

## EVALUATION OF THE RELATIONSHIP BETWEEN INTESTINAL PARASITIC INFECTION AND HEALTH EDUCATION AMONG SCHOOL CHILDREN IN GAZA CITY, BEIT-LAHIA VILLAGE AND JABALIA REFUGEE CAMP, GAZA STRIP, PALESTINE

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**Abstract:** This study aimed to test the impact of health education programmer's intervention on the prevalence of intestinal parasites among school children in Gaza city, Beit labia villages and Jabalia refugee camp "Gaza Strip" over 6 month.

In this study 432 stool samples were collected from school children aged 6-11 years old, each stool sample was examined using wet mount and formal-ether sedimentation technique. Of these 432 stool sample 125 were found to be positive with a prevalence of (28.9%). The infected children were treated with suitable anti- parasitic drug under the supervision of school of health in the ministry of health. Then the treated children were divided into two groups the first group remained on the treatment only but the second group received treatment and health education. After 6-month a second stool sample was collected from each child in the two groups then analyzed.

The final result indicated that prevalence of intestinal parasites had declined from 21.5% to 5.1%. Ration was 3.4% in first group which received treatment only and 1.62% in second group which received treatment and health education. The rule of health education in decreasing prevalence of intestinal parasitic infection was statistically significant (P= 0.001). The relationship between intestinal parasites and sex, residence, age, school, job, of father and other relations were investigated and studied.

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432

6-11

28.9%

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.5.1% 21.5%

### **Key words**

Health education, Behavior, Knowledge, Intestinal parasites, Prevalence, Gaza.

### **Introduction**

Gaza Strip is one of the most over populated areas in the world. The population density in Gaza Strip is estimated at 3,867/Km<sup>2</sup> out of the total area of Gaza Strip (364Km<sup>2</sup>). PCBS (1998). Studies have proved that there are many places in Gaza Strip especially in refugee camps has a considerable prevalence's of intestinal parasites which leads to a great dangerous on the health of those people especially children (Abed, 1979; Yassin et al., 1999; Shubair et al., 2000; Al-Agha, 2000; Al-Hindi, 2002; Al-Zain and Al-Hindi, 2005). So, the problem of parasitic infection still exists in the local community. Intervention programmes may be lacked in the area. Some health education programmes were applied by health authorities in insufficiently manner. Health education is one of the most important components of health promotion and lead to promot behaviors and to make decisions about their health (Hubley, 1993). Health education encourages behavior that promotes health, prevents illness, cures diseases, and facilitates rehabilitation. Health education programmes put the priority for needs and interests of individuals, families, groups, organizations and communities (WHO, 1988). The aim of the present study was to test the impact of health education programmes intervention on the prevalence of intestinal parasites among school children in Gaza city, Beit-lahia village and Jabalia refugee camp, Gaza Strip.

### **Subjects and Methods**

The present study was carried out in three localities of Gaza Strip with a total of 432 school children who has participated in the study.

### Study type

During the second stage two approaches of intervention were followed, the first is treatment of the infected children and the second approach in combining treatment with health education session.

### Study population

The population who participated in the study was distributed as follow in table 1.

Location	Population	Number of school children aged 6-11 years old	Examined children
Gaza city**	359,941 individuals	57,634	192
Beit-lahia** village	55,350 individuals	75,230	158
Jabalia refugee camp**	79,987 individuals	20,000	82

\*\*Data obtained from Municipality of Gaza, Beit-lahia and Ministry of education and high education (2003).

### Sampling and parasitological examination

Random sampling was applied and one stool sample was obtained in a clean container from each school children participated in the study. Each sample was inspected by direct wet mount and Lugole's iodine searching for protozoal parasites stages (cysts and trophozoites) and helminth (eggs, larvae and adults worms). The negative stool samples were confirmed using formal-ether sedimentation technique.

### Treatment of infected children

All infected children were treated with the proper drug under the supervision of physician from department of school health and the treatment process was as follow: children infected with *Ascaris lumbricoides* and *Enterobius vermicularis* were treated with vermazol (Mebendazole) 100mg dose/3days (Jerusalem pharmaceuticals-Al-Birah, Palestine). Children infected with *Giardia lamblia* were treated with metronidazole 5mg/kg per 5 days. (Birzeit-Palestine pharmaceutical company ltd, Palestine). For *Entamoeba histolytica* (Metronidazole was used for treatment 50mg/kg, 3 doses for 10 days (Behrman, 1992) (Birzeit-Palestine pharmaceutical company ltd, Palestine). For children infected with *Hymenolepis nana* they were treated with (Yomesan) Niclosamide where children over 6 years were

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given 2 mg as a single dose one first day then 1 mg daily for 6 days (Martindale, 1999) (Bayer company, ltd).

