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Mothers' Knowledge and Practice regarding care of their Children with Ventricular Septal Defect

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ABSTRACT

Background: Ventricular septal defect is the most common congenital defects and accounts for nearly one-third of all major congenital anomalies. **Aim**: This study aimed to assess the mothers' knowledge and practice regarding care of their children with ventricular septal defect. **Design**: A descriptive study was utilized to fulfill the aim of this study. **Setting:** The current study was conducted at the inpatient and outpatient departments of the Academic Institute for Heart surgery in Ain-Shams University. **Subject**: A purposive sample consisting of 60 children suffering from VSD and their accompanying mothers attending the previously mentioned setting. **Tools**: Data was collected through two tools. **Tool 1:** An interviewing questionnaire to assess mothers' knowledge regarding ventricular septal defect. **Tool 2:** Observational checklist included studied mothers' reported practice. **Results**: The study revealed that only 23.3% of mothers of children's demonstrated satisfactory knowledge. Mothers of children also achieved a lower level of practice with only 26.7% achieved a poor level of practice. Study demonstrated strong positive relationships between mothers of children's knowledge, practice. **Conclusions**: There was more than two-thirds of the studied mothers had an unsatisfactory overall level of knowledge, and over one-third of them demonstrated inadequate practices. Additionally, there was a statistically significant relationship between the mothers' socio-demographic characteristics and both their total knowledge and reported practices regarding the care of their children with ventricular septal defect. **Recommendation:** Continuous health educational program for mothers of children with ventricular septal defect initiatives be widely implemented, especially in low-income and rural areas.

Keywords: *Congenital heart defect, Child health, Quality of life, Ventricular Septal Defect*

INTRODUCTION

A ventricular septal defect is an opening in the ventricular septum or dividing wall between the two lower chambers of the heart known as the right and left ventricles. VSD is a congenital (present at birth) heart defect. As the fetus is growing, something occurs to affect heart development during the first eight weeks of pregnancy, resulting in a VSD ***(Jivanji et al., 2019).***

Ventricular septal defects arise from problems early in the heart's development, but there's often no clear cause. Genetics and

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environmental factors may play a role. VSDs can occur alone or with other congenital heart defects. During fetal development, a ventricular septal defect occurs when the muscular wall separating the heart into left and right sides (septum) fails to form fully between the lower chambers of the heart (ventricles) ***(Seyoum, 2019).***

Ventricular septal defects may close spontaneously as your child grows. A larger VSD usually requires surgical repair. Regardless of the type, once a ventricular septal defect is diagnosed, your child's cardiologist will evaluate your child periodically to see whether it is closing on its own. A VSD will be repaired if it has not closed on its own to prevent lung problems that will develop from long-time exposure to extra blood flow ***(Shah et al., 2020).***

Quality of life for children with congenital heart disease means the children's physical and psychological well-being, level of confidence, social relationships, environmental agents, and individual opinions. While evaluating quality of life, the child is asked what to consider about their own life, and the purpose is to grade the child's physical, psychological, and social well-being by discussing the child as a whole with all their characteristics ***(Sertcelik et al., 2018).***

Health education is essential for parents having children with Ventricular Septal Defects (VSD) regarding contributing factors such as illness and care of the child. Emphasis program related to nutritional status, feeding problems. Nurses should give parents and their children with VSD effective guidance about their illness and lines of management. Encouraging maternal participation in the care of their children suffers from VSD. Furthermore, absence of studies in Africa to evaluate the mother's knowledge and attitudes towards their children with congenital heart disease, as well as their quality of life ***(Zuechner et al., 2019).***

The researcher found lack of mothers knowledge towards VSD in inpatient and outpatient departments of academic affiliated that affect the quality of children life from this point it's important from researcher point of view to conduct this study to evaluate the effect of educational program to improve quality of life for children with Ventricular Septal Defect.

