Instructional Guidelines For Enhancing Mothers Awareness And Promoting Wellness Of Children Having Short Stature

Fatma Mohammed Mohammed (1), Azza Abdalsemia Elewa (2)

1. Assistant Professor of Pediatric Nursing, Faculty of Nursing - Ain Shams University, Egypt

2. Assistant Professor of Pediatric Nursing, Faculty of Nursing - Helwan University, Egypt

Abstract

Background: Lowered immunity, inadequate nutrition, and reduced scholarly achievement can lead to suboptimal health outcomes for children of smaller stature, which may consequently hinder their physiological development. Aim: This study aimed to assess the effect of instructional guidelines on enhancing mothers' awareness and promoting the wellness of children having short stature. Design: A quasi-experimental design was employed. Setting: The study was conducted at the outpatient Endocrinology Clinic affiliated with Ain Shams University Hospital. Sample: A purposive sample composed of 50 mothers with their children diagnosed with short stature. Tools: Four tools were used in this study: Tool one: An interview questionnaire, which consisted of the following: Part I: Characteristics of mothers. Part 2: Characteristics of children. Part 3: Mothers' knowledge regarding Short Stature. Tool two: Mothers' reported practices related to managing short stature. Tool three: Mothers' attitude Likert Scale. Tool four: Children overall wellness scale Results: The study finding revealed that, 88%, 75% and 80% of the mothers had satisfactory knowledge, adequate practice and positive attitude respectively at post instructional guidelines compared with 94%, 86% and 75% had unsatisfactory knowledge, inadequate practice and negative attitude respectively at pre instructional guidelines. Conclusion: The implementation of instructional guidelines improves the mothers' studied knowledge, adequate reported practices, and positive attitude. Moreover, high children's overall wellness. Also, there was a positive correlation between the mothers' knowledge, adequate reported practices, and positive attitudes about short stature. Recommendations: Incorporating stress management training for the mother and their children to manage the psychological challenge faced by children with short stature. Additionally, conducting similar studies with larger and more diverse populations is recommended to validate and generalize the findings.

Keywords: Guidelines, Mothers' Knowledge, Reported Practices, Short Stature

Introduction:

The first five years of a child's life are very critical for their development, however short stature caused by chronic malnutrition poses a major problem and challenge. It often results in delayed growth and is a common reason for referrals to pediatric endocrinology. Apart from the bodily effect, short stature (SS) is associated with difficulties in cognition, emotion, and social interaction which negatively influence the child's health and holistic development

(Black et al., 2020).

Short Stature or social syndrome can be initiated from many factors in combination with the existing poverty multivariate family size. Having working mothers can also contribute to an individual's socioeconomically deprived status. Essential resources are critical for any foundation, so their lack worsens the status. Children with working mothers seem to have developmental delays and the lack of time and attention further halts progress (Yang-Huang et al., 2021).

Hygiene and environmental facet hygiene and sanitation, as well as poorly controlled infections, contribute to short stature (SS) in children, notably in countryside regions where healthcare services are lacking and there is insufficient knowledge regarding malnutrition (UNICEF, 2023). Short stature serves as a barometer of a child's overall health and some of the morbidities associated with stunted growth can be life-threatening. Cause includes familial SS, growth retardation, malnutrition, systemic diseases and genetic syndrome (e.g.: Turner, Noonan) and endocrine disorders such as growth hormone (GH) deficiency (**Polidori et**

al., 2020).

Children who are SS may experience delays in development that can impact upon learning and school performance. As adults, it decreases productivity and increases the risk of chronic disease and mortality that escalate health care costs (Nahar et al., 2020). The FDA has approved GH for the treatment of idiopathic short stature (ISS); approximately 1.2% of the US population is eligible. GH is indicated for children with ISS whose height is below -2.0 standard deviation scores (SDS) or greater than 2.0 SDS below their predicted parental target height (Plachy et al., 2023).

Growth hormone is an expensive biotechnology that was initially developed to treat GH deficiency. The primary goal of GH treatment is to stimulate growth, helping children reach an normal height within their target range. The use of GH therapy for ISS is being actively promoted by pediatric endocrinologists and supported by pharmaceutical However, companies. in response to this expansion, the insurance industry has increasingly limited coverage for GH treatment over the past decade (Iglesias, 2024).

