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# Biopsychosocial Burden and Adjustment of Families of Children with Short Stature

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## Abstract

**Background:** Short stature is a chronic health condition. The better adaption of the condition to the family's everyday life, the less burdensome the disease is perceived and classified by the affected family member. The personal responsibility of those involved is fundamental and directly influences the medical prognosis. **Aim:** To assess biopsychosocial burden and adjustment of families of children with short stature. **Design:** A descriptive research design was used. **Setting:** This study was conducted at health insurance outpatient clinics for students in El Sharkia and El Qalubia governorates. **Sample:** A purposive sampling was used to choose 196 families. **Tool: A structured interviewing questionnaire,** divided into five parts was used for data collection. **1st part:** to assess demographic data of primary school students and parents.**2nd part:** Present and past history for child and family. **3rd part**: Family knowledge about short stature. **4th part**: Biopsychosocial burden of families of children with short stature. **5th part:** Adjustment of families of children with short stature**. Results:** The study results revealed that 66.8% of families have good knowledge with total burden mean ± SD =101.4133 ± 61.92334, and 63.3% of them had good adjustment with statistically significant correlation between Total Scores of Knowledge, Total Scores of Burdens with r=0.867 and p- value =0.000 and Total Score Adjustment of the studied sample families regarding Short Stature with r=0.984 and p-value=0.000. **Conclusion:** There were statistically significant relations between total Knowledge score, total burden, total adjustment score levels and studied sample socio-demographic data except some. **Recommendations**: Designing and implementing a health awareness program for families of children suffering from short stature.

**Keywords:** *Adjustment, Biopsychosocial burden, Children, Families, Short stature.*

## Introduction

Short stature is a condition in which the height of an individual is below the 3rd centile or more than 2 standard deviations below the corresponding mean height for a given age and gender. Approximately 3% of children in any population will be short, among which half will be physiological and half will be pathological. Physiological causes are familial short stature and constitutional delay in growth and puberty ***(Kandagal et al., 2023).***

Globally, in 2016, ***Aljuied et al., (2023)*** stated that 154.8 million of children under five years of age suffered from short stature, a study which included data from 110 countries, found that the average relative annual decrease in the rate of childhood short stature is 1.8% per annum. This is far below the 3.9% rate needed to achieve the World Health Assembly's goal to reduce the global incidence of short stature to 100 million by 2025.

Globally, children living in poverty experience impaired linear growth that results in a height-for-age more than 2 standard deviations below the world health organization (WHO) Child Growth Standards median, mean short stature, is evident in almost a quarter of children globally. Although short stature is most prevalent in low-

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and middle-income countries (LMICs), there is increasing recognition that linear growth failure is also a marker of socioeconomic disadvantage in high-income countries (HICs) such as the United Kingdom (UK) ***(Freer et al., 2022).***

Family burden is defined as the negative expenditures created by the disabled children for their families. Disabled children significantly affect how their families live, deficiency becomes the core of families' lives upon diagnosis and causes many burdens. Family members' roles and responsibilities start to change. These changes may be seen in intrafamilial roles, private living spaces, social environments, expectations, plans and careers ***(Shattnawi et al., 2023).***

Biopsychosocial dysfunction might happen depending on the interaction of risk factors and resistance factors. Important risk factors for the biopsychological adjustment are the satisfaction with its height, the acceptance from environment, and psychosocial stress related to being bullied due to short stature. Important resistance factors of short stature might be the temperament, familial support, and coping strategies ***(Delima et al., 2023).***

Family adjustment refers to family response to stressful events such as disability, or injury that occurs within the family system. Raising a child with short stature can be an overwhelming experience and may cause many emotional implications for the parents and for the entire family unit that certainly affect the child. The long-term care of short child affects various areas in parents' life domains (e.g., marriage, career, relationships), which can lead to stress and affect the functioning of the family. Moreover, parents of children with short stature may experience higher levels of stress and may be at a higher risk for mental health issues and affected well-being than those with typically developing children ***(Mohammad et al., 2022).***

Community health nurse (CHN) play an important role in educating mothers and families about signs and symptoms related to short stature, as well as counseling families towards appropriate referrals and keeping appointments that have been made. As nurses execute their role in the overall monitoring of the general health, development and well-being of infants, families become more aware of typical growth and development. The CHN should also explain the importance of the early intervention and detection of growth impairment which is necessary to prevent additional problems and complications of short stature ***(Ibrahim et al., 2024).***

## Significance of the study

The Egyptian Ministry of Health and Population revealed the details of activating the initiative of the President of the republic Abdel Fattah El-Sisi. The presidential initiative began in January 2019 due to the state's keenness on the health and safety of students, and in the academic year 2023-2024, 2 million and 883 thousand and 135 students were examined within the initiative of the president of the republic for the early detection of anemia, obesity and short stature in primary schools until January 25. Globally, it was estimated that in 2022, 149 million children under the age of five were short stature (too short for their age) **(Ministry of Health and Population, in Egypt, 2024; World Health Organization, 2024).**

A study done during 2004-2005, in Saudi Arabia that included 19,372 healthy children and adolescents aged 5 to 17 years, found that a significant portion of the population had short stature. For example, the researchers reported that the prevalence of short stature in boys (n=19,372) was 1.8% in adolescents and 11.3% in children, whereas they discovered that it was 1.2% in girls and 10.5% in children ***(Alhumaidi et al., 2023).***

## Aim of the Study

The aim of the study is to assess biopsychosocial burden and adjustment of families of children with short stature.

