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Improving Knowledge, Attitude and Home Care of Mothers Regarding Children with Congenital Anomalies

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Abstract
Background*: there is a gap in the counseling given to mothers about congenital anomalies, so improving the transmission of information to studied mothersand educating the population through implementing educational programs became more significant for healthier families.*
The aim *of the present study was to improve knowledge, attitude and practice of home care of mothers regarding children with congenital anomalies at Menofia and Beni-Suef City.*
Design: *A quasi experimental design was used to achieve the aim of the current study.*
Sample and Setting: *A convenience sample was selected under the inclusion criteria (115 mothers; 50 from Menofia city and 65 from Beni-Suef city) was included in the study. Studied motherswere selected from obstetrics and gynecological outpatient clinics and pediatric physiotherapy outpatient clinics of Menofia and Beni-Suef University hospitals.*
Tools; the first *is interviewing questionnaires composed of 4 parts; Part 1: to assess socio-demographic characteristics of studied mothers. Part 2: to assess maternal risk factors among studied mothers and types of congenital anomalies among children. Part 3: to assess studied mothers' knowledge about congenital anomalies(pre/post- test). Part 4: assess home care as reported by studied mothers (pre/post-test).*
The second:*Likert type-scale of three continuums was used to assess the studied mothers' attitude(pre/post-test).*
The main results *of the present study:The highest prevalence of maternal risk factors was for consanguinity in Beni-Suef city and medication misuse during pregnancy in Menofia city, and the highest percentage of congenital anomalies among children was for congenital heart defect in Beni-Suef city and musculoskeletal disorders in Menofia city. The studied mothershad unsatisfactory knowledge, negative attitude, &unsatisfactory home care.*
Conclusion: *the knowledge, attitude and home care of studied mothersregarding children with congenital anomalies at Menofia and Beni-Suef City improved significantly after implementing education intervention program than before.*
Recommendation: *Scale up community based interventions are needed to reduce the prevalence of maternal risk factors and occurrence of congenital anomalies among their children.*
Keywords*: Improving, Knowledge, Attitude and Home Care, Congenital Anomalies*

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I. Introduction

Congenital malformations, birth defects, or congenital disorders can be defined as structural or functional anomalies (for example, metabolic disorders) that occur during intrauterine life and can be identified prenatally, at birth, or sometimes may only be detected later in infancy, such as hearing defects **(WHO,2016).** In spite of the frequency of congenital anomalies, the underlying causes for most remain obscure. It has been estimated that around 40–50% of birth defects are unknown cause. A combination of hereditary and environmental factors, genetics, and maternal illnesses are attributed to congenital anomalies. One of the most important risk factors of birth defects is consanguinity (when parents are related by blood) also increases the prevalence of rare genetic congenital anomalies and nearly doubles the risk for neonatal and childhood death (**Sadik and Shawky, 2011).**

Worldwide surveys have shown that birth prevalence of congenital anomalies (CA) varies greatly from country to country. It is reported to be as low as 1.07% in developed countries as Japan and high in low- and middle-income countries as Egypt, this higher risk relates to a possible lack of access to sufficient, nutritious foods by mothers, an increased exposure to agents or factors such as infection and alcohol, or poorer access to

healthcare and screening. The most common serious congenital disorders are congenital heart defects, neural tube defectsandDown syndrome**(Francine, Pascale, and Aline 2014).** .

Congenital anomalies have serious consequences on the health of affected children that range from being severely ill, either temporarily or life-long. Children with CA face many problems, including multiple surgical interventions, long neonatal hospitalization, and often uncertainty about future quality of life. Understanding the experience of the family to provide care for a child with a congenital abnormality, difficulties and to what extent does the guidance provided during hospitalization help families to care for their children at home, can provide the initial step to design an effective education program to support the families to provide high quality home health care for a child with a congenital anomaly **(Guiller et-al., 2009 and Sabzevari et-al., 2016)**

Caregivers need better communication from and with healthcare professionals so that they are better able to care for their child with congenital anomalies. Prevention of birth defects is not only essential for the health of future generations, but also to prevent some of the co-morbidities that come with the birth defects (**Lemacks, et-al., 2013**). Itis important that careful examination of newborns be carried out inorder to detect (and correct) early cases of congenital anomalies**(Ekwere, et-al., 2011)**.

