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Mothers' Awareness about Parasitic Worms and Healthy Home Precautions for their Children

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Abstract:
Background: Parasitic worms are organisms that invade other organisms or hosts to survive. Worm infestations in children are very common in Egypt. Worm infestation remains one of the main problems of children development. Since mothers play a vital role in developing healthy life style among children. Aim: The study aimed to assess mothers' awareness about parasitic worms and healthy home precautions for their children. Design: Descriptive research design was used in this study, Sample: A purposive sample was equal 140 mother having children (6-12) years. Setting: Pediatric out-patient clinics at Helwan general hospital (cairo, Egypt). Tools: One tool was used including A structural interviewing questionnaire was used in the study, it contains four parts Socio-demographic characteristics about mother, Past and present history of children with parasitic worms , mother's knowledge about parasitic worms and healthy home reported practices. Results: The study results revealed that 46.4% of studied mothers had fair knowledge about parasitic worms and healthy home precautions and 59.3% of studied mothers had unsatisfactory reported practices about healthy home precautions. Conclusion: There was a highly significant positive correlation between total knowledge scores and their total reported practices scores about healthy home precautions of parasitic worms. Recommendation: Implementing educational program for mothers about parasitic worms and healthy home precautions. .

Key words: *Mothers awareness, Parasitic worms, Healthy home precautions.*

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I. Introduction

Children are the future of every nation across the world. They are today's generation which can go ahead and make the world better. So, health of primary school children has been the vital importance to all societies. At the same time they are at high risk of parasitic worms. So, modern approach of child health care emphasis on preventive care rather than curative care and all this depends on mother's role [1].

Parasitic worms are among the foremost common infections worldwide and have an impression on the poorest and most under privileged communities, regular increase of the population and urbanization, the rise of migrations, loss of healthful facilities, insufficient hygiene and restricted access to health services favor the transmission of parasitic infection. Parasitic infection may as a result of the ingestion of infecting cysts or eggs present in the soil, water and uncooked food, or with the aid of using the penetration of larvae from the soil through the skin. Biological infection of the environment with pet feces is also a serious problem for public health , they will have negative effects on the physical and cognitive development of children, which includes mal absorption syndrome, anemia, anorexia, continual inflammation, under nutrition and diarrhea (2). .

According to estimates of World Health Organization (WHO,2017), infection with round worm, whip worm , hookworms and pinworm increase incidence of morbidity and mortality. Parasitic infection are more prevalent among school children aged 6-12 years. They represent 12 percentage of total disease burden in children because they are always at the highest risk of obtaining parasitic infection because of their dirty habits of playing or handling infested soil, eating with dirty hands, unhygienic bathroom practices, drinking and eating contaminated water and food. When those mixed with low socioeconomic status and low educational status of parents, mainly mothers, the transmission and distribution of the infestations reach the peak, maximum of the worms are geographically distributed in the heat and moist climates of tropics and subtropics. Intestinal parasitic worms are often found in fish, crabs, mollusks, meat, and vegetables in poor and growing countries [3]

Globally, over 3.5 billion people are infected with intestinal worms, regarding, 1.47 billion have roundworm; 1.33 billion are infected with hookworm and 1.05 billion with whipworm. The very best rates of roundworm, hookworm and whipworm infections are often in children between age 6 and 12 years. It is estimated that about 400 million school-age children are infected with hookworm, whipworm and roundworm [4] .

Signs and symptoms of parasitic worms include loss of appetite, fatigue, abdominal pain or tenderness, bloating, nausea, weight loss, diarrhea, gastrointestinal upset, vaginal irritation, joint pain, mucous in stools, abdominal cramps & gas, coughing, fever, vomiting, generally feeling unwell, lethargy, fuzzy thinking, headaches and restlessness. These symptoms, if not treated complicated to low plasma vitamin A, loss of weight, chronic blood loss, iron deficiency anemia, growth retardation, malnutrition, alteration of normal gastrointestinal flora, intestinal obstruction, diarrhea and dysentery which are consider a major cause of childhood mortality and morbidity in developing countries [5].

