

## Educational intervention for Caregivers about Intestinal Parasitic Infestations for First Year Primary School Students in Minia City.

Naglaa Mohammed Amein, Soheir Ali Abed El-Hady Bader EL-Din, Soad Sayed Bayomi, & Yosria EL-sayed Hossein.

Department of , community health nursing- faculty of nursing, EL-Minia university, Department of , community health nursing- faculty of nursing- Cairo university, - Department of , community health nursing- faculty of nursing Assiut university.

### Abstract :

Parasitic infestations are serious public health problem that lead to physical and mental health problems such as iron deficiency anemia, growth retardation, and lack of concentration. The current study aimed to evaluate the effect of an educational intervention for caregivers about intestinal parasitic infestations for first year primary school students at EL-Minia city. Quasi-Experimental research design was utilized in the current study. The study was conducted in four primary governmental schools at EL-Minia city. Multi stage random sample techniques were used in this study. Data were collected using structured interview questionnaire to assess caregiver's knowledge about intestinal infestation, Observational check list for asses house environmental through home visit , observational check list to asses caregivers practice and Attitude scale to assess the caregiver's attitude regarding the safety food. The study result evident that there was a highly statistically significant difference between the caregivers' knowledge about intestinal infestation in pre, post test and follow-up ( $P$  value = 0.001). Also, there with highly statistically significant difference between caregivers and practices in pre and post test ( $p=0.001$ ), the majority of caregivers agree the food eating is healthy in pre test decreased to 95.0% on post test, with statistically significant difference ( $p$  value = 0.04). The present study concluded that the educational intervention there with significant improvement of knowledge, practices and attitudes of caregivers regarding intestinal parasitic infestations. It was recommended that periodical educational intervention should be implemented for caregivers of the primary school children at Upper Egypt regarding intestinal parasitic infestation to improve knowledge and practices.

**Keywords:** parasite, intestinal infestation, hygienic measures,

### Introduction:

Intestinal infestations are common cause of health problems in developing countries. It is estimated that at least one quarter of the world's population is chronically infected with intestinal parasites and 1.5 to 2.7 million deaths annually (WHO, 2009).

Intestinal infestations are amongst the common infections worldwide, it is estimated that about 3.5 billion people are affected, and that 450 million are ill as a result of these infestations, the majority are being children. School age children are important target group in the community health because their physical and emotional health is vital to the future of society and they require guidance and direction. Children are vulnerable to many illness, injuries, emotional problem as a result of a complex and stressful environment, especially intestinal infestations (Allender et al., 2010).

School children carry the heaviest burden of morbidity due to intestinal infestations, it is estimated that approximately 70% of the disease burden on whole population can be prevented in high prevalence communities by treating school children alone (Chan, 2004 & Nies and McEwen, 2011).

Intestinal infestations are among the major diseases of public health problems in sub-Saharan Africa. Apart from causing mortality and morbidity, infection with intestinal parasites has been associated with stunting major of linear growth, physical weakness and low educational achievement in schoolchildren (Erko and Legesse, 2004).

Parasitic infestations have great impact on life quality of people all over the world especially in developing countries; the prevalence of parasitic infections in a particular region depends not only on bioenvironmental situation, but also on social, economical and cultural conditions, in developing Countries that are mainly situated in tropical areas, lack of access to health services, malnutrition, and poor sanitation, increase vulnerability to infection because of physiological and immunological reasons children more susceptible to parasitic infestation (Hazrati Tappeh et al., 2010 & Borg and Ryan, 2010).

The Governorate of Qena, in Upper Egypt, ranks 16 out of the 21 governorates in Egypt for which Health development Indicators are available, although intestinal helminthes are considered to be prevalent in the governorate, there is a complete lack of data on

types of parasites present and their prevalence, the most common intestinal helminthes in the world are *Ascaris lumbricoides* round worm, they are usually referred to as soil-transmitted helminthes since they are most commonly disseminated by contamination of soil and environment with infected faeces, especially by children. Three helminthes present in Egypt are *Enterobius vermicularis*, *Hymenolepis nana* and tape worm). Their effects on child development appear less serious (Curtale et al., 2009).

#### **Significance of the study & role of Community Health Nursing:**

Through research in El-Minia city finding in 1800 case affected with parasitic infestation, this result obtained from Preventive Medical Department in administrative health in west medical center. This result at 2010 and also 2012. Related this result found intestinal infestations are community health problem and more spreading at El - Minia City. In Egypt, 56.0% and 47.0% of children are worryingly suffering from intestinal parasites and anemia, respectively in further detail 40.4% and 1.9%, 5.4%, 6.3%, 8.7%, 8.9%, 22.4%, of the Egyptian school children were suffering from *Enterobius vermicularis*, *Schistosoma* (S.) *haematobium*, *Giardia lamblia*, *S. mansoni*, *Ascaris lumbricoides* *Entamoeba* (E.) *histolytica* and *Ancylostoma duodenale*, respectively.

