

Occupational Health Program for hazards Prevention among Child labor in Delinquency Care Agency

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Abstract: Children around the world are routinely engaged in paid and unpaid forms of work that may be harmful to them **Aim:** The aim of the study is to evaluate the effect of the occupational health program for hazards prevention among child labor in delinquency care agency. **Design:** A quasi-experimental design was used. **Sample:** a Convenience sample of 92 juvenile delinquents, all are males, whose ages ranged from 14 to 18 years. **Setting:** at juvenile delinquents youth institution for social care at Ain Shams, Cairo, Egypt. **Tools:** *First tool:* An interviewing questionnaire was used to assess socio-demographic data of the child labor, family and health history, their knowledge and practices related; safe working environment the occupational hazards of the workplace, PPE and first aid measures. *Second tool:* Modified Observational Checklist Sheet of OHSAS for assessing the workplace environment. **Results:** results of this study indicated that, the majority of juvenile delinquents were aged less than ≤16 years old, residing in urban and Slum areas and left their schools before admission; they suffered many common health problems related to occupational hazards. Mostly of child labors had satisfactory level of knowledge and practices regarding to working environment, PPE, occupational hazards and dealing with injuries and first aid at workplace after implementing the program with statistically significant differences with (P<0.05). **Conclusion:** the occupational health program had improved the child labor knowledge and practices regarding safety measures and first aid with statistically significant improvement before and after implementation of the occupational health program. **Recommendations:** So, it is important to develop successful policies to prevent occupational injuries and promote safer work practices for young workers.

Keywords: Juvenile Delinquent, Occupational hazards, child labor, Occupational health Programs.

1. INTRODUCTION

Child labor refers to children working below the country's minimum age (excluding children in light work) and to children in the worst forms of child labor, namely hazardous work, or in commercial sexual exploitation, forced labor or illicit activities. Hazardous work is any activity or occupation that has adverse effects on the child's safety, physical or mental health, or moral development. Hazards can come from excessive workloads, the physical conditions of work, and/or the duration or hours of work even where the activity is known to be safe (*International Labour Organisation, 2016*).

Children around the world are routinely engaged in paid and unpaid forms of work that are not harmful to them. However, they are classified as child laborers when they are either too young to work or are involved in hazardous activities that may compromise their physical, mental, social or educational development (*International Labor Bureau (ILAB), 2015*).

Risks in the working environment can be divided into five primary classes. Chemical (dusts, liquids, fibers, fumes, mists and smoke), physical (noise, vibration, ionizing and non-ionizing radiation, vibration, and extreme of temperature), biological (bacteria, viruses, fungi, and protozoa), ergonomic and mechanical (lifting, repetitive action, military capabilities, and traps), psychosocial and organizational (work demand and conditions, work environment and organizational). These may produce an immediate or delayed response dictated largely by workers' inherent characteristics and the intensity and frequency exposure (*Smedley and Sadhra 2013& Popov; et al., 2016*).

The elimination of child labor is a long-term objective. However, in the meanwhile, we cannot allow that children are injured or harmed at work in their struggle for survival, especially when we have the knowledge and means to prevent this (*ILO, 2016*).

The human, social and economic costs of occupational accidents, injuries and diseases and major industrial disasters have long been cause for concern at all levels from the individual workplace to the national and international. Measures and strategies designed to prevent, control, reduce or eliminate occupational hazards and risks have been developed and applied continuously over the years to keep pace with technological and economic changes. Yet, despite continuous but slow improvements, occupational accidents and diseases are still too frequent and their cost in terms of human suffering and economic burden continues to be significant (*Tasnim; et al., 2015 & Kamel; et al., 2017*).

Occupational health nurses are highly qualified health care professionals who possess the knowledge and experience from their respective areas of expertise, as well through collaborative partnerships, to develop, manage and implement strategies to promote safe and healthful environments for working youths. Occupational health nurses have the skills, knowledge, and competencies essential for the development and implementation of collaborative partnerships promoting safe and healthful environments or working youth. Have expertise in preserving, protecting, and restoring the health and safety of workers and promoting safe and healthful work environments (*AAOHA& NASN, 2017*).

Significance of the study:

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 possess 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 (*Abo-Shosha, 2014*).

The most prevalent hazardous working condition in Egypt, involving 45.7% of child laborers, is "working in dust or fume's, a common occurrence because most children in Egypt work in agriculture on family farms, a situation that almost always involves dusty conditions. The second and third most common hazardous work conditions are "work that leads to exhaustion"(34.7%) and "work that involves bending for a long time" (29.8%) (*Moawad; et al., 2016*).

Aim of the study

The aim of the study is to evaluate the effect of the occupational health program for hazards prevention among child labor in delinquency care agency through:

- Assessing the health condition of child labor toward safety measures.
- Recognizing the child labor' knowledge and practices about the occupational health hazards related to their workplace to detect child needs.
- Assessing the safety workplace environment in delinquency care agency.
- Designing and implementing of occupational health program for prevention of occupational health hazards among child labor according their needs.
- Evaluating the effect of the occupational health program on improving the child labor knowledge and practice for prevention of occupational health hazards.

Research Hypothesis:

Implementation of the Occupational health program will improve the child labor' knowledge and practices toward safety measures to prevent hazards among child labor in Delinquency Care Agency.

2. SUBJECTS AND METHODS

Technical design:

Research design:

A quasi-experimental design was used in this study.

Research setting:

The study was conducted at juvenile delinquents youth institution for social care at Ain Shams, Cairo, Egypt. This institution is one of the most crowding institutions in Egypt and serves big numbers of juvenile delinquents coming from all over the country.

Subjects of the study:

A convenience sample consists of 92 children were chosen over a period of six months. According to the institution current' statistics (2017) of the previous setting, the total children number was 120 and the study sample size was equal 92 and exclude 10% (10) for pilot study. All children participated from a selected setting; all are males, whose ages ranged from 14 to 18 years. The sample was calculated using normal distribution (50%) to calculate the optimum sample size as the population size was 120 based on confidence level 95% and the margin of error 5% the sample size was 92.

