight loss, depressed fontanel, sunken eye, Dry mucus membrane, Loss of skin elasticity, Vomiting, Tachycardia, Decrease of blood pressure, Oliguria and Loss of consciousness.

Also, this results agree with ***Hockenberry & Wilson, (2015)*** who stated that the basis for the diagnosis of gastroenteritis is physical and physiological examination and blood test. The result of the examination indicated the severity of illness measured among the admission group studied and controlled. Also this results is agree with ***Ward et al., (2016)*** who mentioned that basis for diagnosis should be done physical, physiological examination and complete blood count (CBC), sodium, potassium and stool Culture if the child is dehydrated.

This Finding revealed that the implementation of clinical pathway illustrated that less complication for the studied children as pre-implementation, there was no statistical significant difference between studied and controlled. At initial and post-implementation for the studied children as dehydration, sodium, potassium, temperature, diaper rash and malnutrition. It was found that there was a highly statistical significant difference between studied and controlled. This could be due to the fact that the studied children received their treatment in regular time which lead to positive outcome.

The previous finding is agree with ***Rotter et al., (2012)*** who studied that the effects of clinical pathway on professional practices, patient's outcomes, length of hospital stay, and hospital costs, and reported that, clinical pathway reduces length of hospital stay, hospital charges, hospital costs and less complication. This results is agree with ***Desoky, (2012)*** who found that, a statistically significant difference was observed in relation to the effect of the clinical pathway on the children according to occurrence of complications pre-post implementation of the clinical pathway.

The results of the present study Finding of the present study described that there was a highly statistical significant difference between study and control groups regarding to health education of nursing staff. As all of them provided education in studied compared to the minority of them provided education in controlled. This results is agree with ***Ragab,***

(2014), who studying effect of clinical pathway on care of neonates having hyperbilirubinemia, who stated that there was a statistically significant difference between studied group pre and post implementation regarding to health education of nursing staff.

The results of the present study illustrated that there was a highly statistically significant difference between studied group pre and post implementation regarding to physical examination. As nearly the majority of them have moderate dehydration includes thirst sensation, weight loss, depressed fontanel, sunken eye, Dry mucus membrane, Loss of skin elasticity, Vomiting, Tachycardia, Decrease of blood pressure, Oliguria and Loss of consciousness in pre implementation compared with all of them have mild dehydration and recovery. This results is agree with ***Ragab, (2014)*** who studying effect of clinical pathway on care of neonates having hyperbilirubinemia, who stated that there was a statistically significant difference between studied group pre and post implementation regarding to physical examination.

The present study illustrated that there was a highly statistically significant difference between studied group pre and post implementation regarding to treatment of rehydration. As all of them received intravenous fluids in pre implementation compared with all of them taking oral rehydration therapy. This results agree with ***Hockenberry et al., (2014)*** who mentioned that rehydration of diarrhea through oral rehydration therapy (ORS), or intravenous fluids (IVF).

Findings of the study regarding to the main complications on admission there was a highly statistically significant difference between the main complications on admission and on discharge as dehydration, Hyponatremia and hypokalaemia were the majority of them have complication, compared with recovery from dehydration in post-implementation. This findings is agree with ***El Baz, (2017)*** who mentioned that Clinical pathways are one of the main tools used to manage the quality in healthcare concerning the standardization of care processes. It is proven that their implementation reduces the variability in clinical practice, less complication and improves outcomes.

V. CONCLUSION

From the study we can concluded that the Children having diarrheal disease to whom clinical pathway was applied had fewer complications, less hospital stay and less readmission after discharge, that compared by children who received routine hospital care.

VI. RECOMMENDATION

From this study we can recommended that:

- Application of clinical pathway for children having diarrheal disease was essential for reducing complications, less hospital stay and less readmission.
- Clinical pathway should be applied as a routine nursing care in the hospitals.
- All hospitals should be establish a policy of clinical pathway that should be available at any time for each hospital units.
- Continuous training for all staff regarding application of clinical pathway.
- Further studies should be conducted to apply and demonstrate the research on a larger population for generalization of the results.

