

## Effect of Nursing Intervention program about Care Provided For Children Suffering from Favism on Nurses' Performance

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### Abstract:

**Back ground:** Favism is potentially life threatening hemolytic anemia that can result from the ingestion of fava beans and broad beans. The precipitating factor for Glucose-6-phosphat dehydrogenase deficiency is commonly infection exposure to some medications or chemicals. **The aim of study** was to determine the effect of nursing intervention program about care provided for children suffering from favism on nurses' performance.

**Subjects & Method.** A quasi experimental research design was used. Fifty nurses, twenty four from Hematology and Oncology Unite at Tanta University Hospital, and twenty six from Pediatric department at KaferElsheikh General Hospital. **Two tools** were used to collect data:- A Structured Interview questionnaire sheet to assess Nurses' Knowledge, and Practice observational checklist. **Results:** Total scores of nurses' knowledge and practice for the majority of the studied nurses showed poor knowledge and unsatisfactory practice before applying the study intervention program related to favism children, while immediately, and three months after nursing intervention program the total scores of nurses' knowledge and practice significantly improved.

**Conclusion:** A significant improvement in the mean scores of total level of knowledge and practice is achieved immediately, and three months after implementation of the nursing intervention program. **Recommendations:** In-service training programs should be conducted periodically to refresh nurses' knowledge and practice. Booklet should be available to nurses who provide nursing care for favim children.

**Key words:** Care provider, Favism, Nursing Intervention, Nursing performance.

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### I. Introduction

Glucose 6 Phosphate dehydrogenase is a metabolic enzyme is involved in pentose phosphate pathway, especially important in red blood cell metabolism it also protects red blood cells from the effects of potentially harmful molecules called reactive oxygen species. <sup>(1)</sup>Glucose-6- Phosphate dehydrogenase deficiency is an inherited disorder. Lack of the enzyme G6PD means that red blood cells can be damaged and destroyed when the person is exposed to some chemicals or during some infections. This can lead to mode rate or severe hemolytic anemia deficiency is replaced over the few weeks following the damage. <sup>(2)</sup>Favism is formally defined as hemolytic response to the consumption of broad beans Favism is disorder characterized by hemolytic reaction to the consumption of broad beans all individual with favism show G6PD deficiency however not all individuals with G6PD deficiency show favism. <sup>(3)</sup>Male to female ratio male cases are overrepresented compared with female cases males are homozygous for the G6PD gene; therefore the expression is either normal or deficient in contrast, in females who have two copies of the gene on each chromosome, the gene expression can be homozygous inheritance in females. <sup>(4)</sup>

Manifestations of hemolytic anemia are paleness, dizziness, headache, tea-colored urine, and abdominal or back pain or both. Hemolytic anemia, when very severe, can end in death. Destroyed red blood cells are brought to the liver to be broken down to smaller pieces for disposal. Which products bilirubin, accumulates in the skin and causes it to appear yellowish. In the worst cases, bilirubin accumulates in the brain and causes mental retardation or death. <sup>(5, 6)</sup>

Blood transfusions in acute phase of hemolysis should be necessary, or even dialysis in acute renal failure blood transfusion is an important symptomatic measure, as the transfused red cells are generally not G6PD deficient and will live a normal lifespan in the recipient's circulation. Splenectomy may benefit in some children this is an important site of red cell destruction folic acid should be used. <sup>(7)</sup> Avoidance of the drugs and

foods that cause hemolysis, vaccination against some common pathogens as, hepatitis A and hepatitis B may be the most important measure of prevention G6PD. <sup>(8)</sup>

Parent measures to prevent a hemolytic crisis. Tell child's pediatrician that your child has G6PD deficiency. This is very important so that he will not prescribe oxidative drugs in case your child gets ill. Keep your list of oxidative substances in a handy place. Always double-check food, beverage, and medicine labels against the list, be alert for the signs and symptoms of hemolytic anemia. Bring your child to his pediatrician as soon as these signs and symptoms appear. Do not ignore infections. Teach your child gets older, honestly and gently tell him about his condition and teach him to be careful about what he eats. <sup>(9,10)</sup>

**Aim of the Study:**

**The aim of this study is to:** Determine the effect of nursing intervention program about care provided for children suffering from favism on nurses' performance.

## **II. Subjects and Method**

### **Research Design**

A quasi experimental research design was used in the study

### **Setting:**

The study was conducted at Pediatric Hematology and Oncology Unit of Tanta Main University Hospital, and Pediatric Department at KaferElsheikh Hospital Affiliated to Ministry of Health.

