

Effect of Educational Intervention on Quality of Life for Mothers' Having Children with Ventriculoperitoneal Shunt

Samah Mahmoud Mohamed Abd-EL Baky¹, Sabah Saad Al Sharkawi², Faten Shafik Mahmoud³ and Seham Mohammed Abdelaziz.⁴

(1) Assistant Lecturer in Pediatric Nursing Department, Faculty of Nursing / Beni-suef University,

(2) Professor of Pediatric Nursing, Faculty of Nursing, Ain shams University, (3) Professor of

Pediatric Nursing, Faculty of Nursing, Benha University and (4) Assistant Professor of Pediatric Nursing, Faculty of Nursing, Benha University.

Abstract:

Background: A ventriculoperitoneal shunt is a surgical procedure that primarily treats the hydrocephalus which associated with many physical, psychological, and social problems that can affect on quality of life. Educational intervention has a great effect in improving the quality of life of mothers and their children with ventriculoperitoneal shunt. **Aim of the study** The study aimed to evaluate the effect of educational intervention on quality of life for mothers and their children with ventriculoperitoneal shunt. **Design:** A quasi-experimental study. **Settings:** The study was conducted at the Pediatric Neurology Outpatient Clinic at Specialized Pediatric Hospital in Benha city affiliated to the Ministry of Health and El- Demerdash Neurosurgical Hospital affiliated to Ain Shams University. **Study subjects:** A purposive sample consisted of 60 mothers accompanied their children with ventriculoperitoneal shunt; 20 mothers from Benha Specialized Pediatric Hospital and 40 mothers from El- Demerdash Neuro Surgical Hospital who attended the previously mentioned settings for six months. **Data collection tools: Tool I:** A structured interviewing questionnaire sheet, mothers' knowledge. **Tool II:** Reported practices regarding care of their children with ventriculoperitoneal shunt and **Tool III:** Quality of Life scale for mothers and their children. **Results:** There were highly statistical positive correlations between total level of the mothers' knowledge, reported practice, quality of life and total children's quality of life at post educational intervention phase. **Conclusion:** The educational intervention had a significant positive effect in improving quality of life of mothers and their children with ventriculoperitoneal shunt. **Recommendation:** Developing simplified and comprehensive booklet for children with ventriculoperitoneal to avoid post-operative complication and improving quality of life.

Keywords: Children, Educational Intervention, Mothers, Quality of life, Ventriculoperitoneal shunt

Introduction

Hydrocephalus is defined as dilatation of the ventricular system of brain resulting from an imbalance between the production and absorption of Cerebral Spinal Fluid (CSF). This imbalance results in an increased volume of CSF, dilation of the ventricular system, and often increased Intracranial Pressure (ICP). Hydrocephalus onset can be acute and occur over hours or days. It may also be chronic and occur over months or

years. Hydrocephalus can occur as an isolated condition or one associated with numerous other neurological conditions and diseases. It can then be classified as either communicating or non-communicating (Orrego et al., 2020).

Infants and small children with hydrocephalus had typical symptoms as irritability and vomiting occur with many other medical problems. Imaging studies are

indicated when these symptoms occur in the context of findings suggestive of an intracranial process (e.g. lethargy, seizures and increasing head circumference). The initial diagnostic study is often a plain Computed Tomography (CT) scan of the head. It clearly demonstrates the ventricular size and usually identifies the presence of a mass lesion (**Ebrahim et al., 2019**).

Ventriculoperitoneal Shunt (VPS) placement is one of the most commonly performed neurosurgical procedures and is necessary to treat most forms of hydrocephalus. Complications related to VPS placement are common, and multiple shunt revisions are almost expected throughout a patient's lifetime. Shunt malfunction may be attributed to multiple causes, including obstruction, infection, pseudo cyst formation and bowel perforation. VPS obstruction, which is most often occurs in the proximal catheter, is the most common cause of VPS malfunction moreover, Infection is the second most common cause of VPS malfunction (**Aktas et al., 2019**).

Mothers and their children with VP shunt for HCP face various health- related problems in different domains and low Quality Of Life (QOL), especially in children who underwent multiple surgeries. Hence, appropriate monitoring as well as holistic management by health-care team is essential to improve the QOL of children undergoing VP shunt. Parents of children with a long-term condition have identified the need to develop skills to ensure that their child's education and developmental needs are met, as well as to deal with challenging behavior. Parenting responsibilities including illness-specific demands such as maintaining treatment and care regimes, social and financial constraints, and maintaining relationships with siblings and family members (**Dhandapani et al., 2021**).

Nurses play a vital role in providing knowledge and practices for mothers of children with VP shunt to improve the standard of care and improving quality of life. Nursing responsibilities in the care and management of children with a ventricular shunt are performing and teaching the caregiver about the importance of adherence to strict hand hygiene, provide safe and effective care at all times for the child, closely observation for deviations from normal behaviors, monitoring body temperature, being alert to any changes in physical status, checking skin for redness along shunt site on bony prominences, and checking hydration status and fluid consumption. In addition, using of aseptic techniques when handling shunts, minimize shunt manipulation, use bio-occlusive dressing, and change dressings (**Eloqayli, & Alyousef, 2019**).

Mothers of children with ventriculoperitoneal shunt should be adequately provided by information from nurses in order to increase their awareness regarding child health condition, acquire and perform the correct practices during childcare and early detection and referral of any abnormality such as elevation of body temperature or change in child level of consciousness.

