

ORIGINAL RESEARCH

The effect of pre-hospital discharge care program on mothers' knowledge and reported practice for children after congenital heart surgery

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ABSTRACT

Heart surgery in children is done to repair heart defects for a child born with congenital heart defects and heart diseases. The aim of the study was to evaluate the effect of pre-hospital discharge care program on mothers' knowledge and reported practice regarding discharge care of children after congenital heart surgery. The study was conducted in the Heart Surgery Department at Abo-EL Riech University Children Hospital. The sample included 30 mothers and their children that were available during the period of data collection. Three tools were used to collect data including: Tool I: Interviewing questioner sheet of the participants categorized into two parts. Part I and part II: Personal characteristics of the children and their mothers. Tool II: Assessment of mothers' knowledge regarding care of children after congenital heart surgery. Tool III: Mother's reported care practice checklist. Results: The results of the present study revealed that there was a highly significant difference in all items of care knowledge (activity, food, medication and follow-up) before, after immediately and after one month from discharge program with highly significant statistically ($p < .001$). Discharge program improve mothers' knowledge and practice regarding care of their children after congenital heart surgery. Recommendations: Comprehensive, multidisciplinary discharge planning should design early and should include the mothers and children contain education regarding congenital heart surgery care.

Key Words: Congenital heart surgery, Mother, Children, Pre-hospital Discharge care program

1. INTRODUCTION

A congenital heart defect (CHDs) is a defect structural with the heart present at birth due to heart or blood vessels don't develop normally before birth, its range in severity from simple problems to very severe malformations, such as complete absence of one or more chambers or valves.^[1]

Congenital heart defects are the most common birth defects. CHDs are a leading cause of birth defect-associated infant illness and death.^[2,3] The second cause of death in infancy and

childhood, and are the leading causes of childhood morbidity and mortality especially in developing countries.^[4] About 25% of babies with a CHD have a critical CHD. Infants with critical CHDs generally need surgery or other procedures in their first year of life.^[5]

Congenital heart defect surgery corrects a heart defect that a child is born with it. Surgery is performed if the defect could harm the child's long-term health or well-being.^[6] Heart surgery in children is carried out to correct and repair con-

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genital heart defects and heart diseases needed surgery and hospitalization. The surgery is very important for the child's well-being.^[7,8]

Discharge care planning is the development of a personalized plan for the patient who is leaving a hospital, that aim to enhance mothers' discharge readiness and improve children outcomes.^[9] Discharge care is the role of a nurse. The nurse is responsible for providing mothers with adequate knowledge and instruction about the care of their children.^[10] Discharge planning in pediatric nursing can improve mothers' knowledge and confidence before discharge, reduce the readmission rate of the children, and promote the mother's caring competency.^[11]

Before mothers discharge from hospital with the child, the nurse will explain what to expect during the first few weeks, the activity instruction for child during this period, help the child when he is in pain, follow-up appointments to check on his recovery and overall progress, the exercises that the child needed to help improve his physical abilities, the person will contact when needing any questions. Some children leave the hospital and return easily to their normal daily routines, but most do not get over the effects of being in the hospital for a while. It's common to notice changes in the child's behavior when returning home, even if your child's surgery was minor. The child may need extra comforting and understanding for a short period of time.^[12]

1.1 Significance of the study

Congenital heart disease is a major cause of serious morbidity and mortality in pediatric. Heart disease is the leading cause of death.^[5] Congenital heart disease (CHD) accounts for 8 to 12/1,000 live births.^[13] In Egypt despite the routine recognition about Discharge care provided after heart surgery to help mothers in caring for their children, the mothers still needs program care to help them after open heart surgery with support, guidance, and prepare to care for their children to overcome this period successfully which provide the mothers with knowledge and practice for improving quality of care of their children after discharge from the hospital.

1.2 Aims of the study

- (1) Evaluate the effect of pre-hospital discharge care program on mothers and children after congenital heart surgery. Through:
- (2) Evaluate mothers' knowledge regarding discharge care of children after congenital heart surgery.
- (3) Evaluate the mother's reported practice regarding discharge care of children after congenital heart surgery.
- (4) Compare mothers' reported practice care of their children after heart surgery before and after the program.

1.3 Research hypotheses

The current study results test the following hypothesis. The pre-hospital discharge care program will enhance mothers' knowledge and reported practice of their children with congenital heart surgery.

2. SUBJECTS AND METHOD

2.1 Research design

The current study utilized a quasi-experimental design.

