

## Effect of Empowerment Program on Parents' Self-Competence regarding Caring for their Children with Eye Injuries

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### Abstract

Eye injury is referring to destruction caused by a direct blow to the eye and the surrounding area including adjacent tissue and bony part. It also indicates to any injury to the eye which may be caused by mechanical trauma, chemical agents, or radiation. **The aim** of the current study was to evaluate the effect of empowerment program on parents' self-competence regarding caring for their children with eye injury. **Research design:** A quasi-experimental research design (pre-, post- and 3 months after empowerment program) was used to conduct the current study. **Settings:** The study was conducted in inpatient and outpatient departments at Specialized Ophthalmology Center affiliated to Benha University Hospital and Ophthalmology Hospital affiliated to Ministry of Health and population. **Sample:** a purposive sample of seventy-four parents accompanying their children with eye injuries who attended the previously mentioned study settings. **Tools of data collection:** Four tools were used for data collection; tool (1): A structured interviewing questionnaire sheet to assess parents' knowledge about eye injuries. **Tool (2):** parents' reported practice checklists to assess parents' reported practice regarding eye injuries. **Tool (3):** Parenting Sense of Competency Scale to assess parents' level of competency regarding care of their children with eye injuries, and **tool (4):** child medical data sheet. **Results:** Parents' knowledge, reported practice and self-competence regarding eye injuries was unsatisfactory on pre-empowerment program, while there is a significant statistical difference pre- and post-empowerment program implementation. **Conclusion:** There is an improvement in parents' knowledge, reported practice and self-competence post-empowerment program implementation regarding management of children with eye injuries. **Recommendation:** Establishment of continuous education and training programs for caregivers regarding management of children with eye injury to improve their sense of competency regarding care of their children.

**Key words:** Parents' Self-Competence, Empowerment Program, and Eye injuries

### Introduction:

Eye injury is one of the most common causes of visual disability and acquired blindness in children. It also had a negative effect on the psychological, social, and emotional development of children. Simultaneously, parents are also anxious regarding quality of their children life. Eye injury is more widespread in developing countries more than in developed countries. Eye injuries for pediatric population contract special attention for numerous reasons because children are functioning and more prone to a lot of accidents. A lot of children do not identify dangerous situations which will provoke eye injuries. In greatest cases, injuries can be avoided by taking minor precautions and identification of risk factors for eye injury and visual impairment (*Madan et al., 2020*).

Eye injuries can cause many dissimilar symptoms such as corneal abrasions eye pain, sensitivity to light (photophobia), increase secretions of tears, blurred or one-sided vision, squinting, feeling that something can't be removed from the eye. Symptoms can be exacerbated by exposure to light, flashing, and squeezing the injured surface against the inner part of the eyelid (*Kuhn & Pieramici, 2018*). Foreign bodies symptoms may include discomfort sensation in the eye, increase tears secretions, eye pain, blurred or duple vision, hypersensitivity to light, a visible foreign body on the cornea. In case of exposure of the eye to chemical substances; the child may experience eye pain, eye redness, difficulties for keeping the affected eyes open, swelling of the eyelid, and blurred vision (*Bučan et al., 2017*).

Pediatric eye trauma can be avoided through increasing awareness regarding eye injury among parents with certain emphasis on dangerous points surrounded by domestic environment especially sharp objects like scissors, knives, and needles. Additionally emphasizing the importance of wearing safety glasses during sports. Moreover, public health campaigns designed for parents, caregivers, teachers and children for promoting perception of eye safety would significantly reduce risky behavior for those children (*Tijani et al., 2020*).

The nurses have a vital role as an educator and consultant, in educating public services and professions in addition to in providing health education in society. Also, they have essential role in health promotion and eye injury prevention through health education to the children and their parents about dangers that increase the incidence of eye injury through teaching the child and their parents. Additionally, they teach the child the proper safety rules in the home as sidestepping electric outlets, use of bicycle head covering while riding and circled toys to avoid eye injuries. The nurse also has a significant role in giving information and teaching the parents regarding eye care such as eye drops instillation and ointment administration, hot and cold compresses, and eye irrigation (*Mutie & Mwangi, 2019*).

Parents play a key role in the way children with eye injuries come to understand and handle with their undesired variation. They have their own particular set of anxieties regarding care delivery, maintaining health for their eye injured children, and ensuring the well-being of the caregivers and family unit. Challenging is greatest to care for these children in the home settings. So, being a mother or father is considered the most significant role in life. Parents' perceptions of their abilities to manage the demands of parenting and the parenting skills they possess are reflected by perceived parental sense of competence level (*O' Toole et al., 2015*).

### Significance of the study:

Eye injury is a major public health problem in the world. It is the leading cause of acquired unioocular blindness and is a main

cause of significant morbidity. Pediatric eye injury is different from those in adults. It is accidental and has an age specific pattern. Worldwide, as many as six million children annually suffer from eye injury, with equal to a quarter of a million children requiring hospitalization (*Barry et al., 2019*). Pediatric eye injuries forms about 20–50% and 8-14 % of total injuries in children. There are 3.3–5.7 million annual eye injuries in children under 15 years of age. Eye trauma accounts for 7% of all bodily injuries and 10%-15% of all eye diseases (*Al-Mahmoud et al., 2020*). However, about 90% of eye injuries can be prevented by simple methods (*Surkont et al., 2018*).

Pediatric populations are predisposed to complications than adults after care of eye injuries, leading to substantial reduction in visual acuity. The most frequent causes of loss of visual acuity are amblyopia, complexity in follow-up examinations, and the outcome of puncturing ocular injury. There are many factors which contribute to loss of visual acuity after ocular trauma, it includes young age children during injury, poor primary visual acuity, posterior location of injury, wound size, lens of the eye involvement, vitric hemorrhage, retinal detachment, and endophthalmitis (*Cohen et al., 2021*).