Tools of data collection:

The data was collected through the following tools:

I- First tool: A structured interviewing Questionnaire:

- This tool was an Arabic interviewing questionnaire sheet constructed by the researcher after reviewing related literatures and the content validated by the specialist and researchers. This tool was divided into five parts:

Part I: this part it was concerned with:

(A). **Socio-demographic data of the child labor** this part included as age, residence, level of educational, child ranking.

(B). **Family Socio-demographic data** this part included as family type, family size, family stability, Parent supervision, father's and mother's education, and their occupation, and family income.

Part II: this part was concerned with Child labor' **health history** related to their work nature, regarding; types of exposure to occupational hazards during the working day, first aids providers, place of treatment, Previous hospital admission, injury complication, excessive fatigue, frequency of work related illness and its severity of, smoking and drug abuse.

Part III: this part was concerned with child labor' **work characteristics**, including: type of work (either in printing, baker, Carpentry, welding, mechanic workshop, others), working hours/daily, daily wages, Supervision attitude toward child mistakes, Rest Period, Physical effort Exposure, use of safety measures, Training on occupational safety measures .

Part IV: this part was concerned with **Child labor' knowledge**, and used for pre and post program evaluation as regarding:

A. **Safe working environment** as Good ventilation and sufficient lighting, Vacuum for fumes dusts, Good Temperature, Noise, Enough space, Special places to change clothes, drinking safe water.

B. **Personal protective equipment as** meaning and types of PPE used, its availability, importance of using it, and Reasons for not using PPE.

C. **Occupational hazards as** Types of occupational hazards and risk exposure to the various occupational hazards, and health problems related to Occupational hazards exposure.

D. **Different first aid measures** at workplace environment included questions such as First Aid meaning, First aid equipment, dealing with injuries, as (fracture, wounds and bleeding, epistaxis, burn, shock, etc...).

Scoring System for Knowledge:

The child labor' knowledge was calculated for each item as follows: the child labor' knowledge were given scores (1) marks to incorrect/incomplete answer and (2) marks to correct/ complete answer. According to The child labor' answers, their knowledge was categorized into satisfactory level of knowledge $\geq 50\%$ and unsatisfactory level of knowledge score $<50\%$.

Regarding the total knowledge was categorized into satisfactory level of knowledge $\geq 50\%$ and scored one point (2), and unsatisfactory level of knowledge score $<50\%$ and scored one point (1).

Part V: this part it was concerned with:

(A).this part was concerned with **Child labor' practices** regarding the occupational health hazards of the workplace, as regarding: using of personal protective equipment, occupational safety measures, training, proper waste disposal.

(B). **Observational Checklist sheet:** This part was concerned with Child labor' practices as regarding of different first aid measures at workplace environment such as Deal with the injuries, fracture, wounds and bleeding, epistaxis, burn, shock, etc...).

- These checklists were used for pre-program assessment and post program evaluation

Scoring System for practices:

According to child labor practices its scoring (1) marks for steps that done incorrectly/not done, and scoring (2) for steps that correctly done/ completely done and accordingly their practices were categorized into two levels as done correctly $\geq 60\%$ of total scores and not done $< 60\%$ of total scores.

Regarding the child labor' total practices were categorized into two levels as done correctly $\geq 60\%$ of total scores and scoring (2) marks and done incorrectly $< 60\%$ of total scores with scoring (1) marks.

II- Second tool (A): Modified Observational Checklist Sheet of OHSAS (2008); to assess the application of the work field. it was adapted by the researcher, it composed of the proper ventilation, lighting, hazard identification, risk assessment and risk control, Presence of PPE. **In different** Institutions' rehabilitation activities which were (6) workshops.

Scoring System:

Evaluating the score of observational checklist sheet, it was as follows: a good applicable item was scored one point (1), and poor application item was scored zero (0).

Content validity and reliability:

Content validity was ascertained by a Jury consisting of 7 experts in community health nursing. Their opinions were elicited regarding the format layout, consistency, accuracy and relevancy of the tools. About the content reliability, the Cronbach's alpha coefficient was calculated through test and re-test to assess the internal consistency of the tool.

II. Operational Design:

The study' operational design passed through different phases, preparatory phase then pilot study and finally the field work.

A. Preparatory phase:

A review of recent, current, national and international related literature covering the various aspect of the problem was done at this phase in order to design the study data collection tools and to be acquainted with various aspects of the research problems.using textbooks, articles, magazines and internet search.

B. Pilot study/ pretest :

A pilot study was carried out included 10% (10) from the sample size to evaluate clarity, visibility, applicability as well as the time required to fulfill the developed tools. According to the obtained results, modifications such as omission, addition and rewording were carried out to be more applicable to the children' level and develop the final form of the tool. It took about one month on December 2017. The numbers of the pilot study were excluded from the sample.

C. Field work:

The actual fieldwork started from January to July 2018. After that the researcher developed the occupational health program based on the needs assessed and implement it in the form of sessions. (Time allowed 10 hours distributed on 10 sessions: 6 hours for theory and 4 hours for practice).

Program Construction:

The program was constructed in four phases: assessment, planning, implementation, and evaluation.

- Assessment phase:

By using the developed pre-test questionnaire to assess the child labor's knowledge and practices related to safety of the workplace and its environment, using three part of the interviewing questionnaire the child labor's knowledge and practices checklists. The program time allocated = 10 hours divided into 10 sessions (6 hours theory and 4 hours practices). This phase last for 2 weeks.

- Planning phase:
General objective of the program:

The general objective of this occupational health program was to improve the Child labor' knowledge, practices towards safety measures and first aids in workplace environment.

The program content was included the following topics:

Knowledge about the meaning of occupational hazards, types, risk factors, availability of PPE, its types, the important of using PPE and the occupational health problems when using PPE, types of occupational health problems, measures to prevent the occupational hazards, training and periodic checkup.