2.2 Setting

The study was conducted in the heart surgery department at Abo-EL Rieh University Pediatrics Hospitals University children Hospitals surgery.

2.3 Subjects

Convenience sample consisted of 30 (all available) mothers and their children with heart surgery during the period of data collection.

Inclusion criteria for children: 1) Children undergoing open heart surgery; 2) Both sexes, male and female; 3) Ageing from 6-24 months.

Inclusion criteria for mothers: Mothers willing to participate in the study.

2.4 Tools of data collection

Three tools were used to collect data which included:

Tool I: Interviewing questioner sheet of the participants categorized into two parts.

Part I: Children Baseline characteristics as age, sex, Birth order, child past history and type of Surgery.

Part 2: Mothers' Baseline characteristics as mothers' age, level of education, and occupation.

Tool II: Assessment of mothers' knowledge regarding care of their children after congenital heart surgery. As activities, rest, wound care, nutrition, medication, warning signs which inform the mothers attend to the hospital, and follow-up.

Scoring for knowledge: Each item assigned a completely correct answer was scored (2), the incompletely correct answer was scored (1), and don't know/incorrect answer was scored (0). The total scores of knowledge question were 42 score, above $\geq 65\%$ considered Satisfactory; meanwhile less than 65% were considered unsatisfactory.

Tool III: Mother's reported practice care check-list to evaluate the mothers' practice regarding caring of their children after congenital heart surgery as:

- Physical activity, which include activity intensity, patterns of activity and how to choose an activity place

for children after discharge.

- Incision care and prevention of infection.
- Child nutrition.
- Medication administration after discharge, the effects and side effects of the drugs, and how to give them.
- Dental care and Immunizations.
- Follow-up appointments and informed mothers the times of each appointment.

Scoring for practice: Each item was scored as 0 for not done, 1 for done but incomplete and 2 for done completely. Total practice score was classified as the following: adequacy practice $\geq 75\%$, and less than 75% considered inadequacy practice. The mean and standard deviation was calculated for each item.

2.5 Validity and reliability

Data collection tools were submitted to three experts of pediatric nursing to test the content validity. The experts agreed on the content, according to their review. Regarding reliability, the reliability coefficients alpha between questions was 0.72.

2.6 Ethical considerations

Ethical approval from the Nursing Faculty Ethical Committee of Benha University was obtained. Oral consent was obtained from children's mothers to participate in the current study after orally and in writing an explanation of the aim of the study, that participation was voluntary and their freedom to withdraw from the study at any point. Confidentiality of the information collected and anonymity is guaranteed.

2.7 Pilot study

The pilot study was carried out on 10.0% of the sample was three mothers to test the applicability and clarity of the study tools, as well as determine the time needed to fill the study tools and to find out any problem that may interfere with the process of collecting data. These mothers were excluded from the main study sample.

2.8 Fieldwork

The pre-hospital program conducted according to the following phases: Assessment, implementation, and evaluation phases. These phases were carried out from beginning of June 2017 to August 2017 covering three months. An official permission was granted from the Dean of the Faculty of Nursing and the director of Abo-EL Rish University Pediatrics Hospitals in order to obtain their approval for conduction of the research after explaining its purpose. The previous mentioned settings were visited by the researchers two days/week Sunday and Thursday from 11.00 and extended to 2 hours.

The average time consumed to fill in the tools was 45 minutes.

2.8.1 Pre-hospital discharge program

The Pre-Hospital discharge Program was designed by the researchers after extensive review of related literature.

The first part of the Pre-Hospital discharge Program was conducted 7 days prior to child discharge from the hospital based on the expectation of the Cardiologist. It focused on: gave the mothers description about CH surgery, assessed her knowledge about CH surgery and her reported practice.

The second part of the Pre-Hospital discharge Program provided by the researchers post program immediately included a half-hour session with each mother to evaluate her knowledge and reported practice.

The third part of the Pre-Hospital discharge Program provided by the researchers post follow-up care after 1 month post-discharge of each child during each follow-up to reinforce the mother's knowledge and reported practice which provided during first part of the program.

2.8.2 Assessment phase

This phase encompassed interviewing the studied mothers to collect general data, at the beginning of the interview the researchers greeted the mothers, introduced themselves to each participant included in the study, explained all information about the study purpose, duration, and activities and taken an oral consent. The researchers used tools I, II and III the average time for the completion of each participant interview was around (30-45 minutes); average number collected was 2-3 participant/day.