Community health nursing should play an essential role in supporting caregivers and increase awareness about how to deal with infected children with intestinal parasitic infestations through families, and community (Bogitsh et al., 2013)

#### **Aim of the study:**

##### **This study aims to:**

- Evaluate the effect of an educational intervention for caregivers about intestinal parasitic infestations for first year primary school students at EL-Minia city. Through
- Assessing the caregiver knowledge about intestinal infestation.
- Assessing the hygienic measures of home environment and the caregiver's practices.

#### **Research hypotheses:**

- Designing and implementing educational intervention program according to their needs
- Evaluating the knowledge and practice improvement after program

#### **Subjects and Methods**

##### **5.1 Research Design:**

Quasi-Experimental research design was utilized in the current study.

##### **5.2 Subject:**

- Multistage random sample techniques were used in this study.

- First stage: four primary governmental schools were chosen from 42 schools of 4 sectors in Minia city
- Second stage: one class were selected from each school (1<sup>st</sup> year primary) the total classes were 1/1, 1/3, 1/2 and 1/1 respectively of Saad Zaglol, Tark ebn Ziad, Elfath and EL-shaheed
- Third stage: 25 student's select of each class participate with their caregivers from school and home visit
- Four stage 100 caregivers have children in the first role primary participate in the study from the previous mention setting

##### **5.3 Setting:**

The study was conducted at four primary governmental schools. These were Saad Zaglol, Tark ebn Ziad, Elfath and EL-shaheed schools at EL-Minia city.

##### **5.4 Tools of data collection:**

Data were collected through using the following tools:

- A- Structured interview questionnaire** they were designed by the researchers after reviewing the relevant literature, it was written in Arabic language and composed open and close ended questions to assess the following:

##### **Part (1):**

- a) The demographic characteristics it includes (child age, child sex, residence, education and occupation of caregivers .....etc)
- b) The Caregivers knowledge regarding the intestinal infestation and consists of the following: (definition, types of intestinal worm, cycle of Pin worm and Ascariasis, mode of transmission, prevention, treatment .....etc)

##### **Part 2:**

##### **It includes:**

- a) Asking question and school recode related to child care, place of playing, absent from school, irritability during sleep, healthy food, weight, types of drinking water.
- b) Caregivers knowledge regarding the food safety in the house includes (presence of disease from the contaminated food, types of disease, causes of this disease, prevention etc.....)

##### **B- (Observational check list):**

- a) Observational check list was developed for assessing house environmental through home visit (cleanliness, ventilation, crowding, water supply, waste disposal, types of toilet, sewage disposal
- b) Assessing the caregiver's practices through asking question & really observation. The observation check list included certain items concerning environmental sanitation, hygienic measures & health behaviors of the child and

caregivers e.g.(hand washing, nail care, clothes hygiene, methods of washing vegetables and fruits )each items measuring between done/ not done .This tool used before and after the educational intervention to evaluate what extend the effectiveness of the program.

**c) Attitude scale, (Rojas and Brewer, 2008)**

Attitude scale was developed and modified by the researcher to obtain the necessary data under supervision of expertise of community department. It includes questions concerning food safety habits, responses by agree and disagree.

**Scoring system for knowledge, practice and attitude**

**Were calculated as the following:** Knowledge: The level of knowledge was then categorized into three categories as following:

1. Those with scores of <50% were considered having poor knowledge.
2. Those with scores of >50 - 75% were considered having fair knowledge
3. Those with scores of > 75% were considered having good knowledge

a- parasitic infestation: its questions were recorded into know with score 1 and do not know with a score 0 and the total score was ranged from 0-15 and classified as the following: Poor = less than 50% (7 or less).Fair= 50-75% ( $\geq 8- 12$ ).Good =more than 75% ( $>_{13-15}$ ).b- food sanitation: its questions were recorded into know with score 1 and do not know with a score 0 and the total score was ranged from 0-8 and classified as the following: Poor = less than 50% (4 or less).Fair= 50-75% ( $\geq 5- 6$ ). Good =more than 75% ( $>_{7-8}$ ).

b-**Practice:** a- Food sanitation: its questions were recorded into done with score 1 and not done with a score 0 and the total score was ranged from 0-9 and classified as the following: Poor = less than 50% (5 or less).Fair= 50-75% ( $\geq 6 - 7$ ).Good =more than 75% ( $>_{7- 9}$ ). B- Personal hygiene: its questions were recorded into done with score 1 and not done with a score 0 and the total score was ranged from 1-16 and classified as the following: Poor = less than 50% (8 or less). Fair= 50-75% ( $\geq 9-12$ ).Good =more than 75% ( $>_{13-16}$ ).

**Attitude:** its questions were recorded into agree with score 1 and disagree with a score 0 and the total score was ranged from 0-10 and classified as the following: Poor = less than 50% (5 or less).Fair = 50-75% ( $\geq 5- 7$ ). Good =more than 75% ( $> 7$ ). % the probability of less than 50 was used as a cut off point for all significant tests.

