

Impact Of An Educational Program For Nursing Management About Care Of Children Treated With VP Shunt In Mosul City

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Abstract:

Background: Hydrocephalus management present as a significant challenge for child, parents, and multidisciplinary health care team. Despite the advancements in shunt technology and neurosurgery treatment techniques, many children with hydrocephalus reported high rates of shunt failure and require shunt revision or replacement. Infants are more susceptible than older children to die as a result of shunt failure, which caused by variety of reasons such as prematurity, low birth weight, infection.

Objective of the Study: Evaluate the effectiveness of an interventional program on nurse's knowledge and practices toward care of children treated with ventricular peritoneal shunt.

Material and Method: A pre experimental design used to evaluate the educational program about nurse's management concerning care of children treated with ventricular peritoneal shunt. The sample of the study was chosen purposively (non-probability). The study sample was (30) nurses. The sample of the study was collected from Ibn Sina Teaching Hospital at Mosul city. Two tools were used for data collection, Part 1:- knowledge questionnaire, Part 2:- observational checklist.

Results: The results showed that total nurses' knowledge about care for children treatment with ventricular peritoneal shunt, that 53.3% (16) of the sample at Poor Knowledge level in pretest, but 90.0% (27) of the sample at Good Knowledge level in posttest 1, also 70.0% (21) of the sample at Good Knowledge level in posttest 2. With most of the sample practice in pretest at sometime level, but in posttest1 and posttest2 that most of the sample practice at always level.

Conclusion: The study most nurse's knowledge and practices were scored at good level after application the interventional program, during the period of posttest 1 and2.

Keywords: Educational Program, Nursing management, Ventricular Peritoneal Shunt

Introduction

Hydrocephalus is a common type of cerebral malformation in early childhood, it characterized by accumulation of cerebrospinal fluid (CSF) in the ventricular of the brain, result of an imbalance between absorption and synthesis of CSF and

elevation in intraventricular pressure (National Institute of Neurological Disorders and Stroke, 2018; Wright et al., 2016; Smith et al., 2013; Oreskovic´ & Klarica, 2011).

The onset of hydrocephalus might be sudden and last for hours or days; it could

also be persistent for months or years. Hydrocephalus can be caused by acquired or congenital reasons or associated with different anomalies (Ebrahim et al., 2019; Cartwright & Wallace, 2017).

Hydrocephalus management presents as a significant challenge for child, parents, and multidisciplinary health care team (Smith et al., 2013). Despite the advancements in shunt technology and neurosurgery treatment techniques, many children with hydrocephalus reported high rates of shunt failure and require shunt revision or replacement. Infants are more susceptible than older children to die as a result of shunt failure, which is caused by a variety of reasons such as prematurity, low birth weight, infection (Hasanain et al., 2019).

Nursing practice that is based on scientific concepts for early detection of potential health problems and formulates activities for saving child's quality of life. Nursing with technical and scientific preparation to care of hydrocephalic patients, which necessitates knowledge of neuroanatomy, neurophysiology, neurological clinical images, neurodiagnoses, and nursing assessments, as well as critical care and admission units (Cestari, et al., 2013).

Objective of the Study:

Evaluate the effectiveness of an interventional program on nurse's knowledge and practices toward care of children treated with ventricular peritoneal shunt.

Material and Method:

A pre-experimental design was used to evaluate the educational program about nurse's management (Knowledge, and practice) concerning care of children treated with ventricular peritoneal shunt. The sample of the study was chosen purposively (non-probability). The study sample was (30) nurses. The sample of the study was collected from Ibn Sina Teaching Hospital at Mosul city. The design of an application

program based on assessment need outcome and reviewing of literature as well as expert's opinions and researcher experience based on nurses' need for further information regarding ventricular peritoneal shunt. Two tools were used for data collection, **Part 1:-** knowledge questionnaire (15 items), consist of three axis: General knowledge that belongs to hydrocephalus: this section consists of (5 items), General knowledge that belongs to VP shunt: this section consists of (5 items), Knowledge that belongs to complication of VP shunt: this section consists of (5 items). While the reliability of questionnaire was examined by test – retest technique ($\alpha = 0.802$). **Part 2:-** the instrument of the study based on observational checklist for nurses' practice was used from a previous study by the researchers Elbilgahy and Mohammed (2019), in their study about improving nursing care for children with VP shunt in Egypt. While the reliability of checklist practice scale was examined by Inter-Rater (Inter-Observer) method ($\alpha = 0.836$), scored by always, sometimes, never.

