Agricultural Labor among School Children in Rural Assiut, Egypt

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Abstract: Background: Child labor is alarmingly prevalent in Egypt, a country with a population of nearly 75 millions; there are some 1.5 million (12%) child workers between 6 and 15 years. Agricultural work posses several characteristics that are risky for health: exposure to extremes of weather, close contact with animals and plants, extensive use of chemical and biological products, difficult working postures and lengthy hours and use of hazardous agricultural tools and machinery. Aim of the study: Determine the causes of agricultural child labor in Koom Abousheel village, Assiut, Egypt and highlight some of its related health problems. Methods: Descriptive cross sectional study included 630 randomly selected students enrolled in primary and preparatory schools aged from 6 to 17 years old in Koom Abousheel village 2008-2009. Data collection from the target population using structured personal interview. Anthropometric measures: weight, height and body mass index were measured. Laboratory investigations including urine and stool examination were done to detect parasitic infections in these children. Urine samples were collected, centrifuged and examined microscopically. Stool examination was done macroscopically and stored in two different fixative (10% formalin and sodium acetate-acetic acid-formalin), concentrated and examined microscopically by: direct wet mount using saline, iodine and lacto-phenol cotton blue and stained by modified Kinyoun acid-fast stain. Data analyzed using SPSS version 16. Results: 52.7% of the studied students worked in agricultural duties and 73.2% of them began work at early age (less than 10 years). Boys were more often involved in labor activities than girls. About half of the worked students helped their fathers in their work. Worked students reported negative impact on their education and social life. Health hazards at the farm such as exposure to high temperature, animal bite, and injuries were prevalent among them. Parasitic infections were more prevalent in worked students (69.3 %). The detected parasites were Ascaris lumbricoides, Ancylostoma doudenale, Hymenolepis nana, Enterobius vermicularis, Entamoeba histolytica, Giardia lamblia, Cryptosporidium parvum, Blastocystis hominis and Entamoeba coli. Conclusion: The problem of child labor is serious. In rural areas especially, children work as cheap labor because their parents are poor and do not earn enough to support the family, thus the problem of child labor will persist and it exposes the children to many health hazards and risks. Improving legislation and enforcement measures to establish a legal minimum age for work, community education and mobilization are essential and have been the traditional response to the problem of child labor. [Safaa A. M. Kotb, Asmaa G. Mohamed Ekram M. Abdel Khalek, Doaa A. Yones Agricultural Labor among School Children in Rural Assiut, Egypt. Life Science Journal. 2011;8(2):323-339] (ISSN:1097-8135).

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1. Introduction

Child labor is a persistent problem throughout the world, especially in developing countries. It is prevalent in rural areas of those countries where income poverty is widespread (ILO, 1997). Child labor, according to ILO conventions, is work that harms children's well-being and hinders their education, development and future livelihoods. One out of six children in the world is involved in child labor, doing work that is damaging to his or her mental, physical and emotional development (ILO, 2004). Because children's bodies and minds are still growing and developing, exposure to workplace hazards and risks can be more devastating and long-lasting for them (Hurst, 2007).

According to the International Labor Organization's new report on child labor (ILO, 2006); of nearly 250 million children engaged in child labor around the world, the vast majority 70 percent are working in agriculture. Child agricultural workers, who frequently work for long hours in scorching heat, haul heavy loads of produce, are exposed to toxic pesticides, and suffer high rates of injury from sharp knives and other dangerous tools (Fassa *et al.*, 1999). Their work is grueling and harsh, and violates their rights to health, education, and protection from work that is hazardous or exploitative (FAO, 2006; Cole, 2006). The number of children working in agriculture is nearly ten times that of children involved in factory works such as garment manufacturing, carpet-weaving, or soccer-ball stitching. Yet despite their numbers and the difficult nature of their work, children working in agriculture have received little attention compared to child labor in manufacturing for export (ILO, 2004). The International Labor Organization goal of eliminating all of the worst forms of child labor by 2016 will only be possible if more work is done in agriculture (Hurst, 2007).

Child labor is an important global issue associated with poverty, unbalanced economic growth, inadequate educational opportunities, gender inequality, inadequate regulations to restrict child labor, lack of public awareness and a range of health risks (Parker, 1997; Forastieri, 2002). Most child laborers begin working at a very young age, are malnourished, and work long hours in hazardous occupations; frequently they do not attend school. They receive very low wages or are unpaid, and their income or help is usually essential for family survival. It is estimated that, in developing countries, at least 90% of economically active children in rural areas are employed in agriculture (Human Rights Watch Reports, 2006; Forastieri, 1997; Wilk, 1993).

An investigation in Egypt, Ecuador, India, and the United States, Human Rights Watch has found that the children working in agriculture are endangered and exploited on a daily basis. Despite the vast differences among these four countries, many of the risks and abuses faced by child agricultural workers were strikingly similar (Human Rights Watch Reports, 2002).

The most obvious economic impact of child labor at the family level is an increase in household income as a short term. While the long term, is under accumulation of human capital caused by low school attendance and poor health which is a serious negative consequence of child labor, representing a missed opportunity to enhance the productivity and future earnings capacity of the next generation (Heady, 2003).

The Egyptian Child Law (Law No. 12, 1996) prohibits the employment of children below the age of fourteen. However, children between the ages of twelve and fourteen are allowed to receive vocational training from employers and to take part in seasonal agricultural work, provided that the work is not hazardous to their health and growth, and does not interfere with their studies. The child Law limits the workday for these children to six hours, only four of which may be consecutive, and requires the provision of one or more breaks (Bureau of International Labor Affairs, 2004).

Child labor is also addressed in the Egyptian Labor Code Law No. 12, 2003, which states that "employing children under the age of fourteen or children who have not completed elementary education yet, is prohibited". However, the provisions of this law do not apply to children working in agricultural labor, which is one of the most problematic forms of child labor in Egypt (Bureau of International Labor Affairs, 2004).

Poverty is the main cause of child labor in Egypt. About 17% of the population lives in poverty with almost 12 million people having difficulty meeting their basic needs. Rural Upper Egypt is the poorest region (Mattar, 2007). Also, there is a low standard of health and medical services in rural areas. This particularly is true in developing countries compared with developed countries. Health status in rural areas is below that found in urban centers in both developed and developing countries (Forastieri, 1999).

