

## Effect of Postoperative Immobility on Children with Musculoskeletal Injuries

Naglaa Ahmed Abd El-Ghani, Safy Salah Eldin. El-Rafay, Asmaa Naser El-Din Mosbeh  
Pediatric Nursing, Faculty of Nursing - Ain Shams University.

### Abstract

**Background:** Immobility has serious consequences physical, social and psychological for a child. **Aim of the study:** A study aimed to assess the effect of postoperative immobility on children with musculoskeletal injuries. **Design:** A descriptive design was used to conduct this study. **Setting:** the study was conducted at pediatric orthopedic surgical Inpatient and outpatient clinic at children's Hospitals affiliated to Ain Shams Hospital and El-Helal Hospital affiliated to Ministry of Health. **Subjects:** A purposive sample including 80 children exposed to musculoskeletal injuries. **Tools of data collection:** **Part I** structured interview format to assess characteristics and medical history of children. **Part II-1** assessment of physical postoperative immobility. **Part II-2** assessment of psychologically postoperative immobility. **Results:** more than half of the studied sample had physical effect, low self-esteem and severe anxiety. **Conclusion:** The current study concluded that the main cause of musculoskeletal injuries was traumatic injuries. Children stayed in cast for long period, so that the effect of postoperative immobility had negative effects on physical and psychological wellbeing of children with musculoskeletal injuries. **Recommendations:** Emphasize on the importance of implementing nursing care program for children in postoperative period for minimizing the physical and psychological effects of immobility on children with musculoskeletal injuries.

**Key words:** Musculoskeletal injuries, Immobility, Physical, Psychological, Children.

### Introduction

The musculoskeletal system supports the body and provides for movement, the muscular and skeletal system work together to enable a person to sit, stand, walk and remain upright. Muscle move air into and out of the lungs, blood through vessels and food through the digestive tract. Musculoskeletal system also produces heat which aids in numerous body chemical reactions. Red blood cells are produced in the bone marrow and minerals such as calcium and phosphorus are also store there (*Witmer et al., 2018*).

Musculoskeletal injuries are common in pediatric trauma victims and result in extensive surgical intervention and long-term hospitalization. Rapid healing rates in children enhance the prognosis for children with musculoskeletal injuries and may decrease the rate of morbidity from infection and other complication. Musculoskeletal injuries are conditions that involve the nerves, tendons, muscles and supporting structure of the body and compromise their function (*Harrison, 2014*).

The musculoskeletal injuries sustained by children and adolescents have increased markedly. This may reflect an increasing use

of motorized and high-speed wheeled vehicles among this population. It is important to recognize the basic skeletal differences between children and adults; the common signs and symptoms of fractures, sprains, strains, and dislocations; and the initial treatment and stabilization of these injuries in children (*Walter & Glen, 2018*).

Immobility may often be necessary in order to benefit injured or affected acutely parts of the body. However, it is now well established that extensive periods of bed rest can cause harm of the rest of the body. The most obvious effect of prolonged immobilization is seen in musculoskeletal system and includes the loss of muscle strength and endurance and weakens of bone. Immobility not only affected on the ability of move but also impact upon child's ability to independently carry out activities of daily living with resulting reduction in quality of life (*Crist, 2013*).

Immobility characterized by reluctance to try moving or inability to move in with their own physical environment and limit the range of motion, imbalance of coordination, decreased muscle strength, control and mass in advanced stage. The most frequent reason of immobility is due to congenital defect, or acquired musculoskeletal injuries or the therapies such as traction and cast (*Template, 2013*).

Moreover, immobility for long period is affected on each musculoskeletal system, cardiovascular system, respiratory system, gastrointestinal system, genitourinary system, metabolic system and integumentary system (*Maniere, 2012*).

Nurses have an important role in actively preventing complications and promote healing that and psychological support may be crucial in helping the child cope with the changes associated the musculoskeletal injuries. Nursing assessment should on not only the injured part but also

the functioning of other system that may be affected the circulatory, gastrointestinal, renal and musculoskeletal system. Orthopedic postoperative nurse is responsible for the majority of child care following any orthopedic include close supervision and care immediately following surgery, routine daily monitoring and care plan management that helping in decrease length of hospitalization (*Wilson, 2012*).