The nurse has a unique opportunity to influence the child's physical and emotional health. Nurses have a crucial role in education, treatment, research, and support of children with congenital anomalies and their families to help them learn to live with the defect and attain optimal health **(James, Nelson &Ashwill, 2013).** Managing a congenital anomaly requires an individualized approach to the child and parent's emotional, as well as physical, requirements. Nurses should include families in the care of their children, accompanying and helping them to establish a more affective connection with their children. Thus, professionals have stimulated parents to talk to their babies, touch them, and bring objects from home that are significant to children, and care for their hygiene and feed them **(Helwick, 2012).**

Significance of the study

The congenital anomalies deaths in Egypt reached 15.723 or 3.06% of total deaths. The age adjusted death rate is 12.32 per 100,000 of population ranks Egypt ≠ 36 in the world (**WHO, 2017)**. About 1 every 33 babies currently born with a birth defect, and with birth defects being a leading cause of morbidity and mortality in children. Having a child with a birth defect impacts the whole family. Parents of children who have birth defects face unique challenges and desire to make life better for their kids. First, parents need others to be aware of the impact of birth defects and how they affect quality of life within families and in the children. Second, parents would like better communication from and with healthcare professionals so that they are better able to care for their child. Third, prevention of birth defects is not only essential for the health of future generations, but also to prevent some of the co-morbidities that come with the birth defects**(Centers for Disease and Prevention, 2018).**Mothers are still not knowledgeable about the factors can affect them and their unborn children negatively which leads to maternal and infant mortality. Inadequate knowledge about the defects including the causes, risk factors and early recognition of some features among mothers could result in delayed interventions, and unwanted pregnancy outcome. Improving knowledge, attitude, and practice for mother's aboutcongenital anomalies is the base of prevention, control and important for planning care so the community receives healthy families.

Aim of the study

The aim of the present study was to improve knowledge, attitude and practice of home care of mothers regarding children with congenital anomalies at Menofia and Beni-Suef City. This aim achieved through the following objectives:

1. Assess knowledge, attitude, and home care of studied mothers regarding congenital anomalies.
2. Assess maternal risk factors of congenital anomalies among studied mothers.
3. Identify types of congenital anomalies among children of studied mothers.
4. Implementing and evaluating nursing education intervention about congenital anomalies.

Research hypotheses: The research hypotheses were that:

RH1: The studied mothers in both Beni-Suef and Menofia city have unsatisfactory knowledge, practice, and negative attitude regarding congenital anomalies.

RH2: Themothers receiving nursing education intervention will make significant improvements in their knowledge, attitude and practice of home care regarding children with congenital anomalies.

II. Methodology

Research Design:

A quasi experimental design was used to achieve the current study aim

Research settings:

The study was conducted in the outpatient clinics of the pediatric physiotherapy department, and obstetrics and gynecological clinics of Menofia and Beni-Suef University hospitals, Egypt.

Research sample:

A convenience sample of 115mothers(50 Menofia and 65 Beni-Suef mothers) was included in the study, selected according the following inclusion criteria:

- Pregnant mothers in the first trimester.
- Mothers have child or more with any type of congenital anomalies.
- Accept to participate in the study.

Data collection tools: to achieve the aim of the study, data was collected by the following tools:

I- Interviewing questionnaire was used to collect data and composed of 4 parts

Part 1: It involve questions related to socio-demographic characteristics of studied mothers such as age, level of education and occupation.

Part 2: it comprised questions related maternal risk factors among studied mothers and types of congenital anomalies among children.

Part 3: It contained 48 questions to assess studied mothers' knowledge about congenital anomalies; causes, types, diagnostic measures and control and Preventive strategies **(Mohamed, Mohamed and Abdelfatah, 2013)**

Scoring system: For knowledge; each correct response took one score with a total score of 48 represent 100%. Total knowledge's score of less than 50% considered as unsatisfactory level of knowledge, while score of 50% and more considered as satisfactory level of knowledge. The scoring system was applied on the questions of each category and on the total questions.

Part 4: It contains 50 points to assess home care as reported by studied mothersthat cover 5 major elements. The 5 major elements were balanced nutrition, prevention from infection, prevention from injuries, health care administering medications and personal hygiene.

Scoring system: For home care each done step response took one score with a total score of 50 steps represent 100%. Total home care score of less than 70% considered as unsatisfactory level of care, while score of 70% and more considered as satisfactory level of care. The scoring system was applied on the steps of each element and on the total steps.