Seeing vulnerable children risking their lives and harming their health is disturbing and painful to everyone. Although child labor is globally recognized as a health problem, research into the health impacts of child labor in Egypt has been limited to some urban areas (El-Gilany *et al.*, 2007; Kishk *et al.*, 2004).

The present study aimed to:

• Determine the causes of agricultural school child labor in Koom Abousheel village, Assiut, Upper Egypt.

- Study the socioeconomic and demographic backgrounds of the target children.
- Determine the predictors of agricultural child labor.
- Highlight the work related health hazards of the agricultural child labor; including parasitic infection in these children.

2. Materials and Methods Methods

A cross sectional study was carried out during the academic year 2008-2009 in Koom Abousheel village, Abnoub District which is located in north Assiut. **The total population of the village according to the census 2006 was 17**,394. The study was conducted on students enrolled in primary and preparatory schools, aged from 6 to 17 years. Sample size has been calculated using the following equation: n = (Z2 * p* "p)/D2(Lwanga and Lemeshow, 1991). The suggested prevalence of the child labor between 6 to 15 years was 12% (Kishk *et al.*, 2004). A value of 2.5 is chosen as the acceptable limit of precision (D) at 95% level of confidence. Accordingly, sample size is estimated to be 500+ 10% students to guard against non-respondent's rate.

In the randomly selected village, there is an educational campus that includes two primary and two preparatory schools. The four schools were included in the study, total number of the students in the selected schools was 3,529 (2,275 in primary schools and 1,254 in preparatory schools), 15 classes were selected by simple random sampling (8 classes in primary schools and 7 classes in preparatory schools). All students in the class, who were present on the day of the survey, were included. The mean class density in the selected schools was 45.6 students. The actual number of enlisted students in the randomly selected classes was 684 of which 630 (92%) successfully completed the questionnaires making a dropout rate of 8% (54). Absenteeism was the reason for dropout.

A semi-structured questionnaire gathered information concerning: personal data, family background, questions about work and work environment, health hazards of the work. Field pre-testing of the questionnaire was carried out on a sample of 30 students who were not in the sample; the necessary modification in the sheets was done.

Formal administrative approvals were taken before the start of the fieldwork. Students were briefed about the study, encouraged to participate. The researchers stressed on the issue of confidentiality and all students were requested to fill out the questionnaires anonymously. To control for variations in reading ability, the questionnaire was read aloud to students; the instrument required between 45 and 60 minutes. Student participation was voluntary, however, no student refused to cooperate in the research. Verbal and written instructions reminded students of the importance of giving honest answers. As regard the young students aged 6- 8 years, home visits were done to complete the questionnaires by personal interviews.

Weight and height were measured. Body mass index was used to determine the degree of obesity. Obesity was defined as BMI more than or equal 30 Kg/m2 (WHO, 2004).

Parasitological methods

630 urine and stool samples were collected from the children after procuring informed permission from the school and parental authorities. Students were instructed about what they will do. Urine and stool samples were collected at schools in dry, clean, leak proof plastic disposable cups with lids labeled with name, age, date, class and sex of the student. The collection rate was 2-3 classes per visit. All samples were transported within half an hour to parasitology laboratory, Department of parasitology, Faculty of Medicine, Assiut University, Assiut, Egypt. Urine samples were examined in the same day, it were poured in a conical centrifuge tube and immediately centrifuged at 400 rpm and the sediment examined by wet mount.

Stool specimens were examined as the following: Macroscopic examination of faeces was performed to detect adult worms, segments of tapeworms, larvae, blood and mucus (if present). Stool consistency (i.e. formed, soft, loose or watery) was reported. Each stool sample after macroscopic examination was divided into 2 parts, one was well mixed and stored in10% formalin and the other was well mixed and stored in Sodium Acetate- acetic acid- formalin (SAF) at 4°C, (one portion stool with three portion preservative) using suitable containers labeled with the same information. After the same time preservation of both preservatives; each stool specimen was concentrated using formalinethyl acetate sedimentation and zinc sulfate floatation concentration methods. Direct microscopic examination of saline, iodine and lacto-phenol cotton blue (LPCB) wet mounts preparation of stool specimens were prepared to microscopically screen for helminthes eggs or larvae, protozoal trophozoites, cysts and oocysts. The saline wet mount preparations were examined first and then the iodine wet mounts and lastly the LPCB wet mounts. These wet mounts were microscopically screened initially by using a low-power objective and then using highpower objectives of a compound light microscope at the same time for the two preservatives of each sample. Stool samples were stained using modified Kinyoun acid-fast staining technique for coccidian parasites (Parija et al., 2003).

Reports were sent to the school administers and school health teams including the names of the positive students and the detected parasites for proper treatment.

Data were analyzed using SPSS (version 16). The frequencies, percentages, the mean and standard deviation were computed. Chi-squared test was used as the test of significance; P < 0.05 was considered significant. Body Mass Index was calculated by using BMI percentile by nutritional program EPInfo 2000.

3. Results:

A total number of 630 students were included in this study; 298 (47.3%) boys and 332 (52.7%) girls. The age of the respondents ranged from 6 to 17 years with mean of 11.5. As regards smoking behavior, 1.4% of students were smokers. It was found that 332 (52.7%) of the students were working in agricultural duties (Table 1).

Table (2) shows the family characteristics of the studied students. 93.5% of the students lived with both parents. The family of the vast majority of the students was well constructed. Nearly, 6% of the students reported that their fathers are drug abusers.

A greater percent of mothers fall in the illiterate category more than the fathers (43.3% and 17.8%, respectively) (Table 3). About 58% of the student's parents were employers and 13% were farmers. Most of the student's mothers were housewives. Father's work was the source of the family income in 72%. Only 1.4% of the families depended on siblings work as a source of the income (Table 4, Figure 1).

The study revealed that male students are more involved in agricultural work than female students (60.2% versus 39.8%) about three quarters of the working students began the work at age below 10 years. The most important cause of the students' work was helping their fathers in the work and sharing in the family expenses. It was noticed that about two thirds of the working children were unpaid. Gather grass and dig up represent the common types of agriculture activities reported by working children. More than half of the working students go to the farm on their feet because the farm is near the home. The majority of the students (80%) worked in the farm not more than three hours (Table 5, Figure 2).