Adequate provision of comprehensive information helps in maintenance of the child health condition, improving the mother and children quality of life, decrease possible complications that may results from inadequate practices and improve children prognosis and outcomes (**Copley et al., 2021**).

Significance of the study:

The incidence of ventriculoperitoneal shunt in the place of study about 300 case at the El-Demerdash surgical hospital and 240 case at the Benha University Hospital in 2017-2018 (**The Official Statistical Department at Benha University Hospital**

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and El-demerdash Surgical Hospital) the researcher observed that children with ventriculoperitoneal shunt were at high risk for many complications and impaired in quality of life for the mothers and their children due to lack of awareness and inadequate care given to their children at home, so that the study was conducted to improve the quality of life for mothers and their children with ventriculoperitoneal shunt.

Aim of the study:

The aim of the current study was to evaluate the effect of educational intervention on quality of life for mothers' and their children with ventriculoperitoneal shunt.

Research hypotheses:

- The educational intervention would improve quality of life of mothers and their children with ventriculoperitoneal shunt.

Subjects and Method:

Research design:

A quasi-experimental design was utilized to conduct this study

Study setting:

The study was conducted at the Pediatric Neurology Outpatient Clinic at Specialized Pediatric Hospital in Benha city affiliated to the Ministry of Health and El-Demerdash Neurosurgical Hospital affiliated to Ain Shams University Hospitals. The Pediatric Neurological Outpatient Clinic of both hospitals found in the ground floor.

Research Subject:

A purposive sample consisted of 60 mothers accompanied their children with ventriculoperitoneal shunt which available during data collection (20 mothers from Benha Specialized Pediatric Hospital and 40 mothers from El-Demerdash Neuro Surgical Hospital) and attended the previously mentioned settings for six months.

Inclusion of criteria:

- Mothers who had children with ventriculoperitoneal shunt.
- Mothers' willing to participate in the study.
- Children aged from 3-18 years who are able to participate and communicate with the investigator.

Exclusion criteria:

- Mothers who had children with any other chronic disease.
- Mothers who had children with any psychological problems

Tools of Data Collection

Data of the current study was collected by using the following three tools:

Tool (I): A Structured Interviewing Questionnaire Sheet:

This tool was developed by the researchers in the light of current relevant studies and research. It was written in English language and translated into Arabic language; it was composed of two parts:

Part (1): Characteristics of mothers which included; age, marital status, level of education, occupation, number of children, residence, it consisted of **(8 question)**.

- Characteristics of children which included; age, gender, ranking, educational level, and level of scientific achievement at the school, it consisted of **(6 questions)**.

- Family and medical history which included genetic factors, family history of VP shunt, consanguinity relationship, Length of installation of the shunt, history of complication ad its types, complain from infection, signs and symptoms of infection, hospitalization and causes of hospitalization. It consisted of **(9 questions)**.

Part (2): Mothers' knowledge regarding ventriculoperitoneal shunt: It was designed by the researcher based on **Hockenberry and Wilson, (2018)** to assess mothers' knowledge

regarding care of their children with ventriculoperitoneal shunt (pre-post) and written in the form of multiple-choice questions included definition, types, causes, signs and symptoms of hydrocephalus, as well as included knowledge related to definition, indication ventriculoperitoneal shunt cases that require the VP shunt, source of knowledge, dangerous signs, complications, signs of VP shunt obstruction, actions if symptoms of obstruction occur, home health instruction and failure symptoms of VP shunt, It consisted of **(14 questions)**.

Scoring system of knowledge:

The studied mothers answered were compared with the model key answers; where scored as correct answer had score (1), unknown or wrong answer had scored (0). Total knowledge scores ranged from (0- 14) points. In this respect the level of mothers' knowledge was classified into 3 categories as the following:

- Good knowledge ($\geq 60\%$.)
- Average knowledge (50 - 60%).
- Poor knowledge ($< 50\%$).

Tool (II): Mothers' reported practices questionnaire (pre-post): It was adopted from **Wilson & Rodgers, (2016)** to assess mothers' reported practice regarding care of their children with ventriculoperitoneal shunt (pre & post). It contained of 67 steps grouped under nine domains that included parental discharge (9 steps), dealing with constipation (6 steps), incision care (8 steps), nutrition of child (4 steps), physical activity and exercise (5 steps), measurement of head circumference (8 steps), measurement of abdominal girth (10 steps) measurement of axillary temperature (11 steps) and cold compression (6 steps).

Scoring system:

Scoring system for reported practice of the studied mothers scored as the following one score was given to each step reported correctly done and zero score for each step reported

incorrectly done or not reported. And classified into 2 categories as following:

- Satisfactory level ($\geq 60\%$).
- Unsatisfactory level ($< 60\%$).

Tool (III): Quality of Life scale for mothers:

It was adopted from **Skevington et al., (2004)** and was used to assess quality of life for mothers who had children with ventriculoperitoneal shunt. It was used twice before and after educational program implementation (pre & post). It contained of 27 items grouped under five domain that included physical domain (8 items), emotional domain (7 items), cognitive domain (3 items), economic domain (3 items) and social domain (6 items).