II- Likert type-scale of three continuums was used to assess the studied mothers' attitude.It consisted of 9 statements to assess studied mothers' attitude regarding congenital anomalies, it consisted of 3 items {agree (3), not sure (2) and disagree (1)}. The general attitude was calculated as follows, the total score of 9 statements represent 100%. Total attitude score of less than 60%considered as negative attitude, while score of 60% and more considered as positive attitude.

Approval:

An official permission was obtained from the official personnel in Menofia and Beni-Suef University hospitals to conduct the study and collect the necessary data. Simple explanation was given to them about the nature of the study, its aims, benefits and study data collection tools.

Ethical considerations:

The study was conducted with careful attention to ethical standards of research and rights of participants. Oral consent was taken from each mother they were informed that the data collected will be used for the research only, and confidentiality manner is assured. They were assured about confidentiality; as well they informed that they can withdraw at any time from the study.

Data Collection Procedure

- **The tool validity** test was done through five expertises. They were faculty members of community health nursing department and maternal and neonatal health nursing department and necessary modifications were done. Cronbach' alpha test was used to measure the internal consistency reliability of the questionnaire. Reliability coefficients' alpha for questions of knowledge was 0.74 and for attitude was 0.78 and for steps of home care was 0.86.

- **Pilot study:** A pilot study was carried out on 10% (12 mothers) to test the content of the questionnaire as well as to estimate the time needed for data collection and the necessary modifications were done. Those who shared in the pilot study were excluded from the study sample.
- Data were collected during the period from the beginning of March 2017 to the end of August 2017 (6 months). The data collection process has been in a parallel manner, data was gathered in Menofia and Beni-Suef University hospitals at almost the same time.
- Each mother was interviewed by researchers individually after explaining the purpose and of the study. The time needed for each mother to answer the structured interview schedule and attitude sheet ranged from 25 - 35 minutes depending upon the understanding and response of the studied mother. Waiting areas in the outpatients clinics were the place where interview took place.

The health education intervention program was implemented by researchers through 4 sessions each session took about 30-45 minutes;includingitems regarding knowledge about congenital anomalies (risk factors, types, diagnostic measures, control and preventive strategies)and items regarding mothers'practice of home care to their children(balanced nutrition and healthy eating patterns, prevention from infection, health care and follow up, personal hygiene of the child)

- Post-test was done immediately after intervention to evaluate the effect of the program.

Statistical analysis:

The collected data were organized, revised, stored, tabulated and analyzed using the number and percentage distribution, statistical analysis was done by computer .Proper statistical test were used(chi square) to determine whether there was a significant differences or not, using statistical package for social science program (SPSS) version 20.

III. Results

Table (1) reveals that 29.2% of studied mothers aged Less than 35 years old in Beni-Suef compared to 22.0% in Menofia, 35.4 % of them aged more than 40 years in Beni-Suef compared to 44.0% in Menofia.Regarding level of education, the data denotes that only 9.2 % of studied mothers graduated from university in Beni-Suef compared to 52.0% in Menofia, while 50.8 % of studied mothersare illiterate in Beni-Suef compared to 10% in Menofia. As regards of occupation, 81.5 % of studied mothers are housewives in Beni-Suef compared to 54.0% in Menofia

Table (2) indicates that the highest percentages of maternal risk factors in Beni-Suef city were for consanguinity, followed by studied mothers misuse medication during pregnancy, exposed to bacterial infection, exposed to passive or negative smoking (69.2 %, 43.1%, 35.4% respectively) while among Menofia city' studied mothers, the highest percentages of risk factors were for medication misuse during pregnancy, followed by pregnancy at late age, malnutrition or anemia and exposed to passive or negative smoking (46.0%, 42.0%, 38.0% respectively).

Table (3) shows that the higher percentage of congenital anomaly among studied mothers in Beni-Suef is for congenital heart defects (47.7 %), followed by musculoskeletal disorders (27.7 %), Cleft lip and cleft palate (13.8), and minimal percentage is for neural tube defects (10.8 %), while in Menofiathe higher percentage of congenital anomaly is for musculoskeletal disorders (44.0 %), followed by congenital heart defects (24.0 %), cleft lip and cleft palate (20.0 %), and less percentage for neural tube defects (12.0 %)

Table (4) denotes that 70.8 % 0f studied mothers in Beni-Suef have unsatisfactory knowledge regarding Congenital Anomalies among Children compared to 52.0 % in Menofia and the rest have satisfactory knowledge.