Nurses were evaluated after implementing the program in posttest1, then re-evaluated after one-month period in posttest2.

The Data Collection gathered information was done from selected teaching hospitals in Mosul City. They were Ibn Sina Teaching Hospital, from the period of 17/ January/2022 up to the 30 of March/ 2022. The Data Analysis Methods: this investigation's data was dissected using the Social Science Statistical Package (SPSS) version 25. As a result, the following statistical procedures were employed to analyze the data and assess the outcomes: (Frequencies and percentages are used to describe demographic characteristics and to approximate the data value, the means and standard deviation are rummaged through).

Results:

Table (1): Statistical Differences Result for Nurses' Knowledge about care for children treated with ventricular peritoneal shunt

	Estimate	Pre-test				Post-test 1				Post-test 2			
		Fre q.	%	M .	St. D.	Fre q.	%	M .	St. D.	Fre q.	%	M.	St.D .
General knowledge which belongs to hydrocephalus	Poor Knowledge	14	46.7			0	0.0			0	0.0		
	Accepted Knowledge	13	43.3	1.63	0.669	2	6.7	2.93	0.254	10	33.3	2.67	0.479
	Good Knowledge	3	10.0			28	93.3			20	66.7		
General knowledge which belongs to VP shunt	Poor Knowledge	6	20.0			0	0.0			0	0.0		
	Accepted Knowledge	17	56.7	2.03	0.669	4	13.3	2.87	0.346	9	30.0	2.70	0.466
	Good Knowledge	7	23.3			26	86.7			21	70.0		
Knowledge that belongs to complication of VP shunt	Poor Knowledge	15	50.0			0	0.0			0	0.0		
	Accepted Knowledge	12	40.0	1.60	0.675	3	10.0	2.90	0.305	8	26.7	2.73	0.450
	Good Knowledge	3	10.0			27	90.0			22	73.3		
Total nurses knowledge	Poor Knowledge	16	53.3	1.53	0.629	0	0.0	2.90	0.305	0	0.0	2.70	0.466
	Accepted Knowledge	12	40.0			3	10.0			9	30.0		
	Good Knowledge	2	6.7			27	90.0			21	70.0		
Total		30	100.0			30	100.0			30	100.0		

Table (2): Statistical Differences Result for Nurses' Practice about care for children treated with ventricular peritoneal shunt

Practice Items	Estimate	Pre-Test				Post-Test 1				Post-Test 2			
		Fre q.	%	M.	St.D .	Fre q.	%	M.	St.D .	Fre q.	%	M.	St.D .
Hand hygiene before procedure	Always	0	0.0			22	73.3			15	50.0		
	Someti me	4	13.3	2.87	0.346	7	23.3	1.30	0.535	14	46.7	1.53	0.571
	Never	26	86.7			1	3.3			1	3.3		
Hand hygiene after procedure	Always	0	0.0			21	70.0			19	63.3		
	Someti me	14	46.7	2.50	0.509	9	30.0	1.30	0.466	11	36.7	1.33	0.479
	Never	16	53.3			0	0.0			0	0.0		
Use personal protective equipment during the procedure	Always	5	16.7			19	63.3			17	56.7		
	Someti me	17	56.7	2.10	0.662	10	33.3	1.40	0.563	11	36.7	1.50	0.630
	Never	8	26.7			1	3.3			2	6.7		
Assessing vital sings every 4 hours	Always	10	33.3			22	73.3			17	56.7		
	Someti me	16	53.3	1.80	0.664	7	23.3	1.30	0.535	12	40.0	1.23	0.430
	Never	4	13.3			1	3.3			1	3.3		
Assessing head circumference	Always	0	0.0			24	80.0			13	43.3		
	Someti me	0	0.0	3.00	0.000	6	20.0	1.20	0.407	12	40.0	1.27	0.521
	Never	30	100.0			0	0.0			5	16.7		
Assess fontanel	Always	0	0.0			21	70.0			16	53.3		
	Someti me	2	6.7	2.93	0.254	8	26.7	1.33	0.547	11	36.7	1.23	0.430
	Never	28	93.3			1	3.3			3	10.0		
Assess level of consciousness according to Glasgow coma scale	Always	1	3.3			21	70.0			15	50.0		
	Someti me	14	46.7	2.47	0.571	9	30.0	1.30	0.466	14	46.7	1.27	0.521
	Never	15	50.0			0	0.0			1	3.3		
Assess signs and symptom of seizures	Always	0	0.0			17	56.7			15	50.0		
	Someti me	3	10.0	2.90	0.305	13	43.3	1.43	0.504	13	43.3	1.23	0.430
	Never	27	90.0			0	0.0			2	6.7		
Assess infant eye for any nystagmus	Always	0	0.0			18	60.0			9	30.0		
	Someti me	0	0.0	3.00	0.000	9	30.0	1.50	0.682	13	43.3	1.37	0.718
	Never	30	100.0			3	10.0			8	26.7		