Scoring system:

The mothers' response was classified into five-point Likert scale ranged from (1- 5) as: strongly disagree (1), disagree (2), indifferent (3), agree (4), strongly agree (5). The total scores were ranged from (28- 140) points and classified into 3 categories:

- **High** quality of life ($\geq 75\%$).
- **Moderate** quality of life (60% -< 75%).
- **Low** quality of life ($< 60\%$).

Tool (IV): Quality of Life scale for children:

It was adopted from **Kulkarni et al, (2007)** and was used to assess quality of life for children with ventriculoperitoneal shunt. It was used twice before and after educational program implementation (pre-post). It contained 50 items grouped under three domains that included physical domain (15 items), social emotional domain (23 items) and cognitive domain (12 items).

Scoring system:

The children response was classified into three-point Likert scale, very much (1), sometimes (2), little (3). The total scores were ranged from (50- 150) points and classified into 3 categories:

- **High** quality of life ($\geq 75\%$).
- **Moderate** quality of life (60% -< 75%).
- **Low** quality of life if score ($< 60\%$).

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Validity of tools:

Tools of data collection were investigated for their content validity by panel of three experts in Pediatric Nursing specialty (two experts from the Faculty of Nursing Benha University and one expert from the Faculty of Nursing Ain Shams University, they are selected to test content validity of the study tools and to judge its clarity, relevance, comprehensiveness, understanding and applicability. The opinion was elicited regarding the layout, format and sequence of the questions and all of their remarks were taken into consideration and the tools were regarded as a valid from the experts' point of view.

Reliability of the study tools:

Reliability for tools was applied by the researcher for testing the internal consistency of the tools by administrating of the same tool to the same subjects under similar condition. Internal consistency reliability of all items of the tools was assessed using Cronbach's alpha coefficient test. It was (0.89) for structured interviewing questionnaire and (0.94) for the mothers' reported practices. This indicates a high degree of reliability for the study tools.

Ethical considerations:

The researchers clarified aim of the study to the studied mothers and verbal approval was prerequisite to participate in the study. Mothers were assured that all gathered data were used in research purpose only and the study was harmless. Additionally, mothers were allowed to withdraw from the study at any time without giving the reason. Confidentiality of the gathered data and results were secured.

Pilot Study:

A pilot study was conducted on 10% of the total sample (6) mothers & (6) accompanied children of the total sample where collected

from pediatric neurology outpatient clinic at Specialized Pediatric Hospital in Benha city and El-Demerdash Neurosurgical Hospital affiliated to Ain Shams University Hospitals. In order to test the applicability of the constructed tools and the clarity of the included questions. The pilot has also served to estimate the time needed for each subject to fill in the questions and to identify the problems that may be encountered during the study. All participants in the pilot study were excluded from the sample where minor modifications were done in the form of rephrasing, organization, omission and addition of some questions in the study tools. Pilot study took about one month from the beginning of December 2020 to its end.

Filed Work:

The field work was from the beginning of January 2021 up to the end of June 2021. The educational program was implemented to achieve the aim of the current study; assessment, planning, implementation and evaluation phases.

Assessment phase:

Assessment phase involved interviews with mothers and their children to collect baseline data. The researcher was available two days/ week (Monday and Thursday) at the Pediatric Neurological Outpatient Clinic at Benha Specialized Hospital and two days / week at El – demerdash Neuro Surgical Hospital (Sunday and Wednesday) from 9:00 am to 1: 00 pm, number of mothers taken every day was ranged from 4- 5 mothers.

At the beginning of interview, the researcher welcomed mothers and their children, explained the purpose, duration of the study and take their oral approval to participate in the study prior to datacollection. An individual interview was conducted for every mother to collect the necessary data

using the tools for data collection, the average time needed for (**Tool I**) to assess personal characteristics and assess their knowledge was around 15 minutes and 30 minutes for reported practice (**Tool II**) and about 15-25 minutes for (**Tool III**) to assess mothers' quality of life. Also, 15-25 minutes for to assess children's' quality of life. This phase of pretest took about 4 weeks (From the beginning of January 2021 to the end of January 2021).

30-45minutes This period of pretest took 4 weeks (from the beginning of December 2020 to the beginning of January 2021).

Planning phase

Based on baseline data obtained from assessment phase and relevant review of literature, the educational program was designed by the researcher for mothers and their children according to their needs and level of understanding in simple organized and scientific Arabic language.

Different methods of teaching were used as lecture, group discussion and role play, videos, Suitable teaching media were included a hand out as well as audio visual aids to help understanding of content by mothers.

This was taken period of time from beginning of February 2021to the beginning of March 2021.

Implementation phase:

General and specific objectives of educational program were stated and implemented to satisfy the actual needs of the studied sample. The studied mothers and their children were divided into 12 groups in two hospitals (4 groups from Benha Specialized Hospital and 8 groups El – demerdash Neuro Surgical Hospital); each group consisted of 5 mothers and their children. The implementation phase was achieved through

seven sessions (two theoretical & five practical) at period of two days/ week 2 sessions / day, the time of each theoretical session was taking 45 minutes and for each practical session was took 60 minutes. The program has taken about 7 hours for each group. Each session started by a summary of the previous session and objective of the new one. Taking into consideration the use of Arabic language that suits the mothers' and children educational level. Motivation and reinforcement during sessions were used to enhance motivation for the sharing in the study. During sessions, each mother has an opportunity to ask questions and share information with each other. The educational program was implemented through seven sessions for allmothers as following:

-**The first session** of program included introduction of educational program, objectives, overview of hydrocephalus as definition, risk factors of hydrocephalus, types, causes, signs and its complications.