By univerate analysis, the strong predictors of students work, were age, sex (be a male), education of the parents (Table 6).

Regarding the social effect of agricultural labor on students, Table (7) shows that the majority (89.2%) of the studied working students had friends. More than two thirds of the working children had a spare time for playing. Nearly, one fifth of them reported that they didn't have time to talk with their families and to know their problems. Also, 4.5% of them were facing problems in dealing with their labor peer and land owner in the farm as verbal assault and physical harm. It was found that 37% of the working students absent several times from school.

Table (8) presents the psychological effects as 80.1% of the working students felt happy in farm working. About two thirds of them reported that the work affected their personalities. Reported positive effects such as: they grew up and were responsible (61.2%) and they were self dependent (45%). While the most reported negative effects of agricultural labor were being nervous (16.5%) and speak abusive words (2.4%). Concerning the behavior of the land owner toward any mistakes in the farm work, 15.7% of the working children reported that he said to them abusive words, while 9.3% of them reported hitting. Less than half of the working students felt that they are better than their schoolmates who did not work.

A statistically significance difference was found between educational achievement and the working status of students (Table 9). As 63% of working students failed in the previous year in comparison with 37% of not working students and nearly 69% of working students successed with failure in some subjects versus 31% of not working students.

As shown in Table (10), the most reported work hazards among working children were exposure to high temperature, sharp instrument, wild animals, dust, heavy machines and equipments, harmful insects and reptiles, noise and pesticides. More than one third of the working students had a history of injuries. The most common reported physical problems were back pain, general weakness and fatigue and headache (34.6%, 21.4%,18.7%, respectively).

Table (11) illustrates that the most common last type of injury was "cut wound" (62%). Regarding site of injury, hand injury represented 45.8% of the injuries.

Table (12) shows a statistically significant difference between working students and not working students in their Body Mass Index.

Parasitological (urine and stool) examination revealed that school children were exposed to many parasitic infections (Table 13). The infection was 69.3% in working children while it was 41.9 % in not working children. The infection rate was 33.6% in males and 19.4% in females in working children. While it was equal in both sex in not working children (13.4%). The infection rate was 49.6 % in the age group less than 15 years old and it was 23.4% in the age group 15 years old and more. The parasitic infection rate was 12.4% when the number of individuals in the household 10 or more, 8.2% when they were from 6-9 and 4.7% when they were 2-5. The detected gastrointestinal parasitic stages were *Ascaris lumbricoides* fertilized *eggs*, *Giardia lamblia* cysts and trophozoites, *Entamoeba coli* cysts and trophozoites, *Ancylostoma doudenale* eggs, *Entamoeba histolytica* cysts, *Cryptosporidium parvum* oocysts, *Blastocystis hominis* cysts and *Hymenolepis nana* eggs, in order of frequencies. *Enterobius vermicularis* eggs were detected in 2.1 % urine samples of female working students and 1.3% of not working ones (Table13).

The trophozoite stage of both *Giardia lamblia* and *Entamoeba coli, Entamoeba histolytica* cysts and *Cryptosporidium parvum* oocysts were detected in loose or watery stool of the examined stool samples. Single infection was detected in 65% of positive cases while 23% showed double infection and 12% showed multiple infections. Double infection was detected between *Giardia lamblia* and *Cryptosporidium parvum* and multiple infections between *Ascaris lumbricoides*, *Giardia lamblia* and *Entamoeba histolytica*. 75% of the collected stool samples were well formed, 20% were loose and 5% were watery in consistency.

The more detectable parasitic stages in the examined stool specimens were in SAF preserved samples rather than 10% formalin preserved samples. In LPCB wet mounts cysts, trophozoites, and eggs of the identified parasitic species stained blue which facilitate their identification. Modified Kinyoun acid-fast staining technique for coccidian parasites facilitated the identification and confirmed the detection of *Cryptosporidium parvum* oocyst in stool specimens.

Fable (1): Personal characteristi	cs of respondent students, Koom	Abousheel village, 2008-2009
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Variable	Number (n= 630)	Percent
Sex		
• Male	298	47.3
• Female	332	52.7
Age in years		
• 6-	203	32.2
• 10-	258	41.0
• 14-17	169	26.8
Mean ± SD	11.4	± 2.5
Religion		
• Moslem	625	99.2
Christian	5	0.8
Smoking		
• Yes	9	1.4
• No	621	98.6
Type of smoking		
Cigarettes	7	77.8
• Gouza	2	22.2
Working in agricultural duties		
• Yes	332	52.7
• No	298	47.3
Academic performance of the students in the last academic year *		
Succeed	461	79.6
 Succeed with failure in some subjects 	91	15.7
• Failed	27	4.7

* 51 students were in the first year of primary education

Fig. (1): Source of family income of studied students, Koom Abousheel village, 2008-2009



Table (2): Family characteristics of studied students, Koom Abousheel village, 2008-2009

Variable	Number (n= 630)	Percent		
Family construction				
• Intact family	602	95.6		
Divorced parents	10	1.6		
One or both parents died	18	2.9		
Living with whom				
Both parents	589	93.5		
• Mother	28	4.4		
• Father	7	1.1		
• Others	6	1.0		
Father is drug abuser/ drunker °				
• Yes	38	6.1		
• No	580	93.9		
Ordering among living siblings:				
• 1 st	113	17.9		
• 2^{nd} or 3^{rd}	248	39.4		
• $4^{\text{th}} \text{ or } 5^{\text{th}}$	166	26.3		
• 6 th +	103	16.3		
Number of brothers				
• None	24	3.8		
• 1-3	499	79.2		
• 4+	107	17.0		
Number of sisters				
• None	38	6.0		
• 1-3	449	71.3		
• 4+	143	22.7		
Number of individuals in the household				
• 2-5	82	13.0		
• 6-9	425	67.5		
• 10+	123	19.5		
Number of the house' rooms				
• 1-3	319	50.6		
•				
• 4-6	241	38.3		
• 7+	70	11.1		
Crowding index (Mean ± SD)	2.4 ± 1.3			