REFERENCES

[1] **Aarnoutse, M. (2015):** The effectiveness of clinical pathway management software. Master thesis. 14 (9): 45-49. Available at https://dspace.library.uu.nl/.../M.F.Aarnoutse_FinalVersion.pdf?...2

[2] **Adiong, M. (2014):** Nursing Services Administration Practice Tools to Manage and Evaluation Care: Clinical Pathway & Clinical Practice Guidelines; 12 (4): 112-116. Available at www.slideshare.net/.../ clinical-pathway-and-clinical-practice-guidelin...

[3] **AI Mohammed, A. & Li Zungu, B. (2016):** Environmental health factors associated with diarrheal diseases among under five children in the Sebeta town of Ethiopia, 31(4):122–129. Available at www.tandfonline.com/ doi/pdf/10.1080/23120053.2016.1156876

[4] **Annie, M. & Justin, K. (2017):** Developing Clinical Pathways, Royal Children Hospital, Melbaume Univ. 22(2): 20-25.

[5] **Ball, J. ; Bindler, R. & Cowen, K. (2015):** Caring for children, principles of pediatric nursing, 6th ed., United States of America: pearson education Co., p. 743.

[6] **Bare, B. & Smelter, S. (2011):** Medical surgical nursing, 9th ed., Philadelphia: Lippincott Williams and Wilkins Co. pp: 40-46.

[7] **Carman, S. (2016):** Essentials of pediatric nursing, 3rd ed., Canada: Wolters Kluwer Co.,pp:720-725.

[8] **Chungyang, N. (2011):** The role of clinical pathways in improving patient outcomes, American Academy of physical medicine and rehabilitation , 4(2): 67-77.

[9] **Desoky, S. (2012):** The effect of nursing clinical pathway on care of children undergoing bone marrow transplantation. Doctorate thesis, Faculty of Nursing, Ain Shams University, pp. 83-84; 88-89.

[10] **Doan, Q.; Chan, M.; Leung, V.; Lee, E. & Kissoon, N. (2010):** The impact of an oral rehydration clinical pathway in a paediatric emergency department, Journal List, 15(8): 503–507. Available at https://www. ncbi.nlm.nih.gov ‹ ... ‹ PubMed Central (PMC

[11] **El Baz, N. (2017):** Chapter 2 Are the outcomes of clinical pathways evidence-based? A critical appraisal of clinical pathway evaluation research. Journal of Evaluation in Clinical Practice December; 13(6): 920 – 929. Available at www.rug.nl/research/portal/ files/2685385/03.Chapter2.pdf

[12] **European Federation for Medical Informatics [EFMI] (2015):** Synthesizing Analytic Evidence to Refine Care Pathways; 12(6): 820-828 Available at person.hst.aau.dk/ska/ MIE2015/Papers/SHTI210-0070.pdf file.scirp.org/ pdf/SS_2016070515565535.pdf

[13] **Fleisher, G. (2014):** Evaluation of diarrhea in children. 12(6): 40-45. Available at http://www.uptodate.com/ contents/evaluation-of-diarrhea-in-children.

[14] **Hinkle, J.; Bare, B. & Smeltzer, S. (2014):** Brunner & Suddarth's textbook of medical-surgical nursing. Understanding clinical pathways. pp. 2240-2246. Available At https://books.google.com.eg/books?isbn= 0781785898

[15] **Hockenberry, M. & Wilson, D. (2015):** The child with gastrointestinal dysfunction. Wong's nursing care of infants and children,10th ed., Canada: Mosby, pp: 1058-1062.

[16] **Hockenberry, M.; Wilson, D. & Rodgers, C. (2017):** The child with gastrointestinal disorder. Wong's essentials of pediatric nursing, 11th ed., Canada: Elsevier pp: 699-702.

[17] **Hockenberry, M.; Wilson, D.; Perry, S. & Lowdermilk, D. (2014):** Maternal child nursing care, 5th ed., Canada: Mosby Co., pp: 1263 -1265.