-**The second session** of program included overview about ventriculoperitoneal shunt as definition, indications and cases that require the ventriculoperitoneal shunt, dangerous signs that require contacting the doctor after a ventriculoperitoneal shunt, signs of ventriculoperitoneal shunt, and complications of ventriculoperitoneal shunt obstruction.

-**The third session** of program included care after ventriculoperitoneal shunt such as care needed for a child's wound, sleeping, head injuries prevention, time of showering, care given for parental discharge.

-**The fourth session** of program included care given for improve physical activity and exercise and steps of head circumference measurement.

-**The fifth session** of program included care after ventriculoperitoneal shunt; incision care, steps of axillary temperature measurement and tab sponge bath.

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-**The six session** of program include care given for constipation and care given for improve child nutrition and abdominal girth measurement.

-**The seven session** of program about follow-up and living and adaptation with ventriculoperitoneal shunt. This phase was implemented for five months from the beginning of January 2021 up to the end of May 2021.

Evaluation phase:

After the implementation of the program contents, the post test was carried out to assess mothers' knowledge, reported practices and quality of life for mothers and their children towards ventriculoperitoneal shunt by using the same formats of pretest. This phase took one month from the beginning of June 2021 to the end of June 2021.

Statistical analysis:

The collected data organized, tabulated and statistically analyzed using Statistical Package for Social Science (SPSS) version 25 for windows, running on IBM compatible computer. Descriptive statistics were applied (numbers, percentages, mean and standard deviation). Test of significance, Chi-square test (χ^2) and fisher exact test (FET) to compared for qualitative variables and correlation coefficient (r) were done for assessment of inter relationship among quantitative variables that were normally distributed or when one of the variables is qualitative, these tests were applied to test the study hypothesis. Reliability of the study tools was done using Cronbach's Alpha coefficient test. A highly significant level value was considered p- value < 0.001, significant level value was considered when p- value < 0.05 and no statistical significance difference was considered when p- value > 0.5.

Results:

Table (1): Shows that, half (50%) of the studied mothers aged between 30-<40 years with mean age was 33.18 ± 9.33 years, more than two-thirds (68.3%) of mothers have 3-5 children with mean 4.65 ± 1.35 . In addition, the majority (92%) of mothers don't attend mothers' class about VP shunt.

Figure (1): Shows that, less than two-thirds (61.7%) of the studied mothers have secondary educations, while, less than one fifth (16.7%) of them have basic education.

Figure (2): Clarifies that, more than half (60%) of the studied mothers were housewives.

Table (2): Presents that, more than half (55%) of the studied children were in age between 3-<6 years with mean age 6.55 ± 3.62 years and more than half (55%) of them were at preschool period of education. In addition, more than one third (37%) of the studied children go to school continuously and more than half (51.9%) of them had succeed level of scientific achievement at the school.

Table (3): Illustrates that, less than one fifth (16.7%) them have family history of ventriculoperitoneal shunt and less than one-third (30%) of them had brother with ventriculoperitoneal shunt. And one-third (33.3%) of children had brain tumor. Moreover, more than half (76.7% & 56% & 56.7%) of the studied children had history of complications after the installation of the shunt, these complications was related to infection and presence of an infection after shunt, respectively. This table also found that, more than half (61%) of children have fever. In addition, more than one third (36.7%) of the studied children were hospitalized after the shunt and less than two third (63.6%) of the

hospitalized children were hospitalized due to blockage in the shunt

Figure (3): Shows that, less than two-thirds (63.3%) of studied mothers had poor level of knowledge at pre-educational intervention, which improved post educational intervention to the majority (86.7%) of them had good level of knowledge regarding ventriculoperitoneal shunt.

Figure (4): Shows that, the majority (80%) of studied mothers had unsatisfactory level of total reported practice at pre-educational intervention program, which improved to 90% of them had satisfactory level at post-

educational intervention regarding to care of their children with ventriculoperitoneal shunt.

Figure (5): Shows that, less than three-quarters (70%) of studied children had low-level of quality of life at pre- educational intervention, which improved to be the majority (80%) had high level of total quality of life at post-educationalintervention.

Table (4): Clarifies that, there were highly statistical positive correlation between total level of the mothers' knowledge, reported practice and quality of life at post educational intervention phase (P= < 0.001).

Table (1): Distribution of the studied mothers regarding their characteristics (n=60).