Mothers are considered the first important caregivers which take care of their children ,Mothers are generally the food handlers at home to protect children's health and fitness assessing mother's knowledge, behavior and collecting information about healthy home environment is crucial as away to lessen transmission of infection. So, the World Health Organization (WHO) has for a long time been aware of the need to educate mothers about their responsibility for food safety. WHO developed 5 Golden Rules for safe food preparation, that was wide translated and reproduced .The core messages of the Five keys to safer food are: first, keep clean, the mother ought to clean surfaces continuously, wash vegetables and fruits under running water, wash cutting board well once use [6].

Community health nurses(CHNs) are playing a key role to improve health education for children and mothers , wellbeing by delivering health promotion, providing health advice, signposting to other services, active treatment, education, family support, safeguarding, service coordination , multi-agency work , understanding community needs through a local health needs assessment or public health profile and provide essential knowledge and adequate practices for prevention of parasitic worms (7).

1.1Significance of study:

In Egypt, according to statistics obtained from Centre for Mobilization and Statistics(CMS), the percent of children with age ranging from 10-17 years was about 27 million child which represented 38% from total population in 2018(8).

Based on the recent researches conducted at Assiut University, Children's Hospital in Egypt. Out of the 260 children under study, aged between four months and 15 years, 158 were males and 102 were females and 69 of them were infected with one or more parasites (9). According to statistics obtained from Helwan General Hospital through 2019-2020 the number of children from 6-12 years diagnosed with parasitic worms were 3.000 child.Therefore, this study was conducted to assess mothers awareness about parasitic worms and healthy home precautions for their children. .

1.2 Aim of the study

The aim of the study is to assess mothers' awareness about parasitic worms and healthy home precautions for their children through:

1- Assessing mother's knowledge about parasitic worms and healthy home precautions.

2-Assessing mother's reported practices about healthy home precautions.

1.3Research Questions

1-What are mother's knowledge about parasitic worms and healthy home precautions for their children?

2-What are the reported practices of mothers about healthy home precaution?

II. Subject and Methods

2.1Study design:

A descriptive research design was applied to achieve the aim of this study.

2.2 Study setting:

The study has been carried out at pediatric out-patient clinics at Helwan general hospital.

2.3Subject:

A purposive sample was used to achieve the aim of this study. The study sample consists of 140 mother who have children aged from 6-12 years attended to outpatient clinic of Helwan general hospital and diagnosed with parasitic worm , which represent 10% from total of 1400 mother of children attended to outpatient clinic of Helwan general hospital through 2018/2019. The mothers have been selected according to the following criteria:

-Age from 6-12 years.

-Mother agrees to participate in the study.

- Child diagnosed with parasitic worms.

Tools of data collection:

One tool was used to carry out the current study namely, a structural interviewing questionnaire, this tool was developed by investigator after reviewing the national and international related literature and contains four parts:

Part I:A) Socio-demographic characteristics of mothers including age, sex, marital status, level of education, occupation, place of residence, monthly income and number of family members

b) Child characteristics including sex, age and order of child in the family members.

c) Home environment including housing status, number of rooms in the house, place of the house, type of land of the house, main source of drinking water ,water conservation method, type of the toilet , garbage disposal, birds in the house, cattle in the house and house exposed to sun.

Part II: Child past& present medical history ,past and present infection with any type of parasitic worms, treatment , recurrence of infection.

Part III: A) Assess mother's knowledge about parasitic worms, which include: meaning, types, causes, signs, symptoms, method of transmission, diagnostic tests, complications, methods of prevention, treatment of parasitic worms and precautions during infection.

B) Assess mother's knowledge about healthy home environment which include: importance of hand washing, washing poultry and meat cutters thoroughly with soap and water after use, fruits and vegetables should be washed thoroughly with running water before eating, keeping surfaces clean prevent spread of parasitic worms at kitchen, disinfect toilet with chlorine after infected child using, cleaning surfaces and equipment used for food preparation before re using and contain 10questions.