Scores obtained on knowledge and practices of studied caregivers were used to make the required analysis before and immediate post-test and follow

up at 3 months after the program. All statistical analyses were mainly computerized

**5.5. Validity test:**

- Data collection tools were developed by the researchers after extensive review of related recent literature .Tools were submitted to a panel of five experts in the field of community health nursing staff to test the content validity. Modification of the tools were done according to the panel judgment on clarity of sentences, appropriateness of content and sequence of items

**Pilot study.** A pilot study was conducted before starting of data collection; it was carried out on 10 caregivers of the total sample. Which was excluded from the studied subject to confirm question clarity and objectivity, and to estimate the interview time and its duration, some significant modifications were done to avoid the ambiguous of the questionnaires.

**Field work:-**

**Data collection procedure:**

An official letter from the Dean of Faculty of Nursing, El-Minia University, sent to Vice Ministry of Health and population to obtain the biostatistician data of parasitic infestations among children, and agreement of country safety, Vice of Ministry of Education then administrative directory of learning and education in El-Minia governorate for data collection was obtained. Then the approval given to every director of schools. This letter included the nature, importance and expected out comes of the study.

**The educational program Objectives**

- a)To assess knowledge and practice of caregivers about intestinal parasitic infestation and its relation with hygienic measures
- b)To assisting environmental factors, behavioral habits and complaints related to intestinal parasitic infestation.
- c) To implement an educational intervention about parasitic infestations.
- d)To evaluate the effect of an educational intervention upon the caregivers about intestinal infestations.

**The program has been developed through four phases:-**

**Assessment phase:** Based on the experience& general knowledge about lake of knowledge and practices towered intestinal infestation, the educational intervention was developed to improve the caregiver's knowledge and practices, also based on pretest assessment which denoted knowledge deficit and unsatisfactory practices so the program media were prepared

**Planning phase:** The arrangement of conducting the program done; the sessions and time of the program decided. The study sample (caregivers) was divided

into 10 groups in a variety of numbers ranged between (8-10) mothers in each group according to the numbers of sample in each place. Other facilities were checked and arranged as the teaching place, audiovisual aids, handout etc.....

**Teaching Time:** the teaching was decided according to coordination between the researchers and caregivers. **Teaching place** the program was conducted in the home or training room in each school those arrangements done with the director of each school. **Teaching methods and materials:** It was important before implementing the educational program to prepare simple teaching methods to be used; as lecture, discussion, and brainstorming. **The media as** power point presentation, blackboard, picture and handouts.

**Implementation phase:** - The educational program was conducted in one year starting from October 2011 until the end of October 2012 the researcher assesses the caregivers' needs before the educational intervention, this program continued for seven days to complete the program content for each group. The total numbers of sessions was (11), each day one or two session was to be given according to the planned course, after completed the program content followed by post test and finally follow up test done after three months from application of the program. Each interview took average 30 minutes. Throughout this interview relative information was recorded in the designed sheet depending upon the response of the participant. Every week about (2) sheet was finished (three days/week).

**Evaluation phase:** follow up which was don after completing the program

**Ethical consideration:**

The purpose of this study was explained for all caregivers. The caregivers have ethical rights to agree or refuse to participate in the study, oral consent was obtained from every caregivers. Also the probable benefits as well as the probable harm was clearly explained to the caregivers and informed that the information and data obtained will be confidential and used only for the purpose of the study. The participant's dignity and privacy was maintained and respected throughout the research process.

**Statistical design:**

Data entry and analysis were done with I.B.M. compatible computer using software called SPSS for windows version 11. Graphics were done by Excel. Quantitative data were presented by mean and standard deviation, while qualitative data were presented by frequency distribution. Chi square test and fisher exact were used to compare between proportions. One way ANOVA test was used to compare between means. The probability of less than 0.05 was used as a cut off point for all significant

tests.

**Limitations of the study**

The researcher was faced with some obstacles before and during fieldwork. Some directors were uncooperative with the researcher. Also some caregivers refused to participate in the study because they had no enough time for the interview and need to meet with the researcher out of their time. Some participants were preoccupied with other duties.

**Results:**

**Table (1):** shows that the distribution of demographic characteristics for the school child and caregivers. The mean age of children was  $6.9 \pm 0.6$ , more than half of them were males and less than half were females. Also this table illustrates that less than half of caregiver's had 4-6 children and 65.0% of children were first, as regards the order of the child in the family while 10.0% of them were came last, more than half of caregivers from urban area and 41.0% from semi urban. Regarding the levels of educations, it was clear 45.0% of caregivers were illiterate and only one tenth had basic level of education. 73.0% of caregivers were house wives. As regards to income 38.0% of the caregivers earn for 400-799 pounds a month and 30.0% of them earn more than 800 pounds / month.