### **Health education process**

For transmission to the stage of health education, the infected children completed the course treatment in the present study under the supervision of a physician. To treat children properly, each mother of an infected child was invited to the school and advised by the physician for the suitable way of giving the medication. After the completion of treatment, the treated children were divided into two groups in each area.

### **Choosing cases and controls**

Both groups were samples selected from the 432 studied children. **The first group** represented the first school in each study area, which received treatment only (controls) their total was 52 individuals.

**The second group** represented the second school in each area which received treatment plus health education (cases) their total was 41 individuals.

### **Health education sessions applied in the present study**

One visit weekly for each second school was made for the three locations; each meeting was 25-30 minutes.

### **Methods of health education applied**

- 1. Health talks** this was applied for the children in each school.
- 2. Posters** large sheet of paper was used describing by words and pictures the topic of intestinal parasites to convey the health education message about cleaning and healthy behavior for those children.
- 3. Story** This was the third method of communication with school children. It was believable with normal names around the concept of washing vegetables before eating and disease.
- 4. Handout** handout and written materials that contained advices and information about intestinal parasites and its transmission.

### **Statistical analysis**

Statistical Package for Social Sciences Inc., Chicago, Illinois (SPSS/PC) was used for statistical analysis. Frequency, cross-tabulation and Chi-square were carried out, p-value less than 0.05 are considered statistically significant.