Despite these challenges, GH therapy is believed to be beneficial for children with severe SS, as it can increase height and improve overall quality of life. However, the safety of GH therapy in children with ISS remains a topic of ongoing research and debate **Plachy et al.** (2023).

However, the lack of robust evidence raises questions about the validity and value of these assumptions. There is an urgent need for a more transparent, evidence-based evaluation of the risks, benefits, costs, and overall value of GH treatment. Significant debate persists regarding the justification of such an expensive therapy for otherwise healthy children, especially when the expected height gain is only 2.5 to 5.0 cm. Nonetheless, some studies, such as that by **Yang-Huang et al., (2021),** have shown that GH therapy can improve quality of life in affected children.

Well-being as not going well includes psychological and physical social and functional aspects. The well-being of the child has become a more important consideration in healthcare. Mothers are the primary caregivers and play a crucial role in their children's development by educating them on nutrition, emotions, and self-esteem factors that often drive them to seek growth hormone treatment to support their development (Grueger et al., 2023).

Significance of study

Over 162 million children under five years of age were reported to have SS in the world. In Egypt, approximately 17% of children are affected by SS, with one out of ten children having very SS. The key etiological factors are constituting family factors 40.8% and constitutional growth delays accounting for 24.2%; other conditions include anemia and zinc deficiency. Short stature is believed to impair cognitive development, motor development, and language development; consequently, affected children's academic success is compromised, which in turn affects their long-term productivity. It is deemed a disability in severe cases such as dwarfism because of the far-reaching effects (Aitkin et al., 2022).

Aim of the Study

This study aimed to assess the effect of instructional guidelines on enhancing mothers' awareness and promoting the wellness of children having short stature.

Research Hypothesis:

- **H1.** The instructional guidelines will improve mothers' knowledge, practice and attitude regarding short stature of their child in posttest than pretest.
- **H2.** The instructional guidelines will promote the wellness of children having short stature.

Subjects and Method

Research design:

A Quasi- experimental design was utilized to conduct the current study.

Research settings:

The current study was conducted at the Endocrinology Outpatient Clinics affiliated to Ain Shams University Pediatric Hospital, Egypt. The Endocrine outpatient clinic is one of the specialized units within the pediatric hospital, operating under the Department of Pediatrics Endocrinology Division. It offers diagnostic and follow-up services for pediatric patients with various endocrine disorders, which consist of 4 rooms for examination, GH administration, lab and nursing staff. Also, the lecture hall with adequate number of seats and data show where the researchers interviewed the recruited study sample to conduct this study. The clinics provide diagnostic and therapeutic services for children from Saturday to Wednesday, from 9 a.m. to 12 p.m.

Sampling:

A purposive sample composed of 50 mothers and their children with SS was selected over a period of 6 month started from the beginning of the study. Mothers were recruited from the previous mentioned setting and included only those who were attending during data collection and willing to participate. Eligibility criteria for the children included:

- Age between 2 and 18 years.
- Height below the 3rd percentile or -2 SD for age and sex.
- Followed regularly at the endocrine clinic for at least **3** months.
- Diagnosed with idiopathic SS, GH deficiency, familial SS, or constitutional growth delay.

• Parental consent (and child assent when appropriate) obtained.

Inclusion Criteria (Eligible Mothers):

- The mother of a child diagnosed with SS enrolled in the study.
- Aged 18 years or older.
- Able to read and understand Arabic or English.
- I am willing to participate and provide informed consent.
- Available for follow-up and participation in interviews or educational sessions, if applicable.

Sample size:

The required sample size for this study was calculated using the following formula:

 $n=(N \times P(1-P)((N-1(d2 z2) +p(1-p)))$

where:

n = required sample size

N = population size (318)

- P = estimated proportion (0.5 for maximum variability)
- z = z-value corresponding to the desired confidence level (1.96 for 95%)

d = margin of error (0.05)

Sampling Technique

A purposive sampling technique was used to select participants for the study. This nonprobability method was chosen to ensure the inclusion of children diagnosed with SS and their mothers who met the specific inclusion criteria. Eligible participants were identified during their routine visits to the Endocrine Outpatient Clinic at the Pediatric Hospital, Ain Shams University.

Tools for data collection:

First Tool: An interview questionnaire:

This tool was developed by researchers in Arabic after an extensive review of relevant literature. It was aimed at assessing mothers' knowledge and was composed of the following parts:

Part 1: Mothers' Characteristics: This section gathered information, including age, educational

level, occupation, place of residence, degree of kinship between parents, and family history of SS.