- Implementing phase:

- The program was implemented over a period of 7 months; it was carried out in 10 sessions; 2 sessions per week /5 weeks, with a total of 10 sessions encompass knowledge and practices about occupational health practices with transfer of theoretical knowledge and practical skills about safety of the workplace and its environment and first aid. Every session was taken about one hour/day for collection of data. Pre-test was done to assess the knowledge of the child labor about safe work practices also to assess the child labor' general condition regarding to the health status related to the workplace.
- Administered a questionnaire to the Children before, immediately after and 4 months after the training course. In addition, children were tested in first aid scenarios before and immediately after teaching, and then re-tested 4 months later.
- At the beginning of each session, the researcher started by a summary about what was given through the previous sessions and objectives of the new one, taking into consideration using simple and clear language to suit the participants level of understanding.

Teaching methods:

Different teaching Methods were used in the program content including the following: lectures, small group discussion, brain storming, demonstrations and re-demonstration, models and role-play. The educational media were used in a form of brochures, colored posters, lab-top CDs, videos, real objects and handouts.

- Evaluation phase:

Occupational health program outcomes were assessed Based on the scores acquired for the knowledge and practices level in the pre-test and post-test.

Ethical consideration:

The approval was taken from the faculty ethical committee. Furthermore, all relevant ethical aspects were considered for ensuring the confidentiality of the collected data through; gaining oral consent for the children in the study, after explaining the objectives of the study, the children had the right to accept or refuse the participation at any time without giving any reasons and the study was posed no risks or hazards on their social, psychological or physical health.

Statistical Design:

The calculated data was analyzed and tabulated by using the Statistical Package for Social Science (SPSS) version 22. Qualitative variables were presented as frequencies, percentages also mean, and standard deviation was calculated for Quantitative variables. Relations between different qualitative categorical variables were compared using Chi-square test (X^2) and Spearman Correlation coefficient test (r) and (P) value was used to test association among the variables.

3. RESULTS

Table (1) shows that 47.8 % of the total sample aged 15-16 years with the mean age 16.12 ± 0.739 , while 38.0% of them live in urban areas compared with 32.6% live in Slum areas. The table illustrates also 51.1% of study sample were middle child in the family. Regarding educational level 30.4% leaved the school during preparatory school while 38.0% of them stop education.

Table (2) illustrates that 82.6% of the child labors were living in nuclear families and 72.8% of them were living in families more than 5 Members. Regarding parents' marital status, 48.9 % of total parents were divorced, but 39.1% were married. The table displays that 82.6% of study sample fathers' were handcrafted and 39.1% left the school during Secondary school level compared to 46.7% of study sample mothers were Illiterate and 58.7 % were housewives. Regarding the family monthly income, 70.7% from the total sample had insufficient income. Regarding child' parent supervision, there were 47.8 % of the total sample were living with both parents compared with 39.1% were living with Single parent while, 5.4 % of them were living without supervision.

Figure (1): displays that 39.1 % of study sample fathers' left the school during Secondary school level compared to 46.7% of study sample mothers were Illiterate.

Table (3): clarifies that 75.0% of study sample suffered from skin infections followed by 35.9% of them had skin burn while 59.8% of them exposed to eye inflammations and 72.8% of them complain of anemia and 83.7% of suffered wounds while 53.3% exposed to fractures as physical problems. While 92.4% of them faced stress and 89.1 % from depression, 13.0 % of them attempted suicide as psychological problems. In addition, the Table demonstrates that 50.0% of study sample exposed to occupational Injuries more than 3 times during working days and 45.7% of them had medium injuries' severity. 73.9%, of them received First aid at workplace by Physician /nurse and 70.7% of them receive treatment at Institutions' clinic While 38.0% of them admitted to hospital once at least followed by 19.6% of them had three times hospital admission. While 75.0% of them sometimes exposed to Past complications.

Table (4): demonstrates that 75.0% of them working less than 6 hours daily and 15.2% were working from 6-8 hours and 48.9% of them had only Half hour/daily as resting time and 62.0% of them having less than 25 pound/month. Regarding Supervisor attitude toward child mistakes 79.3% suffered from violence and beating as an institutional punishment way. 68.5% from the total sample sometimes exposed to physical effort during working hours. The table elaborates that 50.0% from the total sample were suffering from unavailable and insufficient safety measures at work environment. 81.5% of them sometimes exposed to occupational risk while 33.7% of them had Training on occupational safety measures by Dealing with Devices. Regarding Emergency exits workplace only 40.2% were Adequate and accessible and 69.6 % Medical Record

Figure (2): shows that 29.30% of total study sample practiced carpentry activities while 17.40% practiced Sewing & Embroidery activities and 16.30% practiced welding activities and 14.10% practiced agriculture activities.

Table (5): reveals that the child labor' satisfactory level of knowledge regarding to safe working environment there were highly statistically significant differences ($P < 0.001$) between pre and post program implementation. While there were No statistically significant differences for drinking safe water and toilets availability with P value respectively at (0.751 and 0.210).

Table (6): displays that there were highly statistically significant differences ($P < 0.001$) between pre and post program implementation. Moreover, there was an improvement of child labors' knowledge regarding PPE after implementing the program.

Table (7): pointed out that there were an improvement of child labor Satisfactory level of knowledge pre and post program regarding Occupational Hazards at workplace after implementing the program Highly statistically significant differences, $P < 0.001$.

Table (8): Clarifies that there were an improvement of child labor Satisfactory level of knowledge pre and post program regarding First Aid with Highly statistically significant differences, $P < 0.001$.

Table (9): demonstrated that there were an improvement of child labors' practices pre and post program regarding Safety measures of occupational hazards, PPE, Waste disposal Training and Periodic checkup with highly statistically significant differences ($P < 0.001$).

Table (10): elaborated that there was an improvement of child labors' practices regarding dealing with the injuries and first aid measures' after implementing the program with highly statistically significant differences ($P < 0.001$).

Table (11): Detects that 66.7% of institution' workplace environment having good applicable of ventilation and sufficient lighting and 100.0% medical clinic inside the institution and first aid supplies while 100.0% had poor applicable for presence of safety measure, periodic workers training on occupational safety, first aid training procedures and personal protective equipment (PPE).