### **Subjects:**

A convenience sampling of 50 nurses working in above previously mentioned settings.

### **Tools of data collection:**

Two tools were used to collect the necessary data.

### **Tool I: Structure Interview questionnaire sheet for nurses who provide direct care for favism children:**

It was used to assess the nurses' knowledge and skills regarding children with favism. It included the following parts:-

**Part I: Socio- demographic characteristics of the nurses included in the study** such as: age, education, marital status, and level of years of experiences.

### **Part II: Nurses' knowledge assessment questionnaire sheet.**

Group of questions assessed the nurses' knowledge regarding the care which provided for children with favism in acute stage: knowledge of the nurses regarding favism as definition, causes, signs, and symptom of favism, treatment, and complication.

### **A scoring system for nurses' knowledge: was followed as:**

- Correct & complete answer was scored (2).
- Correct & incomplete answer was scored (1).
- Wrong answer or don't know was scored (0)

### **The total score of nurses' knowledge were classified as follow:**

- From 75-100% were considered good level of knowledge.
- From 65% to less than 75% were considered fair level of knowledge.
- Less than 65% were considered poor level of knowledge.

### **Tool II: Nurse's practice observation checklist:**

An observation check list was developed by the researcher to assess the nurses' performance during the care of children with favism in acute stage. It was used for observing every nurse during different nursing procedures. It was included as following procedures: Child physical assessment, checking child vital signs, administration of medication (intravenous fluid), receiving blood transfusion, provide safety for hospitalized child, administration of oxygen therapy, laboratory investigation (drawing complete blood sample, urine analysis), documentation, and discharge plan.

### **Scoring system for nurses' practices was classified as the follow:**

- Done was scored (1).
- Not done was scored (0).

### **Scoring system for nurses' practices was classified as the follow:**

- From 70% and more were considered satisfactory.
- From 69% and less was considered unsatisfactory.

**Method:**

**1-Administrative Process:-**

Permission was directed to the responsible authorities of Hematology and Oncology uniteat Tanta University, and Pediatric Department at KaferElsheikh Hospital Affiliated to Ministry of Health.In order to obtain their approval to collect the data and facilitate the research implementation after explaining its purpose.

**2- Ethical considerations:**

- Nature of the study didn't cause any harm or pain to the participating of the study.
- Confidentiality and privacy were taken into consideration regarding the data collection.

**3- Tool development:**

The researcher distributed the (tool II) to the nurses to collect data as the end of shift or during the work time.

- The researcher was assessed nurses' knowledge by using (tool II) to fillet and returned back to the researcher.
- Every nurse was observed by the researcher during morning and afternoon shift to assess the practice while providing care for children with favism through using observational checklist Tool II.

**4-Content validity of the tools:** The tools of the study had been tested for content validity by 5 jury experts in the field of Pediatric Nursing and modification was carried out accordingly.

**5- Content reliability:** -to assess reliability, the study tool was tested using (Tool I, II) Cronbach's Alpha which was tested = 0.950.

**6- A pilot Study:** A pilot study was carried out on 10% of the study sample to test the clarity, applicability and consistency of the different items of the study tools and time needed for each one. It was excluded from the study sample.

**Phases of the study:**

**1- Assessment phase:** It was carried out by the researcher for all nurses to assess their knowledge related to favism and their care related to favism children using (**tool I**).

The researcher was available 2 days per week in the previously mentioned setting to assess the actual nurses' practice before, immediately after and three

months after implementation of intervention guidelines (**Tool II**). As all the studied nurses were observed during pre and post-program intervention for favism disease during all period of morning shift.

**2- Planning phase:** It was based on the result of questionnaire, observational checklist and reviewing the most recent related literature and program was involved. Preparation of teaching was chosen. It included the following steps:

- Setting objectives
- Preparation of the content which covered the reasons behind the application of the session.
- The studied nurses were divided into five groups and each group was included five nurses.

**3- The program implementation phase:** The program was carried out at Hematology and Oncology Unite of Tanta University, and Pediatric department at KaferElsheikh General Hospital according to nurses' work place. The program consists of five sessions. The action plan was done through a structure interview with the nurses. The suitable media for teaching nurses as lecture, video, group discussion, demonstration, and remonstrations were used during the program presentation according to the content of each session. Every session lasts form 30-40 minute.