**Table (2):** It shows that the majority of houses have electricity source, and 89% presnet ventilation in the house, regarding the source of water in the house 94% of the caregivers are using the tap water, and only 6.0% of them are using the pump water, most of the caregivers drinking water directly from the tap, and only 1.0% of them boiling the water before drinking it, and also the same number 1.0% of them drinking the distilled water, related to the type of toilet, 81.0% house toilet ordinary and 19.0% are modern. Regarding the source of water in the toilet, about two thirds 61.0% of the caregivers using the tap water directly in the toilet, while 39.0% of them are using the water in the container, regarding the sewage 92.0% present sewage in the house, and only 8.0% not present.

**Table (3) :** it cleared that more than half of the caregivers having animals in the home. Regarding animal's wastes disposal, 60.4.0% disposes the animal wastes at the front in home and only 7.5% by governmental cares. 68.0% of the caregivers don't use any basket or container for home trash, 87.5.0% of those baskets did not cover .Regarding frequency dispose of home trash more than half of the caregivers dispose the trash daily and only 11.0% weekly. Regarding housing sanitary condition this table illustrates that about two third of houses bad,



32.0% good and only 7.0% very good housing sanitary conditions

**Table (4):** revealed that more than two thirds (67.0%) of caregivers washing hands before preparing the food in pre test then increases to the majority 95.0% on post test and decreases again to 79.0 on follow up test, with statistically significant difference ( $p=0.001$ ). Regarding to hands washing after eating 99.0% done after eating on post test and only 1.0% not done on post test, with highly statistically significant differences ( $p= 0.001$ ). 47.0% of caregivers wash hands after leave the toilet in pre test and then increases to the majority 99.0% on post test, and these percent decrease again to 60.0% on follow up test, with statistically significant differences ( $p= 0.001$ ). more than one third of caregivers wash hands with water only, more than half with water and soap, only 10.0% use disinfected solution in pre test while used soap and water elevated to 80.0% on post test, with statistically significant differences ( $p= 0.001$ , the majority 94.0% of caregivers didn't wash hands after dispose the home and animals wastes these percent decreased to 71.0%, on post test and 10.0% on follow up test, these difference were statistically significant ( $p=0.001$ ). Regards cut nails and hygiene, 37.0% of caregivers done in pre test, 38.0% on post test and 92.0% done on follow up test. With statistically significant differences ( $p= 0.001$ ).

**Table (5) :** proved that more than one third of caregivers use clean heated water in pre test elevated to majority on post test and 92.0% on follow up test, with statistically significant difference ( $p=0.001$ ). Regarding use liquid soap 22.0% of caregivers done in pre test these percent increase to the majority 95.0% on post test and then decrease to 92.0% on follow up test, and these difference were statistically significant ( $p= 0.001$ ). Regarding to use alcohol after hands washing only 2.0% of caregivers done then elevated to 9.0% on post test decreases to 5.0% on follow up test, only 0.3% of caregivers rub fingers circular in pre test, these percent elevated to 99.0% on post test, and become 90.0% on follow up test. There with statistically significant difference ( $p= 0.001$ ). Regarding other practices, with statistically significance difference ( $p=0.001$ )

**Table (6) :** proved that the scores of caregivers attitude in pre test, post test and follow up test after educational intervention, with statistically significant difference regarding attitude of caregivers in pre test, post test and follow up test ( $P=0.001$ ).

**Figure (1) :** scoring of caregiver's knowledge of parasitic infestation in pre/ post test and follow up test of educational intervention. With highly statistical significant difference between caregivers

practice and personal hygiene in pre test/ post test and follow up test ( $p= 0.001$ ).

**Figure (2):** scores of caregiver's knowledge about food sanitation in pre test, post test and follow up test of educational intervention, with high statistically significant differences between caregivers about parasitic and food sanitation, ( $p= 0.001$ ) in pre- test post test and follow up test.

**Figure (3):** scores of caregivers practice about food sanitation in pre test, post test and follow up test of educational intervention. Regarding food sanitation only (1.0%) of caregivers have good score in pre test increased to 87.0% on post test and decrease again to 57.0% on follow up test, with highly statistically significant differences ( $p= 0.001$ ), with highly statistical significant difference between caregivers practice of food sanitation With highly statistical significant difference between caregivers practice and food sanitation in pre test/ post test and follow up test ( $p= 0.001$ ).

**Figure (4):** scores of caregivers practice about personal hygiene in pre test, post test and follow up test of educational intervention. With highly statistical significant difference between caregivers practice and personal hygiene in pre test/ post test and follow up test ( $p= 0.001$ ).

