

Some Health Problems Among Working Children In Zagzig City, Sharkia Governorate

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ABSTRACT

Background: Children's increased vulnerability puts them at a high risk of work related health problems. **Objectives:** 1) identifying the characteristics of the child labor, work perceptions and job satisfaction among working children in Zagazig City 2) determining some health problems among them, 3) determining the haemoglobin and blood lead levels of the studied children and 4) studying the risk factors associated with the blood lead level among these working children. **Subjects and Methods:** A comparative cross-sectional study was used to compare 74 male working children (aged 6-17 years) in small industrial workshops and a comparison control group of 82 school children of the same age group. All children were interviewed using a pre-designed questionnaire including socio-demographic, work characteristics, social & nutritional habits and health complaints. Also, the studied groups were subjected to physical examination and blood samples were taken to assess haemoglobin and blood lead levels. **Results:** Working children reported higher significant prevalence of current smokers, drug abusers than their control group. Also, more than one third of working children (37.8%) were suffering from increased work tiredness, hoping to leave their work in 58.1%, with little job satisfaction in 45.9%, and with high physical or verbal abuse from their current employer in 62.2%. Also, a significant higher prevalence of recent health complaints were detected among working children compared to their control group. Injuries were significantly higher among working children (18.9%) compared to their control group (7.3%). Physical examination revealed a significant higher prevalence of nail, hand, eye, mouth, throat and chest problems among working children compared to their control group ($P < 0.05$). Results of blood analysis revealed that lead toxicity was significantly higher among working children (41.9%) compared to control group (20.7%). Mother's education, working in mechanic workshop, duration of work and smoking habit had a significant effect on the prevalence of lead toxicity among working children. Logistic regression analysis revealed that, duration of work for more than 3 years was the only significant independent predictor for high blood lead level ($P < 0.05$). **Conclusion and recommendations:** This study concluded that working children are at high risk for many health problems, unhealthy habits and lead toxicity. More attention to health problems among working children, with control child labor, abolishing child labor in hazardous occupations and covering young workers by social security.

Key words: child labor, health problems, lead toxicity, social security.

INTRODUCTION

Children are the most easily exploited of all workers. They account for 11% of the workforce in some countries in Asia, 17% in Africa and a fourth of the workforce in Latin America. The ILO states that almost 250 million children ages 5 to 17 years are

involved in child labor worldwide, where two thirds of these children are under the age of 15 and about 60 million are from 15 to 17 years old^(1,2). Also 180 million of these children are exposed to hazardous work that endangers child's physical, mental or moral well-being⁽³⁾, and 140

million of them work in very bad conditions^(1,2).

In fact, most child Labor occurs in developing countries, where poverty, traditions and cultural differences inhibit international efforts to stop it^(1,2). In Egypt, ILO estimated that 8.3 percent of children ages 10 to 14 years were working⁽⁴⁾, where rural children and children from poor households account for the overwhelming majority of them⁽⁵⁾.

The working children are in occupations with exposures to hazards known to cause illness or injury in adults^(1,2), like dermatosis, bowel diseases, asthma and other respiratory problems⁽⁶⁾.

Childhood lead poisoning is considered a major public health problem in many countries as children are more susceptible to the toxic effects of lead than adults where the developing nervous system is particularly vulnerable to lead toxicity that can affect various functions of the brain, and the insufficient intake of iron, calcium and vitamin D may further increase these adverse effects⁽⁷⁾. There is a link between elevated body burden of lead and antisocial and delinquent behavior⁽⁸⁾.

Laws and regulations are a major tool in protecting the children health as most small-scale industries in industrializing countries lack appropriate occupational health regulations and protective or control measures.

So the objectives of the study are:

- 1) to identify the characteristics of the child labor, work perceptions and job satisfaction among working children in Zagazig City.
- 2) to determine some health problems among them.
- 3) to determine the haemoglobin and blood lead levels of the studied children.
- 4) to study the risk factors associated with the blood lead level among working children.

SUBJECTS AND METHODS

This study was a comparative cross-sectional study conducted at small

industrial shops in Zagazig City, Sharkia Governorate, Egypt during the period from January till April 2007.