Nurses were divided into five groups according to the number of nurses where presented in each unite and each group included in the study in 5 session. Infer nurses did not attend the session for any reason, the content of the session were explained to them later or when they come for the next session as a review with others, Each group has attended the following sessions:

- **The first session:** At the beginning of the initial interview, an orientation to the program and its objectives took place. It covered the following topics: informing nurses about favism including: definition, causes, manifestation, diagnosis, complication, and management. By the end of first session nurses were able to define favism, mention causes, manifestation, management and complication of favism they were also able to mention and list all topics discussed in this session.

- **The second session:** It was began with review the concepts which was previously presented in the first session and progressed to the next level which focuses on: explanation about child physical assessment, measure child weight, and height. Checking child vital signs temperature, pulse, and respiration. The content presented to nurses through demonstration of related skills.

- **The third session:** It was focused on demonstration of different steps of nursing intervention for favism children through demonstration of administration of IV fluid, and blood transfusion practice. At the end of the session nurses' questions were answered.

- Provide safety for hospitalized child..

- **The fourth session:** It was concentrated on reviewing the points previously instructed, demonstrating about assisting in laboratory investigation (dawning blood sample, and urine sample) and oxygen therapy through demonstration on child.

- **The fifth session:** It was concentrated on providing education program for nurses about safety measure, documentation, and discharge plan. The content presented to nurses through discussion of related concepts.

**4-Evaluation phase:** The program implementation was evaluated pre, immediately, and three months after implementation of education program using constructed tools II.

**Statistical analysis:**

The collected data were organized, tabulated and statistically analyzed using SPSS software. For quantitative data, mean and standard deviation were calculated. For qualitative data, using Chi-square test ( $\chi^2$ ). For comparison between means of two groups of parametric data Z value of Mann-Whitney test was used. F or comparison between more than two means of parametric data, F value of ANOVA test was calculated. For comparison between more than two means of non-parametric data, Kruskal-Wallis ( $X^2$  value) was calculated. Correlation between variables was evaluated using Pearson's correlation coefficient (r).

### III. Results

Table (1) shows the percentage distribution of socio demographic characteristics of studied nurses. It was presented that a half of studied sample (50%) had age more than 30 years old while only (6%) of studied nurses less than 20 years old with mean  $\pm$  SD (12.5 $\pm$ 8.812). The result also pointed out that the majority of studied sample (86%) was married, and (8%) widow.

Regarding to years of experience this table show more than two third (66%) of studied sample more than three years of experience with mean  $\pm$  SD (10  $\pm$ 9.66). While only (6%) less than one year of experience. It also presented that half of studied nurses (50%) have Diploma degree 3 year on the other side there are (32%) have Technical nursing institute while only (16%) have Bachelor degree. It also demonstrate that slightly more than half (52.00%) of studied nurses at have training program on hematology.

Table (2) presented the nurses knowledge regarding to blood, and favism it demonstrate that the majority (80%) of studied nurses have incorrect answer regarding to number of red blood cells for children, and slightly less than half (46%) of studied nurses regarding to composition of human blood, and hemoglobin level pre implementation of nursing education program. While immediately after application of nursing education program the result revealed that the majority of studied sample (96%, 92%) have correct answers for the same knowledge with (p=0.00\*\*).

Regarding to immediately after program the result reveals that all studied (100%) nurses have correct knowledge related to complication of favism, indication of blood transfusion, nursing precaution for infection control. It also shows that studied sample mentioned the same result (80%) of correct answers after three months of implementation of nursing education program regarding to definition of favism, precaution when drawing blood sample. There was highly statistical significant value was found

Table (3) Illustrates percentage distribution of studied nurses related to knowledge regarding to documentation and discharge plan. It revealed that only nearly one third (30.00%) have incorrect answers related to health education to child and his mother, and less than half (44.00%) related importance of nursing documentation pre implementation of nursing education program, while nearly two third (60.00%) have correct answers regarding to accident may occurs to child during hospitalization.

Regarding to immediately after implementation of nursing program the result pointed out that nearly all of studied have correct answers regarding nurse's knowledge regarding to documentation and discharge plan. Regarding to after three months of program implementation the result revealed that only (8.00%) of studied sample have incorrect answers related to child safety to prevent medication poisoning, and health education to child and his mother. The result also pointed out there was statistical significant value was found for knowledge of studied nurses related to nursing care in acute stage for favism children with (p=0.000\*\*). Table (4): illustrated percentage distribution of total studied nurses knowledge related to nursing care for favism children. Before the program implementation the study pointed out that slightly more than two third (64%) of total knowledge scores of studied nurses were poor, while fair and good with percentage (28%, and 8% respectively) with Mean  $\pm$  SD (28.00 $\pm$ 5.76). Whereas immediately after implementation of the program the total score of knowledge for all nurses was good with percentage (96% respectively).