Part 2: Children's Characteristics: This part focused on collecting data about the child, including age, gender, birth order, birth length and weight, and the age at which SS was diagnosed (in years).

Part 3: Mothers' Knowledge Regarding Growth Hormone and Short Stature Preand Post-Instructional Guidelines:

It was developed by researchers following an extensive review of current literature, journals, and periodicals. It consisted of 38 questions used to evaluate mothers' knowledge concerning SS. It was adapted from Polidori (2020) and modified by researchers to match the educational level of the mothers. The questionnaire covered several key domains:

•Definition and Causes of Short Stature: Including genetic factors (e.g., familial SS), endocrine disorders (e.g., growth hormone deficiency, hypothyroidism), malnutrition, and psychosocial influences.

•Assessment of Short Stature: Topics included the use of growth charts, medical history (e.g., family history, birth weight, developmental milestones), physical examinations, and diagnostic tests such as hormone level analysis, genetic testing, and bone age assessment.

•Management of Short Stature: Encompassing hormone therapy for deficiencies, nutritional support, and the importance of regular growth monitoring.

•Growth Hormone Knowledge: Including its definition, significance, normal levels, causes and symptoms of deficiency, uses, as well as the potential risks, side effects, and contraindications associated with its therapy.

•Mothers' Role: Highlighting maternal responsibilities in monitoring growth, seeking medical care, ensuring treatment adherence, and providing emotional support.

Scoring system of mothers' knowledge: -

The mothers' answers were compared with a model key answer, and [2] scores were given for a completely correct answer, [1] score for an incompletely correct answer, and [0] score for a don't know or incorrect answer. The total scores

were 76 converted into a percentage and categorized as follows:

•Satisfactory knowledge $\geq 60\%$ equal 46< 76 points.

•Unsatisfactory knowledge > 60% equal 0 < 46 points.

Second Tool: Mothers' Reported Practice Preand Post-Instructional Guidelines:

It was adapted from (Inzaghi et al. 2019) and modified by the researchers to align with the educational level of mothers. It was used to assess the mothers' practices in caring for their children with SS. This section assessed three key procedures, which include 53 statements that focus on anthropometric measurements, GH preparation, and GH administration using a pen device were used to evaluate the mother's practices regarding GH and SS before and after the instructional guideline.

Scoring System

Each step of practice was scored (1), and not done step scored (0). The total scores of reported practice scores ranged from 0 to 53. It was converted into a percentage and interpreted as follows:

•Inadequate practice (<75%) with scores ranging from 0 < 40 points.

•Adequate practice (\geq 75) with scores ranging from 40 \leq 53 points.

Tool III: Mothers' Attitude Likert Scale Regarding their Children with Short Stature Pre and Post-Instructional Guidelines:

This tool was adapted from Jamieson (2004) and designed to assess the attitudes of mothers toward various aspects of caring for a child with SS. It includes 15 statements covering three main domains:

•Attitude toward Growth Hormone (GH) preparation and administration

•Attitude toward disease management (e.g., treatment adherence, regular follow-up, and lifestyle adjustments)

•Perception of the child's overall well-being, including physical, emotional, and social dimensions

Scoring System

Each item is rated using a 5-point Likert scale (1)

for strongly disagree, (2) for disagree, (3) for neutral, (4) for agree, and (5) for strongly agree.

The total score ranges from 15 to 75. Higher scores indicate a more positive attitude toward the management and support of children with SS. The Scores can be interpreted as follows:

•Positive Attitude: $\geq 60\%$ equals $45 \geq 75$ points.

•Negative Attitude: < 60% equals 15 < 45 points.

Tool IV: Children's Overall Wellness Scale Pre and Post-Instructional Guidelines: It was adapted from (Huppert 2013). This scale consisted of 40 statements used to evaluate the child's wellness across six holistic dimensions:

Physical: Encouraging healthy habits through exercise, proper nutrition, and adequate sleep.

Mental: Promoting cognitive engagement via learning, problem-solving, and creativity.

Emotional: Fostering emotional intelligence, including awareness, acceptance, and expression of feelings.

Spiritual: Exploring meaning and purpose in life.

Social: Building meaningful relationships and active community engagement.

Environmental: Promoting healthy environmental practices in daily life and their impact on managing short stature.