### **Significant of the study**

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Children who survive their injuries may require continuing care for disabilities that impact their health, their education and livelihoods of their families. Immobility have its effect physically on child wellbeing, functional and metabolic responses can be noted in the most of the body system and each a direct influence on child growth and development. Also, psychosocial wellbeing of child will be affected by immobility such as feeling isolation, helplessness, unwanted and being forgotten especially by peers. Children may understand immobility as a way of punishment for misbehavior. Worldwide, over 957,000 children aged less than 18 years die as result of injuries. In Egypt, count for 25% of total injury among children aged less than 15 years (*WHO, 2017*).

### **Aim of the study**

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The aim of the study to assess the effect of postoperative immobility on children with musculoskeletal injuries.

### **Research Questions:**

1. What is the effect of postoperative immobility on children with musculoskeletal injuries on physical wellbeing?

2. What is effect of postoperative immobility on children with musculoskeletal injuries on psychological wellbeing?

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## **Effect of Postoperative Immobility on Children with Musculoskeletal Injuries**

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### **Subjects and Methods**

This study was aimed to assess the effect of postoperative immobility on physical and psychological wellbeing of children with musculoskeletal injuries.

### **Research Questions**

1. What is the effect of postoperative immobility on children with musculoskeletal injuries on physical wellbeing?

2. What is effect of postoperative immobility on children with musculoskeletal injuries on psychological wellbeing?

**The subjects and methods of the current study are discussed under the following four (4) designs:**

I. Research Design

II. Operational Design

III. Administrative Design

IV. Statistical Design

### **Technical Design:**

Technical design includes; the research design, setting, subjects and tools for data collection.

### **Research Design:**

A descriptive design was used to conduct this study.

### **Study Setting**

This study was conducted in Pediatric Orthopedic Surgical Ward and Outpatient Clinic at children's Hospital affiliated to Ain Shams University and El-Helal Hospital affiliated to Ministry of Health.

### **Subjects**

A purposive sample was 80 children and their caregivers were included in the study. Inclusion criteria:

- 1- Children aged from 6 to 18 years and both sexes.
- 2- Musculoskeletal injuries.
- 3- Immobile.

**Exclusion:** Children who have chronic illness and other physical disabilities.

### **Tools of Data Collection**

Data collected by using two tools:

- 1) **Structured Interview format:** It was designed by the researcher and written in simple Arabic language based on relevant literature review to collect data about the following parts:

**Part 1:** Characteristics of the studied child including: Age, sex, Rank, School grade.

**Part 2:** Medical history data about the child's cause of musculoskeletal injuries, previous admission, day of onset of clinical signs noticed, diagnostic tests and treatment.

**Part 3:** Socio-demographic data of caregiver including: Age, level of education, occupation, family income, and number of sibling, place of residence, and the presence of consanguinity.

- 2) **Postoperative effect on immobility:** It was designed by the researcher to assess physical postoperative immobility on children with musculoskeletal injuries. It was composed of the following items about:

- **Musculoskeletal system** (muscle strength, joint mobility, bone mineralization and

calcium balance). **Respiratory system** (vital capacity and respiratory muscle strength)

- **Cardiovascular system** (efficiency of orthostatic neuromuscular reflexes, vasopressin mechanism, distribution of blood volume, strength of heart muscle).
- **Gastrointestinal system** (muscle tone, feeding in prone position, digestion, elimination, appetite).
- **Genitourinary system** (gravitational force, voiding in supine position, urinary retention and ureteral peristalsis).
- **Integumentary system** (circulation and pressure leads to reduced healing process).
- **Sensory nervous system** (4 statements) (pain and sensation)

➤ **Scoring system:**

If the problem present the answer was scored one, and that not present was scored zero. The score of (47 statements) were summed-up and the total score (47) grads was divided by number of the items, giving a mean score of the part. These scores were converted into a percent score was classified as the following:

- < 50% mild effect from zero < 23
- 50% < 75% referred to moderate effect from 23 – 35
- 75% ≤ 100 referred to severe effect from 35.5 – 47

3) **Postoperative effect on psychologically:** it was used to assess the psychologically postoperative immobility on children with musculoskeletal injuries; it was included the following:

**1. Anxiety scale:** it was used to assess anxiety level of children which adapted from (**Abd El-Khalek, 2007**).

➤ **Scoring system:**

Scoring system was done using three points Liker scale ranging from Zero to 2 respectively as: (Zero) rarely, (1) sometimes, and (2) frequent. The score of (19 statements) were summed-up and the total score (38) grads was divided by number of the items, giving a mean score of the part. These scores were converted into a percent score was classified as the following:

- < 50% mild anxiety from zero < 19
- 50% < 75% moderate anxiety from 19 – 28
- 75% ≤ 100 severe anxiety from 29 – 38

**2. Depression scale:** it was used to measured depression level of children which adapted from (**Abd El-Khalek, 2000**).