Table (5) illustrates percentage distribution of studied nurses according to their performance of physical assessment for favism children. It was

found that slightly more than one third (34%) of studied nurses performance for inspection of skin in preprogram was done while immediately after the implementation of nursing program the majority of studied sample (96%) was done inspect child skin but after three months of the program implementation the result pointed that only (24%) done this practice. Regarding to performance of studied nurses immediately after implementation of the program the result show the majority of studied sample was done in all practice of physical assessment procedure for favism children. It also show that studied nurses' performance was equal in practice of inspection of skin lesion, color, hair, trauma, eye color, deformities, level of consciousness, balance. No statistical significant difference was found with (p=0.802-0750).

This table also shows the performance of studied nurses who not done before implementation of nursing education program was decline in the most practice of procedure especially in communication skills, and memory. After three month of the program it was found that half (50%) of studied nurses have done practice of inspection child shape, color communication skills. No statistical significant difference was found with ( $p=0.443-0.640$ ). After three months of program application the result pointed out that slightly less than half (48%) of total scores of studied nurses was good while (46%) was faire. In addition, the effect of the program implementation on nurses had significance difference on the total of knowledge about nursing intervention for a favism child was found ( $p=0.000^{**}$ ). The difference between pre, immediate and three months after implementation of nursing program were statistically significant ( $X^2=108.936$ ).

Table (6) reveals percentage distribution of studied nurses according to their performance regarding to blood transfusion. It was noticed that half (50%) of the studied nurses performance preprogram haven't done reviewing doctors' orders for blood component transfusion with date, time, of transfusion, duration and any pre-transfusion & post transfusion will be administering , and slightly more than half (52%) haven't done practice of remain with child during the first 15 min. of a transfusion , and nearly two third (62%) haven't done obtain patient's transfusion history, and note know allergies including previous transfusion reaction perform hand hygiene and apply clean gloves and appropriate attire.

The table also demonstrates that studied nurses who have done practice of blood transfusion in immediately after implementation of the program have (100%) scores obtain blood component from blood bank following agency protocol, monitor IV site and status of infusion each time vital signs are taken, and nearly all (98%) have done heck that child has properly completed and signal transfusion consent before ret receiving blood check the appearance of blood of blood product for leaking bubbles, clots, or purplish color, check expiration date and time Set all clamp to off position, hang the bag on an IV pole, and prime tubing, open the upper clamp on normal saline side of tubing and squeeze the drip chamber unit fluid cover the filter and one third to one half of the drib chamber.

This table also shows all the studied nurses in both setting have scored performance preprogram less than their performance immediately and three months after implementation of the program in their performance after blood transfusion with no statistical significant different was found with ( $p=0.994-0.977-0.726$ ).

Table (7) clarified percentage distribution of total scores of studied nurses related to their practice of. It was notice that all studied nurses are not satisfied before implementation of nursing education program, while all studied nurses immediately after implementation of nursing education program were satisfied. The result pointed out that the majority (90%) of studied nurses after three months of program implementation was satisfied. It also shows the difference between pre, immediate and three months after implementation of nursing program were statistically significant ( $p=0.000^{**}$ ).

Table (8) shows the correlation between total knowledge and practice score in relation to the time of program implementation. It was revealed that there were a positive correlation between total knowledge scores of the studied nurses before, immediately after and three months after implementation of the nursing program and the total practice scores of nursing intervention for favism children before, immediately after and three months after implementation of the program with ( $r =0.120, r = 0. 228, r =0.413$ ) respectively..

**Table (1): Percentage distribution of studied nurses regarding to socio demographic characteristics.**

Socio demographic characteristics	Total	
	No	%
<b>Age</b>		
< 20 years	3	6.00
20 - < 25 years	4	8.00
25 - < 30 years	18	36.00
> 30 years	25	50.00
Mean±SD	12.5±12.13	
<b>Marital Status</b>		
Married	43	86.00
Single	3	6.00
Widow	4	8.00
<b>Experience</b>		
< 1 year	3	6.00
1 - < 2 years	4	8.00
2 - < 3 years	10	20.00
> 3 years	33	66.00
Mean±SD	12.5 ±9.34	
<b>Qualification</b>		
Diploma 3Y	25	50.00
Nursing Institute	16	32.00
Bachelor	8	16.00
Other	1	2.00
<b>Training</b>		
Yes	24	48.00
No	26	52.00