Study Population:

As child labor is illegal, it was not easy to choose the sample of working children. The research team tried several sources, including the central agency for public mobilization and statistics, and the labor force license administration in Zagazig city, but none of these sources had registries of working children.

As an alternative, a quick survey of the workshops in Zagazig city was conducted before sample selection to determine zones of working children. The selection criteria include only the required age limit adopted by the study, i.e. working children aged 6 to 17 years, where Al-Harery zone was chosen randomly from working zones in Zagazig City, in which all working children (74 boys) in this zone were included in this study, where they are working in a variety of small industrial workshops as carpentry, mechanic, spray painters, blacksmith and autobody repair workshops and others (dry cleaning, construction work, ironing clothes). A control group of 82 children of the same age group was recruited from students attending schools in the same area.

The employer of each industrial shop was informed about the study and informed consent was conducted for participation of the children in the study.

METHODS

1- Questionnaire: A pre-designed questionnaire was used that inquired about the following:

a- Socio-demographic characteristics of the children including:

- 1- Name, age, level of education, father's and mother's education.
- 2- Father's occupation and if the mother involved in paid work.
- 3- Number of siblings and percent of working siblings.

b- Work characteristics: as type of work, exposure at work, reasons for starting to work, duration of work, use of safety

measures, hours of work per day, and weekly salary and its uses.

c- Social and nutritional habits: all children were asked about:

- 1- smoking: to know the current smokers(those who smoked one day or more in the previous month preceding the study⁽⁹⁾) and whether any of their siblings or fathers are smokers.
- 2- Drug abuse among them.
- 3- Nutritional habits: all children were asked about:
 - Lunch mostly outside home.
 - Dinner mostly outside home.
 - Intake vegetables daily.
 - Intake fruits daily.
 - Drink milk daily.

d- Work perceptions and relation with current employer: as perception of physical exertion at work, ambitions and satisfaction with current job. Also, employer's attitude toward child's mistakes or absence from work, and physical or verbal abuse by employer.

e- Health complaints among studied children:

- 1-Recent health complaints (in the last 2 weeks)among children, which included :
 - Skin complaints (pain, redness, itching, vesicles, thickening of the skin...etc)
 - Eye complaints (watery eye, itching, visual impairment, redness...etc).
 - Ear complaints (earache, tinnitus, vertigo, itching...etc).
 - Headache.
 - Respiratory complaints (running nose, cough, dyspnea, phlegm, chest tightness ..etc).
 - Gastrointestinal complaints (dyspepsia, diarrhea, constipation, abdominal pain ...etc).
 - Musculoskeletal complaints (backache, neck or muscle pain....etc).
- 2-Chronic illnesses: any history of diabetes, heart diseases, tuberculosis, cancer etc.
- 3- Injuries: any type of injury as cut wound, burn, fracture, sharp or blunt injuries .. etc, and their relation to work.

2- Physical examination: to all the studied children, a full physical examination was conducted assessing any problems in the nails, hands, eyes, mouth, throat and chest.

2- Blood sampling:

Under complete aseptic conditions, 5 ml venous blood sample was withdrawn (from each child who agree to participate in the blood analysis) for estimation of::

a- Haemoglobin (Hb) level: 2 ml blood were put into a tube for estimation of Hb level in g/L using colorimetric method. The children were considered anemic if their haemoglobin level $\leq 12\text{g/L}$ ⁽¹⁰⁾.

b- Blood lead level: 3 ml blood were put into tubes containing heparin and stored at 4°C for estimation of blood lead levels using atomic absorption spectrophotometer (Buck Scientific Model 210 VGP) at the laboratory of faculty of medicine, Zagazig University. Lead concentrations were further divided into two categories ($\leq 10 \mu\text{g/dl}$, $> 10 \mu\text{g/dl}$) with $10 \mu\text{g/dl}$ being the CDC permissible level for children⁽¹¹⁾.

Only 62 working children had agreed to participate, while 58 school children only had agreed.

Data management and statistical analysis: The collected data were computerized and analysed using SPSS program version 10⁽¹²⁾. Comparison between group means was done using t-test, while comparison between proportions using chi-square (X^2) test and fisher exact results were taken when an expected cell value is less than 5. Logistic regression analysis was done for significant risk factors associated with high blood lead level among working children. The significance level was considered at P-value < 0.05 .