° 12 fathers were died

Educational level	Father's educat	ional level °	Mother's educational level ^{oo}	
	Number	Percent	Number	Percent
Illiterate	110	17.8	270	43.3
Read and write	91	14.7	44	7.1
Completed basic education (Primary + Preparatory)	99	16.0	68	10.9
Completed Secondary school (General/Technical)	167	27.0	136	21.8
Higher education	65	10.5	38	6.1
Do not know	86	13.9	68	10.9
Total	618	100.0	624	100.0

Table (3): Educational level of the parents of studied students, Koom Abousheel village, 2008-2009

° 12 fathers were died

^{oo} 6 mothers were died

Table (4): Occupation of the parents of the studied students, Koom Abousheel village, 2008-2009

	Number	Percent
Father's occupation: *		
Farmer	80	12.9
Employer	358	57.9
Skilled workers	25	4.0
Unskilled workers	45	7.3
Free business	56	9.1
Retired	24	3.9
Does not work	13	2.1
Does not know	17	2.8
Total	618	100.0
Mother's occupation: **		
Housewives	531	85.1
Employee	93	14.9
Total	624	100.0

* 12 fathers were died ** 6 mothers were died





Variable	Number (n= 332)	Percent
Age at first work:		
• < 10 years	243	73.2
• 10 years	89	26.8
Cause of working: °		
• Help my father and share in the family in expenses	256	77.1
Occupying spare time	97	29.2
• Buying my special needs	36	10.8
Response to the parents	26	7.8
Types of agricultural activities: ^o	-	
• Gather grass	216	65.1
• Dig up	108	32.5
• Irrigate water	83	25.0
Collect crop	39	11.7
• Move the crop	33	9.9
• Help my father generally	59	17.8
Worked in past 7 days:		1110
• Paid	18	54
	200	60.2
Did not work	114	34.3
Distance between farm and house:	117	54.5
Near the house	169	50.9
Distant from the house	163	49.1
How do you go to the farm? °		
• On feet	190	57.2
• By donkey/other animals	115	34.6
• By bicycle	50	15.1
By transportation	27	8.1
Time spend in working in the farm:		
• 1-3 hours/ day	266	80.1
• 4-6 hours/ day	53	16.0
• More than 6 hours/ day	13	3.9
Work break:	240	75.0
• Yes	249	75.0
• NO Time of work breaks (minutes)	8.3	25.0
Moon + SD	10.3	+ 8 2
• Weall \pm 5D • Range	19.3	20
• Range	5 -	- 30

 Table (5): Characteristics of working students in agricultural activities in farm, Koom Abousheel village, 2008-2009

° More than one answer was allowed

Predictor	Wor (n=	king 332)	Not w	orking 298)	P-value
	No.	%	No.	%	
Age					
• < 15 years	293	51.0	281	49.0	0.008*
• 15 years and more	39	69.6	17	30.4	
Sex					
• Male	200	67.1	98	32.9	0.000*
• Female	132	39.8	200	60.2	
Ordering among living siblings					
• 1 st	46	40.7	67	59.3	
• 2^{nd} or 3^{rd}	136	54.8	112	45.2	0.046*
• $4^{\text{th}} \text{ or } 5^{\text{th}}$	92	55.4	74	44.6	
• $6^{th} +$	58	56.3	45	43.7	
Father's education: ^o					
• Illiterate	59	53.6	51	46.4	
Read and write	57	62.6	34	37.4	
• Completed basic education (Primary +	57	57.6	42	42.4	
Preparatory)					0.033*
 Completed Secondary school 	69	41.3	98	58.7	
(General/Technical)					
Higher education	36	55.4	29	44.6	
Do not know	47	54.7	39	45.3	
Mother's education: ⁰⁰					
• Illiterate	156	57.8	114	42.2	
Read and write	26	59.1	18	40.9	
Completed basic education (Primary +	43	63.2	25	36.8	
Preparatory)					0.001*
Completed Secondary school	49	36.0	87	64.0	
(General/Technical)	15		21		
Higher education	17	44.7	21	55.3	
Do not know	37	54.4	31	45.6	
Father's occupation:			2.5	22.5	
• Farmer	54	67.5	26	32.5	
• Employer	185	51.7	173	48.3	
Skilled workers		44.0	14	56.0	
Unskilled workers	20	44.4	25	55.6	0.264
• Free business	27	48.2	29	51.8	
• Retired	13	54.2	11	45.8	
Does not work	7	53.8	6	46.2	
Does not know	8	47.1	9	52.9	
Mother's occupation: ⁰⁰					
Housewife	285	53.7	246	46.3	0.328
Employer	43	46.2	50	53.8	

Table (6): Univariate analysis of predictors of students work, Koom Abousheel village, 2008-2009

^o 7 fathers of working children and 5 fathers of not working were died.
 ^{oo} 4 mothers of working children and 2 mothers of not working were died.

* Statistical significant difference

Social effect	Number (n=332)	Percent
Are you having friends?		
• Yes	296	89.2
• No	36	10.8
Do you have spare time to play?		
• Yes	246	74.1
• No	86	25.9
Where do you go in the holiday? °		
• Stay at home	125	37.7
• In the street	36	10.8
• Wandering	50	15.1
Café shop	121	36.4
• Go to the Club	5	1.5
• Visit my relatives	97	29.2
Do you have time to talk with your family and to know their		
problems?		
• Yes	266	80.1
• No	66	19.9
How does the work affect your schooling?		
• I absent many times from school	123	37.0
• I can not concentrate in the class	122	36.7
• I failed	87	26.2
Do you facing any problem in dealing with your friends and		
teachers in the school?		
• Yes	38	11.4
• No	294	88.6
If yes, what are these problems?		
Problems with school mates	12	31.6
Problems with teacher	12	31.6
Physical violence	8	21.1
Emotional problems	3	7.9
Homework	3	7.9
Do you facing any problem in dealing with your friends and		
landowner in the farm?		
• Yes	15	4.5
• No	317	95.5
If yes, what are these problems?		
Physical harm	11	73.3
• Verbal assault	4	26.7

Table (7): Social effects of agricultural work on working students, Koom Abousheel village, 2008-2009