### Aim of the study:

The aim of this study was to evaluate the effect of empowerment program on parents' self-competence regarding caring for their children with eye injuries through:

- Assessing parents' knowledge, reported practice and self-competence regarding eye injuries.
- Designing and implementing empowerment program based on parents' actual needs assessment about eye injuries
- Evaluating the effect of implemented empowerment program on parents' knowledge, reported practice and self-competence regarding care of children with eye injuries.

### Research Hypotheses:

- The empowerment program will improve parents' knowledge, reported practice and

self-competence regarding care of children with eye injuries.

- There are significant positive correlations between total parents' competency level, total knowledge and their total reported practices regarding eye injury of their children pre-, post- and after 3 months of empowerment program implementation.

### Operational definitions:

#### Empowerment:

Empowerment is an intervention and educational model that helps parents and caregivers to feel the desired changes.

#### Eye injury:

Refers to any injury to the eye that may be due to blunt or penetrating trauma, chemical substance, or radiation.

### Subjects and Method

**Research Design:** A quasi-experimental research design was used to conduct this study (pre-, post- and 3 months after empowerment program implementation).

#### Settings:

The study was conducted in inpatient and outpatient departments at Specialized Ophthalmology Center affiliated to Benha University Hospital and Ophthalmology Hospital affiliated to Ministry of Health and population.

#### Sampling:

A purposive sample of 74 parents accompanying their children with eye injuries who attended the previously mentioned study settings through two shifts (morning and, afternoon shifts) for a period of six months. They were taken according to the following inclusion criteria for children:

- From both genders.
- Ages ranged from birth to 15 years.
- Definite diagnosis with eye injury.
- Free from any other previous eye diseases.

#### Tools of data collection:

Four tools were used to collect data of the current study.

### Tool I: A Structured Interviewing Questionnaire Sheet:

It was developed in an Arabic language to assess the actual parents' knowledge regarding eye injury. Each mother/father was interviewed exclusively for filling the knowledge questionnaire sheet. It composed of two main parts which are:

**Part 1:** Personal characteristic of the studied parents as; age, consanguinity, level of education, occupation, residence, and attendance of training courses regarding eye injury.

**Part 2:** Parents' knowledge regarding eye injury, which consisted of multiple-choice questions (12 questions) and open-ended questions (1 question) covering the questions related to; definition, causes, risk factors, types, signs and symptoms, dangerous signs, complications, prognosis, prevention of occurrence of disease, prevention of potential complications of the disease, warning signs and nursing management. The scoring system consisted of giving score (1) for the correct answer and (0) for the incorrect answer. The total questions composed of (13 questions).

#### The scoring system for knowledge classified as follows:

- Good knowledge level: Equal to or more than 60%
- Poor knowledge level: Less than 60%

### Tool (II): Parents' reported practices Checklists:

It was adapted from *Lippincott, (2018), and Hong, and Song (2018)* and modified by the researchers to assess the parents' reported practices regarding care of children with eye injury concerning general observations (5 steps), eye care (6 steps), application of hot compresses (10 steps), cold compresses (7 steps), eye drops instillations (14 steps), eye ointment administration (12 steps), eye irrigation (12 steps) meeting psychological needs for children and their families (6 steps) and home care (3 steps). Score (1) was given to a correctly done step. Score (0) was given to

incorrectly done or not done step. The total steps included 75 steps.

### **The scoring system for reported practice checklists:**

Total scores were ranged from (0-75). Accordingly, parents' reported practices were classified as the following:

- Incompetent practice level: Less than 60% which ranged from (0 - 44) steps.
- Competent practice level: Equal to or more than 60% which ranged from (45-75) steps.

### **Tool (III): Parenting Sense of Competency Scale (PSOC):**

It was adopted from *Gibaud-Wallston and Wandersman, (1978)*. It is used to assess parents' sense of competency regarding caring for their children with eye injury. The PSOC is a 17 items scale, with 2 subscales (self-efficacy subscale and satisfaction subscale). Regarding self-efficacy subscale, it included 8 items (1, 6, 7, 10, 11, 13, 15, and 17), each item is rated on a 6-point Likert scale ranged from (1) for strongly disagree, and (6) for strongly agree. Regarding satisfaction subscale it is reverse coded, it includes nine (9) items (2, 3, 4, 5, 8, 9, 12, 14, and 16). Reverse coded indicates that a high score on the parent item is not indicative of having a sense of competency; the item expressed negatively, and each item also, is rated on a 6-point Likert scale ranged from (1) for strongly agree, and (6) for strongly disagree.

#### **Scoring System:**

The score for each item can be recorded in the right-hand side of the PSOC scale once completed. Regarding scoring of self-efficacy subscale, these 8 items, 1, 6, 7, 10, 11, 13, 15, and 17 only write the number the participant indicated as their choice where, strongly disagree (1), somewhat disagree (2), disagree (3), agree (4), somewhat agree (5), and strongly agree (6). Total scoring for self-efficacy subscale was (8 - 48). Reverse coding for satisfaction subscale (the remaining 9 items 2, 3, 4, 5, 8, 9, 12, 14, and 16), replace the following numbers and record in right hand side for totaling: strongly disagree (6), somewhat disagree (5), disagree (4), agree (3), somewhat agree (2), and strongly agree (1). Total scoring for these 9 reverse items (9-54).