RESULTS

Socio-demographic characteristics of the studied children: This study shows that, there was significant difference between the two groups as regard level of education($P<0.01$), where 13.5% of working children were illiterates compared to 0.0% among school children and 23.1%

of school children were in the secondary schools compared to 12.2% among working children. The father's and mother's level of education were significantly higher among school children compared to working group. The percentage of workers and non workers among fathers of working children was higher (48.7% and 13.5%) compared to control group (30.5% and 2.4%), while employers (67.1%) were significantly higher among fathers of school children compared to the control group (37.8%). Also, his study revealed that there were no significant differences between the working children and the control group as regard age, mother involved in paid work, number of siblings and percent of working siblings (**table 1**).

Work characteristics of working children: This study reveals that the majority of studied working children were at the mechanic workshop (27.0%), and the educational failure was the most common reason for starting to work (48.7%). Combined exposures represented the main occupational exposure (79.7%) among working children, followed by exposure to noise (66.2%), and nearly 19% of them exposed to vapors, gases and dust, while 14.9% exposed to heat. Also the majority of them were working for more than 10 hours per day (82.4%), and without safety measures (74.3%) while 39.2% were working for one to two years. More than one half of working children receive about 26-50 Egyptian pounds per week (56.8%) which were used mainly in family basic needs (75.6%) (**table 2**).

Social and nutritional habits among working children and controls: The results of this study shows a high significant prevalence of working children were current smokers (54.1%), drug abusers (21.6%), while 25.7% and 56.8% of their siblings and fathers respectively were smokers compared to the control group (17.1%, 8.5%, 4.9% and 36.5% respectively) (**table 3**). Also, from this table, the percentage of working children who had their lunch and dinner outside their home was significantly higher compared to the control group, whereas a significantly higher percentage of the control group (52.4%) was drinking milk compared to

working children (31.1%). Otherwise, there were no significant differences in taking vegetables and fruits between the two studied groups ($P > 0.05$).

Work perceptions and relation with current employer in working children:

About more than one third of the working children (37.8%) were suffering from work tiredness, and more than half of them hoping to leave their work (58.1%) with little job satisfaction in 45.9% and no satisfaction in 25.7%. The relation with the current employer showed higher physical or verbal abuse (62.2 %) among them which sometimes occur in the majority (78.4%) of them (**table 4**).

Health complaints and physical examination among studied children:

Table (5) shows a significant higher prevalence of skin, eye, ear, headache, respiratory, gastrointestinal and musculoskeletal complaints among working children compared to the control group ($P < 0.05$). Also, this table reveals a significant high prevalence of chronic illness among school children compared to the working group ($P < 0.05$), but injuries were significantly higher among working children (18.9%) compared to the control group (7.3%), which mostly (71.4%) related to industrial operations (10 out of 14 reported work injuries) and occurring mainly in the hands and fingers.

As regard physical examination, (**table 6**) shows a significant higher prevalence of nail, hands, eye, mouth, throat and chest problems among working children compared to the control group ($P < 0.05$).

Results of blood analysis among studied groups:

Table (7) shows that there was no significant difference between working children and their control as regard haemoglobin level, but a significant higher prevalence of lead toxicity (41.9%) was detected among working children compared to the control group (20.7%) ($P < 0.05$).

Factors affecting lead toxicity in working children:

As concerning the factors that may affect blood lead level among working children, this study revealed that mother's education, mechanic workshop, working more than 3 years and smoking habit had a significant

effect on the prevalence of lead toxicity among working children(**table 8**).

On logistic regression analysis, the only significant predictor for high blood lead level was work duration ($P < 0.05$) (**table 9**).

Table (1) : Socio-demographic characteristics of the studied children.