[18] **Hollak, C.; Demirdas, S.; Kessel, I.; Korndewal, M.; Meutgeert, H.; Klaren, A.; Spronsen, F. & Bosch, A. (2013):** Clinical pathways for inborn errors of metabolism: warranted and feasible. US National Library of Medicine National Institutes of Health. 8(4): 37. Available at http://www.cdc.gov/eid/content/17/8/110824.

[19] **Huiskes, N.; Schrijvers, G. & Hoorn, A. (2012):** The care pathway: concepts and theories: an introduction. 12(5): 22-28. Available at https://www.ncbi.nlm.nih.gov ‹ ... ‹ PubMed Central (PMC).

[20] **Leigh, A. & Resnick, M. (2014):** Paving Clinical Pathways. ASQ's Healthcare; 6 (4): 114-116.

[21] **Lux, T. (2012):** Hospital Engineering. In M. Szomszor & P. Kostkova , Electronic Healthcare, 69(22): 229–234. Berlin, Heidelberg: Springer. doi:10.1007/978-3-642-23635-8

[22] **Miller, K. (2013):** Diarrheal illnesses in babes, Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health, 7th ed., Saunders, an imprint of Elsevier, pp. 122-129. Available at http://%3A%2fFinfomama andme.com%2Fwp-Content%2Fuploads%2F2015%....

[23] **Morris, J. & Arone, B. (2017):** Pathways Can Improve Health Care Quality; 8(3): 66-75. Available at www.hhnmag.com/articles/8165-pathways-can-improve-health...

[24] **Nassar, A. (2014):** Effect of clinical pathway on outcome of children with hemolytic anemia. Doctorate Thesis, Faculty of Nursing, Ain Shams University, pp. 20-85.

[25] **Paul, P. & Barbara, J. (2014):** Critical pathways: The role of pharmacy, today and tomorrow: pharmacotherapy; 26(9): 1358-1368.

[26] **Piazza, A. (2015):** Clinical Pathway Guideline; 25(8): 1355-1362. Available at https://www.health.govt.nz/ system/files/.../moh_tce_2015.pdf

[27] **Pirog, F.; Kleiner, H.; Marcheva, B.; Jagun, D.; Sweetnam, N. & Frieder, M. (2015):** Clinical Pathways: Overview of Current Practices and Potential Implications for Patients, Payers, and Providers; 27(7): 1233-1239.

[28] **Ragab, H. (2014):** Effect of clinical pathway on care of neonates having hyperbilirubinemia. Doctorate Thesis, Faculty of Nursing, Ain Shams University, pp. 105:115.

[29] **Rotter, T.; Author, E.; Kinsman, L.; James, E.; Machotta, A. & Steyerberg, E. (2012):** The quality of the evidence base for clinical pathway effectiveness: Room for improvement in the design of evaluation trials. 33(10): 89-99. Available at rube.asq.org/health/2014/09/change.../paving-clinical-pathways.pdf.

[30] **Sanad, L. (2011):** Clinical pathways : Effect on professional practice, patient outcomes, length of stay and hospital costs, Cochrane collaboration, 5(30): 120-128.

[31] **Sayed, Y.; El Sayed, A. & El-Fattah, S. (2014):** Effect of socioeconomic status on infectious diarrhea in Egyptian children, International Journal of Nutrition and Food Sciences. 3(6): 519-525. Available at article. Science publishing group. com/.../10.11648.j.ijnfs.20140306.15.

[32] **Sharma, R. (2013):** Essentials of Pediatric Nursing, 1st ed., London, Jaypee Brothers Medical Publishers, p. 341.

[33] **Ward, S.; Hisley, S. & Kennedy, A. (2016):** Maternal – child nursing care, 1st ed., United states of America, F.A. David Co., pp: 942 – 945.

[34] **World Gastroenterology Organisation Global Guidelines [WGOGG] (2012):** Acute diarrhea in adults and children: a global perspective. 30(14): 122-150. Available At http://www.who.int/child_global_health /documents/9241593180/en/index.html

[35] **World Health Organization (WHO) and The United Nations Children Emergency Fund recommend (UNICEF) (2011):** WHO Technical Staff. Water, Sanitation and Hygiene Interventions and the Prevention of Diarrhea. 1(3): 1-52.