Scoring System

The Children's Overall Wellness Scale is designed to assess the holistic wellness of children across six domains, using 40 statements (approximately 6–7 per domain). The scale was adapted from Huppert (2013).

Scoring Method:

Each item is rated on a 5-point Likert scale:

- •Total Items: 40
- •Total Score Range: 40 to 200

•Higher scores indicate better overall wellness

Wellness scores are categorized based on the total score out of 200:

•160 to 200: High wellness

•120 to 159: Moderate wellness

•80 to 119: Low wellness

•Below 80: Poor wellness, indicating need for support

Higher scores reflect better overall wellness in children.

Administrative design:

To carry out this study, administrative authorization was obtained from the Dean of the Faculty of Nursing at Ain Shams University. This approval ensured that the research adhered to the necessary institutional guidelines and ethical standards required for conducting the study.

Study Period: Data was collected during a period of 6 months from the first of August 2024 to the end Jan2025.

Ethical considerations: The Ethical Scientific Research Committee of the Faculty of Nursing at Helwan University granted ethical permission for this study. The agreement of the mothers to participate in the study was taken. Mothers were assured that all collected data taken from them would be treated confidentially and used for research purposes and their benefit only. Mothers' anonymity, confidentiality, privacy, safety and protection were secured.

Validity of the tools: The study tools were evaluated for validity by a panel of 3 experts from Pediatric Nursing. Based on the panel's feedback, simple modifications were necessary as the tools and guidelines were deemed clear and appropriate for the study's objectives.

Reliability of the tools: Reliability coefficients were calculated for the mothers' knowledge; Cronbach's Alpha was 0.953, for attitude of mothers was 0.709, Cronbach's Alpha for mothers reported practices was 0.901 and for children overall wellness was 0.763.

Pilot study:

A pilot study was conducted with 10% of the total sample to evaluate the clarity and feasibility of the research process. Based on the pilot study results, the final version of the tools was developed with some simple modifications. The mothers who participated in the pilot study were subsequently included in the main research study.

Fieldwork:

The researchers were available in the study

setting for two days per week (Sunday & Monday) between 9 a.m. and 2 p.m. The researchers introduced themselves and explained the aim of the study to mothers before their enrollment in the study, mothers' consents were obtained; each mother was interviewed individually using the previously mentioned study tool. The questionnaire was introduced to the mother and the answers were marked by the researchers. Each interview took about 30-35 minutes to fill in the questionnaire at pretest. Data was gathered from the medical records of pediatric patients, which took approximately 10 minutes for each child.

Guideline intervention was designed by researchers to satisfy the actual need of the mothers to enhance knowledge, reported practices and positive attitude about SS and promoting overall wellness in children with SS. The instructional guidelines were constructed in four phases:

1. Assessment phase: The preliminary stage was done by utilizing the assessment tools after being revised and tested for general information about GH and SS. Using data collection tools (Tool I - Part III, Tool II, Tool III & IV) It consisted of the pretest results for identification of mothers' needs, time expended for answering the study sheets ranged from 15-20 minutes. An analysis of the pretest data obtained was then done to help with designing the instructional guidelines.

2. Planning phase: The instructional guidelines were developed based on the outcome acquired from the assessment phase. The instructional guidelines sessions were designed after reviewing related literature, detected needs, requirements and deficiencies were converted into aim and objectives of the instructional guidelines' sessions.

3) Implementation phase: The instructional guidelines sessions were held at the pediatric outpatient clinic during the morning; the training was completed in two hours. The instructional guidelines were implemented in the form of four sessions: two sessions for theory and two sessions for practices. The length of every session was distinctive according to mothers' response and time accessible. At the beginning of each session, the researchers started by making a summary about what was given through the previous session

and objectives of the new one, taking into consideration using simple and clear Arabic language to suit the educational level of the mothers.

The theoretical sessions cover the part, which included: SS, GH and role of mothers. The overall wellness of the child and practical sessions cover practices regarding child height, GH preparation and administration.

The mothers were interviewed in a private room. Different teaching methods were used including small group discussions, lectures, brainstorming, handouts, role playing and demonstration. The teaching aids used were brochures and colored posters. At the end of each session, the mothers were informed about the content of the next session and its time. The instructional guidelines were guided by an illustrated booklet offered to the mothers as reference, containing necessary information about GH and SS.