Variables	Working children n = 74	Control group n= 82	X ²	P-value
	N (%)	N (%)		
Age (y):				
10-12	16 (21.6)	14 (17.1)	0.54	> 0.05
13-15	23 (31.1)	26 (31.7)		
16-< 18	35 (47.3)	42 (51.2)		
Education:				
- Illiterate	10 (13.5)	0 (0.0)	15.05	< 0.001
- primary school	32 (43.2)	30 (36.6)		
- preparatory school	23 (31.1)	33 (40.2)		
- Secondary school	9(12.2)	19(23.2)		
Father education:				
- Illiterate	14 (18.9)	9 (11.0)	11.70	< 0.001
- Read & write	41 (55.4)	30 (36.6)		
- Secondary and higher	19 (25.7)	43 (51.4)		
Mother education:				
- Illiterate	19 (25.7)	13 (15.9)	18.08	<0.001
- Read & write	42 (56.7)	28 (34.1)		
- Secondary and higher	13 (17.6)	41 (50.0)		
Father occupation:				
- Not work	10 (13.5)	2 (2.4)	15.73	< 0.001
- Worker	36 (48.7)	25 (30.5)		
- Employer	28 (37.8)	55 (67.1)		
Mother involved in paid work:				
- Yes	35 (47.3)	42 (51.2)	0.24	>0.05
- No	39 (52.7)	40 (48.8)		
No. of siblings:				
< 3	19 (25.7)	28 (34.1)	2.93	> 0.05
3-5	38 (51.3)	31 (37.8)		
> 5	17 (23.0)	23 (28.1)		

Percent of working siblings:				
0				
< 50	23 (31.1)	38 (46.3)	3.84	> 0.05
≥ 50	30 (40.5)	25 (30.5)		
	21 (28.4)	19 (23.2)		

Table (2): Work characteristics of working children

Variables	Working children n = 74	
	N	%
Type of work:		
- Carpentry workshop	9	12.2
- Mechanic workshop	20	27.0
- Spray painting workshop	11	14.9
- Blacksmith workshop	10	13.5
- Autobody repair workshop	13	17.5
- *Others	11	14.9
Reasons for starting to work:		
- Educational failure	36	48.7
- Learn a profession and again experience	32	43.2
- Provide income for family	34	45.9
- Cover own needs	23	31.1
- **Others	8	10.8
Exposure at work:		
- Heat	11	14.9
- Vapors, gases and dust	14	18.9
- Noise	49	66.2
- Combined exposures	59	79.7
Duration in current work (y):		
< 1	6	8.1
1-	29	39.2
2-	15	20.3
> 3	24	32.4
Use of safety measures:		
Yes	19	25.7
No	55	74.3
Hours of work/ day:		
< 10	13	17.6
≥ 10	61	82.4
Weekly salary (Egyptian pounds):		
≤ 25 pounds	23	31.0
26-50 pounds	42	56.8

> 50 pounds	9	12.2
Use of salary:		
- Family basic needs	56	75.6
- Amusement	9	12.2
- Combination of the above	9	12.2

*Others as dry cleaning, construction work, ironing clothes.

**Others as loves to work, earns own money and has spare time for work.

Table (3): Social and nutritional habits among working children and controls

Variables	Working children n = 74	Control group n= 82	X ²	p-value
	N (%)	N (%)		
Social habits:				
- Current smokers	40 (54.1)	14 (17.1)	23.5	< 0.001
- Drug abusers	16 (21.6)	7 (8.5)	5.30	< 0.05
- Any of siblings smoke	19 (25.7)	4 (4.9)	13.38	< 0.001
- Father smoking	42 (56.8)	30 (36.5)	6.37	< 0.01
Nutritional habits:				
-Lunch mostly outside home	36 (48.6)	10 (12.1)	24.86	< 0.001
-Dinner mostly outside home	25 (33.7)	5 (6.0)	19.20	< 0.001
-Intake vegetables daily	38 (51.3)	47 (57.3)	0.56	> 0.05
-Intake fruits daily	20 (27.02)	25 (30.5)	0.23	> 0.05
-Drink milk daily	23 (31.1)	43 (52.4)	7.27	< 0.01

Table (4): Work perceptions and relation with current employer among working children.