Assess vomiting	Always	1	3.3			20	66.7			16	53.3	1.30	0.53 5
	Someti me	22	73.3	2.20	0.48 4	10	33.3	1.33	0.47 9	12	40.0		
	Never	7	23.3			0	0.0			2	6.7		
Assess hydration status (skin turgor, dryness of mouth, absence of tears)	Always	1	3.3			18	60.0			16	53.3	1.23	0.50 4
	Someti me	16	53.3	2.40	0.56 3	11	36.7	1.43	0.56 8	11	36.7		
	Never	13	43.3			1	3.3			3	10.0		
Check input and out put	Always	2	6.7			22	73.3			15	50.0	1.30	0.53 5
	Someti me	19	63.3	2.23	0.56 8	8	26.7	1.27	0.45 0	14	46.7		
	Never	9	30.0			0	0.0			1	3.3		
Assess abdominal girth	Always	0	0.0			16	53.3			13	43.3	1.40	0.67 5
	Someti me	0	0.0	3.00	0.00 0	10	33.3	1.60	0.72 4	14	46.7		
	Never	30	100.0			4	13.3			3	10.0		
Assess times of defecation	Always	2	6.7			18	60.0			17	56.7	1.27	0.52 1
	Someti me	18	60.0	2.27	0.58 3	12	40.0	1.40	0.49 8	11	36.7		
	Never	10	33.3			0	0.0			2	6.7		
Check VP shunt function	Always	0	0.0	3.00	0.00 0	21	70.0	1.30	0.46 6	16	53.3	1.20	0.40 7
	Someti me	0	0.0			9	30.0			14	46.7		
	Never	30	100.0			0	0.0			30	100.0		
Put the child on the unaffected side of surgery	Always	5	16.7			29	96.7			29	96.7	1.03	0.18 3
	Someti me	13	43.3	2.23	0.72 8	1	3.3	1.03	0.18 3	1	3.3		
	Never	12	40.0			0	0.0			0	0.0		
Position the child on the back with head elevated at 15 °to 30 °	Always	0	0.0			27	90.0			27	90.0	1.10	0.30 5
	Someti me	1	3.3	2.97	0.18 3	3	10.0	1.10	0.30 5	3	10.0		
	Never	29	96.7			0	0.0			0	0.0		
Asses the incision site for any signs of bleeding or infection	Always	8	26.7			30	100.0			30	100.0	1.00	0.00 0
	Someti me	21	70.0	1.77	0.50 4	0	0.0	1.00	0.00 0	0	0.0		
	Never	1	3.3			0	0.0			0	0.0		
	Always	30	100.0	1.00		30	100.0	1.00		30	100.0	1.00	

Giving medication and analgesia as described	Someti me	0	0.0	0.00 0	0	0.0	0.00 0	0	0.0		0.00 0
	Never	0	0.0		0	0.0		0	0.0		
Change dressing every 48_72 hours	Always	30	100.0		30	100.0		30	100.0	1.00	0.00 0
	Someti me	0	0.0	1.00	0.00 0	0	0.0	1.00	0.00 0		
	Never	0	0.0		0	0.0		0	0.0		
Total Nurses Practice	Always	3	10.0		28	93.3		23	76.7	2.77	0.43 0
	Someti me	18	20.0	1.80	0.61 0	2	6.7	2.93	0.25 4		
	Never	9	30.0		0	0.0		0	0.0		
		30	100.0		30	100.0		30	100.0		

Discussion

The data analysis shows that in general the total nurses' knowledge about care of children with VP shunt during the interval period of data collection that more than half of them scored at poor level of knowledge during pretest (53.3%), while high percentages of them scored at good level of knowledge during posttest1 and posttest2 (90 %, 70 %) respectively (table, 1).