**Table (2): Percentage distribution of studied nurses' knowledge regardingto favism.**

Nurses' knowledge regarding to blood.	Pre				Immediate				After three months				χ <sup>2</sup>	P-value
	Incorrect		Correct		Incorrect		correct		Incorrect		correct			
	No	%	No	%	No	%	No	%	No	%	No	%		
Composition of human blood	23	46.00	27	54.00	2	4.00	48	96.00	10	20.00	40	80.00	25.12	0.000**
Red blood cells count	40	80.00	10	20.00	6	12.00	44	88.00	13	26.00	37	74.00	54.03	0.000**
Hemoglobin level	23	46.00	27	54.00	4	8.00	46	92.00	10	20.00	40	80.00	20.31	0.000**
Define favism	30	60.00	20	40.00	3	6.00	47	94.00	10	20.00	40	80.00	38.41	0.000**
Causes of favism	28	56.00	22	44.00	5	10.00	45	90.00	7	14.00	43	86.00	33.21	0.000**
Predisposing factors of favism	23	46.00	27	54.00	4	8.00	46	92.00	9	18.00	41	82.00	21.27	0.000**
Manifestation of favism														
Contraindicated food for favism child	19	38.00	31	62.00	2	4.00	48	96.00	6	12.00	44	88.00	21.41	0.000**
Complication of favism	35	70.00	15	30.00	6	12.00	44	88.00	5	10.00	45	90.00	54.62	0.000**
Precaution when drawing blood sample	20	40.00	30	60.00	0	00.0	50	100.00	13	26.00	37	74.00	24.01	0.000**
Indication of blood transfusion	38	67.00	12	24.00	1	2.00	49	98.00	10	20.00	40	80.00	67.71	0.000**
Nursing action when child admitted in hematology ward	33	66.00	27	54.00	0	00.00	50	100.00	8	16.00	42	84.00	46.82	0.000**
Nursing precaution for infection control	35	70.00	15	30.00	4	8.00	46	92.00	12	24.00	38	76.00	46.17	0.000**
Diagnosis of favism	20	40.00	30	60.00	0	00.00	50	100.00	4	8.00	46	92.00	33.33	0.000**

\* Significant at p-value < 0.05      \*\* Significant at p-value < 0.01

**Table (3): Percentage distribution of studied nurses' knowledge regarding to documentation and discharge plan.**

Nurses knowledge regarding to documentation and discharge plan.	Pre				Immediate				After three months				$\chi^2$	p-value
	Incorrect		Correct		Incorrect		Correct		Incorrect		Correct			
	No	%	No	%	No	%	No	%	No	%	No	%		
Importance of nursing documentation	22	44.00	28	56.00	3	6.00	47	94.00	6	12.00	44	88.00	25.45	0.000**
Accident may occurs to child during hospitalization	20	40.00	30	60.00	2	4.00	48	96.00	8	16.00	42	84.00	21.00	0.000**
Child safety to prevent medication poisoning	35	70.00	15	30.00	0	00.00	50	100.00	4	8.00	46	92.00	76.30	0.000**
Health education to child and his mother	15	30.00	35	70.00	1	2.00	49	98.00	4	8.00	46	92.00	18.81	0.000**

\* Significant at p-value < 0.05      \*\* Significant at p-value < 0.01

**Table (4): Percentage distribution of total studied nurses' knowledge regarding to nursing care for favism**

Total knowledge score	Before program implementation		Immediate after implementation		After three months of program implementation	
	(n = 50)	%	(n = 50)	%	(n = 50)	%
Poor (>56%) Faire(65->75%)	32	64.00	00.00	00.00	3	6.00
Good(75-100%)	14	28.00	2	4.00	23	46.00
	4	8.00	48	96.00	24	48.00
Mean± SD	28.00±5.76		39.02±1.57		35.10±2.95	
$\chi^2$ (p-value)	108.936 (0.000**)					

\* Significant at p-value < 0.05      \*\* Significant at p-value < 0.01

**Table (5): Percentage distribution of studied nurses about their practice of physical assessment for favism children.**