➤ **Scoring system:**

Scoring system was done using three points Liker scale ranging from Zero to 2 respectively as: (Zero) rarely, (1) sometimes, and (2) frequent. The score of (26 statements) were summed-up and the total score (52) grads was divided by number of the items, giving a mean score of the part. These scores were converted into a percent score was classified as the following:

- < 50% mild depression from zero < 26
- 50% < 75% moderate depression from 26 – 39
- 75% ≤ 100 severe depression from 40 – 52

**Self-esteem scale:** it was used to measured self-esteem level of children which adapted from (**Rosenberg, 2004**).

➤ **Scoring system:**

Scoring system was done using three points Likert scale ranging from Zero to 3 respectively as: (Zero)never, (1) rarely, (2) sometimes and (3) frequent. The score of (18 statements) were summed-up and the total score (54) was divided by number of the items, giving a mean score of the part. These scores were converted into a percent score was classified as the following:

- < 50% low self-esteem from zero < 27
- $50 \leq 100$  % high self-esteem from 28 – 54

**Tools Validity and Reliability**

Tools validity was checked through distribution of the tools to five experts in the field of the study of neonatology, content validity was assessed to determine whether the tool covers the appropriate and necessary content, as well as its relevance to the aim of the study, clarity, and its simplicity. The suggested modifications were done (rephrasing of some statements, omission and addition of certain items). Then the final form was stated. Reliability of tools was performed to confirm its consistency reliability of tools accepted coefficient alpha between questions was 0.79 by using Test-Retest reliability.

**Operational Design**

The operational design for this study consisted of three phases, namely preparatory phase, pilot study, and field work.

**Preparatory Phase**

A review of past and current, local and international related literature using journal, magazines, scientific periodicals and books was done to develop the study tools and to get acquainted with the various aspects of the research problem.

**Pilot Study**

Pilot study was carried out on 10% (8 children) and their caregivers who attended to the Pediatric Orthopedic Surgical ward and Outpatient Clinic at Children Hospital of Ain Shams and El-Helal Hospital to test the applicability and clarity of the study tools and to determine the needed time for fulfilling the study tools. Then necessary modifications of some questions were done based on the findings of the pilot study. The children and their caregivers who participated in the pilot study were excluded later from the study sample.

**Fieldwork**

Data collection was carried out in the period from the beginning of June 2017 to the end of January 2018. The researcher was available two days per week in the previously mentioned settings by rotation, during morning shift from 10:12 a.m. The researcher was introducing herself to the study sample and clarifies the objective and aim of the study using the data gathering tools. To carry out the study the questionnaire sheet was filled in by the researcher and it consumed 15 minutes during the children free from any symptoms or signs can irritate them. The Psychometric tools were filled in by the researcher and each one of them consumed 10 minutes.

**Ethical considerations:**

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Agreement was a prerequisite to involve the children and their caregivers in the study sample at the first session. All ethical issues of research were maintained ethical committee. The purpose, specific objectives, anticipated benefits and methods of the study were carefully explained to each eligible subject. When the subjects agreed to participate in the study, they were assured that they could withdraw at any time and they would not be identified in the report of the study. Also, the researcher informed the studied subject that, the research would be harmless, confidentiality in

gathering and treating subject's information was secured.

### Administrative Design

Approval was obtained from the Dean of Faculty of Nursing (Ain Shams University) and the Directors of the Pediatric Orthopedic Surgical ward and Outpatient clinic at Children Ain Shams Hospital and El-Helal Hospital.

### Statistical Design

Data collected from the studied sample was revised, coded and entered using PC. Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 20. Data were presented using descriptive statistics in the form of frequencies, percentages. Chi-square test ( $X^2$ ) was used for comparisons between qualitative variables and correlation coefficient was used to test correlation between variables. Statistical significant was considered at p-value <0.05.