Table (12): reveals that there was statistically significant differences between children total knowledge and practices pretest and posttest Regarding total knowledge 83.7% from total sample was Unsatisfied and 16.3% was Satisfied pretest compared by 95% was Satisfied and 4.3% was Unsatisfied post test. Regarding total practices 89.1% from total sample not done correctly and 10.9%, correctly done pretest compared by 14.1% not done correctly and 85.9% done correctly posttest. In addition, there was an improvement of child regarding their practices after implementing the program with highly statistically significant differences ($P < 0.001$).

Table (13): reflects that there was a highly statistically significant positive correlation between child labors' total knowledge and total practices pre and posttest ($r = 0.741, 0.694$) respectively, with ($P < 0.001$).

Table (1): Frequency Distribution of the child labor' socio-demographic characteristics (N=92).

Demographic Characteristics	No	%
Age in years:		
15 – Years	19	20.7
16 – Years	44	47.8
17 – Years	28	30.4
18 – Years	1	1.1
$\bar{X} \pm SD$	16.12 \pm 0.739	
Residence:		
Urban	35	38.0
Rural	27	29.3
Slum areas	30	32.6
Child Ranking:		

The eldest	47	51.1
The middle	39	42.4
The youngest	6	6.5
Educational level:		
Secondary school	22	23.9
Preparatory school	28	30.4
Primary school	2	2.2
Stop Education	35	38.0
Illiterate	5	5.4

Table (2): Frequency Distribution of child labor regarding their Family socio-demographic Characteristics (N=92).

Family Characteristics	N	%
Family Type:		
Nuclear Family	76	82.6
Extended Family	16	17.4
Family Members:		
3 Members	8	8.7
4 Members	17	18.5
≥ 5 Members	67	72.8
Parents' Marital Status: (Family stability)		
Married	36	39.1
Divorced	45	48.9
Widow(Mother or Father)	11	12.0
Parent supervision:		
Both parents	44	47.8
Single parent	36	39.1
Relative	7	7.6
No supervision	5	5.4
Father's Occupation		
Official Work	5	5.4
Handicraft	76	82.6
Retired	4	4.3
No Work	7	7.6
Mother's Occupation		
Official Work	3	3.3
Handicraft	35	38.0
Housewife	54	58.7
Family Monthly Income		
Sufficient	27	29.3
Insufficient	65	70.7

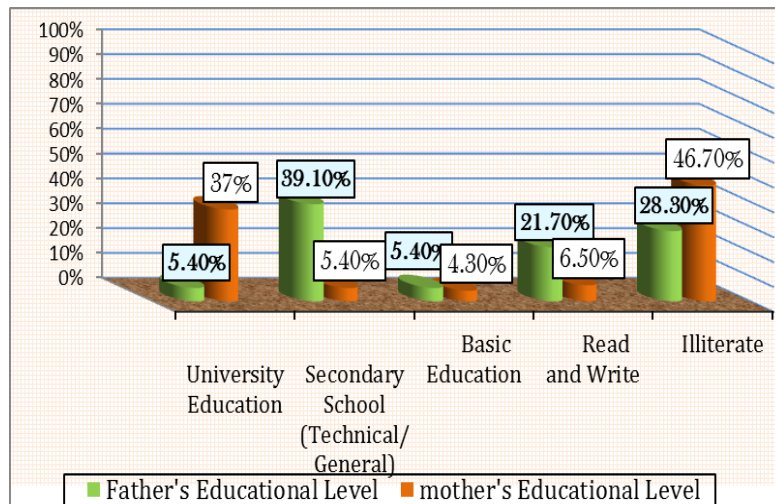


Figure (1): Distribution of the child labor regarding to their parents' educational level (n=92).

Table (3): Distribution of the child labor according to health history of occupational injury and their management (n=92).

Items	N	%
Physical Problems:		
Skin Problems:		
Skin burns	33	35.9
Eczema	22	23.9
Skin Infections	69	75.0
Non	18	19.6
Eye Problems:		
Eye Inflammations	55	59.8
Glaucoma	6	6.5
Disturbed Vision	22	23.9
Non	15	16.3
Blood Problems:		
Anemia	67	72.8
Bleeding tendency	4	4.3
Non	9	9.8
Other Physical Problems:		
Fractures	49	53.3
Bruises	76	82.6
Wounds	77	83.7
Headache	62	67.4
Insomnia	19	20.7
Exhaustion / Fatigue	48	52.2
Permanently Disabilities	1	1.1
Psychological Problems:		
Depression	82	89.1
Stress	85	92.4
Suicide	15	16.3

Non	4	4.3
Injuries frequency :		
Once	9	9.8
Twice	7	7.6
Three times	30	32.6
More than 3 times	46	50.0
injuries Severity:		
Simple	38	41.3
Medium	42	45.7
Serious	12	13.0
First aid provider:		
Physician /nurse	68	73.9
Colleague	24	26.1
Treatment Place:		
Hospital	26	28.3
Pharmacy	1	1.1
Institutions' clinic	65	70.7
Hospital admission frequency:		
Once	35	38.0
Twice	14	15.2
Three times	18	19.6
More than 3 times	15	16.3
Non	10	10.9

* Total items are not mutually exclusive.

Table (4): Frequency Distribution of the child labor regarding their work Characteristics (N=92).