- Assessing knowledge of families of children with short stature.
- Appraising biopsychosocial burden of families of children with short stature.

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- Evaluating adjustment of families of children with short stature.

**Research questions:**

- What is the level of knowledge of families of children with short stature?
- What are the levels of biopsychosocial burdens and adjustment of families of children with short stature?
- Are there relations between families of children with short stature as regards their knowledge, biopsychosocial burdens and adjustment?

## Subjects and Methods

The subjects and methods for this study will be portray under the four main designs as follows:

## Technical designs:

The technical design includes research design, settings, subjects and tools for data collection.

**Research design:**

A descriptive research design was used to in this study.

**Study Settings*:***

This study was conducted at Nassar Health Insurance Clinic for in Shubra al-Khaimah, El Qalubia Governorate. The clinic includes 4 floors with different specialists including the hormone committee in the second floor held on Sundays and Wednesdays each week, with average daily frequency from 1000-1100 cases between new and hesitant cases in total specialists, and 60-70 cases in growth hormone committee. The clinic employs 32 nurses and 50 doctors working from 9a.m to 2 p.m.

As well, this study was conducted at the Diabetic Health Insurance Clinic in Zagazig - Sharkia Governorates, the clinic constitutes one floor with different specialists such as the Hormone Committee held on Wednesdays each week, with average daily frequency from 200-250 cases between new and hesitant cases in total specialists, and 40-50 cases in growth hormone committee. The clinic employs 7 nurses and 14 doctors working from 9 a.m to 2 p.m.

## Sampling*:*

- **Type of sample**

A purposive sample was selected.

- **Sample size**

The estimated sample size is 196 from a total of 400 students diagnosed with short stature in the academic year 2021-2022, Data were collected according to the following inclusion criteria.

**Inclusion criteria involved:**

- Both sex students in primary schools from 6-12 years.
- Children diagnosed with short stature
- Families able to communicate.

**Exclusion criteria involved:**

- Children less than 6 years or more than 12 years old.
- Children whose mothers/guardians or caregivers refused to participate in the study.

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**Tool for data collection*:***

***A structured interviewing questionnaire*:** Based on reviewing the related literature it included five parts as followings:

***Part (1):*** Demographic characteristics of primary school students and their parents:

A. Demographic characteristics of child: such as; age, sex, school level, type of treatment, rank of the child among the siblings, when the disease was discovered and how.

B. Demographic characteristics of parent: such as; age, sex, occupation, social status, number of children, educational level, residence, monthly income, and work status.

***Part (2)***: Present and past history of the disease for child and parent:

A. Present and past history of the child: such as; birth length, weight, relation between father and mother, child born premature, child allergic to dairy products.

B. Present and past history of the family: such as; any medication taken during pregnancy.

***Part (3)***: Family knowledge about short stature: such as; meaning of short stature, causes, types, symptoms, risk factors, complications, diagnosis, and treatment of short stature.

***Scoring system for knowledge:***

The knowledge questions were 8, each knowledge question was scored by zero for a «No answer or don't know», while one for a "Incomplete correct answer" and two for a "Complete correct answer". The total knowledge scores ranged from 0-16, they were evaluated as follows:

**Total score knowledge**

- Poor less than 50% (0 - < 8)
- Average from 50 % to less than 75% (≥ 8- < 12)
- Good from 75 % to100% (≥12- 16)

***Part (4)*:** Biopsychosocial burden for families of their children with short stature: This tool was adapted by **Zairt et al., (1980),** as an instrument to measure the level of burden experienced by caregivers of child with short stature. The Zairt burden interview (ZBI) which provides a comprehensive assessment of both objective and subjective burdens are physical, financial, social, and emotional. Each item has management strategies. The validity and reliability of the Zairt Burden interview in assessing caregiving burden were evaluated by **Seng et al., (2010)** each item has management strategies. This subscale was assessed by a 3-point scale ranging from 1=never to 3=always and composed of 76 items.

**Physical burden**: Composed of 5 items such as feel, health is affected by the care situation.

**Emotional burden**: Composed of 34 items such as feel, from time to time, wish "run away" from the situation I am in.

**Financial burden**: Composed of 7 items such as think, lose income or financial benefits due to time spent in treatment for my child.

**Social burden**: Composed of 30 items such as feel that my child asks for more help than the needs.

***Scoring system for burden:***

A checklist of 76 items was classified into either always =3, sometimes =2, and never =1, they were evaluated as follows:

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**Total score *burden***

- Weak less than 50% (0 - <114)
- Moderate from 50 % to less than 75% (≥114-<171)
- Strong from 75 % to 100% (≥171- 228)

***Part (5)*:** Adjustment of families of their children toward short stature which was developed by investigation after reviewing national and international literature as; think, can handle the problem related to my child's short stature, and think, I can accept my child short stature. This subscale was assessed by a 3-point scale ranging from 1=never to 3=always and composed of 33 items.

***Scoring system for* adjustment*:***

A checklist of 33 questions (adjustment questions), was classified into either always =3, sometimes =2, and never =1, and they were evaluated as follows:

**Total score adjustment**

- Poor less than 50% (0 - < 49.5)
- Good from 50 % to 100% (≥49.5- 99)

**Validity and Reliability:**

- The study tools were tested for content and face validity by a jury of five experts in the field of Community Health Nursing to evaluate the individual items as well as the entire instrument as being relevant and appropriate to test what they wanted to measure. The face validity of the questionnaire was calculated based on experts' opinion after calculating content validity index (%) of its items and it was 94%.
- A pilot study was carried out on 10% from the study subjects who were included in the main sample. To assess reliability, the study tool was tested by the pilot subjects at first session for calculating Cronbach's Alpha (Knowledge questionnaire = 0.854, Burden = 0.834 and Adjustment questionnaire = 0.849).