## Result:

### Part I: Demographic Characteristics of the Studied Children

**Table (1):** Distribution of the studied children according to their demographic characteristics (no=80).

Demographic Characteristics	No	%
<b>Sex</b>		
Male	50	62.5
Female	30	37.5
<b>Child age in year</b>		
3 < 6	4	5.0
6 < 12	32	40.0
12 ≤ 18	44	55.0
Mean ± SD		12.3±4.1
<b>Ranking of child</b>		
First	64	80.0
Second	10	12.5
Third	6	7.5
<b>Level of education</b>		
Illiterate	6	7.5
Primary school	24	30.0
Preparatory school	28	35.0
Secondary school	22	27.5

**Table (1):** shows that, more than half (55.0%) of the studied children their age were ranged between of 12 ≤ 18 years old with mean 12.3±4.1, less than two third (62.5%) of them were male while as most of them (80.0%) were arranged as a first child and more than one third (35.0%) of them were at preparatory school.

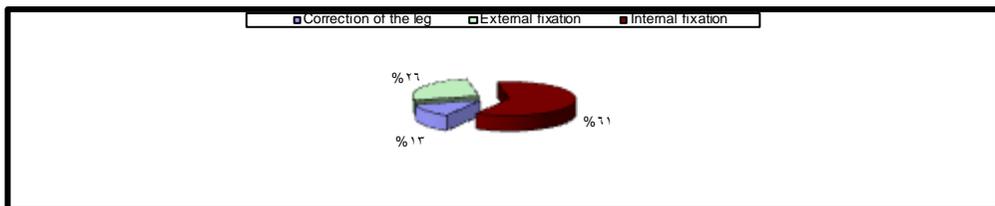
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**Table (2):** Distribution of the studied caregivers according to their characteristics (no=80).

Caregiver characteristic	Caregiver	
	No	%
<b>Age in year</b>		
< 30	9	11.2
30 < 40	64	80.0
40≤	7	8.8
Mean ± SD		37.7±4.2
<b>Educational level</b>		
Primary school	3	3.8
Preparatory school	34	42.5
Secondary school	37	46.2
University	6	7.5
<b>Occupation</b>		
Working	16	20.0
Not working	64	80.0
<b>Monthly income</b>		
Enough	21	26.2
Not enough	59	73.8
<b>Residence</b>		
Rural	25	31.2
Urban	55	68.8
<b>Number of sibling</b>		
First	38	47.5
Second	33	41.2
Third	9	11.2
<b>Presence of consanguinity</b>		
Yes	14	17.5
No	66	82.5

**Table (2):** shows that, most (80.0%) of the studied children their caregiver age were ranged between of 30 < 40 years old with mean 37.7±4.2, less than one half (46.2%) of the studied children their caregiver were secondary school educational level, most (80.0%) of the them were not working, more than two third (73.8%) of them were not enough income, more than two third of them (82.5%) were negative consanguinity and most (68.2%) of them were in urban area.

**Figure (2):** Distribution of the studied children according to their type of surgery (no=80).



**Figure (2):** This figure illustrates that, more than half (61.2%) of the studied children did internal fixation while as more than quarter (26.5%) did external fixation and less than one fifth (12.5%) did correction of the leg.

### Part II: Relation between Physical Effect of Postoperative Immobility of Children with Musculoskeletal Injuries and the Demographic Characteristics

**Table (3):** Relation between physical effect of postoperative immobility of children with musculoskeletal injuries and their Demographic characteristics.

Demographic Characteristics	Physical Effects						X2	P Value
	Mild		Moderate		Severe			
	No	%	No	%	No	%		
<b>sex</b>								
Male	7	8.8	20	25.0	23	28.8	6.0	<b>*0.04</b>
Female	10	12.5	13	16.2	7	8.8		
<b>Child age in year</b>								
3 < 6	0	0.00	2	2.5	2	2.5	15.42	<b>**0.004</b>
6 < 12	5	6.3	21	26.3	6	7.5		
12 ≤ 18	12	15.0	10	14.3	22	27.5		
<b>Ranking of child</b>								
First	13	16.2	28	35.0	23	28.8	5.52	0.23
Second	1	1.3	3	3.7	6	7.5		
Third	3	3.7	2	2.5	1	1.3		
<b>Level of education</b>								
Illiterate	2	2.5	3	3.7	1	1.3	4.84	0.56
Primary school	5	6.3	11	13.7	8	10.0		
Preparatory school	8	10.0	10	12.5	10	12.5		
Secondary school	2	2.5	9	11.3	11	13.7		
<b>Residence</b>								
Rural	11	13.7	8	10.0	6	7.5	11.38	<b>*0.003</b>
Urban	6	7.5	25	31.3	24	30.0		