2.8.3 Planning phase

Discharge program was designed by the researchers after an extensive review of related literature and the needs identified in the assessment phase. The program included illustrated Arabic booklet involve instructions to improve mothers' knowledge and her practice about discharge care of their children with congenital heart surgery. The instructions were presented via: a question/answer session; a discussion session; demonstration and re-demonstration; and printed materials. Different methods of teaching and instructional media were determined accordingly.

2.8.4 Implementation phase

The total number of sessions were 4 sessions it divided as following: A total two sessions for theoretical part: each session took 30 minutes with total hours of (60) hours for theoretical contents related to discharge care of congenital heart surgery children the studied mothers were divided into 3 groups then 6 subgroups, each group consisted of 5 mothers. The two

practical part sessions the mothers' practices it included care activity as nutrition, wound care, medication, follow-up, rest, dental, immunizations and activity. At the beginning of each session, the researchers started by a summary about what was given through the previous session and objectives of the new one, taking into consideration using simple and clear language to suite the mothers. Each mother of all studied groups obtained a copy of the discharge program in Arabic language booklet included all topics. An open channel communication was achieved between researchers and mother to ensure understanding, answer any question and to verify information given.

2.8.5 Evaluation phase

The mothers' knowledge and reported practice was evaluated post program immediately and after 1 month from implementation of Pre-Hospital discharge Program used tools II and III during each follow-up visit at outpatient clinics . The researcher evaluated and compared the effect of Pre-Hospital discharge Program on mothers' knowledge, reported practice pre, post program immediately and after 1 month.

2.9 Statistical analysis of data

The collected data were categorized, tabulated, and analyzed using the SPSS computer program Version 21. Numerical data were expressed as frequency and percentage. Qualitative data were expressed as the mean and standard deviation. The paired-sample *t*-test was used to compare the mothers' knowledge and reported practice mean scores at pre-test, for comparison between pre and immediately training. Correlation among variables was done using Pearson correlation coefficient. The level of significance at *p* < .05, .01, .001 were used as the cut of value for statistical significance.

3. RESULTS

Table 1 showed baseline characteristics of studied children with heart surgery, 50% of child in the study group their ages from 6 to < 12 months. The highest percentages (56.7%) of the study group were male. 36.7% of an infant in the study group as the second infant in the family. also was found that 53.3% of an infant in the groups had the previous history.

Table 1. Percentage distribution of children according to baseline characteristics

Characteristics of studied children	(N = 30)	%
Age (months)		
6- < 12	15	50.0
12- < 17	8	26.7
17-24	7	23.3
M ± SD	9.9667 ± 1.71169	
Gender		
Male	17	56.7
Female	13	43.3
Past history		
Yes	16	53.3
No	14	46.7
Birth orders		
First	9	30.0
Second	11	36.7
Third and more	10	33.3

Figure 1 showed that the majority (46.7%) of children diagnosed with congenital heart disease after one week. And 66.7% of them had a family history of congenital heart disease.

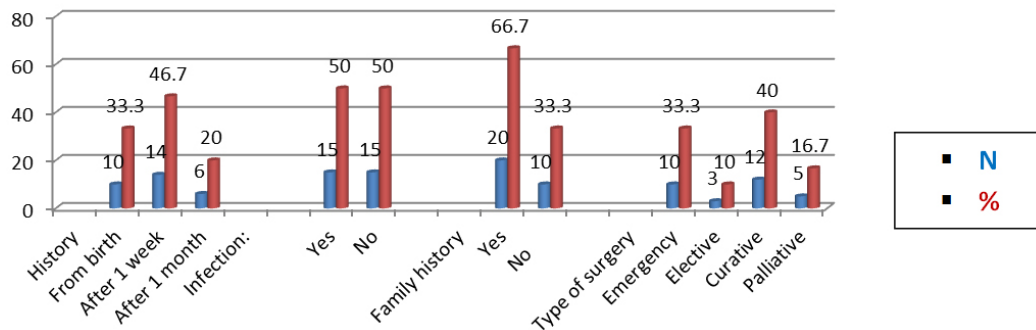


Figure 1. Percentage distribution of children and family' history of congenital heart surgery

Table 2 showed that 40% of mothers above 30 years and their mean age were 30.80 ± 3.27. As regard mother's education, 40% of them illiterate, while 16.7% had the university. In relation to mothers' occupation, the majority of mothers (83.3%) were a housewife and half of them from the rural

area. Table 3 illustrated that there was a highly significant difference in all items of discharge care knowledge (activity, food, medication, and follow-up) before, after immediately and after one month from guideline with highly significant

statistically ($p < .001$).