Characteristics of the mothers	No.	%
Age / years		
< 20	3	5.0
20-<30	16	26.7
30-<40	30	50.0
≥ 40	11	18.3
Mean ± SD	33.18 ± 9.33	
Number of children in the family		
< 3	4	6.7
3-5	41	68.3
>5	15	25.0
Mean ± SD	4.65 ± 1.35	
Attendance of mothers class about VP shunt		
Yes	5	8.0
No	55	92.0

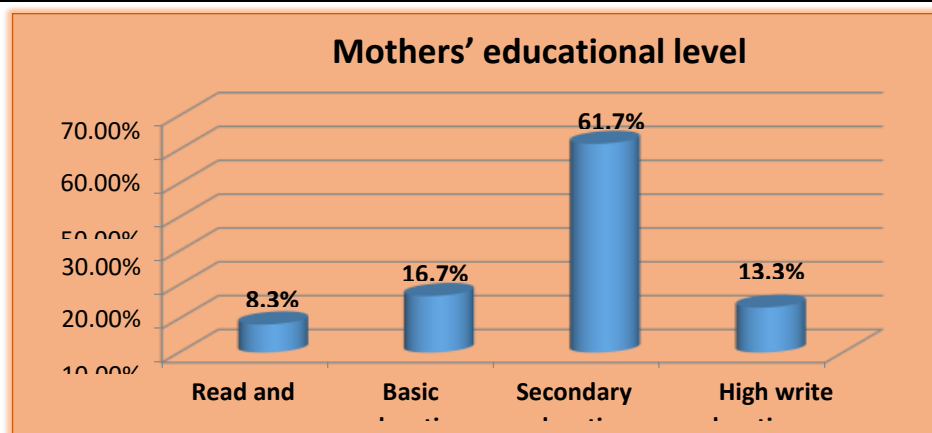


Figure (1):Distribution of the studied mothers regarding their educational level (n=60).

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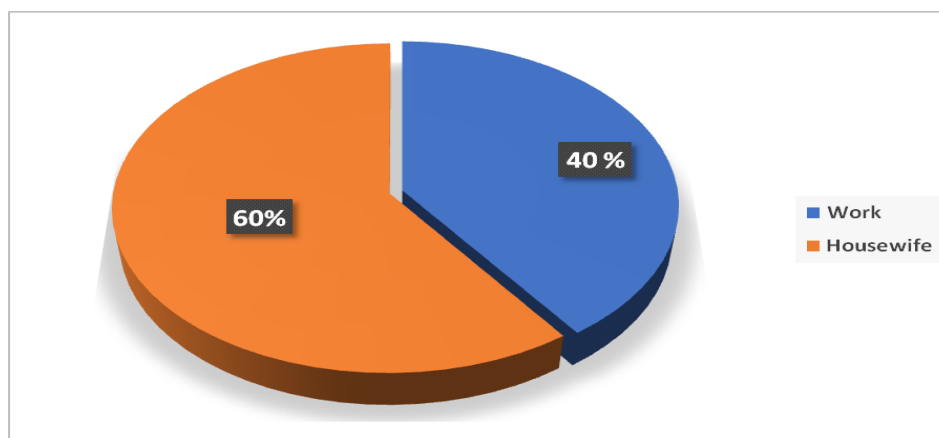


Figure (2): Distribution of the studied mothers regarding their work(n=60).

Table (2): Distribution of the studied children regarding their characteristics (n=60).

Characteristics of the children	No.	%
Age / years		
3-<6	33	55.0
6-<9	14	24.0
9-<12	5	8.0
12-<15	5	8.0
15-≤ 18	3	5.0
Mean ± SD	6.55 ± 3.62 years	
Educational level		
Preschool	33	55.0
Primary school	22	36.7
Preparatory	5	8.3
Go to school continuously (n=27).		
Yes	10	37.0
No	17	63.0
Level of scientific achievement at the school (n=27).		
Succeeds each year to excellent	4	14.8
Succeed	14	51.9
Successful with failed by course	7	25.9
Failed	2	7.4

Table (3): Distribution of the studied children according to their medical history (n=60).

Medical history	No.	%
Family history of ventriculoperitoneal shunt		
Yes	10	16.6
No	50	83.3
If yes, consanguinity relationship to the child: (n=10)		
Brother	3	30
Sister	2	20
Uncle	2	20
Aunt	2	20
Grand father	1	10
Causes of the ventriculoperitoneal shunt		
Brain tumor	20	33.3
Head injury	14	23.3
Cerebral Hemorrhage	10	16.7
Meningitis encephalitis	4	6.7
Congenital defects in the brain	12	20.0
History of complications after the installation of the shunt		
Yes	46	76.7
No	14	23.3
Type of complications(n=46)*		
Obstruction	20	44.0
Infection	26	56.0
Presence of infection after the shunt		
Yes	26	43.3
No	34	56.7
Signs and symptoms of infection (n=26)*		
Fever	16	61.0
Redness,	2	8.0
Swelling	2	8.0
Secretions of the wound	6	23.0
Hospitalization after the shunt		
Yes	22	36.7
No	38	63.3
If yes, causes of hospitalization: (n=22)		
Blockage in the shunt	14	63.6
Infection in the brain	5	22.7
Increased drainage from the cerebral shunt	3	13.6

***Number not mutually exclusive**

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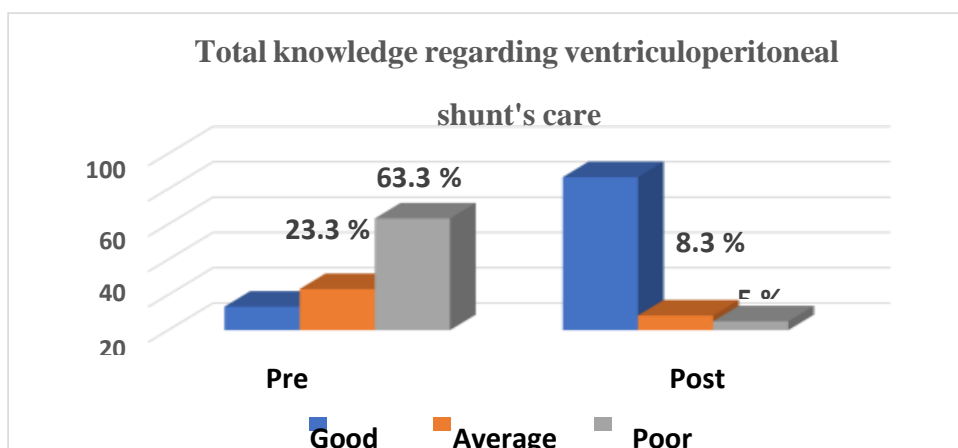


Figure (3): Distribution of the studied mothers' total knowledge regarding ventriculoperitoneal shunt's care at pre and post educational intervention phase (n=60).