Physical assessment	Pre				Immediate				After three months				$\chi^2$	p-value
	Done	%	Not	%	Done	%	Not done	%	Done	%	Not done	%		
Quite room.	32	64	18	36	48	96	2	4	42	84	8	16	0.271	0.873
Child color	36	72	14	28	50	100	0.00	0.00	42	84	8	16	0.25	0.939
Inspection of skin.	17	34	33	66	48	96	2	4	38	76	12	24	0.442	0.802
skin lesion	11	22	39	78	49	98	1	2	28	56	22	44	0.575	0.750
Nail Color	33	66	17	34	49	98	1	2	37	74	13	26	0.084	0.959
Distribution of Hair	22	44	28	56	48	96	2	4	36	72	14	28	0.663	0.718
cleanliness	23	46	27	54	49	98	1	2	39	78	11	22	0.202	0.904
fontanels	13	26	37	74	45	90	5	10	29	58	21	42	0.646	0.724
trauma	14	28	36	72	47	94	3	6	32	64	18	36	0.210	0.900
eye color	28	56	22	44	47	94	3	6	37	74	13	26	0.048	0.976
nose (size, shape)	27	54	23	46	46	92	4	8	34	68	16	32	1.153	0.562
Mouth.	21	42	29	58	41	82	9	18	32	64	18	36	4.536	0.104
Limb colour	7	14	43	86	40	80	10	20	28	56	22	44	0.883	0.643
Discoloration of joint	11	22	39	78	45	90	5	10	30	60	20	40	4.835	0.089
Movement	12	24	38	76	42	84	8	16	30	60	20	40	1.251	0.535
Plume colour	26	52	24	48	44	88	6	12	37	74	13	26	0.109	0.947
Communication skills.	7	14	43	86	36	72	14	28	22	44	28	56	0.128	0.938
Memory.	10	20	40	80	34	68	16	32	23	46	27	54	1.630	0.443
Language development.	11	22	39	78	39	78	11	22	28	56	22	44	0.893	0.640
Consciousness.	16	32	34	68	44	88	6	12	31	62	19	38	1.284	0.526
Balance.	20	40	30	60	44	88	6	12	33	66	17	34	1.638	0.441

\* Significant at p-value < 0.05      \*\* Significant at p-value < 0.01

**Table (6): Percentage distribution of studied nurses about their practice of blood transfusion for favism children.**

Blood transfusion	Pre				Immediate				After three months				$\chi^2$	p-value
	Done	%	Not Done	%	Done	%	Not Done	%	Done	%	Not Done	%		
Review doctor order for blood component transfusion.	25	50	25	50	41	82	9	18	44	88	6	12	2.534	0.282
Obtain child transfusion history.	19	38	31	62	46	92	4	8	42	84	8	16	1.267	0.531
Ensure that IV cannula is patent.	26	52	24	48	48	96	2	4	47	94	3	6	0.013	0.994
Check signal transfusion consent before receiving blood.	37	74	13	26	49	98	1	2	49	98	1	2	0.085	0.959
Obtain blood component from blood bank.	42	84	8	16	50	100	0	0	50	100	0	0	0.047	0.977
Check the appearance of blood product.	43	86	7	14	49	98	1	2	49	98	1	2	0.406	0.816
Record blood match.	39	78	11	22	48	96	2	4	49	98	1	2	0.175	0.916
Check child blood type and RH.	39	78	11	22	48	96	2	4	50	100	0	0	0.387	0.824
Check expiration date and time on unite of blood.	35	70	15	30	49	98	1	2	47	94	3	6	0.002	0.999
Check the child first and last name	20	40	30	60	48	96	2	4	42	84	8	16	0.342	0.843
Perform hand hygiene and apply clean gloves.	19	38	31	62	47	94	3	6	46	92	4	8	1.106	0.575
Open Y tubing blood.	27	54	23	46	47	94	3	6	46	92	4	8	0.112	0.946
Set all clamp(s) to off position	31	62	19	38	49	98	1	2	49	98	1	2	0.115	0.944
Hang the bag on an IV pole.	33	66	17	34	49	98	1	2	45	90	5	10	0.119	0.942
Close normal saline clamp	33	66	17	34	47	94	3	6	46	92	4	8	0.581	0.748
Maintaining asepsis.	37	74	13	26	46	92	4	8	47	94	3	6	0.435	0.805
Open common tubing clamp and regulate blood infusion.	33	66	17	34	47	94	3	6	47	94	3	6	0.478	0.788
Remain with child during the first 15 min.	24	48	26	52	48	96	2	4	45	90	5	10	0.640	0.726
Monitor child vital signs	26	52	24	48	47	94	3	6	39	78	11	22	0.165	0.921
If no transfusion reaction regulates or rate.	29	58	21	42	48	96	2	4	38	76	12	24	0.868	0.648
Clear IV line with 0.9% saline.	14	28	36	72	42	84	8	16	41	82	9	18	0.201	0.904
Appropriately dispose of all supplies.	20	40	30	60	45	90	5	10	46	92	4	8	1.386	0.500
Monitor IV site and status of infusion each time vital signs are taken.	34	68	16	32	50	100	0	0	47	94	3	6	0.211	0.900
Observe for any changes in vital signs.	34	68	16	32	49	98	1	2	46	92	4	8	0.319	0.853
Observe child and assess laboratory values.	30	60	20	40	48	96	2	4	46	92	4	8	1.338	0.512