Table (1): Distribution of demographic characteristics for caregivers and school children, n=100

Items	No	%
<b>Child age</b>		
6-	12	12.0
Up to 7-8	88	88.0
Mean $\pm$ SD	6.9 $\pm$ 0.6 years(5-8)	
<b>Gender of child</b>		
Male	54	54.0
Female	46	46.0
<b>Number of siblings:</b>		
1-3	42	42.0
4-6	48	48.0
7-10	10	10.0
Mean $\pm$ SD	4.1 $\pm$ 1.7 years( 1-10)	
<b>Birth order:</b>		
1-3 First	65	65.0
In the middle 4-6	25	25.0
7-10 Last	10	10.0
Mean $\pm$ SD	3.1 $\pm$ 2.1 years	
<b>Age of mother</b>		
20-	26	26.0
30-	51	51.0
40-	23	23.0
Mean $\pm$ SD	34.2 $\pm$ 7.1 years(22-25)	
<b>Residence</b>		
Urban	59	59.0
Semi urban	41	41.0
<b>Caregivers education</b>		
Illiterate	45	45.0
Basic	10	10.0
Secondary	29	29.0
University or Higher	16	16.0
<b>Caregivers job</b>		
worker	27	27.0
House wife	73	73.0
<b>Father education</b>		
Illiterate	28	28.0
Basic	17	17.0
Secondary	36	36.0
University or Higher	19	19.0
<b>Income</b>		
<399	32	32.0
400-799	38	38.0
More(800)	30	30.0

Table (2): Distribution of environmental housing sanitation no=100

Items	No	%
<b>Lighting(electricity)</b>		
Present	97	97.0
Absent	3	3.0
<b>Housing ventilation</b>		
Present	89	89.0
Absent	11	11.0
<b>Sources of water</b>		
Tap	94	94.0
Pump	6	6.0
<b>Source of drinking water</b>		
Drinking directly from the tap	93	93.0
Connect filter in the tap	5	5.0
Boil water before drinking	1	1.0
Mineral water or distilled	1	1.0
<b>Bath room type</b>		
Modern	19	19.0
Ordinary	81	81.0
<b>Sources of water in toilet</b>		
From tap directly	61	61.0
In the container or utensil	39	39.0
<b>Presence of sewage in the home</b>		
Present	92	92.0
Not present	8	8.0

Table (3): Distribution of housing conditions, (presence of animals/animal waste disposal, rubbish disposal and sanitary condition), n=100

Items	No	%
<b>Presence of animals at home</b>		
Yes	53	53.0
No	47	47.0
<b>Animal waste disposal</b>		
Collect at the front in the home	32	60.4
In the Farm	17	32.1
By governmental cars	4	7.5
<b>Presence of basket for home trash(rubbish)</b>		
Present	32	32.0
Not present	68	68.0
<b>If present it</b>		
Covered	4.0	12.5
Un covered	28.0	87.5
<b>When dispose the home trash(rubbish)</b>		
Daily	54	54.0
Day after day	35	35.0
Weekly	11	11.0
<b>Housing sanitary conditions</b>		
Bad	61	61.0
Good	32	32.0
Very good	7	7.0

**Table (4): the difference between pre / post test and follow up test among care givers regarding practices of personal hygiene, n=100**

Practice	Pre-test		post –test		Follow up – test		X <sup>2</sup>	P
	No	%	No	%	No	%		
<b>- Wash hands before preparing food</b>							76.1	0.001**
-Done	67	67.0	95	95.0	79	79.0		
-Not done	33	33.0	5	5.0	21	21.0		
<b>- Washing hands before eating</b>							92.8	0.001**
-Done	40	40.0	99	99.0	45	45.0		
- Not done	60	60.0	1	1.0	55	55.0		
<b>3- Washing hands after eating</b>							92.5	0.001**
-Done	52	52.0	99	99.0	46	46.0		
-Not done	48	48.0	1	1.0	54	54.0		
<b>- Washing hands after leave the toilet</b>							78.6	0.001**
-Done	47	47.0	99	99.0	60	60.0		
- Not done	53	53.0	1	1.0	40	40.0		
<b>-Washing hands after leave the toilet</b>							61.6	0.001**
-With water only	36	36.0	20	20.0	66	66.0		
-With soap and water	54	54.0	75	75.0	30	30.0		
-Use disinfectant solution	10	10.0	5	5.0	4	4.0		
<b>- washing hands after dispose home and animals wastes</b>							155.1	0.001**
- Done	6	6.0	29	29.0	90	90.0		
- Not done	94	94.0	71	71.0	10	10.0		
<b>- Dried hands after washing</b>							38.1	0.001**
-Done	59	59.0	95	95.0	80	80.0		
-No done	41	41.0	5	5.0	20	20.0		
<b>- Cut down nail and cleansed</b>							119.8	0.001**
- Done	17	17.0	38	38.0	92	92.0		
- Not done	83	83.0	62	62.0	8	8.0		

**Table (5): the difference between pre / post test and follow up test among caregivers regarding hand washing practices, n=100**