Scoring system:

For assessing mothers knowledge about parasitic worms and healthy home precautions. Total score of each item stumped up and then converted into percent score:

-Good knowledge ≥75% (30-40)

-Fair knowledge 50%-<75% (20-<30)

-Poor knowledge < 50% (0-<20)

Part IV: Assess healthy home reported practices by mother about hygiene at home which include (9) items, practices for children which include (5) items, practices about food cooking and storing which include (15) item. Total items (29)items: washing hands before preparing food, washing hands after using toilet, keep nails short for every member in the family, the rooms and mattresses are exposed to the sun daily , daily disinfection of surfaces and furniture with antiseptic agents, wash and disinfect the bathroom daily , use sanitary disinfectants for the bathroom, provide soap on the sink for washing hands , ventilate the house continuously , washing hands before and after eating, wash hands after finishing the game, not sharing spoons and dishes of the infected child to prevent spread of the infection, providing disposable towels for each child, wiping and disinfection of toys and disinfection of surfaces for food preparation

Scoring system:

For assessing mothers reported practices about healthy home precautions. Total score were 87 point for 29 items. The score of each item stumped up and then converted into percent score:

Satisfactory ≥60% (53-87)

Un satisfactory <60 % (29-<53)

Validity:

The developed tool was formulated and submitted to three experts from Community Health Nursing from Faculty of nursing in Helwan University to review relevance of the tools for comprehensiveness, understanding and applicability.

Reliability:

Reliability of the tools was tested to determine the extent to which the questionnaire items related to each other. Cronbach's Alpha in this study found to be (0.89) for knowledge and (0.92) for healthy home reported practices of healthy home precautions .

Pilot study:

Pilot study has been conducted to test the applicability, clarity and the efficiency of the tools. It has been conducted on 10%(14) of mothers.The results of the pilot helped in refining the interview questionnaire and to schedule the time framework. The participants of the pilot were excluded from the main study sample.

Field work:
Data collection of the study was started at the beginning of January 2020until the end of March 2020.The investigator introduced herself to mothers, explained the aim of the study and its implications and how to fill in the knowledge questionnaire, and ensure their cooperation. Informed consent was obtained from the participants.
Interviewing the participants was carried out in specialized room in outpatient clinic at Helwan general Hospital (Cairo, Egypt). The questionnaire sheet takes about 15-20 minutes to complete. Data was collected through 2 days from 9am to 12pm every week within 6 months .The interviewing questionnaire sheet was completed by the investigator from each participant.

Ethical consideration:
An official permission to conduct the proposed study was being obtained from the Scientific Research Ethics Committee. Participation in the study is voluntary and subjects was been given complete full information about the study and their role before signing the informed consent. The ethical considerations were including explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information were guaranteed. Ethics, values, culture and beliefs were be respected.

Statistical analysis:
Data collected from the studied sample was revised, coded and entered using Personal Computer (PC). Computerized data entry and Statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 24. Data were presented using descriptive statistics in the form of frequencies; percentages. Chi-square test (X2) was used for comparisons between qualitative variables. Spearman correlation measures the strength and direction of association between two ranked variables. .

Significance of the results:
Highly significant at P-value<0.01
Statistically significant was considered at P-value<0.05
Non-significant at P-value>0.05

III. Results:

Table(1): Shows demographic characteristics of study sample 70% of studied mothers, their age ranged between 20-< 35with the mean age was 32.57±6.53years. In relation to mother's education,45.7% of them had secondary education. Also,57.1% of studied mother's were employed. Concerning residence, 96.4% of studied mothers residing in urban areas.While,74.3% of studied mothers are married. 54.3% of studied mothers had not enough monthly income and 75%of studied mothers had 3-<5 individuals in their family.
Figure (1): Demonstrates that, 46.4% of studied mothers had fair knowledge about parasitic worms and healthy home precautions. While, 28.6% and 25% of them had good and poor knowledge about parasitic worms and healthy home precautions, respectively.
Figure (2): Shows that, 59.3% of studied mothers had unsatisfactory reported practices. While, 40.7%of them had satisfactory practices about healthy home precautions for parasitic worms.
Table (2): Demonstrates that, there were significant relations between total knowledge of studied mothers and their age, education level and monthly income at (p=<0.05). While, there was no significant relation with occupation, marital status and number of family members at (p = >0.01).
Table(3): Demonstrates that, there were significant relations between total reported practice of studied mothers and their education level, occupation and monthly income. On the other hand, there were no significant relation with age, marital status and number of family members at pvalue >0.05.
Table(4): Reveals that, there is a highly significant positive correlation between total knowledge and their total reported practices about healthy home precautions of parasitic worms at p value <0.01.