\* Significant at p-value < 0.05      \*\* Significant at p-value < 0.01



**Table (7): Percentage distribution of total practice score of studied nurses that provide nursing intervention for favism children.**

Total practice score	Before		Immediate		After		$\chi^2$ (p-value)
	NO	%	NO	%	NO	%	
un satisfied	50	100.00	0	00.00	5	10.00	130.622 (0.000**)
satisfied	00.00	00.00	50	100.00	45	90.00	
Mean	158.02		296.90		249.76		
SD	30.571		16.375		25.411		

\* Significant at p-value < 0.05      \*\* Significant at p-value < 0.01

**Table (8): Correlation between total knowledge and total practice score about care provided for favism children.**

Total knowledge scores	Total knowledge scores		
	The study sample (n=50)		
	Before	Immediate	Three months after
	r P	r P	r P
Before	0.020 0.888		
Immediate		-0.008 0.957	
Three months after			-0.029 0.844

\* Significant at p-value < z 0.05      \*\* Significant at p-value < 0.01

#### IV. Discussion

The present study revealed that, about half of the studied nurses were aged over thirty year, while the majority of them were married, and all of them were female. In relation to studied sample experiences, it was found that more two third more than three years indicate. At that time a half of the studied samples were diploma degree. This finding is disagreement with similar study of **Fathy, and Lamia (2008, 2012)** who mentioned that the majority of the study sample were males.<sup>(11, 12)</sup>

In the present study, half of the studied nurses had nursing diploma, while only had Bachelor degree **The American Association of Colleges of Nursing (AACN) 2016** who believes that education has a significant impact on the knowledge and competencies of the nurse clinician, as it does for all health care providers. Nurses with Bachelor of Science in nursing degrees are well-prepared to meet the demands placed on today's nurse. They are prized for their skills in critical thinking, leadership, case management, and health promotion, and for their ability to practice across a variety of inpatient and outpatient settings.<sup>(13)</sup>

According to the present study findings, the majority of the studied nurses reported had training courses about hematology care. Similar findings were described in studies of **Salem (2015), and Zaton (2007)**<sup>(14, 15)</sup>. Who mentioned that. The present study revealed association of no statistical significance difference between nurses' knowledge and practice from one side and their attendance courses from other side preprogram. This lake might be duo to the content and training process in adequate and willingness of participants to actively share and get the most benefits. Thus, **Rappaport (2016)** disagreement with this study finding,<sup>(16)</sup>

This study illustrated that the majority of studied nurses' knowledge related to blood, and favism were poor preprogram implementation related to nursing intervention for favism children in acute stage. Meanwhile knowledge of studied nurses was improved and was satisfied immediately after program implementation. Also it was obvious that there was highly significant statistically difference between studied sample knowledge regarding favism children care pre, immediate, and three months after program implementation. This finding was in agreement with **Hamilton (2014)**,<sup>(17)</sup> who mentioned that was found a highly significant statistically difference between parent knowledge regarding to G6PD pre and post program. This is lack of knowledge per program may be related to the majority of studied nurses have diploma degree nurses in the, science of nursing diploma degree program may not give much emphasis to basic sciences. These agreements with **Kubota (2016)** who mentioned that lack of knowledge has been related to lack of patient adherence and compliance to medication.<sup>(18)</sup>

The current study clarified that, the majority of the studied nurses also had low performance of physical assessment of favism children. The study showed no statistical difference in nursing practice about physical assessment of child pre and immediately after the program, this result not agreement by **Amer, (2013)** who reported that the in service training program has a beneficial effect in improving the nurses' knowledge and skills. **Shymaa et al (2011)**. Who supported this statistically significant difference in level of nurses' knowledge and skills pre, and post test for children with favism. Also recommend that educational programs should be organized according to the needs of nurses with continues evaluation.<sup>(19, 20)</sup>