In the main two domains of nurses' knowledge about care of VP shunt children (general concept of hydrocephalus and management of its complication), high percentage of nurses scored at poor knowledge (46.7%, 50.0%) during pretest period. However, they scored at accepted knowledge about VP shunt general information (56.7%) during the same period (table, 1).

After application of the interventional program, nurses' knowledge in the main the three domain mostly they scored at good level. During the posttest1 period, the nurses document high percentages of Knowledge score regarding the concept of hydrocephalus, VP shunt and its complication (93.3%, 86.7%, 90%) respectively (table,1). While the same nurses during the period of posttest2 document a good knowledge also in the main domain of knowledge (66.7%, 70%, and 73.3%) respectively.

The change in nurses' knowledge level before and after the program

application, mainly due to the benefit of information and the effects of education concerning the management of VP shunt in program components upon nurses' knowledge. This result confirms the positive effects of program components and its variability to increase nurses' knowledge. While the variation of score knowledge between the posttests period may due to the longtime period (30 days) that may cause forgetting of some information, nurses did not update their knowledge.

The finding of the study consists with the researchers Baewy and Aziz (2020), in their research at Baghdad city to assess nurse's knowledge and practices toward hydrocephalus care in Intensive Care Unit, the study showed nurses' scored with poor knowledge in the pretest while after application their program about care of hydrocephalus the nurses documented a good knowledge. Another study Elbilgahy and Mohammed (2019) in Egypt support the result of the study; the researchers reported that nurses' knowledge was poor before implemented their program about care of VP shunt while after application their program the knowledge changed to good level.

Additionally, the researchers Da Equipe and Peditria (2019), in their study about the effect of the constructed program for care of external ventricular drains, indicated that nurse's knowledge improved

to the good level after the program intervention.

Through the observational checklist of nurses' practices, the results in table (2) shows a statistical differences during VP shunt mangement. The total practice during pretest period mostly scored at sometime practices (60%), while during posttest1 and posttest1 period nurses' practices mostly scored at always practice (93.3% and 76.7%) respectively as shown in table (2).

Nurses were reported many negative practices during care of VP shunt during pretest period, they documented a high percentages of never practices during observation such: handwashing before and after care, measure child head circumference and abdominal girth, assess fontanel size, assess conscious level and signs of seizure, check VP shunt function and positioning of child (86.7%, 53.3%, 100%, 100%, 93.3%, 50%, 90%, 100%, 96%) respectively as shown in table (2).

After application the program through posttest1 period nurse were documented a positive practice, they scored with high percentages of always practices in all items of checklist sclae. Unfortunately, those practices after period of posttest2 mostly document a decline in the percentages of always positive practices numbers in day care, except in practice of nystagmus assessment and abdominal girth they scored at sometimes with high percentages.

The significant differences between the pre and post tests, which reveals a significant improvement in daily care practices among nurses due to effitiveness of program content that convince the nurses to change their idea, knowledge, and behaviours in practices positively.

The finding of the study approves with the finding of the researchers Maarouf and Faltas (2020), in their study about application of guideline to care of external ventricular drain that showed the effectiveness of the guideline application in improving participants' practice.

In addition, the study by Elbilgahy and Mohammed (2019) in Egypt, documented the training program was effective in improving participants' practice.

Conclusion:

The study concluded that more than half of nurse's knowledge was scored at poor level, while more than half of nurses' practices were observed at some time practices before period of program application, pretest time. And most nurse's knowledge and practices were scored at good level after application the interventional program, during the period of posttest 1 and 2.

Recommendation:

Encourage nurses who work in neurosurgery unit to participate in continues educational programs and updating their knowledge about care of children with VP shunt. Provide an instructional brochure and posters for nursing staff periodically to help them improve their knowledge, and enhance their practice. Encourage researchers to study nursing practices based on evidence base.

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