## Ethical considerations:

An official permission to conduct the proposed study obtained from the Scientific Research Ethics Committee of faculty of nursing Helwan University. Participation in the study is voluntary and subjects given complete information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs will be respected.

***Field work***:

The actual field work was started at the beginning of August, 2023 after securing all official permissions. It was completed by the middle of October 2023. The investigator met the clinic Manager and Chairman of the Hormone Committee. For each of the diabetes clinics in Zagazig and Nassar clinics in Shubra El-Kheima - to explain the aim of the study to gain official written consent. Then, the investigator collected the data through meeting the families of children with short stature, obtained an informal consent to participate in the study and assured them that their information given will be treated confidentially and will be used only for the purpose of the research. They were also informed that their participation is voluntary, and that they have the right to withdraw from the study, at any stage, without giving any reason. Participants met two days per week on Sundays in Nassar Clinic Committee and Wednesdays in Diabetes Clinic Committee from 9.00 a.m. to 2.00 p.m. The appropriate time of data collection was decided according to type of work and workload of each committee. The time needed for each questionnaire to be filled was 30-45 minutes. The filled forms were revised and checked for completeness to avoid any missing data. The average number of families who respectively filled in the sheets was about 8-9 per day.

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**IV- Statistical Design: -**

Upon completion of data collection, data were computed and analyzed using the Statistical Package for the Social Science (SPSS), version 24 for analysis. The p-value was set at 0.05. Descriptive statistic tests as number, percentage, mean, standard deviation (SD), were used to describe the results. Appropriate inferential statistics such as "F-test" or "t-test" were used as well.

***Statistical analysis:***

The collected data were organized, tabulated and statistically analyzed using the SPSS software, version 24, (SPSS) Inc. Chicago, IL, USA. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test ($\chi 2$). Correlations between variables were evaluated using Pearson's correlation coefficient (r). Significance was adopted at $P< 0.05$ for interpretation of results of tests of significance.

**Table (1):** Frequency Distribution of Families Regarding Demographic Characteristics for Child with short stature (n=196).

| Demographic data | The studied sample (Child) (n=196) | |
|---|---|---|
| | No. | % |
| • **Age:** | | |
| 6 - < 8 | 61 | 31.1 |
| ≥ 8- <10 | 82 | **41.8** |
| ≥ 10- 12 | 53 | 27 |
| **Mean ± SD** | 8.4694 ± 1.73178 | |
| • **Sex** | | |
| Male | 108 | **55.1** |
| Female | 88 | 44.9 |
| • **School level** | | |
| General education | 100 | **51** |
| Experimental | 42 | 21.4 |
| Private | 31 | 15.8 |
| International | 18 | 9.2 |
| Azhar | 5 | 2.6 |
| • **Type of treatment** | | |
| Growth hormone injection | 86 | **43.9** |
| Follow up of nutritionist | 72 | 36.7 |
| Mixed diagnosis | 38 | 19.4 |
| • **Ranking of the child among the siblings** | | |
| First | 64 | **32.7** |
| Second | 62 | 31.6 |
| Third | 21 | 10.7 |
| Fourth | 14 | 7.1 |
| Last | 35 | 17.9 |
| • **Since when was the disease discovered?** | | |
| Through one year | 42 | 21.4 |
| Through two years | 72 | **36.7** |
| Through three years | 36 | 18.4 |
| More than | 46 | 23.5 |

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| • How was the disease discovered | | |
|---|---|---|
| By luck | 113 | **57.7** |
| Through the initiative | 14 | 7.1 |
| Symptoms appear | 69 | 36.2 |

**Table (1)** shows that 41.8% of studied children aged between 8- <10 years, with a mean age ± SD 8.4694 ± 1.73178. Regarding sex, boys represent 55.1%, and for school levels, they represent 51% as general education. Concerning the type of treatment, 43.9% took growth hormone injection, as for rank of child among siblings, 32.7% are considered as the first child, for 36.7% of children, short stature was discovered through two years ago and for 57.7% of them, it was discovered by luck.

**Table (2):** Frequency Distribution of Families Regarding Socio-demographic Characteristics for Parents of Children with Short Stature (n=196).

| Demographic data | The studied sample (family) (n=196) | |
|---|---|---|
| | No. | % |
| • **Age:** | | |
| 18 - < 28 | 61 | 31.1 |
| ≥ 28- < 38 | 69 | **35.2** |
| ≥ 38 | 66 | 33.7 |
| **Mean ± SD** | 34.3316 ± 7.32801 | |
| • **Sex** | | |
| Male | 30 | 15.3 |
| Female | 166 | **84.7** |
| • **Occupation** | | |
| Housewife | 128 | **65.3** |
| Officer/employee | 48 | 24.5 |
| Free work | 20 | 10.2 |
| • **Social status** | | |
| Married | 178 | **90.8** |
| Divorced | 9 | 4.6 |
| Widowed | 6 | 3.1 |
| Separated | 3 | 1.5 |
| **Number of children** | | |
| Less than 3 | 83 | **42.3** |
| From 3-5 | 71 | 36.2 |
| More than 5 | 42 | 21.4 |
| • **Educational level:** | | |
| No read & write | 4 | 2 |
| Read & write | 1 | 0.5 |
| Primary school | 4 | 2 |
| Middle certification | 64 | 32.7 |
| Bachelor's degree and higher | 123 | **62.8** |
| • **Residence** | | |
| Urban | 167 | **85.2** |
| Rural | 29 | 14.8 |
| • **Monthly income** | | |
| sufficient and save | 9 | 4.6 |
| sufficient only | 177 | **90.3** |
| Insufficient | 10 | 5.1 |