The overall items of parents' competence level were ranged from (1-102). The parents' competency level was categorized as the following:

- Low competency level (< 60%) was ranged from (17- 61) items.
- Moderate competency level (60 % to < 75%) was ranged from (62 - 76) items.
- High competency level ( $\geq 75$  %) was ranged from (77-102) items.

### **Tool (IV): Child Medical Data Sheet:**

It developed by the researchers and consisted of two parts as the follow.

#### **Part 1:**

- Personal characteristics of studied children, it included age, gender, child rank and school stage.

#### **Part 2:**

- Medical history of children with eye injury, it includes medical diagnosis, previous eye trauma, Signs and Symptoms of eye injury, frequency of eye trauma complications occur as a result of eye trauma.

### **Operational Design:**

#### **Preparatory phase:**

#### **Tool validity and reliability:**

Validity and reliability assisted the researchers to be aware with the research problem and directed them in designing the tools for data collection. To measure content validity of data collection tools, the researchers assure that items of these tools were sufficiently represent what are hypothetical to be measured by three experts including one professor of pediatric nursing and and one assistant professors of pediatric nursing from the Faculty of Nursing Benha University, and one professor of ophthalmology from Benha Faculty of Medicine to assess the content validity. Modifications were done according to the jury committee opinions regarding clarity of sentences, appropriateness of contents and sequence of items. The experts' agreed on the contents but recommended re-phrasing of some items that would make the items clearer and more accurate. Internal consistency reliability of all items of data collection tools was evaluated using coefficient alpha. It was 0.89 for structured interviewed questionnaire sheet,

0.87 for parents' reported practices checklists and 0.82 for Parenting Sense of Competency Scale (PSOC). These specify a high degree of reliability for the study data collection tools.

### **Ethical Considerations and Human Rights:**

Authorized permissions to carry out the study were obtained from the managers of the previously mentioned study settings. The contribution in the study was voluntary; each studied father/mother was knowledgeable about nature of the study, the purpose, procedures, outcomes, and all information has taken was protected. Each nurse had the right to withdraw from the study at any time without any rationale, and then oral consent was obtained from them. Subjects were informed that obtained data for the research purposes only.

### **Pilot Study:**

A pilot study was carried out for 10% of studied parents accompanying their eye injured children (7 parents and 7 children) to assess possibility of the research process, simplicity, impartiality, applicability and time needed for the data collection tools. Consequently, the required modifications were done in the form of addition or exclusion of some questions. The pilot study subjects were excluded from the real study sample. This phase was carried during May 2020.

### **Field work:**

The definite field work was accomplished from the beginning of July 2020 to the end of March 2021 covering a prolonged period of 9 months to collect data. The researchers were presented three days each week (Saturday, Monday, and Tuesday) in the morning and afternoon shifts. The numbers of father/mother who were assessed and getting the empowerment program each week were ranged from 8-12. The structured interviewing questionnaire sheet (tool I) reported practice checklist (tool II) and parent self-competency scale (tool III) was completed by the studied parents by researchers' assistance. Additionally, child medical data record (tool IV) was filled by the researchers during data collection time. The average times required for accomplishment of each tool was around 25-40 minutes.

### **Procedure:**

#### **Preparation phase:**

It was involved with developing and testing numerous data collection tools, additionally, the administrative procedures to carry out the study other than to conduct the pilot study. Firstly, the researchers introduce themselves to the studied father/mother. Father/mother who agree to contribute to the study interviewed independently by the researchers to explain the character, purposes, and the expected outcomes of the study and an oral agreement was attained from these parents.

#### **Implementing phase:**

At the beginning of the empowerment program sessions, parents were informed about the time and location for implementation of sessions. All sessions were conducted at a separate room at inpatient ophthalmology unit at the previously mentioned study settings. The studied parents were divided into 11 groups, each group consisted of 6-7 mother/ father, the empowerment program was implemented in six sessions for each group and carried by the researchers and distributed as the following: (2) sessions for theoretical part, and (4) sessions for practical part, each session take from 30-45 minutes. Each session started with a conclusion of the previous session and objectives of the new session utilizing simplified Arabic language which matches parents' educational level. Enthusiasm and support during sessions were used to enhance motivation for contribution in the current study. Three sessions were given each day and all the sessions were repeated to each group. Numerous teaching strategies were used for application of the empowerment program such as lectures, brain storming, small group discussion, role playing, demonstration and re-demonstration by utilizing real items. Appropriate teaching aids as simple booklet, colored posters, and videos.

The first theoretical session includes definition of eye injuries, causes, risk factors, types, signs and symptoms, dangerous signs, complications, prognosis, and prevention of occurrence of disease. The second theoretical session includes prevention of potential complications of the disease, warning signs and nursing management. The first practical session of practical part concerned with demonstrating steps of general observations and eye care, and the second session includes applying steps of hot

compresses and cold compresses, the third session contain eye drops instillations and ointment administration, while, fourth session included eye irrigation, meeting psychological needs for children and their families and home care.

#### Evaluation:

After accomplishment of the empowerment program, the post test was done for the studied parents to assess their knowledge, reported practices and their level of competency regarding care of their children suffering from eye injuries by using the same data collection tools after 1 month (post-test) and after 3 months of program implementation during children's follow-up at out-patient clinics at previously mentioned study settings.

#### Administrative design

An official permission for data collection was obtained from the hospital managers and head of ophthalmology unit at previously mentioned study settings through submission of official letters issued from the dean of Benha faculty of nursing. The title, goals, and the supposed outcomes of the study were explained in addition to the main data items to be included, and the study was carried out after gaining the required permissions.