(\*\*) Highly Statistical significant difference at p<0.01 (\*)Statistical significant difference at p<0.05

**Table (3):** illustrates that, there are statistical significant differences between physical effects of postoperative immobility and gender, age and residence of the studied children while there is no statistical significant differences between physical effects of postoperative immobility ranking and level of education and of the studied children.

**Table (4):** Relation between physical effect of postoperative immobility of children with musculoskeletal injuries and their psychological status.

Psychological status	Physical Effects						X2	P Value
	Mild		Moderate		Severe			
	%	No	%	No	%	No		
<b>Anxiety</b>								
Mild anxiety	5	6.3	4	5.0	2	2.5	12.19	<b>*0.02</b>
Moderate anxiety	4	5.0	16	20.0	6	7.5		
Severe anxiety	8	10.0	13	16.2	22	27.5		
<b>Depression</b>								
Mild depression	9	11.3	6	7.5	1	1.2	35.61	<b>**0.0001</b>
Moderate depression	7	8.7	22	27.5	9	11.3		
Severe depression	1	1.2	5	6.3	20	25.0		
<b>Self-esteem</b>								
Low self-esteem	10	12.5	13	16.2	21	26.2	6.07	<b>*0.04</b>
High self-esteem	7	8.8	20	25.0	9	11.3		

(\*)Statistically significant at p<0.05 (\*\*) Highly Statistical significant difference at p<0.01

**Table (4):** illustrates that, there are statistical significant differences between physical effects of postoperative immobility and level of anxiety, level of depression and self-esteem of the studied children.

**Part IV. Relation between Psychological Effect of Postoperative Immobility of Children with Musculoskeletal Injuries and the Demographic Characteristics**

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**Table (5):** Relation between anxiety of children with musculoskeletal injuries and their demographic characteristics

Demographic characteristic	Mild		Anxiety Moderate		Severe		X2	P Value
	No	%	No	%	No	%		
<b>Sex</b>								
Male	4	5.0	10	12.5	36	45.0	14.88	<b>**0.001</b>
Female	7	8.8	16	20.0	7	8.8		
<b>Child age in year</b>								
3 < 6	2	2.5	1	1.2	1	1.2	29.08	<b>**0.0001</b>
6 < 12	4	5.0	20	25.0	8	10.0		
12 ≤ 18	5	6.3	5	6.3	34	42.5		
<b>Ranking of child</b>								
First	6	7.5	20	25.0	38	47.6	8.43	0.07
Second	3	3.7	5	6.3	2	2.5		
Third	2	2.5	1	1.2	3	3.7		
<b>Level of education</b>								
Illiterate	3	3.7	2	2.5	1	1.2	8.49	0.2
Primary school	2	2.5	7	8.8	15	18.8		
Preparatory school	3	3.7	10	12.5	15	18.8		
Secondary school	3	3.7	7	8.8	12	15.0		
<b>Residence</b>								
Rural	6	7.5	11	13.7	8	10.0	7.46	<b>*0.02</b>
Urban	5	6.3	15	18.8	35	43.7		

(\*) Statistically significant at p<0.05

(\*\*) Highly Statistical significant difference at p<0.01

**Table (5):** illustrates that, there are statistical significant differences between anxiety of postoperative immobility and gender, age and residence of the studied children, while there is no statistical significant differences between anxiety of postoperative immobility and ranking of child and level of education of the studied children.