Table (1): Number and Percentage distribution of the studied mother's according to their characteristics (n=140).

Characteristics of studied mother's	No.	%
Mother's age		
20 - <35	98	70
35 - <50	32	22.9
≥50	10	7.1
$\underline{x}$SD32.57±6.53		
Education level		

Do not read and write	1	0.7
Can read and write	13	9.3
Basic education	25	17.9
Secondary education	64	45,7
University education or more	37	26.4
Occupation		
Employed	80	57.1
Do not work / housewife	60	42.9
Place of residence		
Rural	5	3.6
Urban	135	96.4
Marital status		
Married	104	74.3
Divorced	30	21.4
Widow	6	4.3
Monthly Income		
Enough and save	25	17.9
Enough	39	27.8
Not enough	76	54.3
Number of family members		
3-<5 individuals	105	75
5-<8 individuals	32	22.9
≥8 individuals	3	2.1

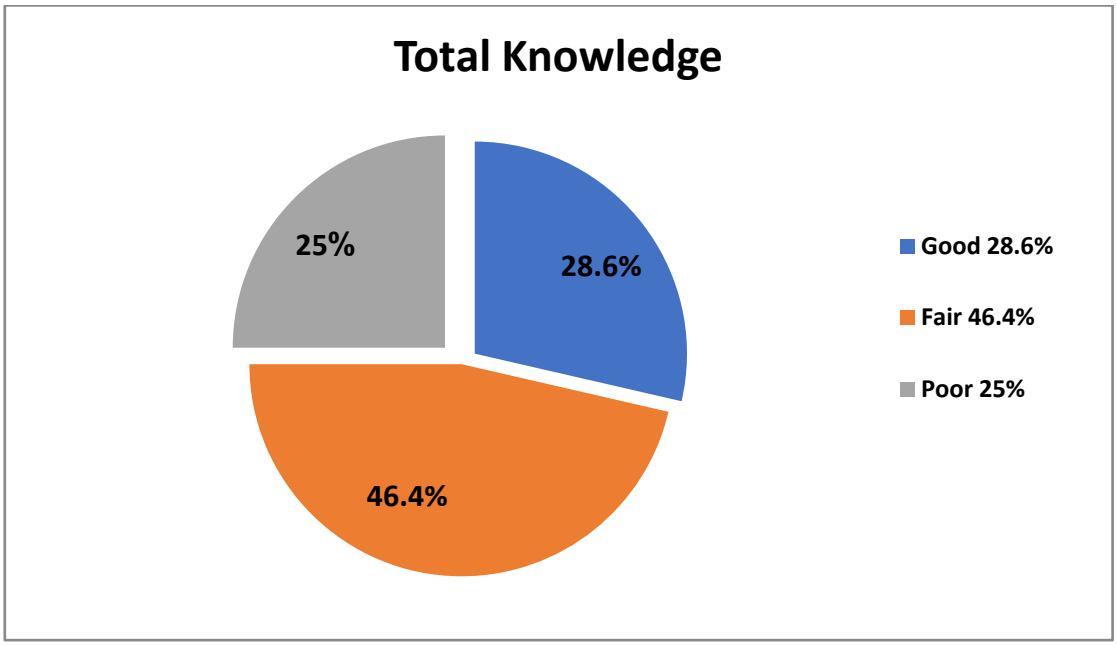

Figure (1): **Total knowledge Scores of Studied Mother's about Parasitic Worms and Healthy Home Precautions (n= 140).**