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| | | |
|---|---|---|
| • **Work status** | | |
| Part time | 3 | 1.5 |
| Full time | 45 | 23 |
| Un employment | 128 | **65.3** |
| Self employed | 20 | 10.2 |

**Table (2)** denotes that 35.2% of parents aged between 28-<38 years with mean age ± SD 34.3316 ± 7.32801, Females represent 84.7%, housewives represent 65.3%, 90.8% were married, 42.3% had less than three children. As for educational levels, bachelor's degree and higher represent 62.8%, and 85.2% reside urban areas, considering monthly for 90.3%, it was only sufficient.

**Table (3):** Frequency Distribution of Families Regarding Child History for Short stature (n=196).

| Child history | The studied sample (n=196) | | | |
|---|---|---|---|---|
| | No | | Yes | |
| | No. | % | No. | % |
| Baby's weight after birth normal. | 8 | 4.1 | 188 | **95.9** |
| Baby's height after birth normal. | 7 | 3.6 | 189 | **96.4** |
| The heel sample result normal. | 73 | 37.2 | 123 | **62.8** |
| There is a relationship between father and mother. | 66 | 33.7 | 130 | **66.3** |
| Child born premature. | 132 | **67.3** | 64 | 32.7 |
| Child breastfed. | 142 | **72.4** | 54 | 27.6 |
| Child allergic to dairy products or any other foods through first year of life. | 150 | **76.5** | 46 | 23.5 |
| Child similar to brothers and relatives. | 135 | **68.9** | 61 | 31.1 |
| Child physically growth normal for brothers and relatives. | 151 | **77** | 45 | 23 |
| Child have a history of recurrent gastroenteritis. | 158 | **80.6** | 38 | **19.4** |
| Child has a history of malnutrition disease such as rickets. | 132 | **67.3** | 64 | 32.7 |
| Child has a history of kidney disease. | 154 | **78.6** | 42 | 21.4 |
| Child has a history of respiratory infection. | 145 | **74** | 51 | 26 |
| Child suffers from any disease else. | 140 | **71.4** | 56 | 28.6 |

**Table (3)** clarifies that 95.9%, 96.4% represent the normality childbirth weight and height, respectively and 19.4% represents the children have a history of recurrent gastroenteritis.

**Table (4):** Frequency Distribution of Families Regarding Family History for Short Stature (n=196).

| Family history | The studied sample (n=196) | | | |
|---|---|---|---|---|
| | Yes | | No | |
| | No. | % | No. | % |
| Medication taken during pregnancy. | 100 | **51** | 96 | 49 |
| The pregnancy monitored with a doctor or a healthy unit. | 105 | **53.6** | 91 | 46.4 |
| Either of the child's parents experienced delayed puberty or slow growth as a child. | 115 | **58.7** | 81 | 41.3 |
| Similar cases in the family | 108 | **55.1** | 88 | 44.9 |
| Other medical history. | 95 | 48.5 | 101 | **51.5** |

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**Table (4)** demonstrates that 58.7% represent that either of the child's parents experienced delayed puberty or slow growth as a child, 55.1% there are similar cases in the family, 51% have taken medication during pregnancy, for other 53.6% they were monitored with a doctor during pregnancy, and 48.5% had medical history regarding to family.