° More than one answer was allowed

Psychological effect	Number (n=332)	Percent
Are you happy with your work in the farm?		
• Yes	266	80.1
• No	66	19.9
Does the work affect your personality?		
• Yes	206	62.0
• No	126	38.0
Positive effect:°		
• I grew up and be responsible	126	61.2
• I depend on my self	94	45.6
• I feel with my importance and earn money	28	13.6
• I am be calm	63	30.6
Negative effect:°		
• I am nervous	34	16.5
• I speak abusive words	5	2.4
Night weakness	22	10.7
• I run away from school	4	1.9
If you do a mistake in the farm, how does the landowner deal		
with you? °		
• Hits me	31	9.3
Talks me abusive words	52	15.7
Negotiate	249	75.0
• Does not give me money	2	0.6
• Complains from me to my family	7	2.1
• Faired me	7	2.1
Feeling toward not working schoolmates:		
• I Feel that I am better than them	158	47.6
• I Feel that they are better than me	75	22.6
• I sense of injustice	99	29.8

Table (8): Psychological effects of agricultural work on working students, Koom Abousheel village, 2008-2009

^o More than one answer were allowed

Table (9): Educational achievement of children in the last year in Koom Abousheel village, 2008-2009

Educational achievement	Working Not wo (n=332) (n=2		orking 298)	P-value	
	No.	%	No.	%	
Successfully pass	251	54.4	210	45.6	
Success with failure in some subjects	63	69.2	28	30.8	0.028*
Failed	17	63.0	10	37.0	
Total °	331	57.2	248	42.8	

° 51 children were in the first class of primary education (not applicable).

* Statistical significant difference

Variable	Number (n=332)	Percent
Work hazards:°		
• High temperature	167	50.3
Sharp instruments	161	48.5
Exposure to wild animals	125	37.7
• Exposure to dust	80	24.1
 Machines and heavy equipment 	74	22.3
• Exposure to harmful insects and reptiles	69	20.8
Noise	61	18.4
Chemicals/ pesticides	55	16.6
Exposed electric wire	15	4.5
Work injuries and accidents:°		
Cuts	158	47.6
• Sun stroke	117	35.2
• Foreign body in the eye	94	28.3
• Falls from height	56	16.9
Animal bite/kick	45	13.6
Corporal punishment by employer	20	6.0
Fracture/ contusion	15	4.5
• Drowning in the canal	12	3.6
• Electric shock	6	1.8
Health problems and diseases: ^o		
Back pain	115	34.6
Generalized weakness and fatigue	71	21.4
• Headache	62	18.7
• Eye problems	36	10.8
Skin problems	31	9.3
Respiratory problems	27	8.1
• Ear and hearing problems	19	5.7

 Table (10): Occupational and health hazards of agricultural work on working students, Koom Abousheel village, 2008-2009

^o More than one answer was allowed

Variable	Number (332)	Percent
Type of injury°:		
Cut wounds	291	87.7
Contusions	42	12.7
Fractures	19	5.7
Sprains	4	1.2
Dislocation	16	4.8
• Others	10	3.0
The injured part:		
Upper extremities	20	6.0
Lower extremities	84	25.3
Head & Neck	30	9.0
Chest/ Back	21	6.3
Hands	152	45.8
• Eyes	13	3.9
• Nose	12	3.6
Admission to the hospital:		
• Yes	25	7.5
• No	307	92.5
Days of hospitalization:		
• 1-2	9	36.0
• 3-4	9	36.0
• 5 or more	7	28.0
Days of absenteeism from the school:		
• 0 day	316	95.2
• < 7 days	9	2.7
8 days or more	7	2.1
Presence of deformity or disability:		
• Yes	12	3.6
• No	320	96.4

Table (11): The last injury among children in farm, Koom Abousheel village, 2008-2009

^o More than one answer was allowed

BMI percentile	Working (n= 332)		Not working (n= 298)		P-value
	No.	%	No.	%	
Underweight	26	65.0	14	35.0	
Normal	277	56.6	212	43.4	0.000*
Overweight	23	34.8	43	65.2	
Obese	6	17.1	29	82.9	
Mean ± SD	18.02 ± 2.59		18.15 ± 2.82		0.566

* Statistical significant difference

Laboratory investigations	Working (n=332)		Not working (n=298)	
	Number	Percent	Number	Percent
Urine examination:				
Negative	325	97.9	294	98.7
Enterobius vermicularis	7	2.1	4	1.3
Stool examination:°				
Ascaris lumbricoides	48	14.5	29	9.7
Giardia lamblia	41	12.3	25	8.4
Entamoeba coli	41	12.3	20	6.7
Ancylostoma doudenale	39	11.7	19	6.4
Entamoeba histolytica	34	10.2	17	5.7
Cryptosporidium parvum	14	4.2	7	2.3
Blastocystis hominis	9	2.7	6	2.0
Hymenolepis nana	4	1.2	2	0.7

Table (13): Laboratory investigations of students, Koom Abousheel village, 2008-2009

° More than one type was found

4. Discussion:

There are a number of health and safety issues directly related to child workers. First of all, children are not the same as adults physically and emotionally. Child workers are at a greater risk than adult workers of suffering from work-related problems. Furthermore, occupational hazards and work conditions may have permanent effects on the development of children who work. In spite of these facts, little investigations are available concerning the actual conditions under which these children work (Forastieri, 2002).

The present study found that 52.7% of students worked in agricultural duties. This percentage is lower than that found by ILO statistics from 20 developing countries, the proportion of children aged 5 to 14 was 74% (73.3% of boys and 78.8% of girls) (Admassie, 2003; Kebebew, 1998). El-Gilany and his colleagues (2007) conducted a study about labor among students aged 13-18 years in Mansoura, and found that the proportion of students who worked during the year prior to the study was 36.1%. This could be explained as in many rural areas where farm work is the main job; many parents believe that children will receive more useful training by working on farms than they would in the classroom. In Egypt, economic and social factors have been cited as being responsible for the increasing prevalence of child labor.Although the Egyptian child labor law (1996) bans the employment of children who are less than 14 years of age. The result of the current study revealed that more than two thirds of working children started work below age of 10 years and the majority of them worked from 1 to 3 hours per day, while Mathews and his colleagues found that children worked about 12 hours per day (Mathews et al., 2003). In 2006 a survey about child labor in agriculture conducted by Human Rights Watch in developing countries, revealed that the vast majority worked between nine and thirteen hours per day.