Practice	Pre –test		post-test		Follow up –tes		X <sup>2</sup>	P
	No	%	No	%	No	%		
<b>-Use clean water is heated at 45 C</b>							119.2	0.001**
-Done	37	37.0	79	97.0	92	92.0		
- Not done	63	63.0	3	3.0	8	8.0		
<b>- Use liquid soap :</b>							180.1	0.001**
-Done	22	22.0	95	95.0	92	92.0		
- Not done	78	78.0	5	5.0	8	8.0		
<b>- Use alcohol after washing hands</b>							12.6	0.001**
-Done	2	2.0	9	9.0	5	5.0		
- Not done	98	98	91	91.0	95	95.0		
<b>- Rub fingers circled</b>							244.01	0.001**
-Done	3	3.0	99	99.0	90	90.0		
- Not done	97	97.0	1	1.0	10	10.0		
<b>- Rubbed between the fingers</b>							248.3	0.001**
-Done	2	2.0	99	99.0	90	90.0		
- Not done	98	98.0	1	1.0	10	10.0		



Practice	Pre -test		post-test		Follow up -tes		X2	P
	No	%	No	%	No	%		
<b>-Rub your nails and under nails with soft braches</b> -Done - Not done	3	3.0	96	96.0	90	90.0	232.4	0.001**
	97	97.0	4	4.0	10	10.0		
<b>-Rinse hands under running water after specification for 20 second</b> -Done - Not done	17	17.0	99	99.0	92	92.0	194.3	0.001**
	83	83.0	1	1.0	8	8.0		
<b>- Drying your hands by toilet paper</b> -Done - Not done	3	3.0	22	22.0	30	30.0	25.6	0.001**
	97	97.0	78	78.0	70	70.0		

Table (6): Scores of caregivers attitude about safety food in pre test / post test and follow up test of educational intervention, n =100

Attitude	Pre- test		post- test		Fallow- up test		Fisher exact	P
	No	%	No	%	No	%		
<b>Positive</b>	75	75.0	96	96.0	100	100.0	41.3	0.001**
<b>Negative</b>	25	25.0	4	4.0	0	0.0		

Figure (1): scoring of caregiver's knowledge of parasitic infestation in pre/ post test and follow up test of educational intervention.

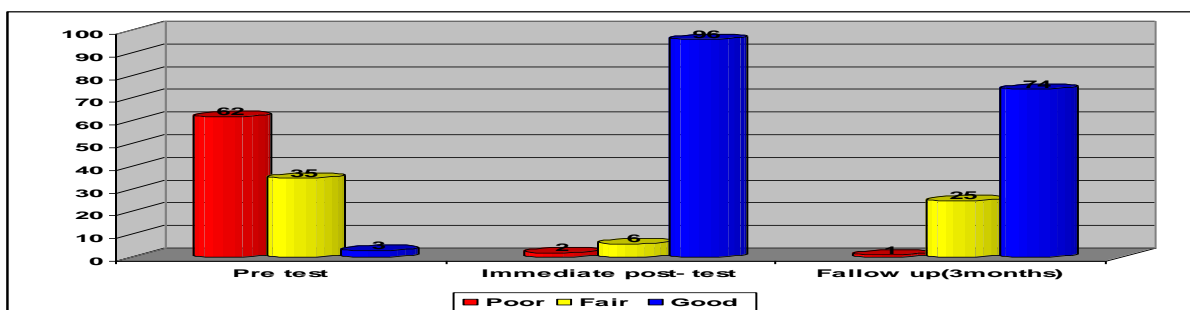
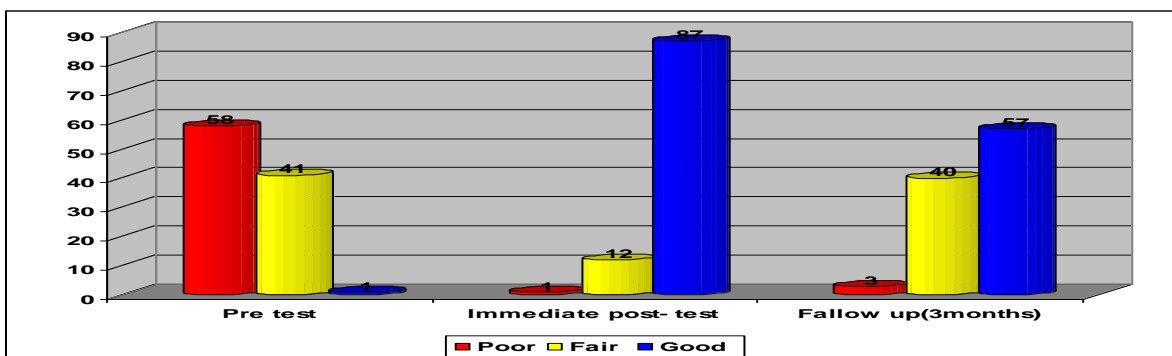


Figure (2): scores of caregiver's knowledge about food sanitation in pre test, post test and follow up test of educational intervention



Figure(3): scores of caregivers practice about food sanitation in pre test, post test and follow up test of educational intervention.