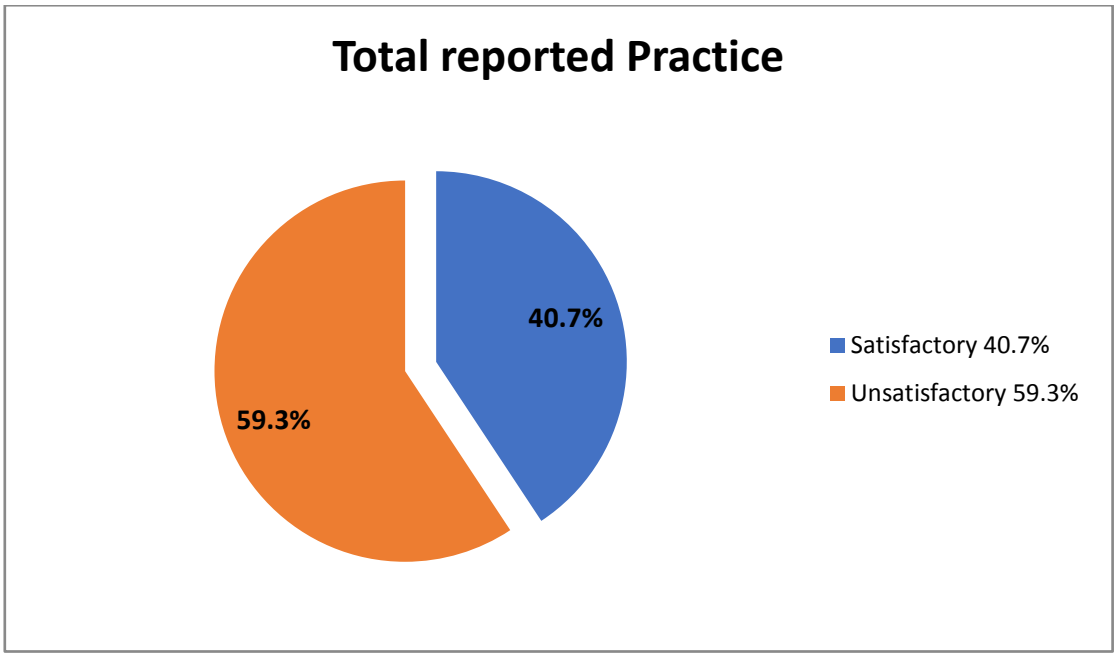

Figure (2) Total reported practices scores of studied mother's about healthy home precaution for parasitic worms (n= 140)

Table(2): Relation between socio demographic characteristics of the Studied Mother's and their Total Knowledge regarding Parasitic Worms and Healthy Home Precautions (n=140).

Items		Total Knowledge						X^2	P-Value
		Good (n=40)		Fair (n=65)		Poor (n=35)			
		No.	%	No.	%	No.	%		
Age	20 - <35	34	85	54	83.1	10	28.6	4.997	.014*
	35 - < 50	5	12.5	10	15.4	17	48.6		
	≥50	1	2.5	1	1.5	8	22.8		
Education level	Do not read and write	0	0	0	0	1	2.8	7.956	.008**
	Read and write	0	0	1	1.5	12	34.3		
	Basic education	2	5	15	23.1	8	22.8		
	Secondary education	8	20	44	67.7	12	34.3		
	University education or more	30	75	5	7.7	2	5.7		
Occupation	Employed	25	62.5	30	46.2	25	71.4	2.010	.058
	Do not work/ house wife	15	37.5	35	53.8	10	28.6		
Marital status	Married	28	70	52	80	24	68.6	2.003	.056
	Divorced	10	25	12	18.5	8	22.8		
	Widow	2	5	1	1.5	3	8.6		
Monthly Income	Enough and save	20	50	5	7.7	0	0	6.958	.009**
	Enough	20	50	15	23.1	4	11.4		
	Not enough	0	0	45	69.2	31	88.6		
Number of family members	3-<5 individuals	24	62.5	54	84.6	24	71.4	1.567	.071
	5-<8 individuals	15	37.5	10	15.4	10	28.6		
	≥8 individuals	1	0	1	0	1	0		

Table(3): Relation between socio demographic characteristics of the studied mothers and their total reported practice regarding healthy home precautions of Parasitic worms (n=140).