AIM OF STUDY

This study aimed to assess the mothers' knowledge and practice regarding care of their children with ventricular septal defect.

1. Assess the mothers' knowledge regarding the care of their children with VSD.
2. Assess the mothers' reported practice regarding care of their children with VSD.

Research question:

Research Questions:

1- What are the mothers' knowledge regarding care of their children with VSD?
2- What are the mothers' reported practices regarding care of their children with VSD?
3- Is there relation between mothers' knowledge and practices regarding care of their children with VSD?

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SUBJECTS AND METHODS

The subject and method for this study were portrayed under four main items as the following:

I- Technical design.

II- Operational design.

III- Administrative design.

IV- Statistical design

I- Technical design:

Technical design for this study included a description of the research design, setting, subjects, and tools of data collection.

Research design:

A descriptive study was utilized to fulfill the aim of this study.

Research settings:

The current study was conducted at the inpatient and outpatient departments of the Academic Institute for Heart Surgery in Ain-Shams University.

Research Subjects:

A purposive sample consisted of sixty children suffering from VSD and their accompanying mothers attending to the previously mentioned setting under the following inclusion criteria:

Inclusion criteria for children:

Children: Both genders, aged birth-12 years, confirmed diagnosis with VSD, Children free from any other physical or mental disease.

Exclusion criteria:

Other children who have physical or mental disorders were excluded from the study.

Tools for Data collection:

The tools of data collection were designed by the researcher in the light of the relevant review of literature and written in simple Arabic language. All tools designed for the mothers were used twice pre and post program implementation.

Tool (I): A Structured Interview Questionnaire Sheet:

It was developed by the researcher and consist of 4 parts:

- **Part (1):** Characteristics of studied children included (age, gender, and child rank and educational level)
- **Part (2):** Concerned With characteristics of studied mother's included (age, educational level and occupation and material status)
- **Part (3):** Studied children's medical records to assess the health status of children which included (physical, circulatory, respiratory, urinary tract, nervous, motor system and skin condition for the child).
- **Part (4):** Studied mothers' knowledge about VSD include (definition, types, causes, signs and symptoms, complications and treatments).

Scoring system:

The total score of knowledge comprises 0-7 grades with rating ranging from 0 to 1 with a higher score reflecting satisfaction for each item. Each question response was either correct (1 grade) and incorrect (0 grade).

Score % = (the observed score / the maximum score) × 100

- Knowledge satisfied >75% (Score 5-7).
- Knowledge unsatisfied <75% (Score 0-4).

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Tool (II): Observational Checklist:

Part (1): Regarding studied mothers' reported practice regarding caring of their children with VSD include (healthy nutrition, upper respiratory tract infection, immunization, infectious disease, fever, difficult of breathing, weight loss, drug administration, daily activities)

Scoring system:

Mothers reported practices in managing their child's condition. It included 69 items, scored on a scale of 0 to 1 (done = 1, not done = 0). The total score ranged from 0-69, with practices classified as:

- Competent: > 75% (Score 69-104).
- Incompetent: < 75% (Score 105-138).

Validity of tool:

To ensure the trustworthiness of the data collection tools used in this study, revision of the tools was done by a panel of (3) expertise in pediatric health nursing. They evaluated the tools for clarity, relevance, comprehensiveness, simplicity, and applicability.

Reliability of tool:

The reliability of the tool was assessed across all its components. The determination of internal consistency was carried out using Cronbach's alpha coefficient test.

This assessment comprised the following elements:

Items	Cronbach's alpha coefficients
Reliability for knowledge	0.845
Reliability for practices	0.813

Pilot study:

The pilot study was carried out on 10% of the participants in the research, which included 6 children and their mothers who met the sample criteria. The aim was to assess the clarity of questions, and the time required to complete the study tools. After analyzing the results of the pilot study, no changes were made. The participants in the pilot study were also included in the overall study sample.