Table (5)elucidates that the studied mothers in Beni-Suef agree that this condition not punishment of the god, not affect the desire to another pregnancy, resources of care are available (35.3%, 40.0%, 36.9% respectively), while among Menofia' studied mothers, they agree that this condition not punishment of the god, early detection is important, resources of care are effective and available (44.0%, 50.0%, 48.0%, 40.0% respectively)

Table (6) illustrates that only 29.2 % of studied mothers in Beni-Suef compared to 40.0 % in Menofiahave positive level of attitude toward congenital anomalies among children.

Table (7) representsthat 63.1% of studied mothers have unsatisfactory level of practice toward their children in Beni-Suef, compared to 62.0 % in Menofia**.**

Table (8) demonstrates that socio-demographic characteristics of studied mothersaffect their total level of knowledge; the percentage of mothers have satisfactory level of knowledge increasedin the age of >40 years and highly educated and is higher among Menofia' mothers than Beni-Suef. There are significant relation between studied mothers'age, education & their setting and their total level of knowledge ($P< 0.05$).

Table (9)illuminates that percentage of mothers have positive attitude increased in age ranged from 35 to 40 years old, highly educated, and Menofia' mothers.There are significant associations between studied mothers'age & education, and their total level of attitude (P< 0.05).

Table (10) lightens that that percentage of mothers have satisfactory practice (self-reported) increased in age ranged from 35 to 40 years old, highly educated, and Beni-Suef 'mothers. There are significant associations between studied mothers' education & setting, and their total self-reported practice (P< 0.05).

Table (11)reveals that percentage of satisfactory knowledge, positive attitude and satisfactory practice (self-reported) increased after implementing nursing education intervention. There are significant relations between total level of knowledge & attitude of mothers regarding congenital anomalies before and after implementing nursing education intervention.

Table (1) Distribution of studied mothers according to their socio-demographic characteristicsin Beni-Suef and Menofia city(115)

Item	Beni-Suef (65)		Menofia (50)		Total	
	N	%	N	%	N	%
Age in years:						
<35 years	19	29.2	11	22.0	30	26.1
35 to 40 years	23	35.4	22	44.0	45	39.1
More than 40 years	23	35.4	17	34.0	40	34.8
Level of education:						
-University education	6	9.2	26	52.0	32	27.8
-Secondary school education	10	15.4	11	22.0	21	18.3
-Just read and write	16	24.6	8	16.0	24	20.9
-Illiterate	33	50.8	5	10.0	38	33.0
Studied mothers' occupation:						
-Working	12	18.5	23	46.0	35	30.4
-House wife	53	81.5	27	54.0	80	69.6

Table (2) Distribution of maternal risk factors associated with congenital anomalies in Beni-Suef and Menofia city (115)

Items	Beni-Suef (65)		Menofia (50)		Total	
	N	%	N	%	N	%
Presence of consanguinity	45	69.2	15	30.0	60	52.2
Exposure to radiation during pregnancy	9	13.8	4	8.0	13	11.3
Environmental pollution	13	20.0	6	12.0	19	16.5
Exposure to infections during pregnancy	23	35.4	14	28.0	37	32.2
Dietary lifestyle (Malnutrition or anemia)	21	32.3	19	38.0	40	34.8
Medication misuse during pregnancy	28	43.1	23	46.0	52	45.2
Exposure to emotional stress during pregnancy	21	32.3	5	10.0	26	22.6
Pregnancy at early age / late age	11	16.9	21	42.0	32	27.8
Pregnancy / Delivery complications	4	6.2	3	6.0	7	6.1
Family history of genetic problem (for any one of mother' extended family)	3	4.6	3	6.0	6	5.2
Delayed / no antenatal care	9	13.8	5	10.0	14	12.2
History of disease during pregnancy	13	20.0	15	30.0	28	24.3
Exposed to passive or negative smoking	23	35.4	19	38.0	42	36.5

Table (3) Distribution of studied mothersaccording types of congenital anomalies amongtheir childrenin Beni-Suef and Menofia city (115)

Items	Beni-Suef (65)		Menofia (50)		Total	
	N	%	N	%	N	%
Congenital heart defects	31	47.7	12	24.0	43	37.4
Neural tube defects	7	10.8	6	12.0	13	11.3
Musculoskeletal disorders	18	27.7	22	44.0	40	34.8
Cleft lip and cleft palate	9	13.8	10	20.0	19	16.5