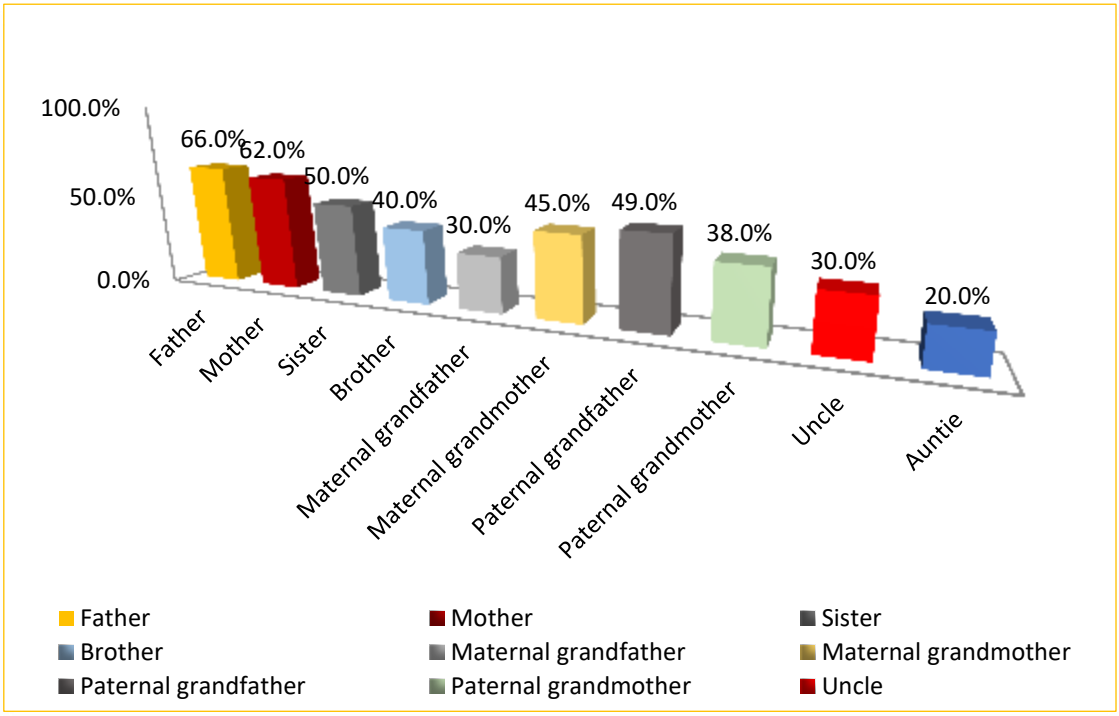


**Figure (1):** Distribution of Family Members Affected with Short Stature (n=108).

**Figure (1)** illustrates that fathers represent 66%, and mothers 62%, while uncles and aunts represent 30% and 20% respectively, in the distribution of family members of children with short stature.

**Table (7):** Frequency distribution of Total Knowledge Scores and Level among the Families Regarding Children with Short Stature (n=196).

| Total knowledge scores | The studied sample (N=196) | |
|---|---|---|
| | No. | % |
| **Level of total knowledge** | | |
| - Poor (0-<50%) | **45** | **23** |
| - Average (≥50-<75%) | **20** | **10.2** |
| - Good (≥75-100%) | **131** | **66.8** |
| **Range** | **16** | |
| **Mean ± SD** | **12.7959 ± 5.61584** | |

**Table (7)**: shows that total knowledge scores among the studied sample regarding children with short stature, it was for 66.8% good level with a mean ± SD=12.7959 ± 5.61584.

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**Table (12):** Mean and Standard Deviation of Studied Family Sample Burden Regarding Children with Short Stature (n=196).

| Burden regarding Short Stature | The studied sample (n=196) |
|---|---|
| | Mean ± SD |
| **Physical** | **7.2347 ± 4.11327** |
| **Emotional** | **47.4031 ± 27.72162** |
| **Financial** | **7.2959 ± 6.01060** |
| **Social** | **39.4796 ± 24.87187** |
| **Total Burden regarding Short Stature** | **101.4133 ± 61.92334** |

**Table (12)** shows the mean and standard deviation of studied sample burden regarding children with short stature. The physical burden represents 7.2347 ± 4.11327, the emotional represents 47.4031 ± 27.72162, the financial represents 7.2959 ± 6.01060, the social represents 39.4796 ± 24.87187, and the total burden regarding short stature represents 101.4133 ± 61.92334.

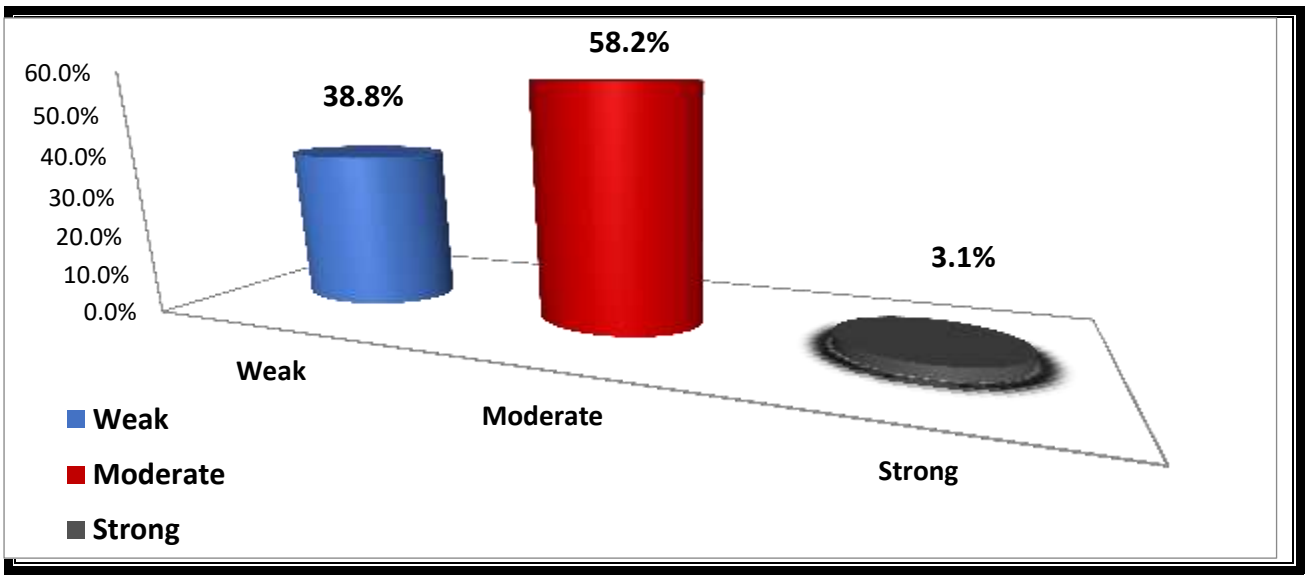


**Figure (4):** Distribution of Total Burden Scores and Level among the Studied Family Sample Regarding Children with Short Stature, (n=196).