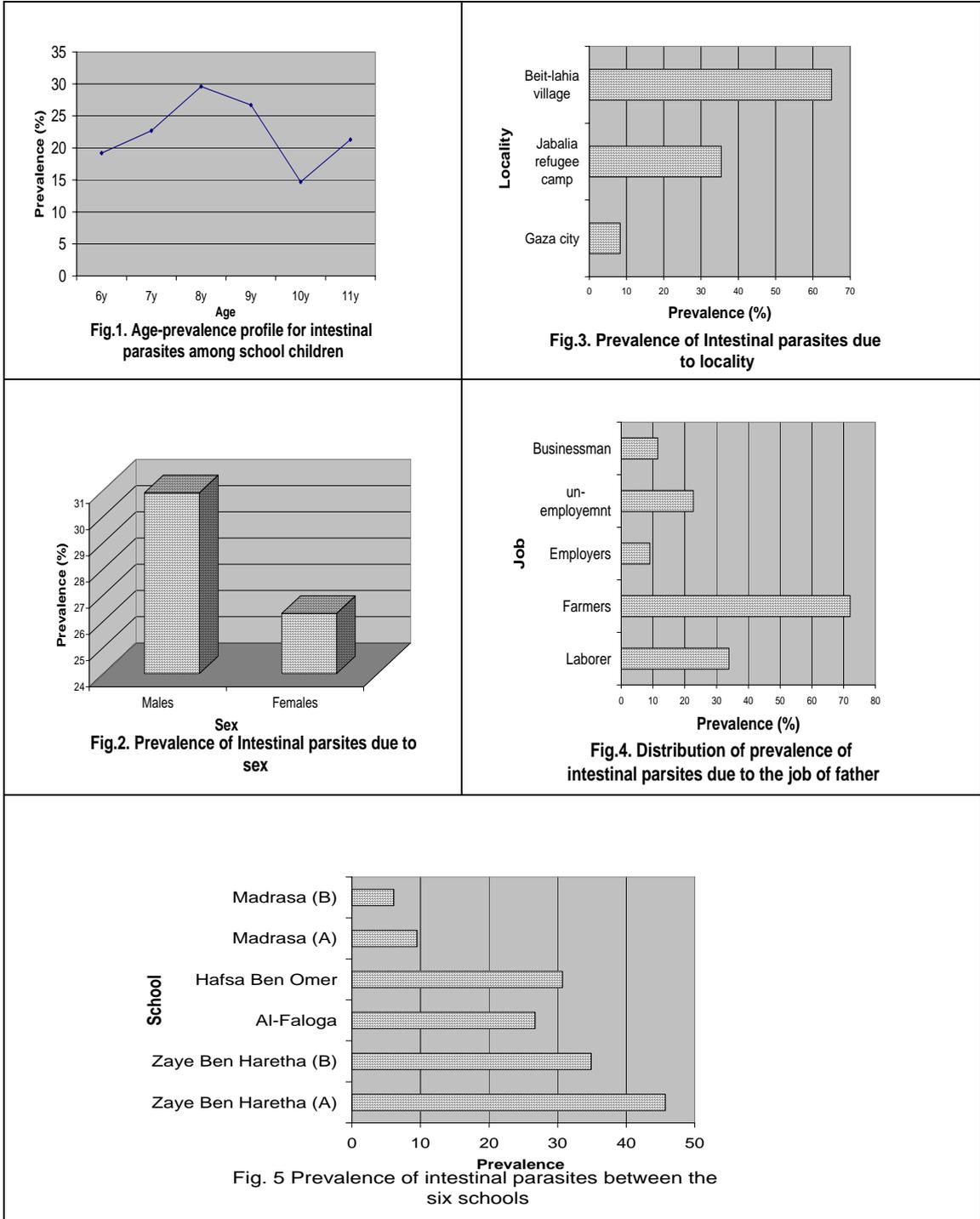
**Results**

The present study included 432 school children 246 (56.9%) were boys and 138 (43%) were girls. One hundred and twenty five primary school children (28.9%) out of 432 were found to be infected with one or more of intestinal parasites. The different types of detected intestinal parasites were indicated in table 2.

**Table 2. The detected intestinal parasites among school children in Gaza city, Beit-lahia village and Jabalia refugee camp**

Parasite	No. of infected children	Prevalence %
<b>Single infection</b>		
<i>Ascaris lumbricoides</i>	49	11.3
<i>Giardia lamblia</i>	40	9.3
<i>Entamoeba histolytica/dispar</i>	24	5.6
<i>Enterobius vermicularis</i>	2	0.5
<i>Hymenolepis nana</i>	2	0.5
<b>Double infection</b>		
<i>A.lumbricoides</i> + <i>E.histolytica/dispar</i>	3	1.8
<i>E.histolytica/dispar</i> + <i>G. lamblia</i>	3	
<i>A.lumbricoides</i> + <i>E. vermicularis</i>	1	
<i>E.histolytica/dispar</i> + <i>G. lamblia</i> + <i>H. nana</i>	1	

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**Table 3. Comparison between cases and controls**

Group	Pre-intervention prevalence	Post-intervention prevalence	Reduction (%)
Health education and treatment (Cases) n=190	41	7	82.9
Treatment (Controls) n=241	52	15	71.2

$\chi^2=1.10$ ,  $P=0.001$

Reduction in the prevalence of intestinal parasites was efficient among children who received treatment and health education in the three localities table 3.

### Discussion

School age children is a liable to suffer the consequences of intestinal parasitic infection as malnutrition (Ordonez. and Angulo, 2002) anaemia, (Shubair et al., 2000) allergy (Cooper, 2004) , decrease in learning level and performance (Nokes and Bundy, 1994). The results of this study were matched with other similar studies in some findings and different in other. The general prevalence of intestinal parasites in the present study was 125 out of 432 (28.9%), and this matched with other similar studies carried out in Gaza Strip (AL-Wahaidi, 1997; Yassin et al., 1999; Shuibair et al., 2000; Sharif, 2000; AL-Hindi, 2002; Al-Zain and AL-Hindi, 2005).

The comparison of the the present findings with those from the neighboring countries such as Yemen Farag (1985), Lebanon Araaj et al., (1996) and in Egypt Younis et al., (1997) showed a considerable differences could be found in the overall prevalence of intestinal parasites. These differences can be explained by the influence of environmental conditions, hygiene, level of sanitation and differences in human behavior towards intestinal parasites. Regarding the collection of stool samples in the present study was in the beginning of semester in the start of scholastic year, where the behavior of school children is mostly good and changing is acceptable, inspection for nails and uniform is periodically so this may lead to decreasing in the prevalence of intestinal parasites. The most common intestinal parasites detected in the present study was *A. lumbricoides* (11.3%) followed by *G. lamblia* (9.3%) and *E. histolytica /dispar* (5.6%), the other types detected as

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*H. nana* and *E. vermicularis* were uncommon. Several authors found that *A. lumbricoides* was the most prevalent intestinal parasite (Udonsi et al., 1993; Eve, 1998; Al-Zain and Al-Hindi, 2005). This could be attributed by the fact that each location has its own demographic, socioeconomic characteristics and special environment sandy or muddy.