Table 2. Percentage distribution of mothers according to baseline characteristics

Characteristics of the mothers	n (N = 30)	%
Mother age (years)		
< 20	10	33.3
20-24	5	16.7
25-29	3	10.0
> 30	12	40.0
Mean \pm SD	30.80 \pm 3.27	
Education		
Illiterate	12	40.0
Preparatory	6	20.0
Secondary	7	23.3
University	5	16.7
Occupation		
Housewife	25	83.3
Worker	5	16.7
Residence		
Rural	15	50.0
Urban	15	50.0

Figure 2 showed that the majority of mothers (66.7%, 83.3%, 76.7% & 80%) of them didn't know the warning signs that must attend the child to the hospital if occur.

Table 4 showed that there were a highly significant difference in all items of discharge care reported practice (activity, diet, wound care, dental hygiene, medication, immunization and school) before, after immediately and after 1 month from guideline with highly significant statistically ($p < .001$).

Table 5 illustrated that there was a highly significant correlation between total discharge care knowledge and mother socio-demographic throughout guideline phases ($p < .001$). There was the positive correlation.

Table 6 illustrated that there was a highly significant correlation between total discharge care observation and mother age and educational level in pre and after immediately of guideline implementation ($p < .001$). While there was no significant correlation between total discharge care observation and mothers' age and educational level after one month of guideline implementation.

Table 3. Percentage distribution of mothers according to discharge care knowledge

Total knowledge	Before (n = 30)		Post (n = 30)		t	p	Before (n = 30)		After 1 month (n = 30)		t	p
	N	%	N	%			N	%	N	%		
Wound Care and Prevent Infection												
Satisfactory	16	53.3	27	90.0	-4.03	< .001	16	53.3	24	80.0	-2.82	< .001
Unsatisfactory	14	46.7	3	10.0			14	46.7	6	20.0		
M \pm SD	5.7 3 \pm 4.71		12.60 \pm 4.059				5.7 3 \pm 4.71		9.80 \pm 3.51			
Activity												
Satisfactory	16	53.3	24	80.0	-4.62	< .001	16	53.3	25	83.3	-5.40	< .001
Unsatisfactory	14	46.7	6	20.0			14	46.7	5	16.7		
M \pm SD	4.20 \pm 3.18		8.43 \pm 2.72				4.20 \pm 3.18		6.23 \pm 2.17			
Food												
Satisfactory	13	43.3	24	80.0	-3.81	< .001	13	43.3	26	86.7	-3.51	< .001
Unsatisfactory	17	56.7	6	20.0			17	56.7	4	13.3		
M \pm SD	3.03 \pm 3.33		7.50 \pm 3.17				3.03 \pm 3.33		5.90 \pm 1.34			
Medications												
Satisfactory	30	100.0	25	83.3	.601	< .005	30	100.0	29	96.7	-829	< .001
Unsatisfactory	0	0.00	5	16.7			0	0.00	1	3.3		
M \pm SD	5.56 \pm 1.69		5.16 \pm 2.19				5.56 \pm 1.69		4.50 \pm 1.63			
Follow-Up												
Satisfactory	21	70.0	24	80.0	-2.90	< .005	21	70.0	26	86.7	-3.45	< .001
Unsatisfactory	9	30.0	6	20.0			9	30.0	4	13.3		
M \pm SD	2.26 \pm 2.09		5.36 \pm 1.93				2.26 \pm 2.09		23.97 \pm 2.82			

4. DISCUSSION

Discharge from the hospital can cause stress, and anxiety for mothers and children, to overcome this problem by preparing

early for infant discharge. Discharge plan for children with open heart surgery is a very important phase in treatment and recovery of these children, that mothers receive instruc-

tion regarding care of their children contains medication, activity, nutrition, follow-up appointments, etc. Providing mothers with all information early and in a simple method will help them increase their confidence when leaving the hospital. And give them the way to care for their children safely at home. Discharge care for congenital heart surgery plays a vital role in caring for the children that can reduce the chances of complications and improve quality of care. The results of this study will be discussed in frame of previously mentioned research hypothesis. As regards general character-

istic of studied sample, the present study illustrated that the children age were 9.96 ± 1.71 , more than half 56% of them were male, and about two-thirds 66.7% of them had a family history of congenital heart disease. In addition, the diagnosis of heart surgery, the same table showed that 46.7% of children diagnosed with heart surgery after one week, while, about 33% of them diagnosed from birth. The diagnosis of the severe heart disease generally becomes evident during the first few months after birth. Other children diagnosed immediately after birth.^[1]