The present study show statistically significant different in level of nurses practice about blood transfusion, measuring body temperature, pulse, respiration, drawing blood sampling, and documentation on pre, immediately, and after three months of program, this may be related to lack of in serves training program for nurses, this result supported by **Abd-Allah (2000)** who mentioned that the in serves training program has been beneficial effect in improving the nurse knowledge and skills. Also recommended that the educational program should be organized according to needs of nurses with continues evaluation.<sup>(21)</sup>

In relation to nurses knowledge and practice related to blood and blood transfusion the current study revealed a great improvement in knowledge and score about, blood, blood transfusion and complication of transfusion after application of nursing intervention program. This may related to the majority of studied nurses age above 30 years the score of knowledge was high in nurses whom years of experience over three years and whom attended previous training program about blood transfusion.

These results are agreement with of **Meyer, and Elliot (2012)**<sup>(22)</sup> who reported that nurses knowledge scores were higher among younger and newly graduated nurses who attend training program. In the same line; a study that was conducted in orthopedic department of **Ghanem, (2009)**.<sup>(23)</sup> entitled as "effect of training program on the quality of nursing care to old patient in Orthopedic Department of Assuite Hospital" on all nurses working in orthopedic department which revealed that there was statistical significant relation between nurses knowledge with their duration of experience. This result was disagreement with those of **Abd Al-Magid,(2011)**

who notice that nurses knowledge scores were higher among younger and newly graduated nurses who attending nursing care standards for cancer patients undergoing chemotherapy.<sup>(24)</sup>

Regarding total nursing practice, the mean scores related to nursing care for children with favism disease, the results of the present study revealed that the total scores of all nurses' practice significantly improved immediately after and three months after the program implementation than before. This may be attributed to lack of nurses' evaluation against identified practice of favism child care and lack of periodic evaluation of nursing practice by the hospital administration to detect points of strength and weakness to act on, enhancing and updating nurses' knowledge and practice besides improving the quality of nursing intervention children.

In the same line the present study pointed out that the all of studied nurses had unsatisfactory practice score before the implementation of nursing education program. While immediately and three months after the result revealed that the majority of studied had satisfactory practice score with significant improvement. This result was in the agreement with **Taha (2015)** also stated that the nurses' practice after intervention guidelines demonstrated significant improvement, which extended throughout the follow-up.<sup>(25)</sup>

Result could be attributed to the fact that works for the nurses became a habit and lack of concern among the hospital to provide administrative supervisors responsible for ensuring from implementation of infection control in each department. In addition, limited educational level with older age for some nurses might be interfere with their performances and provided safe and

effective nursing care. Moreover, this was attributed to their attitude of "leave it to god" and negligence.

Unfortunately, the findings of the present study revealed that totally, the majority of nurses in the study sample demonstrated adequate practice. Their practice was not significant related to any of their personal characteristics. Moreover, it had significant relation to their total knowledge. This is might be related to the small sample size in our study. However, the findings are disagreement with **Mohammed, and Saleh,(2008)**<sup>(26)</sup>

<sup>27)</sup> who, in two studied at Zagazig University Hospital, found no significant relation between nurses' knowledge and practice. On the same line, studies of **Al-Rawaifah, (2015)** in Jorgen who mentioned that no a gap between nurses' knowledge and practice.<sup>(28)</sup>

## V. Conclusion

Based on the findings of the present study, it can be concluded that there was a significant improvement in the mean scores of total level of knowledge and mean scores of total level of practice immediately and three months after implementation of nursing intervention program about care provided for children suffering from favism. Also there was a positive correlation between total knowledge scores among the studied nurses and total practice scores of nursing intervention for children with favism disease.

## VI. Recommendation

- 1- In service training programs in Hematology Units should be conducted periodically and regularly to update nurses' knowledge and practice regarding blood diseases and nursing care provided for children suffering from favism.
- 2- Hematology unit should be organized within KaferElsheikh General Hospital and equipped with the necessary educational facilities and material's necessary to update the knowledge and skills of practicing nurses which reflected a better child recovery.
- 3- Pretest for recent nurses in Hematology Unit, and periodic evaluation of nurses' knowledge and practice regarding to blood diseases.
- 4- Presence and reviewing children records for proper follow-up for child undergoing blood transfusion procedure. Following routine testing policies for favism children and blood diseases.
- 5- Providing procedures manual handbooks containing all necessary information about nursing care provided for favism children and mothers booklet contain prevented food, and medication to avoid hemolytic attack

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