Table (4): Distribution of studied mothers' knowledge regarding children congenital anomalies

Items	Beni-Suef (65)				Menofia (50)			
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory	
	N	%	N	%	N	%	N	%
Risk factors	20	30.7	45	69.3	28	56.0	22	44.0
Types	21	32.3	44	67.7	19	38.0	31	62.0
Diagnostic measures	19	29.2	46	70.8	25	50.0	29	50.0
control and preventive strategies	16	24.6	49	75.4	20	40.0	30	60.0

Total level of knowledge	19	29.2	46	70.8	24	48.0	26	52.0

Table (5): Distribution of studied mothers' attitude regarding congenital anomalies among children

Items	Beni-Suef (65)						Menofia (50)					
	Agree		Not sure		Disagree		Agree		Not sure		Disagree	
	N	%	N	%	N	%	N	%	N	%	N	%
This condition not punishment of the god	23	35.3	21	32.3	21	32.3	22	44.0	18	36.0	10	20.0
Not affect the desire to another pregnancy	26	40.0	18	27.6	21	32.3	10	20.0	28	56.0	12	24.0
This condition can be prevented	19	29.2	36	55.3	10	15.3	16	32.0	27	54.0	7	14.0
Early detection is important	16	24.6	34	52.3	15	23.1	25	50.0	22	44.0	3	6.0
Not affect family stability	18	27.6	30	46.1	17	26.1	12	24.0	30	60.0	8	16.0
Society accept children with this condition	12	18.4	17	26.1	37	56.9	13	26.0	22	44.0	15	30.0
Resources of care are available	24	36.9	19	29.2	22	33.8	24	48.0	13	26.0	13	26.0
Resources of care are effective	12	18.4	26	40	27	41.5	20	40.0	16	32.0	14	28.0
Care of other family member not affected	16	24.6	28	43.1	21	32.3	13	26.0	31	62.0	6	12.0

Table (6): Distribution of studied mothers regarding their total level of attitude (115)

Items	Beni-Suef (65)		Menofia (50)	
	N	%	N	%
Positiveattitude	19	29.2	20	40.0
Negativeattitude	46	70.8	30	60.0

Table (7): Distribution of studied mothers' self-reported practice regarding home care of theirchildren (115)

Items	Beni-Suef (65)				Menofia (50)			
	Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory	
	N	%	N	%	N	%	N	%
Balanced nutrition and healthy eating patterns	21	32.3	44	67.7	18	36.0	32	64.0
Prevent from infection	15	23.1	50	76.9	21	42.0	29	58.0
Prevent from injury	23	35.3	42	64.7	23	46.0	27	54.0
Health care and follow up	25		40		18	36.0	32	64.0
Personal hygiene of the child	24	36.9	41	63.1	20	40.0	30	60.0
Total level of practice	23	35.4	42	64.6	18	36.0	32	64.0

Table (8) Association between socio-demographic characteristics of studied mothers and their self-reported practice regarding home care

Items	Satisfactory (41)		Unsatisfactory (74)		X^2	P
	N o	%	NO	%		
Age in years						
-21-30 years	10	24.4	20	27.0	3.8	.14
31 to 40 years	18	43.9	27	36.5		
More than 40 years	13	31.7	27	36.5		
Level of education						
-University education	19	46.3	13	17.6	34.8	0.0001
-Secondary school education	9	21.9	12	16.2		
-Just read and write	8	19.6	16	21.6		
-Illiterate	5	12.2	33	44.6		
Studied mothers' setting						
Menofia	19	46.3	31	62.0	4.9	.025
Beni-Suef	22	53.7	43	82.0		

Table (9) Association between socio-demographic characteristics of studied mothers and their self-reported practice regarding knowledge

Items	Satisfactory (43)		Unsatisfactory(72)		X^2	p
Age	**n**	**%**	**n**	**%**	6.5	0.003
-21-30 years	6	20.0	24	80.0		
31 to 40 years	17	37.8	28	62.2		
More than 40 years	20	50.0	20	50.0		
Education						
-University education	22	68.8	10	31.2		
-Secondary school education	7	33.3	14	66.7		
-Just read and write	3	12.5	21	87.5	21.09	0.0001
-Illiterate	11	28.9	27	71.1		
Setting						
Menofia	24	48.0	26	52.0	4.2	.03
Beni-Suef	19	29.2	46	70.8		