**Figure (4)** illustrates that the total burden scores were moderate representing 58.2%, while weak representing 38.8%, a strong represent 3.1% regarding children with short stature.

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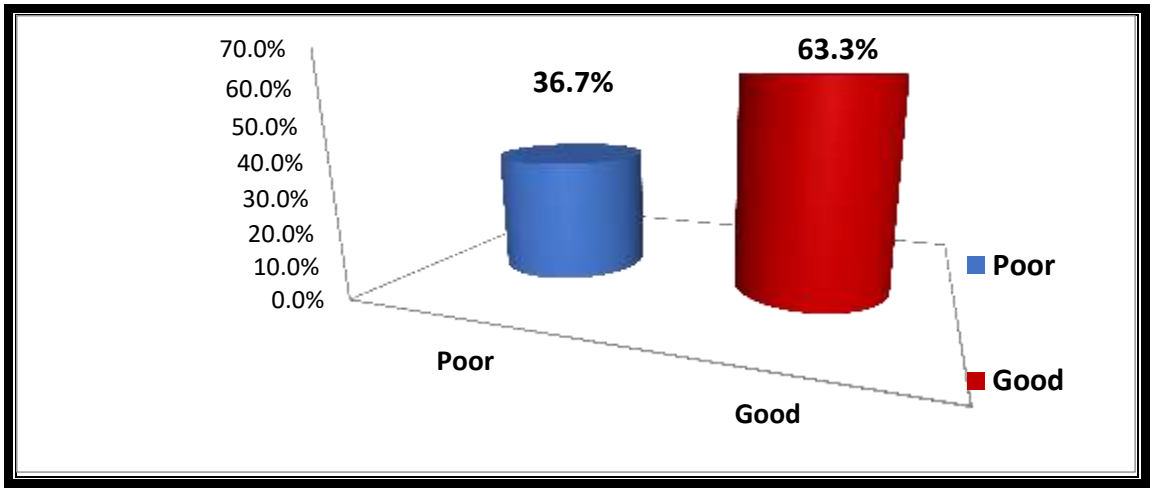


**Figure (5):** Distribution of Total Adjustment Scores and Level among the Families Regarding Children with Short Stature, (n=196).

**Figure (5)** shows that 63.3% of families had good adjustment level regarding their children with short stature, and 36.7% also had poor adjustment regarding their children with short stature.

**Table (19):** Correlations among Total Scores of Knowledge, Total Scores of Burden and Total Score of Adjustment of Families Regarding Short Children with Stature, (n=196).

| Variables | Total knowledge scores | |
|---|---|---|
| | R | P |
| Total scores of burden | 0.867 | 0.000 |
| Total scores of adjustment | 0.984 | 0.000 |

***Significant (P<0.05)**
**r= Pearson Correlation Coefficient**

**Table (19)** reveals that there was a appositive strong highly statistically significant correlation between of total scores of knowledge and total scores of burden at r = 0.867 and p- value = 0.000. The same table also demonstrates that there was a positive strong highly statistically significant correlation between total scores of knowledge and total scores of adjustment at r=0.984 and p -value=0.000.

## Discussion

Short stature is considered as a sign of poor health in childhood. It is unrecognized in early infancy that's why it is diagnosed at a late age which affects the improvement on health outcomes. Short stature is common in children, and it is a result of poor linear growth. Short stature statistically is known as children who are shorter than 97% of their age and gender-matched peers ***(Albalawi et al., 2019).***

Biopsychosocial burden is one of the most principal factors in assessing the level of adjustment and adaptation of family to their child's diagnosis. Families develop stress-related symptoms upon their children's diagnosis. This emotional distress occurs more often than in families with children who are not chronically ill and the stress levels of parents of pediatric short stature children are similar to and comparable with those of other parents coping with pathologies requiring more invasive care as well as stress, anxiety and depression have been found to be two very important variables in predicting and explaining the burden .Families of children requiring continuous or chronic medical follow-up have high levels of anxiety and the presence of stress or emotional symptoms in the primary caregivers is associated with increased discomfort among their children with chronic illness ***(Casaña-Granell et al., 2022).***

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The findings of the current study revealed that slightly more than two fifths studied children aged between 8-<10 years with a Mean ± SD of 8.4694 ± 1.73178, and more than half were males, considering the arrange of the child among the siblings, the highest percent representing approximately third was for first child. This result agrees with ***Omar et al., (2023),***who conducted a study entitled Mothers' Knowledge and Perception toward Short Stature of Their Children and Its Effect on Quality of Life", in Egypt, which revealed that, two thirds of children were males, their ages ranged from 3.0 – 16.0 years with a mean ± SD of 9.0 ± 2.85 years, and more than half of these children were the first child in their families.

Regarding parent demographic characteristics, the current study revealed that, the majority of the studied sample were females, and more than one third of them were in the age group considering ranged from or between 28-<40 years with a Mean ± SD of 34.3316 ± 7.32801**.** Educational levels, for nearly two thirds were holding a bachelor's degree and higher. These findings were in the same line with those of a study done by ***Alhumaidi et al., (2023)*** who conducted study entitled "Parents' Knowledge and Perception Toward Short Stature in Saudi Arabia" Which revealed that, more than half were females, with males comprising more than one third of parents. Age distribution showed prevalence in the 30-39 years group accounting for more than one quarter. Educational levels varied, with more than half holding a bachelor's degree.