Field Work:

The actual field work was carried out for data collection over six months starting from February to the end of June 2023. Data collected three days per week during morning shift from 9 am – 12 pm at previously mentioned settings. Mothers interview to assess mothers knowledge about ventricular septal defect using a questionnaire sheet. Also, data related studied children's characteristics, physical assessment and follow up were obtained from medical record of each child. Meanwhile, each mother was assessed regarding to their reported practices using observation sheet. The Time spent to fill the questionnaire ranged between 30 to 40 minutes according to the needed explanations.

III- Administration Design:

A formal written communication letter sent from the Faculty of Nursing at Helwan University to the administrators of the institution where the study was conducted. The letter was intended to facilitate the implementation of the research.

Ethical Considerations:

Ethical approval was obtained from the scientific ethical committee, Faculty of Nursing, - Helwan University, after submitting a proposal for the research and

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examining all papers by the committee concerned. Then the purpose and nature of the study were explained to the participants and oral permission was taken from the mothers and informed that each study subject is free to withdraw at any time through the study without giving any reasons.

IV- Statistical Design:

The data obtained from the sample under study was meticulously analyzed and organized using Statistical Package for the Social Sciences (SPSS) version 20. Quantitative data was shown using numbers and percentages. The statistical analyses included chi-square tests, mean calculations, standard deviation measurements, and correlation tests, all revealing high internal consistency and construct validity.

RESULTS

Table (1): Distribution of the studied children according to their socio-demographic data for child (n=60).

Socio-demographic data	No.	%
Gender:		
Male	30	50.0
Female	30	50.0
Child's age:		
Birth to 6 years < 6 years	24	40.0
6 years to 12 years	36	60
Mean±SD	7.8±1.6	
Birth order among sibling:		
The first	12	20.0
The second	30	50.0
The third	17	28.3
Others	1	1.7
The child's education level:		
Under school age	14	23.3
Primary school	10	16.7
Preparatory school	36	60

Table (1): Illustrates that, regarding gender, the distribution was equal, with half **(50.0%)** of studied children being male. As regards the children's age, (60%) were aged between 6 to 12 years. The mean age of the children was 7.8 ± 1.6 years. In relation to education level, more than half **(60%)** were in preparatory school. It was found that, **(50%)** of them were the second children in their family

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Table (2): Distribution of the studied mothers of children according to their family's socio demographic data (n =60).

Mother	No.	%
Age in years:		
25 < 35 years	42	70.0
35 < 45 years	9	15.0
≥ 45 years	9	15.0
Mean±SD	34.5±2.86	
Education level:		
Illiterate	13	21.7
Basic education	24	40
Intermediate education	10	16.7
Higher education	13	21.7
Job:		
Unemployed	48	80.0
Employed	12	20.0
Marital status:		
Married	51	85.0
Single	7	11.7
Widow	2	3.3
Consanguinity between mother and father: -		
No	43	71.7
Yes	17	28.3
If 'Yes,' degree of consanguinity.		
First degree	47	78.3
Second degree	13	21.7
Residence (Environment):		
Urban	35	58.3
Rural	25	41.7
Family income:		
Enough	36	60.0
Not enough	24	40.0

Table (2): shows that, regarding the age of studied mothers, the majority (70.0%) were aged between 25 and less than 35 years. In terms of educational level, less than half (40.0%) of the mothers had basic education. Concerning employment status, the majority (80.0%) of the mothers studied were not working. The marital status distribution showed that the majority (85.0%) were married, in terms of residence, more than half (58.3%) of the families lived in urban areas.