Items		Total reported practices				X^2	P-Value
		Satisfactory (n=57)		Unsatisfactory (n=83)			
		No.	%	No.	%		
	20 - <35	45	79	53	63.9	1.605	.059

Age	35 - < 50	10	17.5	22	26.5		
	≥50	2	3.5	8	9.6		
Education level	Do not read and write	0	0	1	1.2	9.613	.003**
	Read and write	1	1.7	12	14.4		
	Basic education	1	1.7	24	28.9		
	Secondary education	20	35.1	44	53		
	University education or more	35	61.5	2	2.5		
Occupation	Employed	50	87.7	30	36.1	4.113	.038*
	Do not work/ house wife	7	12.3	53	68.9		
Marital status	Married	43	75.4	61	73.5	2.007	.051
	Divorced	12	21.1	18	21.7		
	Widow	2	3.5	4	4.8		
Monthly Income	Enough and save	24	42.1	1	1.2	3.997	.041*
	Enough	30	52.6	9	10.8		
	Not enough	3	5.3	73	88		
Number of family members	3-<5 individuals	42	73.7	63	75.9	1.768	.056
	5-<8 individuals	15	26.3	20	24.1		
	≥8 individuals	0	0	0	0		

Table(4): Correlation between total knowledge scores and total reported practices of studied mothers regarding healthy home precautions of parasitic worms (n=140).

Total reported practice	**Total knowledge**						**X^2 p value**
	Good n=40))		**Fair n=65))**		**Poor n=35))**		
	No.	**%**	**No.**	**%**	**No.**	**%**	
Satisfactory (n= 57)	45	78.9	12	21.1	0	0	9.564 .000*
Unsatisfactory(n= 83)	0	0	38	45.8	45	54.2	

IV. Discussion:

Parasitic worm infection is the most common infestations around the world wide, it is distributed with high prevalence in poor and socio-economically deprived and developing communities. These infestations are one of the global health problems. The high prevalence of parasitic infections varies with the level of sanitation, the impure drinking water, low socioeconomic state, low health status and lack of personal hygiene provide optimal conditions for the growth and transmission of intestinal parasites seems directly related to the unhygienic living conditions [10].

Parasitic worms include different types as pinworm, hook worm, ascariasis, round worm are the most common types that affect children. Children are infected more commonly and more heavily than adults, this is because children are more likely to come in direct contact with locally contaminated soil that contains infective larvae [11].

Primary prevention is most effective way to break the chain of transmission and thus reduce the worm load among children in community. Some of these preventive measures are sanitary disposal of human excreta, provision of safe drinking water and habits of hygienically handling the food. To bring a change in the life of individual, society care givers especially mothers, education is a powerful tool. Health education can bring change in behavior, which is required for implementation of primary prevention.(12) Therefore this study was conduct to assess mothers' awareness about parasitic worms and healthy home precautions for their children. .

Regarding to socio-demographic characteristics of the studied mothers, the present study showed that, more than two thirds of studied mothers their age 20-<35 with mean age 32.57±6.53 years. This finding was in the same line with Kassaw et al [13]. whose study entitled "Knowledge, Attitude and Practice of Mothers on Prevention and Control of Parasitic worms Sekota Town, Wag-Himra Zone, Ethiopia" whose reported that, mean age of mothers was 33,43±5.42 years. From the investigator point of view. This age is considered the most suitable age for marriage and child bearing which is a widely accepted with social norms in the Egyptian culture. .

In relation to educational level of the studied mothers, the finding of the current study revealed that, more than two fifths of them had secondary education. These results were accordance with Abossie and Seid{14}, in Southern Ethiopia, whose conducted study entitled as " Assessment of the prevalence of parasitic worms and associated risk factors among primary school children in Chencha town,Southern Ethiopia" who stated that, 46.4% of studied mothers had secondary education.

As regard to occupation, the present study showed that more than half of studied mothers were employed. Also, as regard to marital status, the current study revealed that nearly three quarters of them were married. This finding was in agreement with Alsubaie et al{15}, whose conducted study entitled as" Pattern of parasitic infections as public health problem among primary school children and role of mothers in prevention",in Taibah University Medical Sciences and found that, more than half and about three quarters of studied mothers were employed and married, respectively. .

Concerning place of residence, the present findings revealed that, the majority of studied mothers were lived in urban areas. These is in the same line with Derso et al.,{16} in northwest Ethiopia, whose conducted study entitled as " Prevalence of intestinal parasitic infections and associated risk factors among primary school children attending health care center at Felege Hiwot Referral Hospital, northwest Ethiopia" who stated that majority of the studied sample live in urban area .