#### Statistical design

The collected data were reviewed, coordinated, organized, tabulated and analyzed by utilizing SPSS (Statistical Package for the social Science Software) statistical package version 24 on IBM compatible computer. Numerical data (Quantitative data) was described in tables by using Mean and Standard deviation ( $X \pm SD$ ) and analyzed by using t-test for ordinarily distributed variables, while qualitative data were stated as frequency and percentage and chi-square was used. Moreover, other statistical tests such as independent t test, which used as a parametric test of significance for comparison between two samples means. Pearson correlation ( $r$ ) was used to measure the correlation between quantitative variables. A statistically significant difference was considered  $P < 0.05$ . A highly statistically significant difference was considered if  $p$ -value  $P < 0.001$  and no statistically significant difference was considered if  $p$ -value  $P > 0.05$ .

#### Results:

**Table (1):** This table explains personal characteristics of the studied parents, were more than half of them (62.2%) their age ranges

between 30 to less than 40 years with the mean age  $34.64 \pm 4.42$  years. The vast majority of them are mothers (91.9%) and slightly more than half intermediate education. Additionally, slightly more than two thirds of them have no occupation, while the majority of them constitute rural areas, and no one of them attending training courses regarding care of children with eye injuries.

**Table (2):** This table shows percentage distribution of the studied parents' knowledge regarding eye injuries for their children pre- post-, and after 3 months of empowerment program implementation. It simplifies highly statistically significant improvement of parents' knowledge post- empowerment program implementation ( $p$  values are 0.000\*\*). Also, there is no statistical significance improvement between post program and after 3 months.

**Figure (1):** This figure describes distribution of total level of parents' knowledge regarding eye injury pre-, post-, and after 3 months of the empowerment program implementation, it clarifies that 87.3% of the studied parents had unsatisfactory knowledge pre-empowerment program implementation. In contrast, 86.3% and 75.7% of them had satisfactory total level of knowledge post- program and after three months of empowerment program implementation respectively.

**Table (3):** This table reveals percentage distribution of the studied parents' reported practices regarding care of children with eye injuries pre-, post-, and after 3 months of empowerment program implementation. It discovers that, there is highly statistical significance improvement of parents' self-reported practice post empowerment program implementation ( $p$  values are 0.000\*\*). Meanwhile, there is no statistical significance between post program and after 3 months.

**Figure (2):** This figure designates distribution of total level of parents' reported practices regarding eye injury pre-, post-, and after 3 months of empowerment program implementation, it explains that 88.4% of the studied parents had incompetent reported practices pre-empowerment program. On the other hand, 84.8% and 76.1% of them had competent reported practice post- program and after three months of empowerment program implementation respectively.

**Table (4):** This table shows percentage distribution of the studied parents' total level of

sense of competency regarding eye injuries pre-, post-, and after 3 months of empowerment program implementation, it shows that there was a highly statistically significant enhancement in the total parents' competency level post empowerment program implementation. Additionally, there is no statistical significance improvement between post program and after 3 months.

**Table (5):** This table describes correlation between total parents' knowledge, total reported practices, and their total competency level regarding eye injury of their children pre-, post- and after 3 months of empowerment program implementation, there was a statistically significant positive correlation between total parents' competency level and their total knowledge pre, post- and after 3 months of empowerment program implementation. Furthermore, this table showed that there was a statistically significant positive correlation between total parents' competency level and their total reported practices (P-value= 0.00).

**Table (6):** This table refines the personal characteristics of the studied children, where the

mean age of them was  $5.43 \pm 2.63$  years. As regards the gender of studied children, this table demonstrates that 56.8% of them are males. Regarding child rank, more than half of them (51.3%) of children are the third in order. Concerning child's school phase, this table indicates that 52.7% of them are in primary school.

**Table (7):** This table explains distribution of the studied children according to their medical history and health status, which slightly more than one third of studied children (33.8%) were diagnosed with canalicular laceration, 62.2% of them have previous eye trauma, in which 54.3% of them have previous trauma from foreign bodies. the majority of studied children (89.2%, 83.8% & 81.1%) had eye bruising, distorted vision and swelling of the eye respectively as symptoms of eye injury. Additionally, 62.2% of studied children had no complications compared to 37.8% of them had complications after eye trauma, 57.1% of children who had complications after eye trauma had impaired vision.

**Table (1):** Number and percentage distribution of the studied parents according to their personal characteristics (n=74)

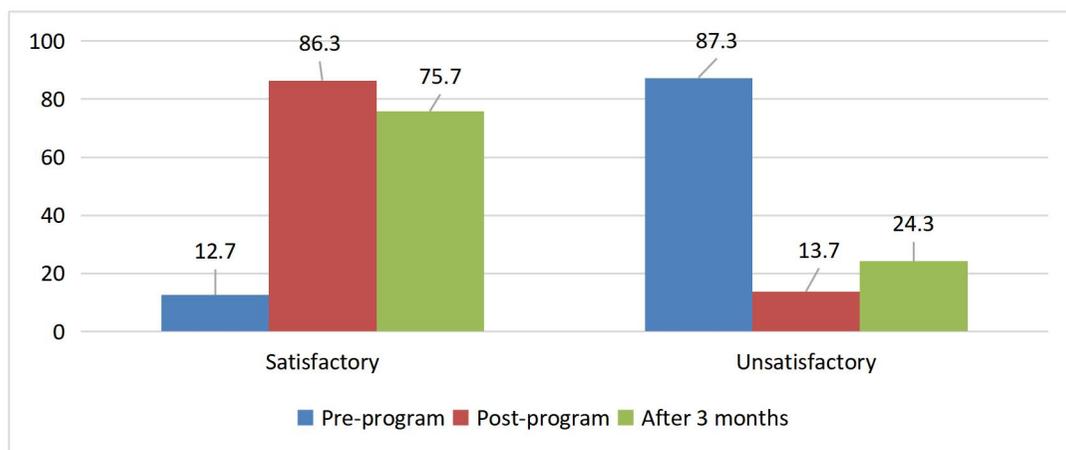
Personal characteristics	Study sample N=74	
	No	%
<b>Age in years</b>		
- 20 - < 30	6	8.1
- 30 - < 40	46	62.2
- $\geq 40$	22	29.7
<b>X <math>\pm</math>SD: 34.64 <math>\pm</math> 4.42</b>		
<b>Consanguinity:</b>		
- Father	6	8.1
- Mother	68	91.9
<b>Educational level</b>		
- Illiteracy	2	2.7
- Read and write	4	5.4
- Basic education	17	23.0
- Intermediate education	38	51.3
- University education	13	17.6
<b>Occupation</b>		
- Yes	23	31.1
- No	51	68.9
<b>Residence</b>		
- Rural	62	83.8
- Urban	12	16.2
<b>Attendance of previous training courses regarding eye injury</b>		
- Yes	0	00.0
- No	74	100.0