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

Items	No.	%
Ventricular Septal Defect detection		
Accidently (by chance)	12	20.0
Through symptoms of the disease	28	46.7
Complications of the disease	17	28.3
Through periodic examinations	3	5.0
Other mention	0	0.00
VSD family history		
Yes	28	46.7
No	32	53.3
Degree of relationship to the child		
First degree	5	17.9
Second degree	23	82.1
Child admission to the hospital		
Once	5	8.3
Twice	13	21.7
Third or more	42	70.0
Causes of admission		
Causes related to the disease	60	100.0
Other reasons mentioned		
Do you follow up periodically		
Yes	41	68.3
No	19	31.7
Period for follow up		
Week	4	9.8
Two weeks	23	56.1
Month	14	34.1
Another mention	0	0.00
Child received all the compulsory vaccinations		
Yes	33	55.0
No	27	45.0

Table (3): shows that presents the medical history of the studied children. Regarding how the ventricular septal defect was detected, nearly half (46.7%) of the cases were identified through symptoms of the disease. Concerning family history, slightly less than half (46.7%) of the children had a family member with a ventricular septal defect, In terms of hospital admissions, the majority (70.0%) of studied children were hospitalized three or more times. The primary reason for hospitalization in all cases (100.0%) was related to the disease itself.

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Table (4): Distribution of the studied mothers according to their total level of knowledge about the ventricular septal defect (n=60).

Total level of mothers knowledge about the ventricular septal defect	No.	%
Satisfactory >75%	14	23.3
Unsatisfactory <75%	46	76.7
Total	60	100.0

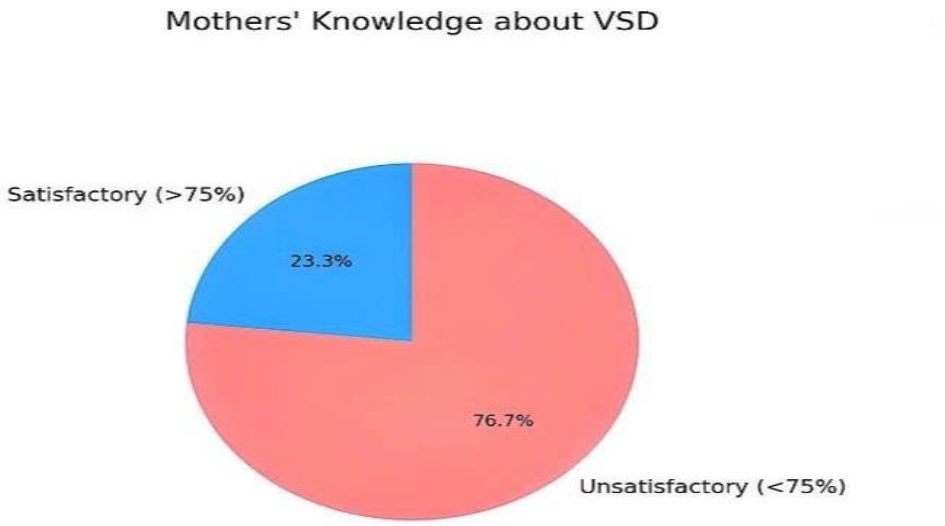

Figure (1): Percentage distribution of the studied mothers according to their total level of knowledge about the ventricular septal defect (n=60).

Table (4), Fig (1): Regarding to studied mothers' knowledge about VSD, this table clarifies that, more than two third of the studied mother's (76.7%) had unsatisfactory knowledge of VSD.

Table (5): Distribution of the studied mothers according to their total level of reported practice towards their children with ventricular septal (n=60).

Total level of mothers practices towards caring of their children with ventricular septal defect		
	No.	%
Competent >75%	16	26.7
Incompetent<75%	44	73.3
Total	60	100.0