The present study revealed that child labor is gender biased as 60% of them were males and 40% were females. The difference is higher in comparison with other country. For instance, Duraisamy (1997) reported that 5.2% of the male children aged 5-14 years in India were economically active on a full-time basis, versus 3.4% of the girls of the same age group.

Working children usually come from low-income households (Mattar, 2007). Concerning the underlying causes of labor reported by the working children, socioeconomic standards of the families represents the majority of stated causes; similarly, in a survey conducted in Egypt by Helmy and Ismail (2005) they reported that poverty is often a chief cause of child labor. Over half of the children surveyed who acted as sole or partial breadwinners asserted that they worked in order to support their households and meet basic household requirements. These findings were consistent with other studies reported by Itani (2009), Özen (2008), Köksal (1992) and Mangir (1992).

According to findings of a survey conducted by UNICEF (2002) in collaboration with the National Centre for Sociological and Criminology Research in Egypt (NCSCR), half of the working children in Egypt claimed that they had to work in order to increase their family income and 33% said that they work to support themselves.

In the present study, child labor increases with age. The low level of family education is identified as one of the most important factors in determining child labor. Girls are less likely to go to school and to work compared to boys. This is similar with the findings found by Wahba (1999).

The relationship between family background and child labor is fairly established in empirical literature (El-Gilany et al., 2007). In our study, low level of parents' educational attainment was an important factor in increasing the likelihood of children labor. This is in agreement with other studies (El-Gilany et al., 2007; Wahba, 2001; Al-Wehedy, 2002; Lashine et al, 1996).

The nature of agriculture work exposes child laborers to many risks and dangers, including long hours in scorching heat, malnutrition, hauling heavy loads, exposure to pesticides and injury from sharp knives and other dangerous tools (Human Rights Watch, 2002). Gamlin and Hesketh (2007) proved that the rural nature of farm work exposes children to extreme climatic conditions, physical hazards, animals and insects, parasites and infection. The results of the current study supported these findings. Our results revealed that working children are exposed to different kinds of risks and hazards as high temperature, sharp instruments, and exposure to wild animals. These results were consistent with the findings of Larson-Bright and other researchers (2007), who observed increased risks of injury for agricultural working children compared to non working children. On the other hand, Graitcer and lerer did not find any health problems in working Egyptian children (Graitcer & Lerer, 2002).

The size of the negative impact on future productivity of child laborers obviously depends on the degree in which work affected their school attendance and progress and their accumulation of working skills (Galli, 2001). Our findings indicate that student labor has a profound effect on education and achievement. About 37% of working children absent many times from school and cannot concentrate in the class and more than quarter of them failed in the school. These unfortunate results are directly related to the fact that the child works several hours at the work, is exhausted and cannot concentrate or perform in school. These results were consistent with the findings of Heady (2003). Leinberger and his colleagues (2005) and El-Gilany et al. (2007) who found that students who worked were more likely to have failed at least one grade in school. Inadequate income and work stress and injuries may affect student health; that in turn can affect academic performance (Robinson, 1996)

British studies have suggested that students working long hours were likely to obtain lower grades and more likely not to complete their studies. Some students found it hard to balance employment and course work (UNISON and YMCA England, 2003). This was corroborated in research conducted by UNICEF (2008) and its conclusion is that Labor often interferes with children's education.

The present study revealed that working children experience positive effect of their work as they were self-dependent and earn money. Similarly, Blair (1992) and Lachowski (2009) reported that positive effect of children's work are perceived primarily in the perspective of education and socialsing this aspect is underlined especially by parents who indicate that by taking part in agricultural work activities children learn responsibility, reliability, work ethics, new skills and coping with problems.

Omokhodion and his colleagues (2006) asked 225 Nigerian children about the benefits of working and

found that 36% of working children felt that work provide a source of income for them, 23% indicated that it was a way of helping their parents and 17% thought it was part of their training to be responsible adults. Bad company, ill health and road traffic accidents were the perceived ill effects of child labor. 47% of children perceived themselves as less fortunate than their peers. 24% thought that child labor was a sign of deprivation

Parasitological examination revealed that working school children were exposed to parasitic infections (69.3 %) more than not working groups (41.9 %). The infection rate was higher in males (33.6 %) than in females (33.6 %) in working children because males were included in farm works more than females, while it was equal in both sex in not working children (13.4%). This finding is similar with that reported by Kishk and his colleagues (2004). High prevalence of parasitic infections among working children is probably due to their frequent contacts with infected and contaminated waterways and soil at work. Also lack of awareness of health risks and lack of adequate health care services is an important factor for spread of parasitic infections.

The infection was higher in the age group less than 15 years old than the age group 15 years old and more. This could be attributed to the poor hygiene of this young age group The parasitic infection was commoner in the students of the overcrowded families than the less crowded ones. This is an additional factor which helped in transmission of parasitic infections among these children. The present study detected that; the common parasitic infections were *Ascaris lumbricoides Giardia lamblia* and *Ancylostoma doudenale* and these parasites are commonly associated with infected waterways and soil contact. El-Gilany *et. al.*,(1999) explained that farm workers commonly to eat unwashed or improperly washed row vegetables or not wash their hands before eating at farms.

Gastrointestinal parasites were the commonest parasitic infection in all studied school children. The detected parasitic stages were Ascaris lumbricoides fertilized eggs, Giardia lamblia cysts and trophozoites, Entamoeba coli cysts and trophozoites, Ancylostoma Entamoeba histolytica cysts, doudenale eggs, Cryptosporidium parvum oocysts, Blastocystis hominis cysts and Hymenolepis nana eggs. A similar study was conducted by El-Masry et. al., (2007) who reported nearly the same parasitic infections among rural school children in Sohag Governorate and they added that most these parasitic infections caused anemia to these children which could affect their school performance. Enterobius vermicularis eggs were detected only in urine samples of female working students and this is common fact for this parasite to be rarely detected in stool samples.