**Table (2):** Percentage distribution of the studied parents' knowledge regarding eye injuries pre-, post-, and after 3 months of empowerment program implementation (n=74)

Items	Pre-program implementation (74)				Post-program implementation (74)				After 3 months of program implementation (74)				X <sup>2</sup> 1	P value	X <sup>2</sup> 2	P-value
	Correct		Incorrect		Correct		Incorrect		Correct		Incorrect					
	No	%	No	%	No	%	No	%	No	%	No	%				
- Definition	18	24.3	56	75.7	66	89.2	8	10.8	63	85.1	11	14.9	32.45	0.000**	3.05	0.16
- Causes	20	27.0	54	73.0	63	85.1	11	14.9	60	81.1	14	18.9	26.43	0.000**	2.13	0.23
- Risk factors	8	10.8	66	89.2	54	73.0	20	27.0	50	67.6	24	32.4	22.36	0.000**	2.31	0.13
- Types	12	16.2	62	83.8	66	89.2	8	10.8	54	73.0	20	27.0	14.23	0.000**	1.27	0.12
- Signs and symptoms	15	20.3	59	79.7	59	79.7	15	20.3	57	77.0	17	23.0	23.23	0.000**	2.02	0.22
- Dangerous signs	11	14.9	63	85.1	60	81.1	14	18.9	57	77.0	17	23.0	22.15	0.000**	2.25	0.04
- Complications	12	16.2	62	83.8	57	77.0	17	23.0	54	73.0	20	27.0	39.64	0.000**	3.04	0.14
- Prognosis	17	23.0	57	77.0	66	89.2	8	10.8	63	85.1	11	14.9	40.65	0.000**	3.15	0.11
- Prevention of occurrence of disease	12	16.2	62	83.8	60	81.1	14	18.9	57	77.0	17	23.0	12.35	0.000**	1.16	0.14
- Prevention of potential complications	14	18.9	60	81.1	57	77.0	17	23.0	54	73.0	20	27.0	18.24	0.000**	1.24	0.11
- Warning signs	8	10.8	66	89.2	59	79.7	15	20.3	50	67.6	24	32.4	12.63	0.000**	1.22	0.17
- Nursing management	11	14.9	63	85.1	60	81.1	14	18.9	57	77.0	17	23.0	20.21	0.000**	0.81	0.19

X<sup>2</sup>1 Difference between pre-test and post-testX<sup>2</sup>2 Difference between post-test and follow-up test.

\*\* Highly statistically significant at p&lt;0.001



**Figure (1):** Distribution of total level of parents' knowledge regarding eye injury pre-, post-, and after 3 months of empowerment program implementation (74)

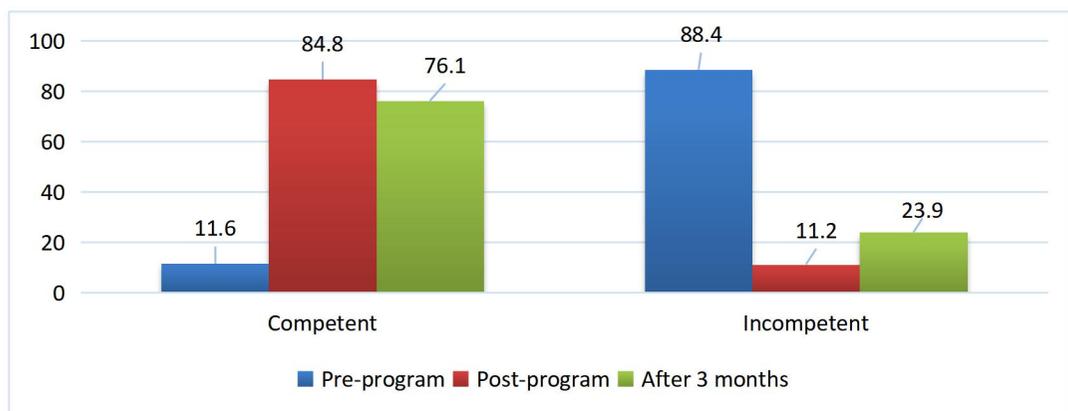
**Table (3):** Percentage distribution of the studied parents' reported practice regarding care of children with eye injuries pre-, post- and after 3 months of empowerment program implementation (n=74)