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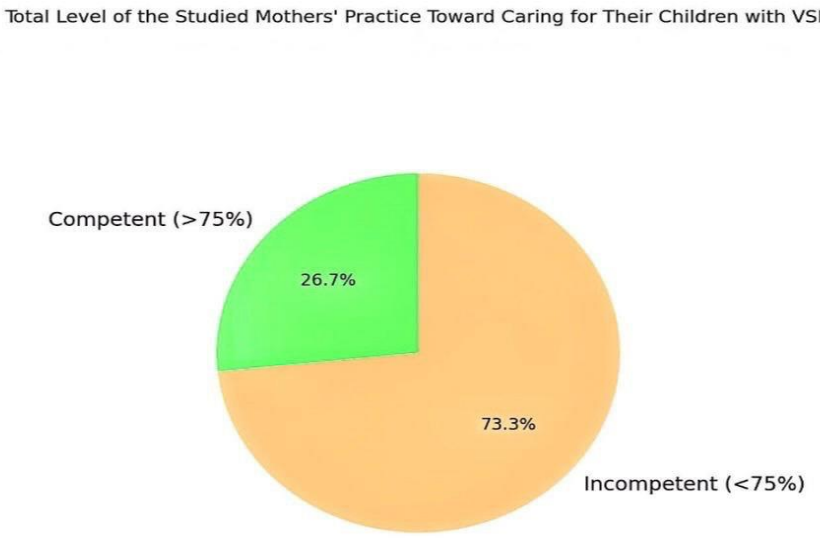

Figure (2): Percentage distribution of the studied mothers according to their total level of reported practice towards their children with ventricular septal (n=60).

Table (5), Fig(2): shows that, highlights the overall studied mothers' practice towards the caring of their children with ventricular septal defects, only 26.7% of mother's demonstrated adequate practices (done >75%), while the majority (73.3%) fell below this threshold.

Table (6): Relation between studied mothers of knowledge about the ventricular septal defect according to their socio-demographic data (n=60).

Socio-demographic data	knowledge score			
	Satisfactory (n=14)		Unsatisfactory (n=46)	
	No.	%	No.	%
Age (Years)				
25 < 35 years	10	71.4	32	69.6
35 < 45 years	2	14.3	7	15.2
≥ 45 years	2	14.3	7	15.2
Chi-square x^2	0.018			
p-value	0.991			
Educational Level				
Illiterate	0	0.0	13	28.3
Basic education	7	50	17	37.0
Intermediate education	2	14.3	8	17.4
Higher education	5	35.7	8	17.4
Chi-square x^2	6.138			
p-value	0.105			
Job				
Unemployed	12	85.7	36	78.3
Employed	2	14.3	10	21.7
Chi-square x^2	0.373			
p-value	0.542			
Marital status:				
Married	13	92.9	38	82.6

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Single	1	7.1	6	13.0
Widow	0	0.0	2	4.3
Chi-square x^2	1.062			
p-value	0.588			
Consanguinity between Mother and Father				
No	11	78.6	32	69.6
Yes	3	21.4	14	30.4
Chi-square x^2	0.429			
p-value	0.513			
Residence (Environment)				
Urban	11	78.6	24	52.2
Rural	3	21.4	22	47.8
Chi-square x^2	3.077			
p-value	0.079			
Family Income				
Enough	13	92.9	23	50.0
Not enough	1	7.1	23	50.0
Chi-square x^2	8.214			
p-value	0.004*			

Using: Chi-square test
*p-value >0.05 NS; *p-value <0.05 S; **p-value <0.001 HS*

Table (6): Shows that, the relationship between studied mothers' knowledge about ventricular septal defects and their socio-demographic data. age and family income show statistically significant relation with the mothers' knowledge levels. Specifically, mothers aged less than 35 years had the highest percentage of satisfactory knowledge (71.4%), and those with enough income were far more likely to have satisfactory knowledge (92.9%) compared to those without (7.1%), with a p-value of 0.004,indicating a significant relationship.

Table (7): Relation between studied mothers of practice about caring for their children with ventricular septal defect according to their socio-demographic data (n=60).