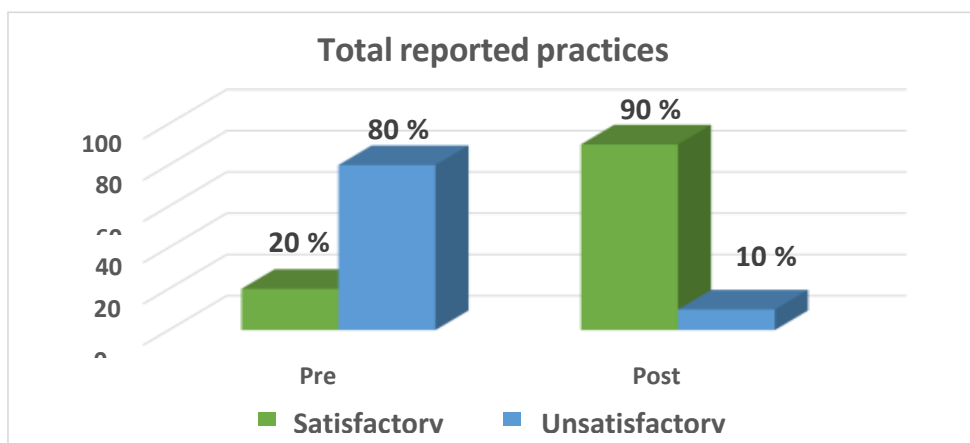


Figure (4): Distribution of the total level of the studied mothers' reported practices regarding care of their children with ventriculoperitoneal shunt at pre and post educational intervention phase (n=60).

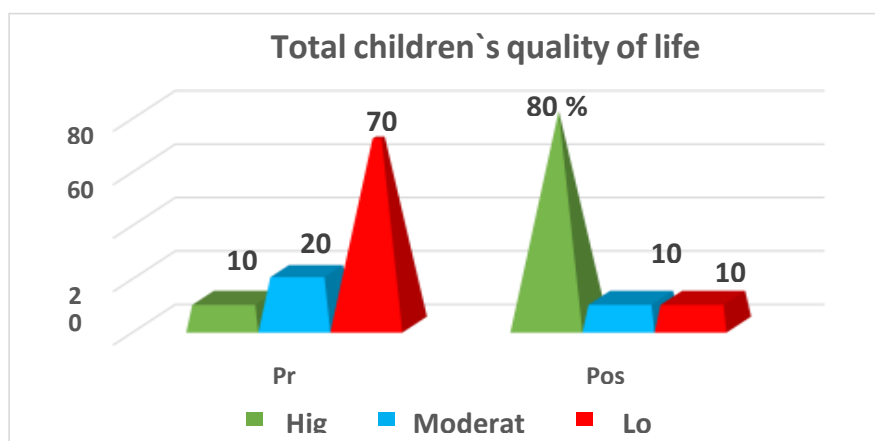


Figure (5): Distribution of the studied children regarding their total quality of life at pre and post educational intervention phase (n=60).

Table (4): Correlation between total mothers’ knowledge, reported practice and quality of life at post educational intervention phase (n=60).

Variables		Total mothers’ knowledge	Total mothers’ reported practice	Total mothers’ quality of life
Mothers’ knowledge score	r	-	0.725	0.801
	p		0.000**	0.000**
Mothers’ reported practice score	r	0.725	-	0.809
	p	0.000**		0.000**
Mothers’ quality of life score	r	0.801	0.809	-
	p	0.000**	0.000**	

r= correlation coefficient test. p= p-value **highly significant at $p < 0.01$.

Discussion:

Hydrocephalus (HCP) occurs when there is imbalance between the production and absorption of the cerebrospinal fluid (CSF) so that excess CSF accumulates in the cerebral ventricles. Ventriculoperitoneal (VP) shunts are widely used in the treatment of HCP. VP shunts are composed of 3 parts: the ventricular catheter, pressure or flow controlled one way valve, and peritoneal catheter. Thus, excess CSF is diverted from cerebral ventricles to the peritoneal cavity in a controlled unidirectional way; decreasing excess intracranial pressure. HCP is mostly diagnosed in the pediatric group of patients (Unver et al., 2020).