Work Characteristics	N	%
Working Hours Daily:		
Less than 6 hours	69	75.0
6-8 hours	14	15.2
More than 8 hours	9	9.8
Daily Wages:		
less than 25 pounds	57	62.0
25-50 pounds	17	18.5
More than 50 pound	18	19.6
Supervision attitude toward child mistakes:		
Deduction from salary	4	4.3
Violence, beating	73	79.3
Nothing	15	16.3
Rest Period:		
Half hour /daily	45	48.9
Hour /daily	20	21.7
2 Hours /daily	19	20.7

Non	8	8.7
Physical effort Exposure		
Never	14	15.2
Sometimes	63	68.5
Always	15	16.3
Training on occupational safety measures:		
Workshops	28	30.4
Dealing With Devices	31	33.7
Warning Regulations Guided	8	8.7
Non	25	27.2

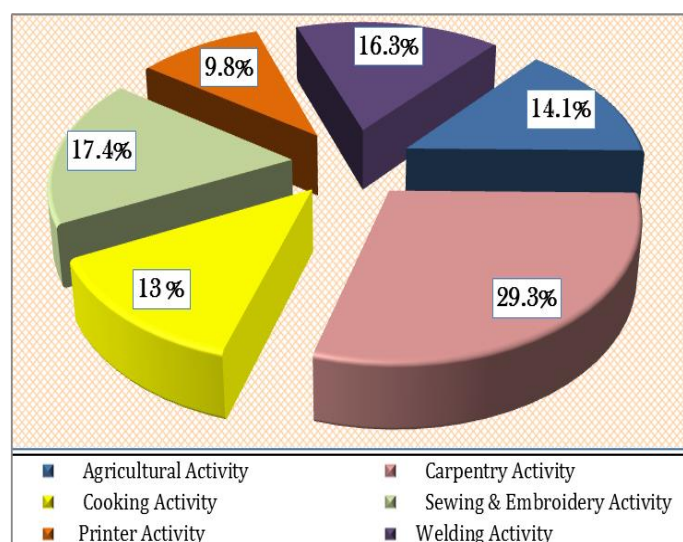


Figure (2): Distribution of the child labor according to their rehabilitation activities during institutionalization (n=92).

Table (5) Distribution of the child labor according to their Satisfactory level of knowledge regarding safe working environment (N=92)

Items	Pre test	Post test	X2	P-value
	Satisfied	Satisfied		
	%	%		
Good Ventilation	43.2	89.9	36.875	0.000***
Sufficient lightening	48.1	85.0	24.531	0.000***
Vacuum for fumes dusts	12.5	55.0	27.562	0.000***
Good Temperature	42.4	88.8	24.024	0.000***
Absence of Noise	43.7	73.8	5.240	0.022**
Enough space	41.4	73.8	5.006	0.025**
Special places to change clothes	40.6	71.3	5.355	0.021**
Chairs for rest	47.6	71.3	17.416	0.000***
Clean and organized places	37.7	91.3	11.518	0.001***

Drinking safe water	35.2	86.8	0.100	0.751*
Private eating places	40.6	47.5	7.886	0.005**
Hand-washing basins	43.8	71.3	51.694	0.000***
Soap and mild detergent and disinfectants	18.8	67.5	47.509	0.000***
Toilets	43.1	53.8	1.569	0.210*
Fire extinguishers	59.0	68.8	39.440	0.000***
First Aid equipment availability	65.6	87.5	74.180	0.000***
Total	34.8	87.0	52.571	0.000***

Not Significant $P > 0.05$ * Significant $P < 0.05$ ** Highly Significant $P < 0.001$ ***

Table (6): Distribution of the child labor according to their Satisfactory level of knowledge pre and post test regarding PPE (N=92).

Items	Pre test	Post test	X2	p-value
	Satisfied %	Satisfied %		
Meaning of PPE	8.7	59.8	53.320	0.000***
Types of PPE Used	8.7	91.3	125.565	0.000***
Importance PPE Used	34.8	87.0	52.571	0.000***
Reasons for not using PPE	6.5	80.4	102.262	0.000***
Availability of PPE	13.0	56.5	38.333	0.000***
Total	7.6	88.0	119.269	0.000***

Highly Significant $P < 0.001$ ***

Table (7): Distribution of the child labor according to their Satisfactory level of knowledge pre and post program regarding various occupational hazards at workplace (N=92).

Items	Pre test	Post test	X2	p-value
	Satisfied %	Satisfied %		
Meaning of Occupational hazards	15.2	84.8	89.043	0.000***
Types of Occupational Hazards	20.7	64.1	35.607	0.000***
Risk factors of Occupational Hazards	23.9	84.8	68.693	0.000***
Types of occupational health problems	6.5	84.8	113.554	0.000***
Causes of Occupational injuries	15.2	84.8	89.043	0.000***
Methods of Protection from occupational hazards	14.1	87.0	97.598	0.000***
Total	2.2	89.1	140.190	0.000***

Highly Significant $P < 0.001$ ***

Table (8) Distribution of the child labor according to their Satisfactory level of knowledge pre and post program regarding First Aid at workplace (N=92)

Items	Pre test		Post test		X2	p-value
	Satisfied %		Satisfied%			
First Aid meaning	18.5		83.7		78.298	0.000***
First Aid Equipment	16.3		85.9		89.086	0.000***
Deal with the injuries	19.6		88.0		86.785	0.000***
Deal with fracture	13.0		85.9		97.598	0.000***
Deal with burn	17.4		85.9		86.374	0.000***
Wounds and Bleeding	21.7		81.5		65.831	0.000***
Epistaxis	28.3		10.9		70.300	0.000***
Shock	17.4		91.3		101.288	0.000***
Chemical poisoning	15.2		83.7		86.293	0.000***
Eye injuries	17.4		84.8		83.605	0.000***
Sun Stroke	9.8		89.1		115.862	0.000***
Electrical Shock	21.7		90.2		87.534	0.000***
Total	10.9		94.6		129.273	0.000***

Highly Significant $P < 0.001$ ***

Table (9): Distribution of the child labor according to their correctly done practices' pre and post program regarding PPE and Waste disposal (N=92).

Items	Pre test		Post test		X2	p-value
	Correctly Done		Correctly Done			
	No	%	No	%		
Wearing of PPE	5	5.4	65	70.7	83.008	0.000***
Safety measures of occupational hazards	12	13.0	59	64.1	50.661	0.000***
Waste disposal	9	9.8	63	68.5	66.536	0.000***
Training	13	14.1	55	59.8	41.148	0.000***
Periodic checkup	14	15.2	66	71.7	59.800	0.000***
Total	3	3.3	53	57.6	64.174	0.000***

Highly Significant $P < 0.001$ ***

Table (10): Distribution of the child labor according to their Correctly Done practices pre and post program regarding Dealing with the injuries and First Aid measures (N=92).