Items	Pre-program implementation (74)				Post-program implementation (74)				After 3 months of program implementation (74)				X <sup>2</sup> 1	P value	X <sup>2</sup> 2	P-value
	Correct		Incorrect		Correct		Incorrect		Correct		Incorrect					
	No	%	No	%	No	%	No	%	No	%	No	%				
- General observations	20	27.0	54	73.0	54	73.0	20	27.0	50	67.6	24	32.4	18.24	0.000**	3.15	0.11
- Eye care	8	10.8	66	89.2	63	85.1	11	14.9	60	81.1	14	18.9	22.13	0.000**	1.16	0.14
- Hot compresses	14	18.9	60	81.1	59	79.7	15	20.3	50	67.6	24	32.4	12.36	0.000**	1.24	0.11
- Cold compresses	12	16.2	62	83.8	66	89.2	8	10.8	63	85.1	11	14.9	14.66	0.000**	1.22	0.13
- Eye drops instillations	15	20.3	59	79.7	59	79.7	15	20.3	57	77.0	17	23.0	20.13	0.000**	0.81	0.19
- Eye ointment administration	11	14.9	63	85.1	60	81.1	14	18.9	57	77.0	17	23.0	22.35	0.000**	3.15	0.21
- Eye irrigation	8	10.8	66	89.2	57	77.0	17	23.0	54	73.0	20	27.0	19.04	0.000**	3.05	0.16
- Psychological needs	17	23.0	57	77.0	66	89.2	8	10.8	63	85.1	11	14.9	19.65	0.000**	2.13	0.43
- Home care	12	16.2	62	83.8	60	81.1	14	18.9	54	73.0	20	27.0	12.35	0.000**	2.31	0.13

X<sup>2</sup>1 Difference between pre-test and post-test

\*\* Highly statistically significant at p<0.001

X<sup>2</sup>2 Difference between post-test and follow-up test.



**Figure (2):** Distribution of total level of parents' reported practice regarding eye injury pre-, post-, and after 3 months of empowerment program implementation (74).

**Table (4):** Percentage distribution of the studied parents' total level of sense of competency regarding eye injuries pre-, post- after 3 months of empowerment program implementation (n=74)

Items	Pre-program implementation (74)		Post-program implementation (74)		After 3 months of program implementation (74)		X <sup>2</sup> 1	P value	X <sup>2</sup> 2	P-value
	No	%	No	%	No	%				
- Low competency level	55	74.3	4	5.4	8	10.8	13.64	0.000**	1.06	0.18
- Moderate competency level	11	14.9	10	13.5	12	16.2	12.43	0.000**	1.64	0.13
- High competency level	8	10.8	60	81.1	54	73.0	13.08	0.000**	1.64	0.16

X<sup>2</sup>1 Difference between pre-test and post-test

\*\* Highly statistically significant at p<0.001

X<sup>2</sup>2 Difference between post-test and follow-up test.

**Table (5):** Correlation between total parents' knowledge, total reported practices, and their total competency level regarding eye injury of their children pre-, post- and after 3 months of empowerment program implementation (n=74)

Items	Total competency level					
	Pre-program implementation (74)		Post-program implementation (74)		After 3 months of program implementation (74)	
	r	P- value	r	P- value	r	P- value
- Total knowledge	0.21	0.00**	0.87	0.00**	0.81	0.00**
- Total reported practices	0.39	0.00**	0.19	0.00**	0.17	0.00**

**Table 6:** Distribution of the studied children regarding their personal characteristics (n: 74)

Characteristics of studied children	No (N=74)	% (100.0)
<b>Age /years:</b>		
- < 1 year	4	5.4
- 1- < 5	18	24.3
- 5- < 10	42	56.8
- 10- <15	10	13.5
<b>± SD</b>	<b>5.43±2.63years</b>	
<b>Gender:</b>		
- Male	42	56.8
- Female	32	43.2
<b>Child rank:</b>		
- The first	6	8.1
- The second	17	23.0
- The third	38	51.3
- The fourth & more	13	17.6
<b>School Phase:</b>		
- Did not enroll	4	5.4
- Nursery school	21	28.4
- Primary school	39	52.7
- Preparatory school	10	13.5

**Table 7:** Distribution of the studied children according to their medical data (n: 74)

Medical data items	No (N=74)	% (100.0)
<b>Medical diagnosis</b>		
- Canalicular laceration	25	33.8
- Foreign body laceration	16	21.6
- Subconjunctival hemorrhage	14	18.9
- Corneal abrasion	9	12.2
- Globe eye rupture	10	13.5
<b>Previous eye trauma</b>		
- Yes	46	62.2
- No	28	37.8
<b>If yes, type of eye trauma (n=46)</b>		
- Foreign body	25	54.3
- Eye lid laceration	12	26.1
- Contusion	9	19.6
<b>Frequency of eye trauma (n=46)</b>		
- Once	42	91.3
- Twice or more	4	8.7
<b>Signs and Symptoms of eye injury (Results not equally limited)</b>		
- Bleeding	46	62.2
- Feeling of a unfamiliar subject in the eye	50	67.6
- Redness of the eye	55	74.3
- Eye bruising	66	89.2
- Swelling of the eye	60	81.1
- Cut out of the eyelid	39	52.7
- Distorted vision	62	83.8
<b>Occurrence of complications after trauma</b>		
- Yes	28	37.8
- No	46	62.2
<b>If yes, the complications are (n=28)</b>		
- Impaired vision	16	57.1
- Infection	10	35.7
- Eye bleeding	2	7.2

**Discussion:**

As regards to the studied parents' personal characteristics, the total number of the studied parents was 74 (68 mothers and 6 fathers). The current study showed that, more than half of the studied parents were between 30 and less than 40 years with the mean age  $34.64 \pm 4.42$  years. This result was disagreed with *Motaharian et al., (2015)* in a study about " Investigating the relationship between coping strategies and quality of life among the principal caregivers of children with Hemophilia" and found that 55.1% of the caregivers were older than 40 years. This result also, is contradictory with *Baashar et al., (2020)* in a study about "Parents' knowledge and practices about child eye health care in Saudi Arabia" and who noticed that majority of the parents belonged to the age group between 21 and 30 years old. Additionally, this result in dissimilar with *Sebaq and Deraz, (2021)* in a study titled "Improve caregivers' competency level regarding care of children suffering from hemophilia: an educational program" who found that 60% of the studied mothers were more than 40 years, with mean age  $36.5 \pm 5.19$  years.