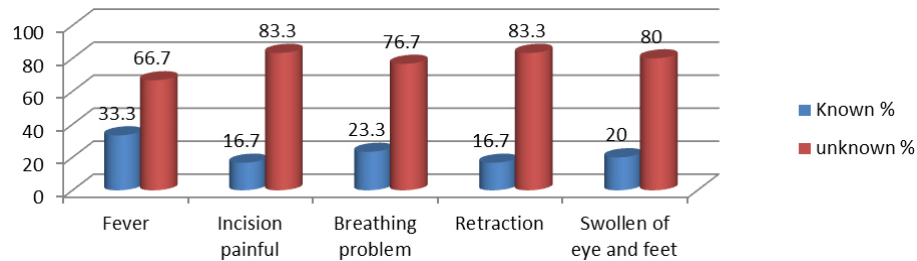


Figure 2. Percentage distribution of mothers according to their knowledge regarding warning signs after discharge from hospital

Table 4. Percentage distribution of mothers according to their reported discharge practice

Total reported Practice	Before (n = 30)		Post (n = 30)		χ^2	p	Before (n = 30)		After 1 months (n = 30)		χ^2	p
	N	%	N	%			N	%	N	%		
Activity												
Adequacy	4	13.3	27	90	175.24	< .001	4	13.3	18	60	50.95	< .001
Inadequacy	26	86.7	3	10.0			26	86.7	12	40		
M ± SD	5.26 ± 6.60		19.56 ± 3.96				5.26 ± 6.60		13.56 ± 3.11			
Child Nutrition												
Adequacy	11	36.7	24	80.0	75.70	< .005	11	36.7	19	63.3	74.70	< .001
Inadequacy	19	63.3	6	20.0			19	63.3	11	36.7		
M ± SD	3.033 ± 4.16		9.46 ± 2.66				3.033 ± 4.16		5.80 ± 2.72			
Incision care												
Adequacy	8	26.7	26	86.7	60.0	< .001	8	26.7	22	73.3	73.57	< .001
Inadequacy	22	73.3	4	13.3			22	73.3	8	26.7		
M ± SD	4.43 ± 6.22		16.73 ± 4.87				4.43 ± 6.22		12.30 ± 2.30			
Dental Hygiene												
Adequacy	9	30.0	24	80.0	77.18	< .001	9	30.0	29	96.7	74.03	< .001
Inadequacy	21	70.0	6	20.0			21	70.0	1	3.3		
M ± SD	2.36 ± 2.80		6.40 ± 2.04				2.36 ± 2.80		4.60 ± 2.22			
Medication												
Adequacy	7	23.3	26	86.7	270.0	< .001	7	23.3	24	86.7	150.0	< .001
Inadequacy	23	76.7	4	13.3			23	76.7	6	13.3		
M ± SD	4.80 ± 6.54		17.90 ± 5.80				4.80 ± 6.54		12.93 ± 3.25			
Immunization												
Adequacy	8	26.7	28	93.3	86.46	< .001	8	26.7	27	91.8	52.44	< .001
Inadequacy	22	73.3	2	2.7			22	73.3	3	10.2		
M ± SD	1.63±1.80		4.40±2.11				1.63 ± 1.80		4.36 ± 1.42			
Follow up												
Adequacy	7	23.3	27	90.0	54.66	< .001	7	23.3	26	86.7	64.28	< .001
Inadequacy	23	76.7	3	10.0			23	76.7	4	13.3		
M ± SD	1.73 ± 2.65		5.93 ± 1.89				1.73 ± 2.65		4.033 ± 1.06			

Table 5. Correlation between knowledge and socio-demographic characteristics

Total knowledge	Age	Educational level
Pre Discharge program		
R	.844	.923
p	< .001	< .001
Post Discharge program		
R	.809	.857
p	< .001	< .001
After Discharge program		
R	.538	.472
p	< .001	< .001

Table 6. Correlation between reported discharge care practice and socio-demographic characteristics

Total Reported Practice	Age	Educational level
Pre Discharge program		
R	.832	.872
p	< .001	< .001
Post Discharge program		
R	.772	.818
p	< .001	< .001
After Discharge program		
R	.305	.321
p	> .005	> .005

In relation to the mean age of the mothers were 30.80 ± 3.27 , More than one-third of them 40% were illiterate, more than two-thirds 83% were a housewife, and about half of them 50% were rural. Mothers' level of education, occupation, and residence effect on mothers' behavior, knowledge, and experience regarding caring of their infant with congenital open heart surgery, this finding was supported by Bagga.^[14] The mothers and children must be aware of normal daily life activities and how to control it according to the child's condition what is expected and what is limited or restricted is necessary. Mothers should have adequate knowledge about child's care for the maintenance of child's health, and helps to prevent complications.^[6] The study conducted by El Mahdi et al.^[15] showed that mothers' knowledge regarding congenital heart disease is generally poor.