Items	Pre test		Post test		X2	p-value
	Correctly Done		Correctly Done			
	No	%	No	%		
Dealing with the injuries	12	13.0	68	73.9	69.354	0.000***
Fracture Injuries	18	19.6	77	83.7	75.754	0.000***
Burn	10	10.9	75	81.5	92.383	0.000***

Wounds and Bleeding	19	20.7	73	79.3	63.391	0.000***
Epistaxis	12	13.0	68	73.9	69.354	0.000***
Shock	10	10.9	72	78.3	84.564	0.000***
Chemical poisoning	17	18.5	68	73.9	56.873	0.000***
Eye injuries	13	14.1	71	77.2	73.688	0.000***
Sun Stroke	9	9.8	68	73.9	77.741	0.000***
Electrical Shock	9	9.8	74	80.4	92.735	0.000***
Total	8	8.7	80	87.0	112.90	0.000***

Table (11): Distribution of workplace environment in the institutional workshop Total (N=6) According to Checklist (OHSAS Checklist Parameters)

Workplace Environmental	Applicable		Not Applicable	
	N	%	N	%
Good ventilation	4	66.7	2	33.3
Sufficient light	4	66.7	2	33.3
Hazard Identification:				
Enough space between machines	3	50.0	3	50.0
Fire extinguisher	2	33.3	4	66.7
Ambulance car	–	–	6	100.0
Medical clinic inside the facility	6	100.0	–	–
Pre-employment examination	–	–	6	100.0
Risk Assessment:				
Emergency plan in cases of emergency	–	–	6	100.0
Periodic workers training on occupational safety	–	–	6	100.0
Periodic medical examination	–	–	6	100.0
Presence of internal auditors to check safety	–	–	6	100.0
Presence of specific occupational risks employees	–	–	6	100.0
Risk Control:				
Application of emergency plan on real ground	–	–	6	100.0
Explanation of change of policy to workers	2	33.3	4	66.7
The workers know these procedures	2	33.3	4	66.7
Part time during working day	2	33.3	4	66.7
Presence of medical records for each worker	6	100.0	–	–
Computerized medical records	–	–	6	100.0
Role of internal auditors is played	–	–	6	100.0
First Aid Training Procedures	–	–	6	100.0
First Aid Supplies	6	100.0	–	–
Personal Protective Equipment (PPE):				
Presence PPE	–	–	6	100.0
Enough PPE	–	–	6	100.0
Training on use of PPE	–	–	6	100.0
Periodic checking of PPE	–	–	6	100.0

Table (12): Relation between the child labor' total knowledge and their total practice pretest and post test (N=92).

Items	Pre test		Post test		X2	p-value
	No	%	No	%		
Total knowledge:						
Satisfied	15	16.3	88	95.7	117.528	0.000***
Unsatisfied	77	83.7	4	4.3		
Total practice:						
Correctly done	10	10.9	79	85.9	103.610	0.000***
Not done	82	89.1	13	14.1		

Highly Significant $P < 0.001$ ***

Table (13): Correlation between child labors' Total Knowledge and their Practices pre and post test. (n=92)

Total Knowledge / Total Practice	Total Knowledge			
	Pre test		Post test	
Total Practices	r	p-value	r	p-value
	0.741	0.000***	0.694	0.000***

r = Pearson correlation Highly Significant $P < 0.001$ ***

4. DISCUSSION

Regarding to socio-demographic characteristics, the present study revealed that concerning the study sample age about more than half of the total sample aged less than ≤ 16 years old with the mean age 16.12 ± 0.739 (Table1). These results were consistent with Abdallah, (2014) in Cairo, Egypt, who elaborated that nearly half of the study sample was in the age group 15-16 years. These results contradicted with Rajir, (2014) who revealed that one in every four of the working children was below the age of nine years when he joined the labor force.

In relation to the child labors' residence, the result of this study detected that the majority of the study sample live in urban and Slum areas (Table 1). This result was congruent with Abdallah, (2014) in Cairo, Egypt, who found that the majority of the samples were living in rural and slum areas. This finding was in congruent with Wanke, (2014) who mentioned that, more than half of children living in rural areas.

As regarding the child labors' ranking in family, more than half of them were middle child in the family (Table 1). These results in agreement with Shafik & Mohamed, (2016) in Egypt which mentioned that while more than half of them were middle child in the family.

In relation to educational level, the results of the current study found that about one third of the total sample left the school during preparatory school while nearly half of them stop education (Table1). On the same line with Abdallah, (2014) in Cairo, Egypt who found that the majority of the study sample left their schools before admission.

Concerning to child labor' family socio-demographic characteristics; the current study result displayed that the majority of them were living in nuclear families and in families more than 5 Members (Table 2). These results were in consistent with Schlick et al., (2014) in Cusco Province, Germany, who mentioned that About one quarter of the kids were living alone

As regard (the family stability) parents' marital status, the findings of the present study indicated that more than half of the total sample their parents were divorced (Table 2). This results in agreement with Shafik & Mohamed, (2016) in Egypt, who stated that less than half of the study sample had separation of the family and divorced.

Regarding child' parent supervision, findings of this study detected that more than half of the total sample were living with both parents compared with nearly one third of them were living with Single parent while the minority of them were living without supervision (**Table 2**). These results in agreement with **Abdallah, (2014)** in Cairo, Egypt who detected that about two thirds of the study sample was living under their both parents and about one quarter of the study sample were living under one parent supervision.

Regarding father' educational level, nearly half of them left the school during Secondary school level while one third of them had illiterate (**Figure 1**). These results in similar observation with **Wonke, (2014)** who mentioned that, less than half of the father had preparatory education.

Concerning to Fathers occupation; the current study explained that mostly of study sample fathers' were handcrafted (**Table 2**). This results in line with **Taha, (2013)** in Cairo who reported that two thirds of the juvenile delinquents' fathers were working handicrafts which affect negatively on their children behaviors because there were no completely fathers' care during their work for a long time daily and their mothers hadn't positive effective changes on their behaviors. On other hand, these results disagreement with contradicted with **Dott & parul, (2014)** who stated that, more than two thirds of fathers were not working.