**Table (6):** Relation between depression of children with musculoskeletal injuries and the demographic characteristics

Demographic characteristic	Mild		Depression Moderate		Severe		X2	P Value
	No	%	No	%	No	%		
<b>Sex</b>								
Male	6	7.5	23	28.7	21	26.2	8.03	<b>*0.02</b>
Female	10	12.5	15	18.8	5	6.3		
<b>Child age in year</b>								
3 < 6	2	2.5	2	2.5	0	0.0	6.60	0.16
6 < 12	5	6.3	19	23.7	8	10.0		
12 ≤ 18	9	11.2	17	21.3	18	22.5		
<b>Ranking of child</b>								
First	10	12.5	31	38.8	23	28.8	5.27	0.26
Second	3	3.8	5	6.3	2	2.5		
Third	3	3.8	2	2.5	1	1.2		
<b>Level of education</b>								
Illiterate	2	2.5	3	3.8	1	1.2	12.21	<b>*0.04</b>
Primary school	5	6.3	12	15.0	7	8.8		
Preparatory school	8	10.0	15	18.7	5	6.3		
Secondary school	1	1.2	8	10.0	13	16.2		
<b>Residence</b>								
Rural	11	13.8	8	10.0	6	7.5	13.12	<b>**0.001</b>
Urban	5	6.3	30	37.5	20	25.0		

(\*) Statistically significant at p<0.05

(\*\*) Highly Statistical significant difference at p<0.01

**Table (6):** illustrates that, there are statistical significant differences between depression of postoperative immobility and gender, ranking and residence of child of the studied children, while there is no statistical significant differences between depression of postoperative immobility and age, level of education and of the studied children.

**Table (7):** Relation between self-esteem of children with musculoskeletal injuries and the demographic characteristics.

Demographic characteristic	Self-Esteem				X <sup>2</sup>	P Value
	High		Low			
	No	%	No	%		
<b>Sex</b>						
Male	21	26.2	29	26.2	7.76	<b>**0.005</b>
Female	23	28.8	7	8.8		
<b>Child age in year</b>						
3 < 6	1	1.2	3	3.8	15.12	<b>**0.001</b>
6 < 12	26	32.5	6	7.5		
12 ≤ 18	17	21.2	27	33.8		
<b>Ranking of child</b>						
First	43	53.8	21	26.2	19.35	<b>**0.0001</b>
Second	1	1.2	9	11.2		
Third	0	0.0	6	7.5		
<b>Level of education</b>						
Illiterate	4	5.0	2	2.5	6.71	0.08
Primary school	12	15.0	12	15.0		
Preparatory school	20	25.0	8	10.0		
Secondary school	8	10.0	14	17.5		
<b>Residence</b>						
Rural	10	12.5	15	18.8	2.48	0.11
Urban	34	42.5	21	26.2		

(\*\*) Highly Statistical significant difference at  $p < 0.01$

## Discussion

Regarding the child's sex, this result showed that, more than half of the children were male. These findings in accordance with study supported by *Twomey (2015)* who studied educational review of common pediatric musculoskeletal injuries and reported that male children have higher injuries compared to female children. The researcher believes that this may be due to that males are more aggressive behavior and exposure to contact sports.

As regards children characteristics more than two third of the studied sample were the first children. This study was in contrasted with *Heimpel (2013)* who studied new study points, to danger of child neglect; found that more than three quarters of

children who exposed of unintentional injuries were born second or later. The researcher believes that this may be due to that in the Egyptian culture they believe that the first child must bear the responsibility of the whole family from childhood especially if he was male.

Regarding to caregiver characteristics, the current study revealed that, more than two third of caregivers age were ranged between (30<40) years old with ( $M=37.7$ ,  $SD=4.2$ ) and less than one half of them were secondary school educational level. These result supported by *Gourbin et al. (2013)* who studied the impact of parental ages and other characteristic at childbearing on the occurrence of congenital anomalies and reported that the age of the mother and father had impact on the incidence of

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musculoskeletal anomalies while, lower education of the mother was shown to be statistical significant related two other congenital anomalies. The researcher believes that this maybe due to that high rate of literacy among caregivers could significantly affect children's health care.

The result of the current study revealed that, more than two third of caregiver were negative consanguinity. This result not agrees with *Kaur and Gupta (2014)* who studied the surveillance of congenital malformations and mentioned that the incidence of congenital malformations of their population was 4.44% frequently associated with consanguineous marriage.

In the current study revealed that more than half of caregiver of studied children came from urban areas. These results agree with *Bishai and James (2014)* who studied the Notional road casualties and economic development, and reported that majority of children exposed to injuries lived in urban areas. This study was in contrasted with *Odero et al. (2016)*. Who studied the Road traffic injuries in developing countries: a comprehensive review of epidemiological studies, and mentioned that areas with significantly higher than expected rates of severe injury were identified in nonurban areas, where children lacked timely access to a pediatric trauma center or Level I adult trauma center. Although highest standardized mortality ratios were in urban areas, nonurban areas experienced elevated mortality with rates over four times higher than expected. The researcher believes that this may be due to urban areas have much population, schools, roads and methods of transportation.