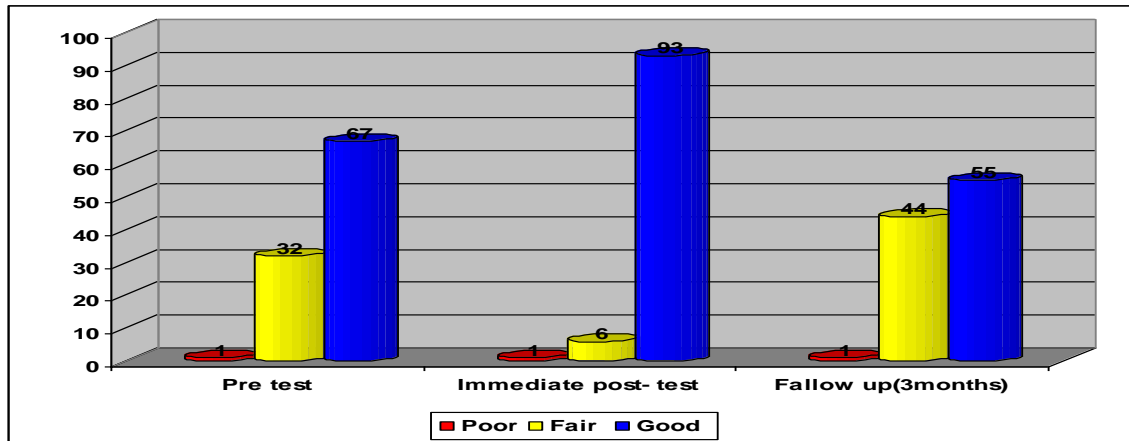
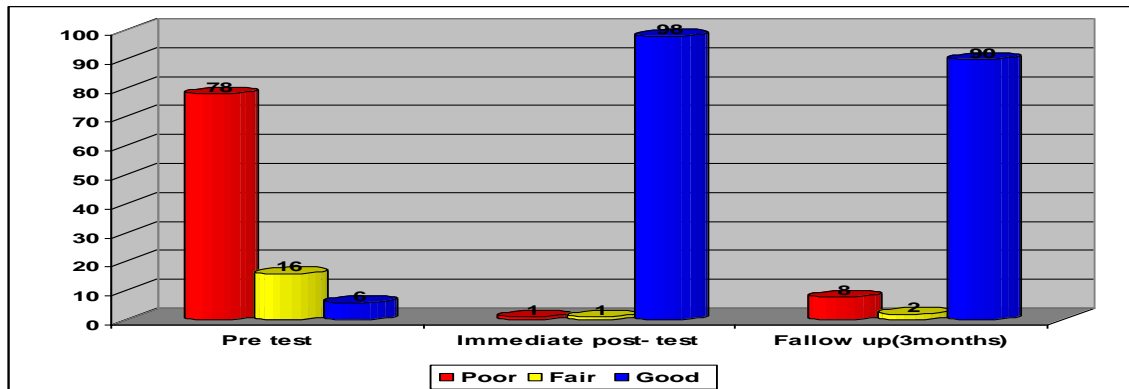


Figure (4): scores of caregivers practice about personal hygiene in pre test, post test and follow up test of educational intervention



### Discussion:

School children are considered one of the vulnerable group of population due to their continuous growth and development at all levels. They are a vulnerable group and great attention should be paid to tackle the health problem of intestinal infestations (Bhalawar et al., 2009 and Belizario et al., 2010)

Less than three quarters of mothers were house wives while only 5.0% un-employed. As regards to the income more than one third of the caregivers earn for 400-799 pounds a month and 30.0% of them earn more than 800 pounds/ month, this results are similar with Mahmoud, (2000) & EL- Masry et al., (2010) in Sohag governorate who showed that low social classes were significant risk factors for intestinal infestations.

Concerning distribution of environmental housing sanitation presented in (tab,2) it was clear that the majority of houses have electricity source, and 89% present ventilation in the house, regarding the source

of water in the house majority of caregivers are using the tap water, and minority of them are using the pump water, most of the caregivers drinking water directly from the tap, and only 1.0% of them boiling the water before drinking it, and also the same number of them drinking the distilled water, related to the type of toilet, more than three quarter of the caregivers using ordinary toilet and 19.0% using modern toilet, in spite off low percent but presence dangerous on the health, this might be interpreted that using the modern toilet may contribute to spread of infection with intestinal infestations.

This results are accordance with Cuevas et al.,(2007) and Jombo,& Akosu, (2007) were noticed that it is already known that environmental sanitation and hygienic practices have been associated with the incidence of intestinal infestations, improved water supply and the use of toilet facilities have contributed to the reduction of infections with intestinal infestations.