In relation to educational level of mothers, the present study result showed that more than half of study sample' mothers were Illiterate (**Figure1**). This results in line with **Shafik & Mohamed, (2016)** in Egypt who illustrated that less than half of them can read and write only, while minority of them were preparatory education. This finding was incongruent with **Wonke, (2014)** who mentioned that less than two thirds of the mothers read and write.

Regarding mother occupation the current study result showed that, more than half of study sample' mothers were housewife (**Table 2**). This finding agreed with **Datt & Parul, (2014)** who found that, more than two thirds of mothers were housewife.

In concern to the family monthly income, the current study asserted that the majority of the total sample had insufficient income (**Table2**).. This results compatible with **WHO (2013)** which reported that the perpetuation of child labor is mainly due to social, economic and educational factors with many physical and psychological consequences.

In relation to the health history of occupational injuries the current study demonstrated that more than three quarter of study sample suffered from skin infections and anemia followed by two third of them exposed to eye inflammations while mostly of them complained of bruises and wounds while more than half of them exposed to fractures as physical problems. The majority of them suffered from stress, depression as psychological problems (**Table 3**). This result was supported by **Shafik & Mohamed, (2016)** in Egypt who pointed out that the studied samples suffered from work injuries, and around less than two thirds of child labor complained the injuries resulted from trauma, fractures and wounds.

Regarding the psychological problems of child labor, the large portion of them faced psychological problems as stress and the majority of them from depression nearly one fifth of them attempted suicide (**Table3**). Moreover, this finding supported by **Abo-Shosha, (2014)** who revealed that psychological status score regarding quality of life for children was affected because children with feel different from their peers and elaborate negative through about their life. This may be due to their exposure to different stressful events experienced during the day.

Regarding to injury complication more than three quarter of them sometimes suffered from past complications (**Table3**). The study supported by **WHO, (2014)** In Mexico 25% of child workers suffer a disabling injury each year. This may be due to lack of training, lack of attention span of young children, unavailability of protective equipment and use of sharp and unsuitable instruments in their work.

In relation to Injuries, the current study clarified that more than half of the total study sample exposed to occupational Injuries more than 3 times during working days (**Table3**). This result was in agreement with the study made in Port-Said, Egypt by **Abdallah & Morsy, (2013)** who mentioned that 68.3% of workers reported injuries. This high prevalence results from poor work conditions and limited control measures. This result on the contrary with **Tarek; et al., (2011)** in Egypt, who asserted that a larger proportion of sampled working children were not exposed to any of the different types of injuries in the workplace.

While more than two fifth of them admitted to hospital once at least followed by more than one fifth of them had three times hospital admission, more than three quarter of them received First aid at workplace by Physician /nurse and more than half of them had medium injuries' severity (**Table 3**). These results in accordance with, **ILO, (2017)** In Malaysia, working children has six-fold greater hospitalization rate than non-working children. On the other hand, this result disagreed with (**Lam. N., et al. (2017)** in Australia, who found that the information source mostly came from multimedia and only 8% via educational programs. In addition, in an opposite observation **Quynh, et al., (2013)** showed that, most information came from family members/friends or relatives (46%) followed the media (36%). It is necessary to conduct further training courses for workers.

Regarding the place of emergency treatment, three quarter of them receive treatment at Institutions' clinic (**Table 3**). This result was consistency with **Shafik & Mohamed, (2016)** in Egypt who explained that almost less than two thirds, it was in the factory clinic and less than one fifth in the injury site. Moreover, these results were in disagreement with **Bazargani; et al., (2013)** investigated people with injuries and found that most of them attempted to go to the hospital as soon as possible.

In relation to the institutional rehabilitation activities; the present study, revealed that 29.30% nearly one third of total study sample practiced carpentry while 17.40%, 16.30%,14.10% around one fifth practiced Sewing & Embroidery, welding and agriculture activities (**Figure 2**). These results in the same line with **Abdallah, (2014)** which found that more than half of the samples were sharing carpentry, two fifths were in agricultural activities and more than half of the females were sharing sewing and embroidery activities. All of these activities were the scheduled activities of the Ministry of Social Affairs and children choose their preferable activities and might share in more than one activity. As sharing in the institutional activities to carry out the institutional roles.

The current study reported that as regard to daily working hours, the majority of them working less than 6 hours daily and around one fifth of them were working from 6-8 hours (**Table4**). These findings incongruent with **Rajir, (2014)**,who revealed that the majority of them working hours daily more than six hours every days. Workers who worked for long hours might have developed fatigue and stress, which increased their risk to injury.

Regarding Supervisor attitude toward child mistakes the present study revealed that the majority of them suffered from violence and beating as an institutional punishment way (**Table 4**). This results in line with **Shafik & Mohamed, (2016)** in Egypt who found that more than half of them suffering from sexual abuse during work. These results were disagreement with **Tarek; et al., (2011)** in Cairo, Egypt, who showed that a larger proportion of sampled working children were not abused while working. However, the 20 percent of sampled working children who were abused while working cannot be ignored.

Regarding the effect of work on child health, the present study revealed that more than two third of them sometimes exposed to physical effort during working hours (**Table 4**). This result in line with **WHO, (2016)** who stated that Long hours of strenuous and monotonous work result in excessive fatigue and exhaustion.

Regarding training on occupational safety measures at work environment, the current study result showed that more than one third of them had training on occupational safety measures by dealing with devices (**Table 4**). The study findings in line with **WHO, (2016)** and **ILO, (2017)** who emphasized that lack of training of child workers was the main cause of work injuries and physical problems.

In concern to the child labors' Satisfactory level of knowledge pre and posttest regarding safe working environment, the present study displayed that there were improvement of child knowledge after implementing the program with statistically significant differences with ($P < 0.05$). While there were no statistically significant differences for drinking safe water and toilets availability with P value at (0.751 and 0.210) respectively (**Table5**). This supports the results of **Jessy Z'gambo, (2015)** in Lusaka, Zambia who stated that worker under poor and dangerous conditions that exposed them to several safety and health hazards.