Variables	Working children n = 74	
	N	%
Work perceptions:		
Perception of physical exertion at work:		
- Very tiring	28	37.8
- Difficult	19	25.7
- Easy	27	36.5
Ambitions:		
- Stay in this job	31	41.9
- Will leaves	43	58.1
Satisfaction with current job:		
- High	21	28.4
- Little	34	45.9
- None	19	25.7

Employer's attitude toward work mistakes or absence from work:		
- Deduction from salary	2	2.7
- Physical or verbal abuse (violence)	46	62.2
- Nothing	26	35.1
Physical or verbal abuse by the current employer:		
- Always	11	14.9
- Sometimes	58	78.4
- Rarely	4	5.4
- Never	1	1.3

Table (5): Health complaints among working children and controls.

Variables	Working children	Control group	X ²	p-value
	n = 74	n = 82		
	N (%)	N (%)		
Recent Complaints:				
- Skin complaints	26 (35.1)	10 (12.1)	11.53	< 0.001
- Eye complaints	21 (28.3)	11 (13.4)	5.34	< 0.05
- Ear complaints	16 (21.6)	6 (7.3)	6.57	< 0.01
- Headache	24 (32.4)	11 (13.4)	8.08	< 0.001
- Respiratory complaints	26 (35.1)	11 (13.4)	10.14	< 0.001
-Gastrointestinal complaints	17 (22.9)	8 (9.8)	5.05	< 0.05
-Musculoskeletal complaints	25 (33.8)	6 (7.3)	17.11	< 0.001
Chronic illness	2 (2.7)	10 (12.1)	4.94	< 0.05
Injuries	14 (18.9)	6 (7.3)	4.68	< 0.05

Table (6): Physical examination among working children and controls.

Physical examination	Working children	Control group	X ²	p-value
	n = 74	n = 82		
	N (%)	N (%)		
- Nail problems	40 (54.1)	25 (30.48)	8.89	< 0.001
- Hand problems	35 (47.3)	22 (26.8)	7.03	< 0.001
- Eye problems	35 (47.3)	25 (30.9)	4.64	< 0.05
- Mouth problems	16 (21.6)	7 (8.5)	5.30	< 0.05
- Throat problems	26 (35.1)	15 (18.2)	5.70	< 0.05
- Chest problems	13(17.5)	4(4.8)	6.45	< 0.01

Table (7): Hemoglobin and blood lead levels among studied groups.

Variables	Working children n =62	Control group n= 58	χ^2	P- value
	N (%)	N (%)		
Hemoglobin level : ≤ 12 g/L > 12 g/ L	11 (17.7) 51 (82.3)	15 (25.8) 43 (74.2)	1.16	> 0.05
Blood lead level: ≤ 10 µg/dl > 10 µg/dl	36 (58.0) 26 (41.9)	46 (79.3) 12 (20.7)	6.25	< 0.01

Table (8): Factors affecting blood lead level among working children.

Variables	Working children with blood lead level > 10 µg/dl N = 26	Working children with blood lead level ≤ 10 µg/dl N = 36	χ^2	P- value
Age (y): 10-12 13-15 16- < 18	9 (34.6) 5 (19.2) 12 (46.2)	18 (50.0) 10 (27.7) 8 (22.2)	3.96	> 0.05
Father's education: - Illiterate - Read & write - secondary, higher schools	10 (38.4) 13 (50.0) 3 (11.5)	15 (41.6) 12 (33.3) 9 (25.0)	2.49	> 0.05
Mother's education: - Illiterate - Read & write - secondary, higher schools	10 (38.4) 14 (53.8) 2 (7.6)	24 (66.6) 3 (8.3) 9 (25.0)	16.14	< 0.001
Type of work: - Carpentry - Mechanic - Spay painting - Black smith - Autobody repair	2 (7.6) 12 (46.1) 3 (11.5) 3 (11.5) 6 (23.1)	4 (11.1) 4 (11.1) 7 (19.4) 8 (22.2) 13 (36.1)	Fisher exact 9.68 Fisher exact Fisher exact 1.2	> 0.05 < 0.001 > 0.05 > 0.05 > 0.05
Duration in current work (y): <1 1- 2- >3	1 (3.8) 3 (11.5) 4 (15.4) 18 (69.3)	4 (11.1) 10 (27.7) 12 (33.3) 10 (27.7)	10.52	< 0.01
Smoking: -Current smokers -Non smokers	21 (80.7) 5 (19.2)	13 (36.1) 23 (63.9)	12.16	< 0.001

Table (9): Logistic regression analysis for blood lead concentration in working children.