The result of the current study revealed that, the highest percentage of children had used surgical treatment. these result supported by *American Academy of orthopedic Surgeons (2016)* which studied Pediatric and musculoskeletal health, mentioned that orthopedic surgeons are involved in all aspects of health care

pertaining to musculoskeletal system. They use medical, physical and rehabilitative methods as well as surgery. Surgery may be needed to restore function lost as result of injury of bones, muscles, joint, ligaments, nerves and skin.

Also this result agree with *Berven and Burr (2013)*, who studied Pediatric orthopedic surgical, and mentioned that highest present of children had used surgical treatment and limb deficiency either a queried or congenital, required lifelong medical attention and frequent surgical services.

The current finding clarified that there are statistical significant differences between physical effects of postoperative immobility and sex, age and residence of the studied children ( $p < 0.05$ ), while there are no statistical significant differences between physical effects of postoperative immobility ranking and level of education of them ( $p > 0.05$ ). This result supported by *Devereux (2017)* who studied complication and their risk factor following hip fracture, mentioned that postoperative complication after surgery and result in significant long hospitalization periods, predictor for complication include being of male gender. Age, in itself dose result in a higher risk of complication.

The current study finding revealed that there are statistical significant differences between physical effects of postoperative immobility and level of anxiety, level of depression and self-esteem of the studied children ( $p < 0.05$ ). This result was accordance with *David and Patricia (2016)* who studied The role of Emotional Health in functional outcomes After orthopedic surgery, found that the emotional health of the child influences the child's physical recovery after surgery, children's who because of emotional health challenges such as depression, anxiety are risk of having less functional improvement after orthopedic surgery.

Finding the present study revealed that there are statistical significant

differences between anxiety of postoperative immobility and age, sex and residence of the studied children ( $p < 0.05$ ), while as there are no statistical significant differences between anxiety of postoperative immobility and ranking and level education of them ( $p > 0.05$ ). This findings accordance with *Mayes and Jospheh (2013)* who studied Anxiety and postoperative pain in children, mentioned that there are positive relation between anxiety of postoperative immobility and age, gender and residence.

The current study finding clarified that there are statistical significant differences between depression of postoperative immobility and gender, residence and level of education of the studied children ( $p < 0.05$ ), while there are no statistical significant differences between depression of postoperative immobility and age and ranking of them ( $p > 0.05$ ) (**Table17**). These findings were accordance with *Venzk and Kashani (2015)* who studied Depression in children admitted to hospital for orthopedic procedure, mentioned that there are positive relation between depression of postoperative immobility and gender, level of education and residence

The current finding clarified that there are statistical significant differences between self-esteem of postoperative immobility age, gender and ranking ( $p < 0.05$ ), while there is no statistical significant differences between self-esteem of postoperative immobility and level of education and residence of the studied children ( $p > 0.05$ ). This finding agree with *Ropert and Rosenberg (2015)* who studied Effect of surgery on self esteem in children, mentioned that more girls reported lower self-esteem than boys during middle and late adolescence

### **Conclusion**

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The current study and research questions concluded that the main cause of musculoskeletal injuries was traumatic injuries. Children stayed in cast for long period, so that the effect of postoperative

immobility had negative effects on physical wellbeing of children with musculoskeletal injuries almost appeared in the most body systems (musculoskeletal, cardiovascular, respiratory, gastrointestinal, urinary, integumentary and neurosensory system). The postoperative immobility had adverse effect on psychological wellbeing of children such as feeling anxiety, depression and low self-esteem.

### **Recommendations**

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

Emphasize on the importance of implementing nursing care program for children in postoperative period aimed to minimize the physical and psychological effects of immobility on children.

Designing a simple Arabic illustrated booklet about care of cast and immobilized child at home and should be available in the orthopedic pediatric ward and outpatients clinics.

A multidisciplinary team consisting of pediatric orthopedist, physiotherapist, play therapist, pediatric nurse and social workers should be involved in caring, teaching and helping the children and their caregivers who have musculoskeletal injuries.

### **Financial Support**

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No funding was received.

### **Conflict of interest:**

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No      Yes

### **References**

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