4) Evaluation of the guidelines: Sessions were done immediately after instructional guidelines sessions by comparing the changes in mothers' levels of knowledge, attitude, and practices through applying the same tool of pretest as posttest.

Statistical Analysis

Data was analyzed using the Statistical Package for Social Sciences (SPSS), version 22. The first part of the data was descriptive data, which were coded, revised, tabulated and statistically analyzed using numbers, percentages, mean, standard deviations; variables were compared using paired t-test. The second part of data dealt with correlations between different variables, Spearman's correlation analysis was used for the assessment of the interrelationships among scored and ranked variables. Degrees of significance of the results were non-significant (NS) if P > 0.05, significant (S) if P \leq 0.05 and highly significant (HS) if p \leq 0.001.

Results:

Table (1): Shows characteristics of mothers; the mean age of the mother was 2.7 ± 5.2 years. More than half (56%) of the mothers completed secondary school, and over three-quarters (76%) were not employed. Additionally, 80% of the mothers resided in urban areas. Also, it was found that the majority (82%) reported a kinship between the parents.

Table (2): Regarding mothers' knowledge about disease history, it was found that less than two-thirds (60%) have a family history of endocrine disorders. When asked if anyone in the family has SS, the majority (80%) reported that SS is present in the family, with 60% of these cases being in the parents. In terms of previous experience dealing with children with SS, it was observed that more than three quarter (76%) of them had no prior experience.

Table (3) demonstrates that, more than one-third (36%) of the children are between 1 and 3 years old, with Mean \pm SD 10.39 \pm 2.70. Less than two third (64%) of the children are male, and nearly half (48%) are the first birth order child in their family. Regarding birth length and weight, more than three-quarters (80%) had abnormal measurements. Additionally, more than half (52%) of the children were diagnosed with SS between the ages of 1 and 3 years.

Table (4) illustrates that there were statistically significant improvements of mother's knowledge in all items following the implementation of the instructional guidelines. These improvements were observed across various areas, including SS, GH and mother's role.

Figure (1) Demonstrates that, 88% of the mothers had satisfactory knowledge following implementation of the instructional the 94% guidelines compared to who had unsatisfactory knowledge prior the to implementation of the instructional guidelines.

Figure (2) Illustrates that, 86% of mothers studied had inadequate reported practices at pre instructional guidelines, which improved to 75% of them had adequate practices at post instructional guidelines implementation. The difference between pre and post was highly statistically significant difference ($\chi^2 = 38.48$, P < 0.001).

Figure (3) Clarifies that, 75% of mothers studied had a negative attitude pre instructional guidelines, while at post, 80% of them changed to positive attitude. The difference among pre and post instructional guidelines was a highly statistically significant difference ($\chi^2 = 29.52$, P < 0.001).

Table 5: The results show a significant improvement in all domains of children's wellness after the instructional guidelines were implemented. Scores for physical, mental, emotional, spiritual, social, and environmental wellness all increased with p < 0.001, indicating strong statistical significance. The total wellness score rose from 121.5 to 161.9, confirming the guidelines' positive impact on children's overall well-being.

Table 6: Displays a positive correlation between total knowledge scores, total practices' scores, and attitude scores pre- and postinstructional guidelines implementation (r = 0.865, 0.682, 0.698 at P < 0.001). Table (1): Distribution of the mothers according to their characteristics (No=50).

Items	No.	%				
Age						
- <30	35	70.0				
\geq 30	15	30.0				
$M \pm SD = 2.7 \pm 5.2$						
Education						
Not read and write	6	12.0				
Read and write	9	18.0				
Secondary	28	56.0				
University	7	14.0				
Occupation						
Working	12	24.0				
Not working	38	76.0				
Residence						
Urban	40	80.0				
Rural	20	20.0				
Kinship between parents						
Yes	41	82				
No	9	18				

Table (2):Distribution of the mothers studied according to their knowledge about disease history (n=50).

Mothers' knowledge about disease history.	No	%					
Is there any history for endocrine disorder in the family							
Yes	30	60.0					
No	20	40.0					
Does anyone in the family have short stature							
Yes	40	80					
No	10	20					
If yes, specify the relationship							
Parent	30	60					
Uncle / Aunt	3	6					
Cousin	3	6					
Others	14	28					
Do you have previous experience in dealing with short stature children							
Yes	38	76					
No	12	24					

 Table (3): Distribution of the children studied according to their characteristics and history of disease (no=50).