Variables	B. coefficient	SE	Wald	Significance
Mother's education	- 0.569	0.970	0.344	> 0.05
Type of work	- 2.549	1.358	3.52	> 0.05
Duration of work	5.695	2.007	6.541	< 0.05
Smoking	- 2.407	1.86	1.67	> 0.05

DISCUSSION

Children's increased vulnerability puts them at a high risk of work related health problems, so the health of working children is still an under researched topic because child labor is mostly limited to developing countries^(13, 14).

This study was conducted to determine the impact of work on the health of working children. Both the studied working and school children came from similarly poor and disadvantaged communities which dilute differences between the two groups. Working children ranging in age from 6 to 17 years were selected in this study, which is the age that children need to be in school, but many factors force them to drop out and join the labour force, usually earning only low wages

Socio-demographic and work characteristics of working children:

This study revealed that there were no significant differences between the working children and the control group as regard age, mother involved in paid work, number of siblings and percent of working siblings. The result obtained as regard the education of the two studied groups is consistent with the fact that all school children must read and write and also it is hard for the old working children to combine between education and work which explained the low percentage of working children present in the secondary school in this study.

According to the findings of this study, the father and mother education of school children was significantly better, as the

majority of them was attributed to secondary or higher education compared to the majority of the fathers and mothers of working children which were read and write.

Also a significant difference was detected between the two groups as regard father occupation, where the percentage of workers among fathers of the working children was higher(41.9%) compared to control group, while the percentage of employers was higher among school children. This is in accordance with the findings of some researchers^(6,15), who reported that workers with little education providing their children's need to gain experience from work and the father's profession can directly affect the life of a child father's inability to support his family and can lead to children being forced to go out to work.

The majority of working children in this study engaged mostly in mechanic workshop (27.0%) and started their work mostly due to educational failure (48.7%) (table 2). This finding was consistent with the findings of other studies^(16,17), who explained this finding by the burden of school expenses, economic pressures and child's contribution to the family budget.

In this study, the majority of working children not used safety measures during their work (74.3%) which denote absence of the child's right to be protected from performing any hazardous work. Family basic needs as house rent, nutrition... etc were the major uses of the working salary (75.6%) which were in accordance to other studies^(18,19). Also Nowier et al.⁽²⁰⁾ reported

that workers' family needs rather than the lack of family care is the responsible factor for sending the child to work, and the economic problems seem to be the underlying factor for all other problems of child labor.

Social and nutritional habits among working children and controls:

Work allows children to spend long hours outside their home. This might expose them to undesirable and adverse habits such as smoking, drinking and drug abuse, so this study revealed a significant higher proportion of smokers among, working children (54.1%), their siblings (25.7%) and their fathers (56.8%) with 21.6% of drug abusers among them compared to their controls (17.1%, 4.9%, 36.6%, and 8.5% respectively), which are consistent with other studies^(19,21,22). This results could be explained by low level of education among children and their parents, with job pressure which are forcing them to these unhealthy habits.

As regard the nutritional habits, the majority of working children had their lunch and dinner mostly outside home compared to control group, which revealed the long time spend outside home. Also the intake of milk was significantly lower among working children (31.1%) compared to control group (52.4%), while no differences were detected between the studied groups in the intake of vegetables and fruits, which are in accordance with several studies^(6,23), and could explained by spreading of poverty, low level of education and other social problems among them, which lead to deprivation from eating in order to achieve a better social life.

Work perceptions and relation with current employer among working children:

On studying the perception of physical exertion in work, more than one third (37.8%) of working children were suffering from increased work tiredness, with more than one half (58.1%) had an ambition to leave their work, and 45.9% of them had little satisfaction with their current job (table 4). This result corroborates with the studies of Omokhodion⁽²³⁾ and Nassar⁽²⁴⁾, who explained this finding by the exposure to stressful conditions and

inability of working children to cope with their work.