Concerning of parents' educational level, the present study showed that more than half of them were intermediate education. This result is incongruent with *Sukati et al., (2018)* who conducted a study about "Knowledge and practices of parents about child eye health care in the public sector in Swaziland" and found that more than one third of parents had obtained middle education. Additionally, this finding

disagreed with *Sebaq and Deraz, (2021)* who found that slightly less than two thirds of mothers were illiterate.

Concerning of parents' residence, the result of this study explained that the majority of studied parents lived in rural areas. This study supported by *Kamble et al., (2020)* who conducted a study about "Observation and epidemiology of ocular trauma in children: hospital based study" and found that the majority of mothers lived in rural areas. Furthermore, this result was consistent with the finding of *Alem et al., (2019)* who performed a study about "Profile of ocular trauma in patients presenting to the department of ophthalmology at Hawassa University: Retrospective study" and discovered that more than half of parents stayed in rural areas.

The current study designated that, there is a highly statistically significant difference ( $p < 0.001$ ) in parents' knowledge regarding eye injuries post- empowerment program implementation than pre-program and no statistical significance between post program and after 3 months. This result may be from the researcher point of view that, the most upgrading in parents' knowledge as a result of an effective empowerment program. This result consistent with *Samir et al., (2018)* in study titled "Mothers' knowledge and practices about eye trauma in early childhood at Assiut University Hospital" who found that there was deficiency of mothers' knowledge about eye trauma in early childhood and suggested that health education programs for caregivers regarding management of eye trauma to increase the caregivers' knowledge.

Regarding total knowledge of studied parents about eye injuries pre-empowerment program implementation, this study described that the majority of studied parents had unsatisfactory knowledge pre-empowerment program implementation compared to minority of them post-program. This finding had an arrangement with *Al Mazrou et al., (2020)* who carried out a study about "Do Saudi parents have sufficient awareness of pediatric eye diseases in Riyadh?" and found that there is a shortage of parents' awareness about ordinary pediatric eye diseases and appropriate eye care behaviors. Therefore, educational programs should be aiming for both parents with a concentrating on mothers. this result also congruent with *Abd El-Halem et al., (2022)* in a study about "Effect of designed guidelines for mothers regarding care of their children with ophthalmological trauma" who stated that less than one third of studied mothers had adequate knowledge, but after implementing the designed guidelines, less than three quarters of mothers had adequate knowledge.

As regard total parents' reported practices regarding care of children with eye injury pre-, post-, and 3 months after empowerment program, this study displays that the majority of studied parents had incompetent reported practices pre-empowerment program implementation compared to minority of them post-program. This finding congruent with *Abd El-Halem et al., (2022)*, who reported that more than half of studied mothers had incompetent reported practices, but after implementing the designed guidelines, there was an enhancement in practice of the majority of

mothers/fathers after the designed guidelines. From the researcher point of view, this finding may be due to the positive effect of the empowerment program in enhancing the total level of parents reported practices about eye injury.

The current study finding discovered a statistically significant positive correlation between total parents' competency level and their total knowledge and reported practice pre-, post- and after 3 months of empowerment program implementation. From the researchers' point of view, this describes that improving parents' knowledge would help to develop their competency level and afterward, enhance their practices towards care of their children with eye injuries. This finding was supported with *Shams El Deen et al. (2016)* in a study titled "Effect of an Educational Training on Mothers' Competency Level for Managing the Children with Autism" and who found that there were a significant positive correlation concerning total competency level of care regarding autism with total mother's knowledge, and total practices before, after and 3 months after program implementation.

This finding disagreed with *Habib et al., (2017)* who conducted a study entitled "Knowledge and practices of teachers associated with eye health of primary school children in Rawalpindi, Pakistan" and found that there was a significant gap among primary school teachers' knowledge and practices related to students' eye health. This finding also supported by *Sebaq and Deraz*

(2021) who mentioned that there was a statistically significant positive correlation between total competency level, total mothers' knowledge, and total reported practices pre-program, after 1 month and 3 months of program implementation.

From the researchers' point of view, the slightly drop of parents' knowledge, reported practices and competency scores after 3 months of implementation of the empowerment program than post- program, this should guide the researchers to the importance of continuous regular parents' education and training to maintain satisfactory knowledge and competent practices.

Regarding personal characteristics of studied children, the present study showed that more than half of the studied children were in age between 5 and less than 10 years with a mean age of them was  $5.43 \pm 2.63$  years. This result concurred with *Archambault et al., (2019)* who performed a study about "Pediatric ocular injuries: a 3-years review of patients presenting to an emergency department in Canada" who found that the majority of studied children was in the 5–9 years with a mean age of them was 7.2 years. This result also supported by *Jolly et al., (2018)* who conducted a study about "Eye injuries in children – incidence and outcomes: an observational study at a dedicated children's eye casualty and found that the mean age was 7.51 years.