Table (10) Association between socio-demographic characteristics of studied mothers and their self-reported practice regarding Attitude

Items	Positive (39)		Negative (76)		X^2	P
	NO	%	NO	%		
Age in years						
<35 years (30)	3	10.0	27	90.0		
35 to 40 years (45)	24	53.3	21	46.7	15.5	0.0004
More than 40 years (40)	12	30.0	28	70.0		
Level of education						
-University education (32)	24	75.0	8	25.0		
-Secondary school education (21)	7	33.3	14	66.7	36.3	0.00001
-Just read and write (24)	3	12.5	21	87.5		
-Illiterate (38)	5	13.2	33	86.8		
Studied mothers ' setting						
Menofia (50)	20	40.0	30	60.0	1.4	0.2
Beni-Suef (65)	19	29.2	46	70.8		

Table (11) Relation between knowledge, attitude and home care of mothers regarding children with congenital anomalies before and after implementing nursing education intervention

Items	Before education intervention		After education intervention		Chi	P
	No.	%	No.	%		
Total level of knowledge						
Satisfactory	43	37.4	81	70.4	25.2	0.0001
Unsatisfactory	72	62.6	34	29.6		
Total level of attitude						
Positive	39	33.9	78	67.8	26.4	0.0001
Negative	76	66.1	37	32.2		
Total level of home care						
Satisfactory	41	35.7	54	47.0	3.03	0.08
Unsatisfactory	74	64.3	61	53.0		

IV. Discussion

Occurrence of birth defects (BD) remains an important public health issue. Inadequate knowledge about the defects among mothers could result in delayed interventions. Mothers with appropriate knowledge about congenital anomalies can participate in screening for these disorders, avoid their negative consequences and provide high quality home care for affected children. Therefore the current study aim was to improve knowledge, attitude and home care of mothers regarding children with congenital anomalies at Menofia and Beni-Suef city. The study included 115 mothers 65 from Beni-Suef city and 50 from Menofia city, one quarter of them aged <35 years, and about one third their age more than 40 years old, and illiterate, and more than two thirds were housewives.

Regarding maternal risk factors of congenital anomalies, the results of the current study revealed that maternal risk factors that were associated with congenital anomalies as reported by studied mothers in Beni-Suef and Menofia city included; presence of consanguinity, exposure to radiation, environmental pollution, infection, dietary life style (malnutrition or anemia), medication misuse during pregnancy, emotional stress, pregnancy at late age/early age, pregnancy/delivery complications, family history of genetic problems, delayed / no antenatal care, history of disease during pregnancy and passive or negative smoking. The highest prevalence of risk

factors was for consanguinity in Beni-Suef city and medication misuse during pregnancy in Menofia city. These findings may be related to a possible lack of access to health care and screening, adopting unhealthy lifestyle, and the belief that we have enough experience with no need for premarital or antenatal counseling.

The results of the current study supported by**Harris, et- al., (2017)** studied risk factors for birth defects in North Carolina, USA, they found that there is strong link between lack of antenatal care, dietary malnutrition, uncontrolled diabetes, drug use, smoking, maternal age, history, consanguinity, &radiation exposure and increased risk of congenital anomalies.These results in agreement with**Mashuda, et-al. (2014)&Marwah, et-al., (2014)** studied risk factors associated with congenital anomalies among infants in Tanzania & India respectively; they reported that incidence of congenital anomalies was frequently associated with increasing age, parity, consanguineous marriage, maternal disease and drug ingestion, lack of peri-conceptional use of folic acid, and an inadequate attendance to antenatal clinic.

Similar results inpreviousstudies about pattern of congenital anomalies in newbornby**El Koumi, Al Banna and Lebda, (2013)&Wright, et-al., (2013)**reported that maternal risk factors for congenital anomalies contained; parental consanguinity, maternal malnutrition, positive history of an anomaly in the family, pregnancy and labor complications were significantly associated with higher frequency of CAs ($P<0.05$). On the same line**Ahmed et al. (2011)**&**Shawky and Sadik, (2011)**studiedcongenital malformations prevalent among Egyptian children and associated risk factors. They found that consanguineous marriage was detected as a maternal risk factor in addition to exposure to pollutants, drugs use in first months,and age of the mother at conception.Furthermore**Taboo (2012)**reported that infections as toxoplasmosis, cytomegalovirus, rubella and herpes virus is among risk factors for congenital anomalies in Mosul city, Iraq. Additionally **Zīle and Villeruša, (2012)** mentioned that there is association between major birth defects of newborns and maternal age.Also**Rychtarikova, et-al., (2013)&Villeruša and Zīle, (2012)** concluded that the age of mother can be associated with congenital anomalies of the child, and that maternal characteristics other than age have also should be considered.