Regarding the source of water in the toilet, about two thirds of the caregivers using the tap water directly in the toilet, while more than one third of them are using the water in the container, regarding the sewage highly present in the house, and only 8.0% not present. Intestinal infestation depends on the hygiene and sanitation of people involved, water contamination, health education status etc. The caregivers and children were advised to treat the well water prior to consumption either by filtering or boiling or both. This finding is consistent with *Shrestha, (2002)* who reported a higher rate of intestinal infestation in general school going children less than three quarter compared to boarding school going children less than half and 40 % who used the latrines built by Family Planning Association Nepal, in Kathmandu and Sunsari respectively

As regards distribution of environmental housing conditions, the current result presented in table (3) it was revealed that more than two third of the caregivers don't use any basket or container for home trash, most of those baskets did not covered. Regarding frequency of home trash disposal more than half of the caregivers dispose the trash daily and only more than one tenth weekly this results may be interpreted that the housing condition may contribute and assist the spread of infection with intestinal infestations this result is consistent with *Abordo et al., (2010)* who stated that all caregivers frequently adhered to some garbage disposal practices, in their homes, they would use garbage containers and place them away from the reach of animals, food and water containers. Regarding housing sanitary condition about two third of houses present bad, about one third good and only 7.0% very good housing sanitary conditions. accordance with WHO who reported that standard score about environment and housing sanitation.

Concerning to hand washing practices the current study illustrated that more than two thirds of the caregivers washing hands before preparing the food in pre test then increases to the majority on post test and decreases again to more than three quarter after follow up test, with statistically significant difference ( $p= 0.001$ ). also less than half of the caregivers washing hands before eating in pre test increase to the most on post test, and slightly decrease after follow up, with statistically significant differences ( $p=0.001$ )

This finding is consistent with *Campos et al., (2009)*, who found that about three quarter of caregivers did not receive periodic training, more than half did not undergo annual health examinations and all did not practice proper hand hygiene, a situation that reflected significantly  $p < 0.05$  in hand contamination, in which fecal coli forms were

detected on 55.6% of the hands analyzed, who concluded that the schools studied did not have appropriate hygienic conditions, suggesting the need for interventions that ensure the quality of houses of the caregivers of school children.

As regards use liquid soap for hand washing more than one quarter of the caregivers are using it in pre test these percent increase to the majority on post test and then slightly decrease

after follow up test, and these difference were statistically significant ( $p= 0.001$ ), this finding in the same line with *Fung and Cairncross, (2009)* who found that hand washing with soap may be one of the most cost-effective means of preventing intestinal infestations in developing countries.

This study revealed that more than one third of the caregivers wash hands with water only, more than half with water and soap, only one tenth use disinfected solution in pre test while used soap and water elevated to most on post test, with statistically significant differences between pre and post test ( $p= 0,001$ ), more than one quarter of them rub finger circular in pre test arrive to the majority on post test and 90.0% after follow up this mean due to the educational intervention was successful in improving caregivers about hand washing practice.

These findings are consistent with study conducted by Mayo Clinic staff, (2010) who estimated that only more than one quarter of child caregivers wash hand with soap after the toilet, make plans' involving hand washing included to improve family health and to teach the caregivers and their children as hand washing with good manners. Also in the same line with *Sehgal et al., (2010)*, who sharing with candidate strategies for promoting hand washing with soap include creating social norms, highlighting disgust of dirty hands and teaching the caregivers and their children as hand washing with soap good manners, environmental barriers were few as soap was available in almost every household, as was water, because much hand washing is habitual.

This study show that the scores of caregivers attitude about food sanitation and personal hygiene, the current study found, one quarter of the caregivers had negative attitude while three quarter had positive attitude toward food safety , with statistically significant difference in pre test, post test and follow up test of educational intervention ( $P =0.001$ ), this result supported with *Hammam et al., (2010)* who reported that less than half of the caregivers had negative while more than half positive attitude toward food safety.

This study revealed that the scores of the caregivers practice about food sanitation and personal hygiene pre /post test and follow up test of educational intervention. Regarding food sanitation only one of

the caregivers have good score before the educational intervention in pretest while improved after the (post test) increased to the most in general but slight decline in their practices after three months from the intervention. So that this findings indicated that highly statistically significant difference between caregivers practice and personal hygiene in pre test/ post test and follow up test ( $p=0.001$ ).

### Conclusions:

From the findings and research hypotheses the following could be concluded:

That the caregiver's knowledge, practices and attitudes regarding the intestinal parasitic infestations (signs and symptoms, methods of diagnosis and treatment, hygienic measures) were improved after the implementation of the educational intervention with slight decline in the knowledge and practices after three months from implementation. With highly statistically significant differences were detected.

### Recommendation

**Based on the results of the present study, following recommendation should be considered:-**

- Health education for improving personal and environmental hygienic measures and regular screening and treatment for parasitic infestation and more studies on big number of students in rural and urban areas at Upper Egypt, and health education for primary school students regards parasitic infestation. Display posters on areas frequently visited by students, like sinks and toilets, on proper hand washing to limit or reduce, if not stop, the oral-fecal transmission of intestinal parasites.

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