Physical or verbal punishment of current employer toward child mistakes or absence from work was present in this study, as the majority (62.2%) of working children suffering from this adverse and bad attitude, while 78.4% of them recorded that this was sometimes occurred. This is consistent with Nuwayhid et al.⁽¹⁹⁾, who expected that working children would report high anxiety, more hopelessness and lower self-esteem than non-working children.

Health complaints and physical examination among working children and controls:

Working children reported more recent complaints in the skin, eye, ear, headache and gastrointestinal complaints with statistical significant differences compared to their control group, with support from other studies^(18,25,26), which has been attributed to the impact of work on health and the low socioeconomic background that compels the children to work, which may constitute a potential health problem from the start⁽²⁷⁾ and could be contributed to deprivation of child labor from medical follow up.

Also respiratory complaints were significantly higher among working children which described the bad environmental conditions and exposure to some hazardous chemicals⁽⁸⁾.

Musculoskeletal complaints were also reported significantly higher among working children (33.8%) compared to (7.3%) among their controls which was attributed to handling of heavy objects and awkward postures^(13,14).

As regard chronic illness as diabetes, cardiovascular diseases and cancer, the school control group had significantly a higher prevalence (12.1%) compared to the exposed working children (2.7%) which demonstrated the role of parents' education in seeking medical care and follow up of school children.

As regard injuries, working children had significantly more injuries (18.9%) compared to their controls (7.3%), which

had been related to industrial operations in 71.4% of them, and occurring mainly in the hands and fingers which could be explained by lack of experience, long work hours, fatigue, and poor work orientation which can enhance the development of such injuries^(19,20,21,23).

On physical examination, this study revealed that working children had a significant higher prevalence of nail, hand, eye, mouth, throat and chest problems compared to their control group ($P < 0.05$), which are in accordance with other studies^(6,25,27). Also others reported bowel diseases⁽²⁶⁾, asthma⁽²⁸⁾, and dermatosis among working children⁽²⁹⁾ which are indicative of possible exposure to hazardous polluted environment and hard labour⁽⁶⁾ with the various forms of child vulnerability which mentioned to the importance of the basic education and health which should be offered to child labor.

Results of blood analysis among studied groups: :

According to the results of this study there was no significant difference between working children and their control group as regard the haemoglobin level. The percentage of the working children who had normal haemoglobin level ($> 12\text{g/L}$) was 82.3% compared to their controls (74.2%), which could be explained by the appropriate intake of vegetables more frequently among the two studied groups.

The findings of this study illustrate the health importance of lead level among the studied groups, since exposure to lead is a threat to child health in the most industrialized areas, where 42% of the studied working children had a lead level $> 10\text{ug/dL}$, which is more than the CDC permissible lead level for children (10ug/dL)⁽¹¹⁾, compared to about 21% among control group. This finding confirms other findings^(30,31,32), which suggested that the increased lead level was due to exposure to lead from exhaust emissions, paints and welding fumes among the studied workers with lack of safety measures and eating at the workplace.

Factors affecting lead toxicity in working children:

On studying the risk factors which predict the high lead level, father's and mother's education had a significant effect on the prevalence of lead toxicity among working children, which support other studies^(31,32), who suggested that child's hygiene practices, as hand washing, and chewing nails were attributed mostly to instructions from educated parents.

Moreover, duration of exposure proved to be a significant risk factor of lead toxicity, which is against the finding of Mahaffey⁽⁷⁾, who suggested an elevated lead levels among younger children with lower duration because of increased gastrointestinal absorption and increased unhealthy behavior.

Smokers experienced a risk of lead toxicity which support the study of, Boseila⁽³¹⁾, who explained their finding by increased absorption of inhaled lead in smokers.

On logistic regression analysis duration of work is the only predictive variable which showed a significant relation with lead toxicity, this is coincides with other researchers^(32,33), who explained this finding by the relation between lead toxicity and the hazard of long duration and spending most time outside home.

CONCLUSION AND RECOMMENDATIONS

This study concluded that working children are at high risk of many health problems, unhealthy habits and lead toxicity, so, we recommended the importance of the issue of children's rights to guarantee their rights to social security and health insurance. Parents should be educated about the adverse effects of child labor on child development and providing educational and training services. Also more attention to health problems among working children, control child labor, abolishing child labor in hazardous occupations and covering young workers by social security.

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