As regards number of children, parent demographic characteristics in the current study presented that more than wo fifths of the studied sample had less than three children, almost two third of the studied sample were housewives and the majority of the studied sample reside urban areas. These result**s** are in disagreement with the study performed by ***Omar et al., (2023)*** who revealed that, the majority of their study sample were from rural areas, more than half of studied mothers had one and two children and the majority of them (82.1%) were working. The study results agreed as regards only the number of children while contrast with other study findings.

Regarding the total level of knowledge about short stature, the findings of the present study showed that, two third of studied sample had good knowledge, approximately one quarter of studied sample had poor knowledge with a Mean ± SD=12.7959 ± 5.61584. These findings disagree with those of ***Alharbi et al. (2022)*** which revealed that, more than two third of studied sample had poor knowledge, approximately one third of studied sample had good knowledge with a Mean ± SD= 2.04±0.92. Moreover, these findings are incongruent with these of ***Ahmed & Abd Elsalam (2019),*** who in a similar study entitled "Mothers' Knowledge and Perception about Short Stature of Their Children", in Egypt. Which revealed that, only 3% of studied mothers had good knowledge about short stature, while three quarters of studied mothers had poor knowledge about short stature.

As well, these previous results are in disagreement with those of ***Omar et al. (2023),*** who reported that, more than half of studied sample had low knowledge while less than half of them had moderate knowledge. Similarity, in the same years, the study carried out by ***Sheta et al. (2023),*** entitled "Evidence Based Assessment of Physical Growth among Primary School Children", in Egypt, revealed that, more than half of studied sample had poor knowledge and more than one quarter of studied sample had fair knowledge.

From the investigator's point of view, this may be related to nearly two third of the studied sample had bachelor's degree and higher educational level.

Regarding to child history, the current study revealed that, most of the studied sample had normal birth weight and height and approximately three quarters of studied sample had no child breastfeed. These results are in the same line with those of the study performed by ***Huang et al., (2022)*** who conducted a study entitled "Analysis of the risk factors and construction of a prediction model for short stature in children" in China which reported that, approximately three quarters of studied sample had normal birth weight, and approximately half of the studied sample had breast feed child.

On other hand, the present study results are in disagreement with the study results of ***Freer et al., (2022)***, who conducted a study entitled "Short stature and language development in the United Kingdom: A longitudinal analysis of children from the Millennium Cohort Study", in UK, which reported that, approximately two thirds of their studied sample had breastfed child.

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The current study findings revealed that, slightly more than two thirds of the studied sample hadn't premature child born as well as hadn't a history of malnutrition disease (rickets). These results are congruent with those of the study performed by ***Penugonda et al., (2020),*** who conducted a study entitled "A study of etiological and clinical profile of short stature in a tertiary care center", in India, which reported that the majority of studied sample had full term child born, while half of them have a history of malnutrition disease (rickets).

Moreover, these results are in agreements with those of ***Alharbi et al., (2022),*** who conducted a study entitled "Knowledge and awareness for the early detection and intervention of short stature among families in Qassim Region 2021–2022: A cross-sectional study", in KSA, which indicated that one third of studied sample had malnutrition disease and 2.8% of studied sample had gastrointestinal disease and renal disease. However, the current study findings revealed that the majority of studied sample hadn't recurrent gastroenteritis and more than three quarters of studied sample hadn't kidney disease.

Similarly, ***Omar et al., (2023),*** who conducted a study entitled Mothers' knowledge and perception toward short stature of their children and its effect on quality of life", in Egypt, which reported that less than one quarter of studied sample had malnutrition disease and 3.8% of them had kidney disease.

From the investigator's point of view, the variation in statistic results might be due to that the studies were conducted in three different continents as Africa, Asia and Europe. Africa and Asia are from developmental continents, where children's mothers are suffering from malnutrition that affects the mothers breast-feeding ability.

Regarding to family history, the current study findings revealed that, approximately half of the studied sample had medication taken during pregnancy, slightly more than half of them had the pregnancy monitored with a doctor, and for less than three fifths of the studied sample either of the child's parents experienced delayed puberty. The present study results are to some extend consistent with those of ***Penugonda et al., (2020),*** who reported higher percentages accounting for three quarters of their study sample for the three items (medication taken during pregnancy, pregnancy monitored with a doctor, and child's parents experienced delayed puberty).

Considering to family history of the studied sample, the current study findings study revealed that, slightly more than half of studied sample hadn't any other medical history and more than half of studied sample had similar cases in the family. These results were in agreement with those of a study done by Huang et al., (2022), who found that, more than half of studied sample had not any other medical history. As well, ***Abdullah et al., (2022),*** who conducted a study entitled "Etiological classification of short stature in children over 5 years old", in Syria, which reported that, approximately half of this studied sample had similar cases in the family.

Concerning family members affected with short stature, the current study results indicate that, the main responsibility falls on parents of short-statured children more than other members in the family. This result was supported with that of a study carried out by ***Lackner et al., (2023),*** who conducted a study entitled" Health-related quality of life, stress, caregiving burden and special needs of parents caring for a short-statured child-review and recommendations for future research'', in Germany, which revealed that, the main responsibility falls on parents of children with short stature with greater caregiving stress than other members in the family.