The trophozite stages of Giardia *lamblia* and *Entamoeba coli, Entamoeba histolytica* cysts and *Cryptosporidium parvum* oocysts were detected in loose or watery stool of the examined stool samples. This was suspected; because these parasites either cause diarrhea or pass with diarrheal stool. Single infection was the commonest finding in the present study, while double

infection and multiple infections were also reported. Double infections were detected between *Giardia lamblia* and *Cryptosporidium parvum* and multiple infections between *Ascaris lumbricoides*, *Giardia lamblia* and *Entamoeba histolytica*. These were in agreement with the study done by Kishk *et. al.*, (2004). Helminth infection rats were nearly equal to protozoal infection rats, in the present study, which indicated that; the infection was a mixture of soil and water pollutions.

Schistsome parasites were not detected in the present study either due to: regular treatment of these children with antischistosomal drugs provided to them by the Ministry of Health and Population or the need to other methods e.g., Kato-Katz stool examination technique for detecting this parasite in stool. El-Masry *et al.*, (2007) recorded schistosomal and intestinal parasitic infections among rural school children using this technique.

Fixatives play an important role in the preservation and transport of human faecal specimens and in the accurate diagnosis of parasitic diseases. Studies by Johnston *et al.*, (2000) found that the SAF fixative works well in concentration procedures of stool samples.

The more detected parasitic stages in the examined stool specimens were in SAF preserved samples rather than 10% formalin preserved samples. Regular intervals in examination of the preserved stool specimens were done to fix the preservative effects on different parasitic stages. In LPCB wet mounts cysts, trophozoites, and eggs of the identified parasitic species stained blue which facilitate their identification. Finding in the present study in agreement with that of Parija and Prabhakar (1995), who stated that; LPCB-stained trophozoites, cysts and helminthic eggs could easily be detected and identified in LPCB wet mounts of stools. The stain is recommended for routine use in the wet mount preparation of stools in a parasitology laboratory.

There are some limitations to this study. Some students were quite young and their perception of the work hazards may not have been accurate. The questions were explained to students and unclear points were discussed. In addition, the researchers did not visit the work sites to check for hazards. This was very difficult due to the wide spread of the farm sites and many students work in family farms.

5. Conclusion and Recommendations

The present study concluded that the phenomenon of student labor is common in our rural and children work in agriculture in Koom Abousheel for many reasons as to share in the family expenses and occupying spare time. It affects students physically, educationally and socially.

Working student exposed to many health hazards injuries, animal bites, high temperature. The detected parasites were Ascaris lumbricoides, Ancylostoma doudenale, Hymenolepis nana, Enterobius vermicularis, Entamoeba histolytica, Giardia lamblia, Cryptosporidium parvum, Blastocystis hominis and Entamoeba coli. The majority of them started work below age of 10 years.

The main recommendations are summarized as the following:

- Comprehensive surveys should be undertaken to determine the scope and scale of child labor in the agriculture sector, the number and nature of injuries or illnesses suffered by children working in agriculture.
- Ensure that all workers including children receive full information and training from their employers about occupational illnesses and injuries related to agriculture work.
- Ensure that all children and their families are aware of the right of children. School education for children should be a priority even when the harsh economic realities in their families force parents to send them to work outside the home.
- Measures should be taken to ensure the effective implementation of convention 182. Such measures should include the allocation of resources to provide for a sufficient number of labor inspectors targeting child labor in agriculture.
- Ensure that primary health care is provided to working children.
- Teachers can become effective agents in providing information to potential child workers, working children, their families and the community as a whole.
- Health education needs to focus the attention on children through the inclusion of information on prevention of accidents and both endemic and work related health hazards in the school curriculum.
- Improving personal and environmental hygiene and regular screening, treatment and health education for students as regard parasitic infections in Egypt is recommended.

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References:

- 1. Admassie, A. (2003): "Child labor and schooling in the context of subsistence rural economy: can they be compatible". International Journal of Education, 23 (2), 167-168.
- Al-Wehedy, A. (2002): "Female working children in Mansoura city, Egypt: A socioepidemiologic study". Egyptian Journal of Occupational Medicine; 26 (2): 203–222.
- 3. Blair, L. (1992):" Children's participation in household labor: Child socializations versus the need for household labor". Journal of Youth and Adolescents; 21(2): 241-258.

- 4. Bureau of International Labor Affairs (2004): "Advancing the campaign against child labor: Effort at country level". At website: http://www.dol.gov/ilab/media/reports/iclp/advancin g1/html/egypt.htm.
- 5. Cole, D. (2006): "Understanding the links between agriculture and health". International Food Policy Research Institute, at website: www.ifpri.org.
- 6. Duraisamy, M. (1997): "Changes in child labor over space and time in India, 1981-1991", in The Indian Journal of Labor Economics; 40 (4): 809-818.
- Egyptian Child Law (1996): Quoted from Article (64) of the Convection on the Rights of Child, Official Journal; (13): 53-54.
- El-Gilany, A.; Khalil, A. and. El-Wehady, A. (2007): "Epidemiology and hazards of student labor in Mansoura, Egypt". Eastern Mediterranean Health Journal; 13(2): 347-363.
- El-Masry H. M.; Ahmed Y. A.; Hassan A. A.; Zaky S.; Abd-Allah E. S. And Abdel-Rahem M. A.(2007): "Prevalence, Risk Factors and Impacts of Schistosomal and Intestinal Parasitic Infections Among Rural School Children in Sohag Governorate". The Egyptian Journal of Hospital Medicine Vol., 29: 616–630.
- 10. FAO (2006): "Agriculture account". FAO Newsroom. Food and Agriculture Organization of the United Nations. Atwebsite: www.fao.org
- Fassa, A.; Facchini, L.; Dall'Agnol, M. and Christiani, D. (1999): "Child Labor and Health: Problems and Perspectives". International Journal of Occupational and Environmental Health Research Paper No. 160
- Forastieri, I. (1999):"The IOL program on occupational safety and health in agriculture". International Labor Office, Geneva. At website: www.E:/ILO Safework-safetyandhealthin Agriculture.htm.
- Forastieri, V. (1997): "Children at Work: Health and Safety Risks". Geneva, Switzerland: International Labor Office. Ix, 138.
- Forastieri, V. (2002): "Children at work: Health and safety risks". Second edition ILO- child labor. International Labor Office Geneva. ix, 169.
- 15. Galli, R. (2001): "The Economic Impact of Child Labor". The International Institute for Labor Studies Geneva.
- Gamlin, J. and Hesketh, T. (2007): "Child work in agriculture: Acute and chronic health hazards". Children, Youth and Environments; 17 (4): 1-23.
- 17. Graitcer, L. and Lerer, B. (2002): "The impact of child labor on health: report of a field investigation in Egypt". Washington DC: World Bank. At website: http:// www.worldbank.org/children/
- 18. Heady, C. (2003): "The effect of child labor on learning achievement". World Dev.31:385–398.
- Helmy, M. and Ismail, M. (2005): "Learning through work: the interface between education and child labor". Commissioned for PPIC-Work,. pp 4. ILO Convention

182.http://www.ilocarib.org.tt/childlabour/ c182.htm.