Concerning types of congenital anomalies among children, the results of the present study showed that the types of congenital anomalies identified among children were; cleft lip and cleft palate, musculoskeletal disorders, neural tube defects, congenital heart defects. The highest percentage of congenital anomalies among children was for congenital heart defect in Beni-Suef city and musculoskeletal disorders in Menofia city. These findings may be due to exposure to radiation, environmental pollution, infection, medication misuse, emotional stress, history of genetic problems, or smoking during pregnancy. In the same context**Yang, et-al., (2017)**, evaluated the prevalence and the related risk factors of birth defects in Shanghai and reported thatthemost frequent birth defect in newborns each year were congenital heart defects followed byorofacialclefts.On the same line **Sunitha, et- al., (2016)**identified that the major CAs observed among Indian mothers was central nervous system (CNS). Theseresultswere consistent with study conducted by **ZĪLE &Villeruša, (2013)** who studied epidemiological aspects of congenital anomalies and associated risk factors in Latvia in North Europe; they mentioned that the most common anomalies were congenital heart defects, followed by limb anomalies.Additionally**El Koumi, Al Banna and Lebda, (2013) &Othman (2013)** mentioned that the musculoskeletal system was the most commonly involved congenital anomaly followed by the central nervous system among mothers in Sharkia& Iraqrespectively.Furthermore**Ahmed et al. (2011)** indicated that fetal congenital malformation categorized as renal, CNS, musculoskeletal then cardiovascular congenital anomalies.

RH1: The studied mothers in both Beni-Suef and Menofia city have unsatisfactory knowledge, practice, and negative attitude regarding congenital anomalies.

As regards knowledge of studied mothers about congenital anomalies, the results of current study revealed that the majority of studied mothers had unsatisfactory knowledge about congenital anomalies. Only lessthanone third of them in Beni–Suef city and less than half in Menofia city had satisfactory knowledge about congenital anomalies.These results may be due to lack of mothers' awareness, lack of premarital/antenatal counseling, or low level of education among studied mothers (more than half of studied mothers were illiterate/ just read and write).On the same line**Lawal, et-al. &Aniekan, et-al., (2015)**studiedknowledge of birth defects among nursing studied mothers in a developing country; they found that studied mothers in Ibadan, Nigeria, had a poor level of awareness about birth defects. On the other hand **Mohamed, Mohamed and Abd El-fattah (2013)**studied congenital anomalies among children: knowledge and attitude of Egyptian and Saudi mothers, they revealed that the majority of the Egyptian mothers had satisfactory levels of knowledge about congenital anomalies.

The current study results indicated that lower percentage of studied mothers had positive attitude toward congenital anomalies among their children; two thirds of studied mothers in Beni-Suef and Menofia city expressed negative attitude toward congenital anomalies.These findings may related to the feeling of stigma and negative connotations connected with the expression of congenital anomalies among their children, and their feeling of guilt and shame, lack of power and control, lack awareness……

Similar results by **Sidhu, et- al., (2017)& Peter (2013)** studied knowledge and attitude regarding congenital malformations among married mothers, mentioned that attitude of mothers regarding malformations not extremely positive. These results agreed with**Cara, Emily, and Assia, (2012)** studied the public perception of birth defects terminology, they expressed that the word 'defect' carries a negative attitude among mothers in Atlanta, Georgia.Similarly**Pinquart, (2013) reported that** the mothers, having children with congenital anomalies shown negative self-concept and low self-esteemso they have negative attitude toward congenital anomalies**.**

On the other hand**El-Said Elwaeshahi and Ashry (2015)** studied Knowledge, attitude and beliefs of Egyptian mothers in reproductive age towards prenatal screening of congenital malformations in Alexandria, they found that more than half of married mothers had positive attitude regarding congenital malformations.These differences may be due to cultural difference, level of education of studied sample, attending health clinics or previous attending educational programs.