From the investigator's point of view, the main responsibility falls on parents of short-statured children more than any other members in the family, because the parents have a sense of responsibility more than other

Regarding to the mean and standard deviation about the family burden related to their children with short stature, the current study results showed that, the physical burden was 7.2347 ± 4.11327, while the emotional burden was 47.4031 ± 27.72162, the social burden was 39.4796 ± 24.87187 and total burden regarding short stature was 101.4133 ± 61.92334. These results are consistent with those of the study performed by ***Maghnie, et al., (2023),*** entitled " Quality of Life in children with Growth Hormone Deficiency and their Caregivers: An Italian Survey" in Italy, which reported that, the emotional burden was 68.57 ± 22.00, the social burden was 71.68 ± 24.61, and total burden regarding short stature was 72.38 ± 20.51. However, it was in disagreement with the present study result as regards the physical burden that was 78.40 ± 20.80.

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Also regarding to the mean and standard deviation about the burden regarding children with short stature of the studied sample the current study findings showed that, the financial burden was 7.2959 ± 6.01060. This result agrees with that of the study performed by ***Khanna, et al., (2019)*** who conducted a study entitled 'Social, psychological and financial burden on caregivers of children with chronic illness: A cross-sectional Study: An Indian survey", in india. which reported that, the financial burden mean was 7.89 ±5.01.

Similarly, the previous results are agreement in with those of a very recent study, done by ***Bullinger et al., (2024),*** entitled "Assessing the Quality of Life of Health-Referred with Short Stature: Health and Quality of Life Outcomes, in Germany. Which revealed that, the emotional burden was 68.37 ± 24.75, the social burden was 67.57 ± 23.17 and the total burden regarding short stature was 68.41 ± 21.93. But disagreement with the result of the physical burden was 69.28 ± 23.82.

Regarding to the total burden scores and level among the studied sample regarding families of children with short stature, the current study results revealed that, less three fifth of the studied sample had moderate level and less than two fifth had weak level. These results are in the same line with those of ***Lackner et al., (2023),*** who conducted a study entitled Caregiving Burden and Special Needs of Parents Caring for their children with short stature, in USA. they reported that, more than half of the studied sample was moderate and more than one third was weak.

From the investigator's point of view more problem arise due to the social expectations of children being tall, and parental worries show the additional challenges of short statured males. From the parents' perspective society, and the social environment emphasize standards, making short-statured children and their parents feel excluded.

Regarding total adjustment scores and level among the studied sample of families regarding their children with short stature, the current study results revealed that, less than two third of the studied sample had good adjustment or coping of family and their children toward short stature, while more than one third had poor adjustment or coping of family and their children toward short stature with a mean ± SD of 45.1378 ± 26.38330. These results are in the same line with those of ***Backeljauw et al., (2021),*** who conducted a study entitled "Impact of Short Stature on Quality of Life: A Systematic Literature Review ", among European, which revealed that the mean ± SD was 51.95 ± 26.51, more than half of the studied sample had good coping and more than third of the studied sample had low coping. Moreover, the current study was supported with the very recent study findings done by ***Bullinger et al., (2024),*** who reported that, the mean and standard deviation of total coping = mean ± SD = 51.95 ± 25.19.

From the investigator's point of view, most of the families and their children have good adjustment or coping toward short stature to decrease stress and being integrated in the society.

Regarding correlations among total scores of knowledge, total scores of burdens and total scores of adjustment of the studied sample regarding short stature, the current study findings represent a positive strong highly statistically significant correlation between total scores of knowledge and total scores of burdens (physical, social, financial, and emotional) at r = 0.867 and p value = 0.000. The results also denotes that there was a positive strong highly statistically significant correlation between total scores of knowledge and total scores adjustment at r=0.984 and p value=0.000. these findings contrast with those of ***Bullinger et al., (2024),*** who recently reported that, all items showed factorial validity, with significant factor loadings ($p < .001$) except for one item of the social domain and of the emotional domain, standardized regression weights were above the threshold of .50. The quality of life in short stature youth (QoLISSY) instrument showed high inter-correlations of the three cores QoL scales, while the association with the coping subscale was lower.

From the investigator's point of view, the highly statistically significant correlation among total scores of knowledge, total scores of burdens (physical, social, financial and emotional), and total scores adjustment regarding short stature due to each core or element affect each other in a positive strong highly statistically significant correlation.

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## Conclusion

**Based on the finding of the present study, it can be concluded that:**

Two third of families of children with short stature had good knowledge with a mean ± SD of 12.7959 ± 5.61584, while more than half had moderate burden with a total burden, mean ± SD =101.4133±61.92334, and good adjustment represents approximately two third with total adjustment, mean ±SD=45.1378±26.38330.There were statistically significant relations between total knowledge score levels of the studied sample and their socio-demographic data (P<0.05) except for social status and monthly income. Also, there were statistically significant relations between total burden score levels of the studied sample and their socio-demographic data (P<0.05) except for number of children. In addition, there were statistically significant relations between total adjustment score levels of the studied sample and their socio-demographic data (P<0.05) except for age, number of children, The study findings also show that there were highly statistically significant correlations between total scores of knowledge, total scores of burden with r=0.867, p=0.000 and total scores of adjustment with r=0.984, p=0.000 of the studied sample regarding short stature of their children.

## Recommendations

**Based on the result findings of the study, the following recommendations were suggested:**

- Increase parent's health awareness regarding their children with short stature for causes and complications in clinics, and maternal and child health centers.
- Design posters for outpatient clinics and maternal and child health centers about malnutrition that leads to short stature, while would help parents to improve their knowledge and attitudes regarding their children with short stature.
- Further studies on the same topic should be conducted in other geographical settings for generalization of the results.

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