Concerning number of family members and monthly income , the present study showed that three quarters of studied mothers had 3-<5 individuals in the family and more than half of them had not enough monthly income. This result in agreement with Forson et al.,{17}, in accra whose conducted study entitled as "The role of family size, employment and education of parents in the prevalence of parasitic worm infections in school children in Accra", showed that about three quarters of studied mothers had 3-<5 members in the family and more than half of them had not enough monthly income. From the investigator point of view. This probably due to deterioration of economic conditions in Egypt.

Concerning to total knowledge score of studied mothers about parasitic infection and healthy home environment. The findings of the current study revealed that, more than two fifths and more than one quarter of the studied sample had fair and good knowledge about parasitic worms and healthy home environment, respectively. These result approved with the study performed by Ahmed et al.,{18}, whose conducted study about" Knowledge, Attitude and Practice (KAP) Assessment of Intestinal Parasitic Infection among School Children in Asmara, Eritrea " whose found that 46.5% and 27% of participants had fair and good knowledge about parasitic worms and healthy home environment . From the investigator point of view, this might be due to low awareness of studied mothers about parasitic worms and healthy home practices.

Concerning the total reported practices score of studied mothers regarding healthy home precautions, the current study showed that more than half of studied mothers had un satisfactory reported practices toward healthy home precautions. This result was in agreement with Yusof et al., [19]. in Malaysia, whose study entitled "Knowledge, Attitude and Practices of Intestinal Helminths and Protozoa Infection among parents of school children in peripheral school and urban school area in Kuantan, Pahang," whose clarified that 55 % of studied mothers had un satisfactory reported practices toward healthy home precautions. From investigator point of view, this shows that lack of knowledge about parasitic worms which can lead to poor healthy home practices.

Regarding to relationship between socio demographic characteristics of the studied mother's and their total knowledge regarding parasitic worms and healthy home precautions, the present study revealed that, there were significant relations between total knowledge of studied mothers and their age, education level and monthly income. These finding agree with Sacolo et al., {20}, whose conducted study entitled " Prevalence and distribution of soil-transmitted helminthes infections among primary school children in India". whose clarified that there were significant relations between total knowledge of studied mothers and their age, education level and monthly income. From investigator point of view,this explained that education level and family income affect level of knowledge.

Concerning relation between socio demographic characteristics of the studied mothers and their total reported practice regarding healthy home precautions of parasitic worms. This finding clarified that, there were significant relations between total reported practice of studied mothers and their education level, occupation and monthly income. This result in the same line with Ashtiani et al., {21}, whose study entitled," Prevalence and factors associated with intestinal parasites among primary school children attending Woreta Health Center, Northwest Ethiopia" whose clarified that there were significant relations between total reported practice of studied mothers and their education level and monthly income. From investigator point of view, this because education level and monthly income can affect mothers home practices.

Regarding correlation between total knowledge scores and total reported practices of studied mothers regarding healthy home precautions of parasitic worms. This finding revealed that, there is a highly significant positive correlation between total knowledge and their total reported practice about healthy home precautions of parasitic worms. This result in agreement with Sachdeva et al., {22}in India, whose study entitled "Knowledge, attitude and practices studies conducted among mothers of primary school children in India " whose clarified that, there is a highly significant positive correlation between total knowledge and their total reported practice about healthy home precautions of parasitic worms. From investigator point of view, this is consistent with the general belief that sufficient knowledge can lead to satisfactory practices.

V. Conclusion

On the light of results of the current study and answers of the research questions, it could be concluded that, more than two fifths of study sample had fair knowledge about parasitic worms and healthy home precautions, more than three fifths of studied mothers had unsatisfactory reported practices about healthy home precautions for parasitic worms. There were positive significant relations between total knowledge of studied mothers and their age, education level and monthly income. Also, there were positive significant relations between total reported practice of studied mothers and their education level, occupation and monthly income. While, there is a highly significant positive correlation between total knowledge and their total reported practices about healthy home precautions of parasitic worms. (p value <0.01).

VI. Recommendation:

On the light of results of the current study findings the following recommendations are suggested:

-Counselling mothers of children with parasitic worms about parasitic worms management and healthy home precautions for their children.

-Disseminating health education booklets to increase mothers awareness about parasitic worms and healthy home precautions at outpatient clinics.

-Further research on a large sample and other setting is needed.

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