- 20. Human Rights Watch (2002): "Backgrounder: Child Labor in Agriculture". Children's Rights. Available Online at http://hrw.org/backgrounder/crp/back0610.htm..
- 21. Human Rights Watch (2006): "350 Fifth Avenue", New York, NY 10118-3299 USA
- Hurst, P. (2007): "Health and child labor in agriculture". Food Nutrition Bulletin.; 28(2 Suppl): 364-371.
- 23. ILO (1997): "The minimum age for employment". International Labor Organization, Convention No.138.
- 24. ILO (2004): "Facts on child labor". International Labor Organization. At website: www.ilo.org/childlabor.
- 25. ILO (2006): "Facts on child labor". International Labor Organization. At website: www.ilo.org/childlabor.
- 26. Itani, N. (2009): Child Labor in Egypt. Master thesis. University of Southern Denmark, Faculty of Humanities. Egypt.
- Johnston, S. M.; Bishop, H.; Wahlquist, S.; Moura, H; Oliveira, N. and Nguyen-Dinh, M.(2000): " Evaluation of Commercially Available Preservatives for Laboratory Detection of Helminths and Protozoa in Human Fecal Specimens." Journal of Clinical Microbiology., vol 38;(5): 1959-1964.
- Kebebew, A. (1998): "Statistics on working children and hazardous child labor in brief". Geneva, Switzerland: International Labor Organization. At website: http:// www.jearn.org.au/clp/archive/index/htm
- Kishk, F.; El-Masry, A.; Abd-Allah S. and Gaber, H. (2004): "Vulnerability of working children to environmental health risks: a case study in a village in rural Egypt". Global Forum for Health Research, (Forum 8). Mexico city, Mexico, 16-20 November 2004.
- 30. Köksal, A. (1992): "A comparative study on the work conditions and problems of 15-18 year-old working children who do and do not attend apprentice training centers". Master's thesis (unpublished). Ankara University. Ankara.
- Lachowski S., (2009): "Engagement of children in agricultural work activities –scale and consequences of the phenomenon". Annual Agriculture and Environmental Medicine; 16: 129-135.
- Larson-Bright, M.; Gerberich S. Alexander, B.; Gurney, J.; Masten, S.; Church, T.; Ryan, A. and Renier, C. (2007): "Work practices and childhood agricultural injury". Injury Prevention; 13 (6): 409 -415.
- Lashine, S.; Metwally, H. and Bahry, M. (1996): "Child labor in two districts in Cairo". Egyptian Journal of Community Medicine; 14 (1):15–21.

- 34. Leinberger-Jabari, A.; Parker, D. and Oberg, C. (2005): "Child Labor, Gender, and Health". Public Health; 120: 642-647.
- Lwanga, S. and Lemeshow, S. (1991): "Sample size determination in health studies". A practical manual, WHO, Geneva. p 80
- 36. Mangır, M. (1992): "A study on the working reasons of students attending apprentice training centers in Ankara and factors affecting these reason s". Ankara University Faculty of Agriculture Publications. Ankara.
- Mathews, R.; Reism C. and Iacopino, V. (2003): "Child labor: A matter of health and human rights". Journal of Ambulance Care Manage, 26(2):181-182
- Mattar, M. (2007): "Child labor in Egypt: Scope and appropriate legal responses". At website: www.protectionproject.org/
- Omokhodion, F.; Omokhodion, S.; Odusote ,T. (2006): "Perceptions of child labor among working children in Ibadan, Nigeria". Child: Care, Health and Development; 32 (3): 281–286.
- 40. Özen, U. (2008): "Reasons why the attendees of Ankara Ostim apprentice training center are left outside of formal education and their views about work life". Master's thesis (unpublished). Ankara University, Ankara.
- Parija, S. C. and P. K. Prabhakar, P. K.(1995): " Evaluation of Lacto-Phenol Cotton Blue for Wet Mount Preparation of Feces". Journal of Clinical Microbiology. Vol 33;(4): 1019-1021.
- 42. Parija, S.; Bhattacharya, S. and Padhan, P. (2003): "Thick stool smear wet mount examination: a new

approach in stool microscopy". Tropical Doctors. 33(3):173.

- 43. Parker D (1997): "Health effect on child labor". Lancet; 350:1395–1396.
- Robinson, L. (1996): "School students and part-time work. Melbourne". Australian Council for Educational Research, (LSAY Research Report No. 2).
- 45. UNICEF (2002): "Survey in collaboration with the National Centre for Sociological and Criminology Research (NCSCR). At website: www.unicef.org
- 46. UNICEF (2008). "Statistics by Area/Child Protection". Available Online at http://www.childinfo.org/ labour.html Accessed on 8-26-08.
- 47. UNISON and YMCA England (2003): "Not just child's pay. Why younger workers need a minimum wage". Submission to the low pay commission, London. UK, UNISON and YMCA England, Ahttp://www.unison. org.uk/acrobat/B1085
- 48. Wahba J. (2001): "Child labor and poverty transmission: no room for dreams". A report on Egypt. Cairo, Economic Research Forum for the Arab Countries, Iran and Turkey.
- 49. WHO (2004): "Appropriate body mass index for Asian populations and its implications for policy and intervention strategies". The Lancet; 157-163.
- 50. Wilk, V. (1993): "Child Labor: Health Hazards and Remedies ".American Journal of Industrial Medicine; 24 (3): 283–290.

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