The present work showed higher rates of parasitic infection among males (30.9%) than females (26.3%) but this difference is not statistically significant ( $P > 0.05$ ). Higher rates of infection among males is justify by that males spend their time in the streets, and playing in sand (Yassin et al., 1999) but usually females tend to spend most of times in homes. AL-Wahaidi (1997) found that the prevalence of intestinal parasitic infection among pre-school children in Al-shate refugee camp was (48%). These differences may be due to that pre-school children have poor health practices, so the possibility for transmission is high for such age. These prevalences of intestinal parasites in each area of study were approximately agreed with other studies in Gaza Strip. Farming area in Beit-lahia village is similar to Deir-El-Balah region which is considered also farming area and has a prevalence of (36.3%) of intestinal parasites Al-Hindi (2002). In comparison with refugee camps and villages the lower prevalence of intestinal parasites were found in Gaza city Shubair et al., (2000) and Yassin et al., (1999). Overcrowdness, poorness, the difficult situation in health services, poor standards of public and personal hygiene are the main factors that contributing to the higher prevalence of intestinal parasites in refugees. The lower prevalence of intestinal parasites in Gaza city may be due to close sewage system, higher level of awareness, sanitation, hygiene, good socio-economic level and Gaza city has improvement in health care system especially in the last 7 years. *A. lumbricoides* was more prevalent in Beit-lahia village. Farming are in Beit-lahia has a suitable environmental conditions for transmission of soil-transmitted helminthes, also personal behavior and close presence of sewage pools near the village. *Giardia lamblia* and *E. histolytica/dispar* were more prevalent in Jabalia refugee camp more than Beit-lahia village and Gaza city because this may be related to the environmental conditions where Jabalia as a refugee camp is a small area, crowded, have a narrow streets with low and poor health practices among children.

The prevalence of intestinal parasites was highest in age 8 years old but there was no clear trend in the prevalence with relation to age(29.6%). There was statistical significance in the prevalence of intestinal parasites among schools in the three localities ( $P=0.001$ ) where the prevalence was

highest in the school D (73.8%) which is located in Beit-lahia and lowest prevalence was recorded in school B (6.1%) which is located in Gaza city. However, for longer term benefits, improvement of people's knowledge of worms and ways of limiting transmission through improvements in water supply, personal sanitation and hygiene is necessary (Mascie-Taylor et al., 1999).

There was strong correlation with statistical significance for the prevalence of intestinal parasites due to the job of father (72%) of infected children belong to farmers while 33.9% laborer while 9% of infected children have employee fathers ( $P=0.001$ ). The previous differences in the prevalence of intestinal parasites may be due to socio-economical factors so that employees have monthly income higher than laborers and farmers. Also, awareness among employee and measures to overcome and minimizing the exposure of those children to environmental hazards may be included. Application of intervention programme for infected children using health education lead to decreasing in the prevalence of intestinal parasites from 21% to 5.09% this prevalence were distributed as 3.5% in the group which received treatment only (control group) and 1.62% in the group which received treatment and health education programme (cases group) but this difference was not statistically significant. The justification of such result may be attributed to many reasons; 1. the low number of positive cases in the present study (125 samples out of 432), 2. During the study it was used face to face system as a channel of communication and this method was not suitable in all cases. Also children may need other approaches to understand the health messages e.g. T.V, radio, drawing and models, 3. Health education programme in the present study was applied for 6 months only, and the impact of health education will come on long run (1 year to 5 years). 4. time and timing, so, the time of the weekly meeting in each target school (25-30 minutes) with each group was not sufficient and there was a question how much the children learned from health educators during this time. 5. the students state of mind wasn't in good condition for many reasons, firstly , the political and economical situation in Gaza strip and this fact affected education in a direct way, for example during lectures there was breaking in by Israeli soldiers, helicopter and tanks , and this put children in a situation of feeling danger and fear. The assassination and valiant death of many Palestinians as shows in T.V left a picture of horror in the mind of those children. That all this facts make the researcher faces a unique situation of un-willingness of children to absorb the information given to them in lectures. there is also another reasons for the study being un significant, the time of the lecture was at the brake time of the students that's why they

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rejected this lecture beside that there was especial situation and family problems to each one of those children .6. The result of this study indicate the needing of more organized, more planned health education programmes in the manner of team work not as single channel. Health education is not included in the schools curriculum in the ministry of education and higher education, and teachers and students are not practices health education activities in the schools also, health education programmes doesn't meet minimum requirement.

On the contrary the study revealed that there is a significant relationship between health education and the improvement of hygiene and low parasitic infestation among target population

Because intestinal parasites still exist, it is suggested and recommended to use health education and mass treatment to reduce and control this health problem.

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