The finding of the present study showed that, the mean age of studied mothers was 33.18 ± 9.33 years, the vast majority of them were married. Also, less than two-thirds of them had secondary education and more than half of them were housewives This result similar with the result of study performed by **Kafil & Mohamed, (2020)** about “Maternal Knowledge and Practices regarding Home-Care Management of their Hydrocephalic Children with Ventriculoperitoneal Shunt”, they indicated that, the high percent of mothers of hydrocephalic children with VP shunt, aged from thirty to thirty-five years and

their mean age was 27.48 ± 8.23 years. Also, These results were almost similar to those of **Abd El Aziz et al., (2017)** they studied “Effect of nursing management protocol for mothers of children having ventricular peritoneal shunt” and reported that two thirds of the studied mothers were married, graduated from secondary schools and the majority of them were house wives.

The results of the current study represented that more than two- thirds of mothers had from three to five numbers of children. These results supported with the study done by **Gürol et al., (2018)** they carried out a study to assess the experienced problems of mothers having children with hydrocephalus, they founded that half of mothers lived in rural areas.

Concerning studied children' age, the findings of the current study presents that, more than half of the studied children were in age between 3-<6 years with mean age 6.55 ± 3.62 years. The current finding was supported by **Moawia, (2017)** about “The study of Hydrocephalus by using CT scan in Sudanese population” and revealed that more than half of patients aged from one day to less than 5 years old and more than one quarter of them aged from 5 to 10 years old

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with mean age 6.55 ± 3.62 years. Conversely the study was disagreed with **Murali et al., (2019)** about “Effectiveness of structured teaching program on knowledge regarding home care management of children with hydrocephalus and shunt among their parents” which reported that nearly half of the studied children were aged less than one to three year.

The findings of the current study illustrated that, more than half of children were at preschool period and more than one third were at primary school. The finding of the current study also revealed that slightly more than one third of children go to school continuously whenever; more than half of them succeed. This might be attributed to the Egyptian policy of passing all children without failure rate till 3rd primary stage. These results are likely with a study conducted by **Szefczyk et al., (2020)** about “Functioning of the children with hydrocephalus” and reported that more than three quarters of participants were at preparatory and pre-school stages and the majority of them attended classes based on their age, whenever, nearly half of them didn't attend continuously in the same manner as their healthy peers.

Regarding to family and disease history among the studied children, the finding of the current study showed that the minority of the studied children had family history of ventriculoperitoneal shunt, and one-third of them suffered from brain tumor. This could be due to the association between brain tumor and hydrocephalus and complicated pathophysiology of brain tumor that results in increasing cerebrospinal fluids and intracranial pressure due to fluid shifting so that results in hydrocephalus. These findings are supported with **Khalafallah et al., (2017)** they carried out an Egyptian study entitled “The impact of protocol of care for mothers of children with ventriculoperitoneal shunt on

occurrence of postoperative complications” they demonstrated that the highest percentage of children in both groups had acquired HC is resulting from a brain tumor. Also, **Narayan et al., (2018)** in their study entitled “Extracranial, peritoneal seeding of primary malignant brain tumors through ventriculoperitoneal shunts in children: case report and review of the literature” found that evidence of extra neural spread (hydrocephalus) was found associated with VP shunt in children in a wide variety of tumors.

The findings of the current study showed that more than three quarter of the studied children had history of complications after the installation of the shunt; more than half of them had infection. Likewise, more than half of the studied children had history of an infection from the shunt in the form of fever, redness, swelling, secretions of the wound. In addition, the current findings revealed that, more than one third of the studied children were hospitalized after the shunt, the majority of them were hospitalized due to shunt obstruction. This could be due to the major surgical operation that might had complication and resulted in presence of infection symptoms, incomplete adherence to medical follow-up and lack of mothers' awareness about early signs of postoperative complications such as fever, chills and child irritability so that they developed certain complications.

These findings are supported with the study of **Bendary (2017)** about " Role multidetector of computer tomography in follow up of hydrocephalus patent manage by endoscopic ventriculostomy" and found that there were more than half of the studied children with VP shunt had post-operative shunt complication and nearly one third of them had shunt obstruction and infection that manifested by fever and infected wound with wound swelling so that they readmitted

to the hospital to manage shunt obstruction. On the contrast, **Khalafallah et al., (2017)** founded that the majority of children in the study group not complained from redness in wound site compared to most of children in the control group had the problem, and vast majority of children in the study group didn't have wound swelling and didn't need hospitalization.

According to total mothers' knowledge regarding care ventriculoperitoneal shunt at pre and post intervention, the finding of the current study illustrated that, less than two-thirds of studied mothers had poor level of knowledge at pre-educational intervention, which improved post educational intervention to the majority of them had good level of knowledge. The study finding is in the line with study of **Abd El Aziz et al., (2017)** they found a significant improvement in knowledge level about hydrocephalus and shunts after educational intervention

Regarding mothers' total reported practice toward care of their children with ventriculoperitoneal shunt at pre and post educational intervention phase, the findings of the current study revealed that there were a highly statistically significant difference between pre and post implementation of intervention program where the majority of the studied mothers had unsatisfactory practices regarding managing constipation, head circumference measurement and abdominal girth pre-educational intervention , which improved significantly post educational intervention. In addition, the majority of studied mothers had unsatisfactory level of total reported practice at pre- educational intervention, which improved to the majority of them had satisfactory level at post-educational intervention. From the researcher point of view, this might be due to increase mothers' motivation to improve their skills in order to obtain the best prognosis and prevent

further complications of their children. This results were agreed with **Abd Elaziz et al., (2017)** they illustrated that more than three-quarters of mothers had poor total practices regarding care of children with hydrocephalus such as measuring head circumference, wound care and managing constipation before the program compared with less more than half of them had satisfactory practices post nursing management protocols. Furthermore, **Kafi and Mohamed (2020)** demonstrated that, two thirds of the studied mothers had poor level of reported practices regarding home care management of their children with hydrocephalic and VP shunt.