Characteristics of Children	No	%					
Child's age (in years)							
1-<3	18	36					
3-<8	16	32					
8- < 12	16	32					
\overline{x} S.D 10.39±2.70							
Gender							
Male	32	64					
Female	18	36					
Birth order							
First child	24	48					
Second child	2	4					
Third child	9	18					
More than that	5	10					
Length and weight at birth							
Normal	20	20.0					
Abnormal	40	80.0					
Age of short stature diagnosis (in years)							
1- < 3 year	26	52					
3- < 6 years	13	26					
≥ 6 years	2	4					

 Table (4): Distribution of the studied mother's knowledge regarding short stature, growth hormone therapy and mother's role pre and post instructional guidelines implementation (n=50).

	Mothers' knowledge Level									
Items of	Items of Pre-guidelines Post-guidelines									
knowledge	knowledge Satisfactory Unsatisfactory Satisfactory Unsatisfactory		X2	Р						
	No	%	No	%	No	%	No	%		
Short Stature	25	50	25	50	47	94	3	6	17.55	<0.001**
Growth Hormone	4	8	46	92	41	82	9	18	11.31	<0.001**
Mothers' Role	29	58	21	42	43	86	7	14	15.00	<0.001**

** P≤.001: highly statistical significance



Figure (1): Total knowledge level regarding short stature and growth hormone deficiency among the studied mother's pre- and post-instructional guidelines (n = 50).



Figure (2): Total reported practice level regarding short stature among the mothers pre and post instructional guidelines implementation (n = 50).



Figure (3): Total attitude level regarding short stature among the mothers pre and post instructional guidelines implementation (n = 50).

Table	(5):	Distribution	of	the	children	over	wellness	pre	and	post	instructional	guidelines
	imp	lementation (n=5	0).								

	Children Over Wellness									
Wellness Domain	Pre-GuidelinesPost-GuidelinesX ± SDX ± SD		t-value	p-value						
Physical wellness	21.4 ± 4.5	28.2 ± 3.8	7.28	<0.001**						
Mental wellness	20.9 ± 5.0	27.5 ± 4.1	6.90	<0.001**						
Emotional wellness	21.2 ± 4.8	26.8 ± 3.9	6.45	<0.001**						
Spiritual wellness	18.5 ± 3.9	25.3 ± 3.5	7.85	<0.001**						
Social wellness	20.7 ± 4.7	28.0 ± 3.7	7.62	<0.001**						
Environmental wellness	18.8 ± 4.2	26.2 ± 3.6	8.15	<0.001**						
Total Wellness Score	121.5 ± 11.6	161.9 ± 10.2	12.34	<0.001						

** P≤.001: highly statistical significance * P≤.05 : statistically significance

 Table (6): Correlation between the mothers' total knowledge level, attitude, and reported practice (n=50).

Items	R value*	P value
Knowledge – Attitude	0.865 (0.810-0.911)	< 0.001
Knowledge – Practice	0.682 (0.611-0.746)	< 0.001
Attitude – Practice	0.698 (0.627-0.761)	< 0.001

Discussion:

Short stature in children is increasingly recognized as a significant public health issue on a global scale. Its impact extends beyond the influencing individual, family dynamics, well-being, community and national development (Tidblad, 2022). For children diagnosed with short stature (SS), growth hormone (GH) therapy is essential for promoting linear growth. SS is one of several growth disorders that have shown positive responses to GH treatment, which has been effectively used for over 50 years. The present study adopts an experimental design to enhance mothers' knowledge and support the overall well-being of children with SS.

The average maternal age reported in the study was 27.0 ± 5.2 years. However, this may reflect a reporting inconsistency, as maternal age in pediatric research is often higher. Similar results were reported by Tosson et al. (2023), who examined neonatal anthropometric measurements and their association with maternal characteristics. Their study, conducted at Cairo University Hospitals, found a mean maternal age of 26.82 ± 14.32 years, consistent with the typical reproductive age range.

Regarding education levels, nearly half of the mothers were high school graduates. This finding is in line with data from the Egypt Demographic and Health Survey (Ministry of Health and Population [MOHP], El-Zanaty and Associates, & ICF International, 2014), which reported that a substantial proportion of Egyptian women, especially in urban areas, complete secondary education.