Socio-demographic data	**practice score**			
	Done (n=16)		**Not done (n=44)**	
	No.	**%**	**No.**	**%**
Age(Years)				
25 < 35 years	12	75.0	30	68.2
35 < 45 years	2	12.5	7	15.9
≥ 45 years	2	12.5	7	15.9
Chi-square x^2	0.260			
p-value	0.878			
Educational Level				
Illiterate	2	12.5	11	25.0
Basic education	7	43.8	17	38.6
Intermediate education	1	6.3	9	20.5
Higher education	6	37.5	7	15.9
Chi-square x^2	4.868			
p-value	0.182			
Job				
Unemployed	13	81.3	35	79.5

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Employed	3	18.8	9	20.5
Chi-square x^2	0.021			
p-value	0.884			
Marital Status				
Married	15	93.8	36	81.8
Single	1	6.3	6	13.6
Widow	0	0.0	2	4.5
Chi-square x^2	1.472			
p-value	0.479			
Consanguinity between Mother and Father				
No	15	93.8	28	63.6
Yes	1	6.3	16	36.4
Chi-square x^2	5.240			
p-value	0.022			
Residence(Enviroment)				
Urban	15	93.8	20	45.5
Rural	1	6.3	24	54.5
Chi-square x^2	11.260			
p-value	0.001			
Family Income				
Enough	15	93.8	21	47.7
Not enough	1	6.3	23	52.3
Chi-square x^2	10.355			
p-value	0.001**			

Using: Chi-square test
*p-value >0.05 NS; *p-value <0.05 S; **p-value <0.001 HS*

Table (7): Shows that, the relationship between studied mothers' practices regarding the caring of their children with ventricular septal defects and their socio-demographic data. where mothers with higher education, urban residence, and sufficient income demonstrated better practice.

Table (8): Correlation matrix between total score of studied mothers' knowledge about the ventricular septal defect, total score of practice of studied mothers towards caring for their children with ventricular septal defect(n=60).

Items		Total score of knowledge	Total score of practice
Total score of knowledge	r		0.277
	p-value		0.137
	N		60
Total score of practice	r	0.277	
	p-value	0.137	
	N	60	

**p-value <0.05 significant correlation; **p-value <0.001 highly significant*

Table (8): Shows that, the results show weak positive correlations between knowledge and practice (r = 0.277, p = 0.137),. However, none of these correlations were statistically significant.

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DISCUSSION

Ventricular Septal Defect (VSD) is a congenital heart condition that develops early in fetal life ***(Children's National Health System, 2024).*** Early diagnosis and intervention improve outcomes, while delayed or untreated cases can lead to complications, making management more challenging ***(Pediatric Cardiology Associates of Houston, 2024).*** Thus, early recognition and proper management are essential for reducing risks and improving prognosis.

The study found that most children diagnosed with VSD were under six years old, aligning with ***Ladak et al. (2018),*** who reported a prevalence among children aged 6-8. This highlights the importance of early diagnosis. In terms of gender, an equal male-to-female distribution was observed, differing from ***El-Gendy et al. (2020) and Meshram et al. (2018),*** who reported higher male prevalence. Birth order analysis revealed a higher diagnosis rate among second-born children, likely due to increased parental awareness, consistent with ***(Researcher, 2016),*** but contrasting with Brown & Smith (2018), who found firstborns more affected.

Regarding education, 61.7% of affected children were in preparatory school, in line with ***Ladak et al. (2018),*** who noted that a significant proportion of diagnosed children were in primary school. This suggests that school-age children are more likely to be diagnosed due to increased medical checkups and parental awareness.

Mothers' Socio-Demographic Characteristics

Most mothers were aged 25-35, had lower educational levels, and high unemployment rates, consistent with ***(Researcher C, 2017),*** who found similar socio-economic patterns among mothers of children with congenital heart defects. Consanguinity was present in 28.3% of cases, aligning with ***(Researcher D, 2018) and Mokhtar et al. (2020),*** who reported a 29% consanguinity rate, reinforcing its link to genetic heart anomalies.