Concerning the child labors' satisfactory level of knowledge pre and posttest regarding PPE at workplace, the present study pointed out that there were highly statistically significant differences ($P < 0.001$) between pre and post program implementation. There was an improvement of child knowledge regarding PPE after implementing the program (**Table 6**). This results in the same line with **Shafik & Mohamed, (2016)** who reported that concerning child labor's knowledge,

relatively high percentages of the studied children had poor knowledge about types of PPE. However, child labor knowledge improved after implementation the program. There were highly statistically significant differences ($P < 0.001$) between pre and post program implementation. On the contrary **Akbar-Khanzazdeh et al., (2015)**, showed that the child labor were wearing safety measures with comfort in average range ; 52% aprons, 51% safety glasses, 42% rubber gloves, and 36% hearing protectors

As regarding the child labor satisfactory level of knowledge pre and post program regarding occupational hazards at workplace; This finding figured out that there was an improvement of child knowledge regarding occupational hazards after implementing the program with statistically significant differences p value $P < 0.001$ (**Table 7**). This result consisting with **Shafik & Mohamed, (2016)** who revealed that concerning child labors' knowledge, relatively high percentages of the studied children had poor knowledge about, types of occupational diseases. However, child labor knowledge improved after implementation the program. There were highly statistically significant differences ($P < 0.001$) between pre and post program implementation. Also This result agreed with **Schlick et al., (2014)** who revealed that increasing the children's knowledge of occupational hazards and by providing safety training as well as skill building programs prevent children from occupational injuries.

Concerning to the child labor Satisfactory level of knowledge pre and post program regarding First Aid; the present findings pointed out that there was an improvement of child regarding their knowledge after implementing the program with statistically significant differences with $P < 0.001$ (**Table 8**). This result on the same line with **Banfai; et al., (2017)** who asserted that almost all of the children the theoretical knowledge after training and at 4 months was significantly higher than pre-test. The proportion improved immediately after the course and remained high at 4 months. This study incompatible with **Varsha.S.Shinde; et al., (2015)** who reported that, Pretest knowledge about first aid services was average among (67.7%), good (29.7%), and best among (2.5%). It was observed that there was statistically significant difference.

In Concern to the child labors' practices regarding PPE and Waste disposal pre and post program, the present study demonstrated that more than two third of total sample of study had satisfactory practices post program compared with pre program with statistically significant differences (**Table 9**). This study in agreement with **Jessy Z'gambo, (2015)** in Lusaka, Zambia who reported that education was positively associated with awareness of both hazards and PPE as well as with the use of PPE.

According to the child labor practices regarding dealing with injuries and First Aid pre and post program; The current study indicated that there was an improvement of child practices regarding dealing with injuries and First Aid after implementing the program with highly statistically significant differences ($P < 0.001$) (**Table 10**). This study compatible with **Banfai; et al. (2017)** who reported that, in almost of the practical' first aids skills the ability immediately after training and at 4 months was significantly higher than pre-test.

In relation to the workplace environment in the institutional workshop According to Checklist (OHSAS Checklist Parameters) The present study result detected that 66.7% of institution' workplace environment having good applicable of ventilation and sufficient lighting and 100.0% medical clinic inside the institution and first aid supplies (**Table 11**). This study consisting with **Shafik & Mohamed, (2016)** who demonstrated that the ventilation, light, and periodic medical examination inside the factories were not available which may be explained by lack of safe working environment and no application the Occupational Health and Safety Assessment Series (OHSAS). As well, **Rosenstock; et al., (2015)** who mentioned that the ventilation is a central component of hazard.

In concern to the safety measure, periodic workers training 100.0% had poor applicable for presence of safety measure, periodic workers training on occupational safety, first aid training procedures and personal protective equipment (PPE) (**Table 11**). This study consisting with **Shafik & Mohamed, (2016)** who argued that the workers did not have periodic training about the occupational safety.

The current study reveals that there was statistically significant differences between children total knowledge and practices pretest and posttest Regarding total knowledge 83.7% from total sample was Unsatisfied and 16.3% was Satisfied pretest compared by 95% was Satisfied and 4.3% was Unsatisfied post test. Regarding total practices 89.1% from total sample not done correctly and 10.9%, correctly done pretest compared by 14.1% not done correctly and 85.9%

done correctly posttest with statistically significant differences (**Table 20**). This study consisting with **Wafik & Tork, (2014)**, who elaborated that the situational practice also demonstrated significant improvements after the intervention. In fact, none of the participants in the pre-intervention phase had reported correct first-aid management, compared to almost all of them giving correct responses after the intervention. In addition, this study consisting with **Absar, (2015)** who demonstrated that the study assessed the knowledge of children regarding first aid and safety measures, the children had inadequate knowledge regarding first aid safety measures. After reading Self-Instructional Module, there was a significant improvement in children knowledge regarding first aid and safety measures.

As regard to Correlation between child labors' Total Knowledge and their Practices pre and post test. The current study reflected that there was a positive correlation highly statistically significant between child labors' total knowledge and total practices pre and posttest with ($P < 0.001$) (**Table13**). This study compatible with **Banfai; et al, (2017)** who reported that, prior to training there was a low level of knowledge and skills on BLS and management of bleeding. Knowledge and skills improved significantly in all of these categories ($p < 0.01$) and remained significantly higher than the pre-test level at 4 months after training ($p < 0.01$).

5. CONCLUSION

According to the findings and research hypothesis, the occupational health program had improved the child labor knowledge and practices regarding safety measures and first aid with statistically significant improvement before and after implementation of the occupational health program regarding their knowledge and practice. Therefore, these results highlight a situation of considerable concern for the health and safety of working children.

6. RECOMMENDATIONS

The findings of this study recommend the needs for:

- Periodic checkup of health status for children early detection of occupational hazards and vigilant identification of occupational health injuries and diseases in order to provide the right treatment and counseling on prevention and control to monitor their health status physically and psychologically.
- Organize Periodic health education and training program for all to child labor about safe and secured work environment with appropriate safety measures and injuries prevention practices and first aid measures.

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