Regarding discharge instruction about warning signs, Figure 2 showed that the majority of mothers didn't know the warning signs that must attend the child to the hospital if occur. The warning signs of congenital heart disease include a heart murmur or abnormal heart sound, fast breathing, poor feeding, puffy or swollen eye, hand and feet, incision painful, incision red, swollen or leak fluid, and high temperature.^[16] The mothers should be informed during discharge instructions and be aware of the warning signs and be alert if anyone

sign of these happened, the mothers should be reported and attend to the hospital for early intervention, and avoid further complication. This was supported by Gaskin et al.^[17]

Discharge instruction increased mothers' knowledge regarding care of their children after open heart surgery that improved outcomes, this finding was in the same line with Ozcan et al.,^[10] Wu et al.^[18] and Remya.^[19]

In relation to mothers' reported practice and knowledge on caring for their children with congenital heart surgery the discharge care improved their knowledge and reported practice. This result supported by Chuambangphae et al.^[20] Limited studies discussed mothers' experience of knowledge and skills regarding home care of their children with open heart surgery. Meanwhile, the study conducted by Poudel et al.^[21] revealed mothers' skills deficit regarding care of their children.

Concerning the care activity as medication, diet, activity, wound care, etc. Table 4 showed that mother's practice of these activities was had a highly significant difference in all items of care after discharge training compared with before the discharge training, this result in the same line with March.^[22] So discharge planning is very effective parts in caring for children after surgery, also should be an important component in the discharge program to ideal outcomes and reduce readmission of children to the hospital with further problems. This is in the agreement with Verhaegh et al.^[23]

As regard to the correlation between mothers' knowledge and their age, and level of education (see Table 5). The present study showed a highly significant correlation between mothers' knowledge and their age, and level of education, this result was agreed with.^[21]

The researcher's point of view suggests that, the mothers' needs to gain knowledge and practice regarding discharge care of their children after heart surgery. The educational session was effective in improving mothers' knowledge and reported practice. The session shows a significant effect increase of the mothers' level of knowledge which plays a significant role in the quality of care providing to children and effective outcomes.

The researchers view that the mothers must be aware of knowledge and reported practice regarding discharge care of their children after congenital heart surgery. Moreover, the result of the present study demonstrated that the mothers had better knowledge on posttest and there were highly statistical significant difference between pretest and posttest. This could be attributed to the fact that any training course increase mothers' knowledge in turn changes their practice.

Limitation of the study

The small sample size is one and considers the most important limitation. The mothers were having many troubles in caring with their infant that there was no a special clinic for pediatric heart diseases in their living place. So their mothers must travel long distances to visit the doctors. Thus, children with CHD referred to these hospitals were in advanced stages of the disease. For the researcher, there was difficulty in collecting the sample.

5. CONCLUSION

Based on the findings of the present study, it could be concluded that:

There was a significant improvement in total level of mothers' knowledge and reported practice regarding discharge care of their children after congenital heart surgery when comparing with pre and post program implementation, More-over highly statistically significant difference in relation to mothers' knowledge and reported practice in pre and post implementation of program also there was highly statistically significant difference in total mothers' knowledge and reported practice in relation to socio-demographic characteristics in post implementation program in to age, educational level, experience and attendance of training course. Thus

this study shows that educational intervention regarding discharge care of children after congenital heart surgery was very effective in improving the level mothers' of knowledge and reported practice.

Recommendation

- Comprehensive, multidisciplinary discharge planning should deign early and should include the mothers and children contain education regarding congenital heart surgery care.
- Providing mothers with discharge care of their children after congenital heart surgery should become a routine practice to congenital heart surgery department to enhance fast recovery and prevent complications.
- Discharge care plans to promote optimum development of the child and focus on normalization, the impact of the child's health status, and requirement of mothers according to educational needs.
- Further researches to examine the importance of discharge planning for congenital heart surgery for mothers and children.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest statement.

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