More than one-third of the mothers had basic education, consistent with ***Elshazali et al. (2018) and El-Gendy et al. (2020),*** who linked lower educational levels to early marriages in rural communities ***(Balat & Sahu, 2018).*** Additionally, nearly three-quarters of mothers were housewives (Hussein et al., 2018). Residency data showed that two-thirds of mothers lived in rural areas, similar to ***El-Gendy et al. (2020) and Elsayed et al. (2020),*** highlighting limited access to specialized pediatric cardiology care.

Mothers' Knowledge and Practices in Managing VSD

The study found that most mothers had poor knowledge about VSD, consistent

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with ***Animasahun et al. (2015),*** who reported that over two-thirds of parents lacked adequate knowledge about congenital heart diseases. Similarly, ***Elshazali et al. (2018)*** found that only 57.5% of parents understood the diagnosis and management of CHDs. This lack of knowledge affects timely symptom recognition and treatment, emphasizing the need for targeted educational interventions ***(Sabrein et al., 2020).***

Many mothers also exhibited inadequate caregiving practices, including missing medical checkups and failing to follow treatment regimens. This aligns with ***Mohamed & Mohamed (2019),*** who reported that less than two-thirds of mothers demonstrated proper care practices. In contrast, ***EL-Gendy et al. (2020)*** highlighted the effectiveness of guided programs in improving caregiving practices. Positive correlations between maternal knowledge and child health outcomes reinforce the importance of structured educational interventions to improve care.

Relation and correlation between the study variables.

Regarding the relationship between mother's knowledge and socio-demographic factors (Elshazali et al., 2018) displayed that good knowledge from urban residents, younger in age and better educated all have a positive contribution to the amount of knowledge., such as education and income, highlights disparities in healthcare access and outcomes, mothers with higher education levels and sufficient income tend to have better knowledge and practices regarding child health

This is in agreement with Mohammed (2015) who reported that being young, well educated, urban areas have a positive impact on knowledge. Residence practice the possible explanation of urban-rural variation of alcohol consumption includes influence of social and cultural factors like religious cultural practices, community and family relationships, economic conditions

This agrees with Singh et al. (2017) who observed that the BMI of school children significantly differed between urban and rural areas. The BMI of school children significantly differed between urban and rural areas was also justified by an Indian study of Punjab (Singh et al., 2017).

Other researchers reported that place of residence had higher odds for having several modifiable VSD risk factors including current smoking, inadequate fruits and/or vegetables intake, physical inactivity, overweight and obesity. Previous studies reported significant urban-rural differences for tobacco consumption and the rate was higher among rural compared with urban children, similar to our study (Mazhar et al., 2016).

Regarding to correlation between total studied of mother's knowledge and score of reported practice regarding the care

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of their children suffering from ventricular septal defect. The present study showed that there was negative insignificant statistical correlation between total knowledge and total mothers'reported practices regarding the care of their children suffering from ventricular septal defect (EL-Sobkey et al., 2018).

This finding is inconsistent with that of EL-Gendy et al. (2020), reported that guiding program for mothers to improve the quality of life of their children with ventricular septal defect and The effect of pre hospital discharge care program on mothers knowledge and reported practice for children after congenital heart surgery" found more than one third was above twenty years old (Meentken et al., 2017).

CONCLUSION

In the light of the current study, it could be concluded that, There was more than two-thirds of the studied mothers had an unsatisfactory overall level of knowledge, and over one-third of them demonstrated inadequate practices. Additionally, there was a statistically significant relationship between the mothers' socio-demographic characteristics and both their total knowledge and reported practices regarding the care of their children with ventricular septal defect.

RECOMMENDATION

In the light of the findings of the present study, the following recommendations are suggested:

- Develop and distribute educational materials for mothers of children with ventricular septal defect.
- Design and validate protocols and guidelines for home care for mothers with ventricular septal defect.
- Investigate the long-term outcomes of designed educational program for mothers on prognosis, mortality and quality of life for children with ventricular septal defect.

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