Regarding children's total quality of life at pre and post educational intervention phase, the current findings demonstrated that, less than three- quarters of studied children had low level of quality of life at pre- educational intervention, while the majority of them had high level of total quality of life at post-educational intervention. This could be due to the effect of educational program and illustrative videos in improving mothers' knowledge, practice and quality of life that positively reflected on all domains of children quality of life. The finding of the study was congruent with study of **Tavares et al., (2020)** about "Evaluating educational material from the perspective of informal caregivers of children with hydrocephalus" they found that, the technological advance for the supportive treatment of the hydrocephalus that made to mothers helped in improving the life quality of children

The findings of the current study clarified that, there were highly statistical positive correlation between total level of the mothers' knowledge, reported practice and quality of life at post educational intervention phase. This might be because of the increasing knowledge of mothers, leading to improved care and practices for their children

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and subsequently improve their quality of life and children's quality of life. Mothers acquired high effective, clear, simple and comprehensive instructions regarding their child care that reflected on their care-practice and decreasing complications and care burden also the educational program provide best instructions for enhancing, maintain and improving mother's quality of life that subsequently reflected on physical, social and psychological quality of life of their children. These results were supported by **Abd Elaziz et al., (2017)** they studied "Effect of nursing management protocol for mothers of children having ventricular peritonealshunt" found that there was a highly statistically significant positive correlation between the studied mothers' total knowledge score, total practices and mother' and children's quality of life score. In addition, the finding of the study in the same line with study of, **Murali et al., (2019)** and they concluded that, the designed protocol of care was effective in improving mothers' knowledge that reflected on practice and QOL of both mothers and diseased children.

Conclusion

The educational intervention program had a significant positive effect in improving quality of life for mothers and their children with ventriculo peritoneal shunt after implementation the educational intervention program. Also, the majority of the mothers had good level of knowledge and satisfactory level of practice regarding care of their children with ventriculo peritoneal shunt, In addition, there were statistically significant relation between children's quality of life at post educational intervention program and their age and educational level, while, there were no statistically significant relation between children's quality of life and their gender and child ranking. Meanwhile, there were highly statistical positive correlation

between total level of the mothers' knowledge, reported practice and quality of life at post educational intervention phase.

Recommendations

1. A simplified, comprehensive and clarified Arabic guided pictures booklet about ventriculoperitoneal shunt must be available in all neuro surgical outpatient clinics and distributed for each newly admitted child diagnosed with VPS.
2. Continuous educational programs to increase awareness of the mothers' having children with VPS to ensure enough knowledge and practice and improving quality of life.
3. Further researches are needed on a larger probability sample at different settings is highly recommended to achieve generalize the results.

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تأثير برنامج تعليمي على جودة حياة الأمهات وأطفالهن الخاضعين للتحويل الدماغي سماح محمود محمد- صباح سعد الشرقاوي- فاتن شفيق محمود- سهام محمد عبدالعزيز

التحويل الدماغي هي حالة مزمنة لها تأثير كبير على الأطفال والقائمين على رعايتهم. أظهرت الدراسات السابقة أن الأطفال الخاضعين للتحويل الدماغي لديهم انخفاض في جودة الحياة مقارنة بالأطفال غير المصابين بالاستسقاء الدماغي ، وفقاً لتقييم مقدمي الرعاية لهم. ارتبط انخفاض معدل جودة الحياة بالعوامل الاجتماعية والاقتصادية مثل دخل الأسرة والتعليم ، بالإضافة إلى العوامل المرتبطة بالأمراض مثل وجود الصرع أو مسببات استسقاء الرأس. لذا هدفت هذه الدراسة الي تقييم تأثير برنامج تعليمي على جودة حياة الأمهات وأطفالهن الخاضعين للتحويل الدماغي. و تم استخدام تصميم شبه تجريبي لإجراء هذه الدراسة. وقد أجريت الدراسة في العيادة الخارجية لجراحة المخ والأعصاب بمستشفى الأطفال التخصصي بمدينة بنها والعيادة الخارجية لمستشفى الدمرداش لجراحة المخ والأعصاب التابع لجامعة عين شمس. حيث تكونت العينة من 60 أم مصحوبة بأطفالهن الخاضعين للتحويل الدماغي (20 أم من مستشفى بنها التخصصي للأطفال و 40 أم من مستشفى الدمرداش) وحضرت المكان المذكور سابقاً لمدة ستة أشهر. و أوضحت الدراسة الحالية أن هناك علاقة إيجابية إحصائية عالية بين المستوى الإجمالي لمعرفة الأمهات ، والممارسات المشار إليها، وجودة الحياة وإجمالي جودة حياة الأطفال في مرحلة بعد التدخل التعليمي . بناءً على نتائج الدراسة الحالية تم اقتراح التوصيات التالية: يجب أن يتوفر برامج تعليمية مستمرة لزيادة الوعي لدى الأمهات اللاتي ينجبن أطفالاً خاضعين للتحويل الدماغي لضمان زيادة المعرفة الكافية والممارسة وتحسين جودة الحياة.