Concerning total level of studied mothers' self-reported practice of home care for their children with congenital anomalies, the current study results revealed that nearly two thirds of studied mothers had unsatisfactory level of practice toward their children in Beni-Suef and Menofia city**,** this indicated that the percentage of studied mothers who had satisfactory level of practice were low, these results supported by **Sabzevari, et-al., (2016)** who studied the burden of care: studied mothers' experiences of children with congenital anomaly as regard heart disease in Iran, they concluded that studied mothers had unsatisfactory practice and reported that supportive and educational packages to the studied mothers and family members are essential to improve their level of child' care.

Regarding association between socio-demographic characteristics of studied mothers and their total level of knowledge, the data revealed that socio-demographic characteristics of studied mothers affected their total level of knowledge; there were significant relations between studied mothers 'age, education *&* their setting and their total level of knowledge, similarly **Law, Yusuf, andFatiregun, (2015)&Al Bu Ali et al. (2011)** clearly stated that socioeconomic challenges are factors contributing increased incidence of birth defect in Nigeria and in Saudi Arabia respectively. Moreover **Masmouh, et-al., (2015)** added that older mothers, motherswith higher levels of education and mothers with more children were more likely to have better knowledge about congenital anomalies. On the other hand **Bello, et-al., (2013)** mentioned that age, parity, and literacy did not show impact on the knowledge of the participating mothers which consisted with a previous report

The present study results revealed that there were significant relations between studied mothers'age *&* education, and their total level of attitude. Similar results by **Sidhu, et- al., (2017)** reported that socio-demographic characteristics had significant impact on the attitude of married mothers. In contrast **Hiremath, et-al., (2016)** studied Knowledge of Mothers about Congenital Anomalies at Krishna Hospital, mentioned that religion, education and occupation were not having any association. Also **Masoumeh et-al., (2015)**studiedknowledge of mothers about congenital anomalies in north of Iran, they reported that there was no statistically significant difference between the general attitudes and socio-demographic characteristics among studied mothers.

The present study results revealed that there were significant relations between studied mothers' education & setting and their total self-reported practice. These results supported by **Sabzevari, et-al., (2016),** they reported that the experiences of mothers' care toward congenital defect child were influenced by culture, education, occupation of studied mothers, residence and health facilities.

RH2: The mothers receiving nursing education intervention will make significant improvements in their knowledge, attitude and home care regarding children with congenital anomalies.

The current study results showed that there weresignificant improvements in knowledge, attitude and practice of home care (self-reported) of the mothers regarding congenital anomalies after receiving nursing education intervention, this result was consistent with **Valente, et-al., (2015)**reported that there were improvements in mean Likert items regarding knowledge about congenital anomalies in heart among adults in USA. On the same context **Owotade, et–al., (2014)** mentioned that level of educational attainment had a statistically significant effect on the level of attitude and knowledge on cleft lip and palate antenatal clinic attendees in Nigeria. Similarly **Ladouceur, et-al., (2014)**reported that structured education program was associated with a higher level of knowledge, and improved adult understanding of their congenital condition by positive attitude, and prevent potential complications through adopting high quality of home care among adolescent and adults in France.

V. Conclusion

Based on the result of the current study; it can be concluded that:

- The highest prevalence of maternal risk factors of congenital anomalies was for consanguinity in Beni-Suef city and medication misuse during pregnancy in Menofia city.
- The most frequent congenital anomalies identified among children were; cleft lip and cleft palate, musculoskeletal disorders, neural tube defects, congenital heart defects. The highest percentage of congenital anomalies among children was for congenital heart defect in Beni-Suef city and musculoskeletal disorders in Menofia city.
- The studied mothers in both Beni-Suef and Menofia city have unsatisfactory knowledge, practice, and negative attitude regarding congenital anomalies.
- Knowledge, attitude and home care of the mothers regarding congenital anomalies significantly improved after receiving nursing education intervention.

VI. Recommendations

Based on the current study's results the following recommendations were suggested: -

- Scale up community based interventions is needed to reduce the prevalence of maternal risk factors and occurrence of congenital anomalies among their children.
- Health education campaigns targeted to potential future parents.
- Surveillance, research and evaluation generating evidence for the initiation or updating of primary preventive measures.
- Strengthening actions which affect risk factors of congenital anomalies as; drug use, foods, smoking, ……
- Further researches to improve knowledge, attitude and home care for Egyptian pregnant mothers regarding congenital anomalies are needed.
- Proper health education during antenatal visit and creating awareness through mass media to mother's knowledge hence incidence and prevalence of birth defect can be reduced.

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