Similarly, this finding is consistent with *Sii et al., (2018)* in a study about "The UK Pediatric Ocular Trauma Study 2 (POTS2): demographics and mechanisms of injuries"

who found that the mean age of study sample was 7.7 years. Even though this result conflicted with *Tijani et al., (2020)* in a study about " Pediatric ocular trauma: Experience of a tertiary center in morocco" and found that the mean age of studied children was  $9.9 \pm 4$  years. This finding also disagreed *Ghosh & Majumdar, (2020)* in a study about "Pediatric Ocular Trauma in a Tertiary Care Hospital in North Bengal- A Prospective Study" and discovered that the most affected age group was from 1 - 5 years.

As regards gender of studied children, the result of this study showed that more than half of the studied children were males. This result was agreed with *Mancebo et al., (2021)* in a study titled "Ocular trauma in the pediatric emergency departments, characteristics and risk factors of immediate sequelae" and found that less than two thirds of the studied children were males. Also, this result granted with *Cohen et al., (2021)* in a study about "Predictors of traumatic eye injuries at high-risk for ophthalmic complications in children" who noticed that less than two thirds of children were males.

Regarding child rank, the current study showed that more than half of the studied children are the third in order. This result was disputed with *Mohammed et al., (2018)* in a study about "Assessment of mothers' role in care of ophthalmological problems in their children" and noticed that the majority of studied children were ranked as a second child in their family.

Concerning to the studied children's education, this study demonstrated that more than half of the studied children were in primary school. This finding consistent with

**Kamble et al., (2020)** who observed that most of the children were in primary school. This finding also supported with **Khalaf and Elaasar, (2020)** in a study about "Effect of training program on mothers' self-competence regarding caring for their epileptic children", who found that more than two third of studied children had primary school.

Regarding medical diagnosis for studied children, this study revealed that slightly more than one third of the studied children were diagnosed with canalicular laceration. This finding contradictory with **Barry et al., (2019)** who conducted a study about "The UK Pediatric Ocular Trauma Study 3 (POTS3): clinical features and initial management of injuries. Clinical Ophthalmology" who found that less than one third of studied children diagnosed with canalicular injury. This result also disagreed with **Madan et al., (2020)** in a study about "Ocular trauma in pediatric age group at a tertiary eye care center in central Maharashtra, India" who discovered that one case only had lid and canalicular injuries. Also, this result disagreed with **Ratanapakorn et al., (2021)** who carried out a study titled "Predictors for visual outcomes in eye injuries with intraocular foreign body" and found that 2 cases only had canalicular injuries. Furthermore, this finding disagreed with **Al-Mahmoud et al., (2020)** in a study about "Surgical management of pediatric eye injuries" and noticed that the canaliculus injury accounted for only one case.

Regarding occurrence of previous eye trauma, the result of the current study demonstrated that more than half of studied children had previous eye trauma. This result

disagreed with **Yehia et al., (2016)** who carried out a study titled "Epidemiological Features of Pediatric Ocular Trauma in Egypt" and discovered that none of the eye injured children had previous history of ocular trauma. This also conflicted with **Abd El-Halem et al., (2022)** who noticed that less than half of studied children had previous eye trauma. Respecting type of previous eye trauma, the current study showed that more than half of studied children suffered from a foreign body eye trauma. From the researchers' point of view, it may be due to children tendency towards harmful play, outdoor interests, and parents' absence of judgement regarding children contribution in more dangerous activities during playing or displaying to blowing dust, eyelashes, sharp objects, and slice of glass.

Concerning to signs and symptoms of eye injury that occurred for the studied children, these results exposed that the majority of studied children had eye bruising and distorted vision as a symptoms of eye injury. This finding disagreed with **Al-Mahmoud et al., (2020)** who noticed that the eye pain was the most common producing symptom for the injured eye. Additionally, this finding also disagreed with **Mohammed et al., (2018)** who realized that the majority of studied children had pain in their eyes.

As regard occurrence of complications after eye injury, this study revealed that more than half of studied children had no complications after eye injuries. This finding strengthened by **Maurya et al., (2017)** who conducted a study about "Pattern of pediatric ocular trauma in an Eastern Uttar Pradesh" and observed that about two thirds of studied children had good prognoses. Additionally,

this result inconsistent with *Okonkwo & Nkanga, (2020)* who conducted a study about "Prevalence of Ocular Morbidity among Primary School Children in Calabar, Nigeria" who noticed that visual impairment was seen in 8 cases of children. Furthermore, this result conflicted with *Puodžiuvienė et al., (2018)* in a study titled "A five-years retrospective study of the epidemiological characteristics and visual outcomes of pediatric ocular trauma" and discovered that less than one third of children had visual impairment in the same way as a complication. Also, this result disagreed with *Guo et al., (2021)* in a study about "Characteristics of pediatric patients hospitalized for eye trauma in 2007–2015 and factors related to their visual outcomes" and found that the most common complication after eye injury was traumatic cataract in more than half of studied children.

### **Conclusion:**

In light of the study findings, it can be concluded that, the research hypotheses were accepted, the empowerment program was highly efficient and successful method to improve parents' knowledge, reported practice and competency level regarding care of children with eye injuries. Nevertheless, there was statistically significant positive correlation between total parents' knowledge, reported practices and total competency level after implementation of empowerment program.

### **Recommendations**

In the light of the findings of the current study, the following recommendations are suggested:

1. Establishment of continuous education and training programs for caregivers regarding

management of children with eye injury to improve their sense of competency regarding care of their children.

2. Printed comprehensive guidelines and simple booklets regarding management of children with eye injury should be accessible on ophthalmological departments for guiding caregivers' practices.

### **For further studies:**

3. An educational program regarding the providing of immediate and emergency care for children with eye injury at schools and different settings should be performed and directed to the teachers, siblings and others who dealing with these children.
4. Further study can be replicated on other Hospitals using a large sample size to generalize the findings.

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