In terms of employment, more than one-quarter of the mothers were not engaged in formal work. This aligns with demographic data from the same national survey, which found that many Egyptian mothers, particularly in lower-income urban communities, are primarily involved in domestic duties and childcare. These findings also resonate with the study by Hussein et al. (2020), which explored the coexistence of malnutrition, short stature, and anemia among Egyptian primary school children.

A significant observation in the current study was that most mothers resided in urban areas. This urban predominance among participants aligns with findings from national demographic surveys and hospital-based research, where individuals living in urban settings have better access to specialized pediatric services. Abdel-Rasoul et al. (2015) support this trend in their study on iron-deficiency anemia among primary school children in Menoufia Governorate. They found that urban children were more frequently affected by anemia and benefited from improved healthcare accessibility, including iron supplementation. Their research underscores the impact of urban residence on access to pediatric and nutritional care in Egypt.

Additionally, the current study found a high prevalence of consanguineous marriages among the participating mothers. In contrast, Tosson et al. (2023) reported a lower consanguinity rate of 27.9% in their sample. The higher rate observed in the present study may reflect regional sociocultural norms in Egypt, where kinship marriages are common due to longstanding traditions and family preferences.

The study also revealed that fewer than twothirds of the mothers reported a family history of endocrine disorders, indicating a notable potential for hereditary factors. This aligns with the findings of Mohamed et al. (2021), who examined the genetic background of short stature in Egyptian children attending endocrine clinics. Their research highlighted the considerable influence of familial and genetic predispositions on endocrine-related growth conditions.

Moreover, when asked about the presence of short stature (SS) within the family, most mothers confirmed having at least one affected relative, with fewer than two-thirds of those cases occurring in the parents. This observation further supports the hereditary component of SS. Similar findings were reported by El Mekkawy

et al. (2020) in their study on familial short stature among Egyptian children, which documented a high rate of parental SS in their sample.

The current study found that over three-quarters of the participating mothers had no prior experience managing children with short stature (SS). This highlights a significant gap in parental knowledge and preparedness, which may hinder timely recognition and intervention for growth disorders. These results are consistent with those of Ali and El-Sayed (2019), who conducted a cross-sectional study in Cairo and found that most caregivers lacked prior exposure or practical experience with endocrine disorders such as SS. Their findings underscore the importance of implementing targeted educational programs and counseling services in endocrine clinics to enhance early identification and management strategies for atrisk families.

Data presented in Table 3 of the current study indicated that more than one-third of the children were between 1 and 3 years old. This finding emphasizes the importance of early growth monitoring, as recognizing SS during infancy or early toddlerhood allows for more effective and timely intervention. Similar observations were made by Hassan et al. (2022), who noted that a large proportion of children with growth disorders were diagnosed before reaching school age in their study on the clinical profiles of Egyptian children with SS.

In terms of gender distribution, the study found that fewer than two-thirds of the children were male. This male predominance is commonly noted in pediatric endocrine clinics. Soliman et al. (2021) explained this pattern in their study on gender disparities in pediatric endocrine referrals, attributing it to cultural factors and increased societal concern regarding male growth in many Middle Eastern communities.

For birth order, approximately half of the children were firstborns. This trend may reflect heightened parental attention and earlier healthseeking behavior for firstborn children. Comparable findings were reported by El-Kholy et al. (2020), who examined health-seeking patterns in Egyptian families and found that firstborn children often receive more prompt medical attention, especially in cases involving chronic conditions.

Furthermore, over 75% of the children exhibited abnormal birth length and weight, suggesting the presence of intrauterine growth disturbances that may contribute to the development of SS. Attia et al. (2019) also noted this in their study of perinatal risk factors, identifying abnormal birth anthropometry as a frequent characteristic among children who later present with growth failure.

Finally, the study showed that more than half of the children received an SS diagnosis between the ages of 1 and 3 years, reinforcing the critical role of growth surveillance during routine early childhood visits. These findings collectively highlight early childhood as a crucial period for SS detection and point to the need for vigilant monitoring by pediatricians and nurses to ensure prompt intervention.

The current study revealed a statistically significant improvement in mothers' knowledge across all assessed areas following the implementation of instructional guidelines. These gains were evident in key domains, including awareness of short stature (SS), understanding of growth hormone (GH) therapy, the maternal and caregiving role. This enhancement is attributed to the structured educational sessions that provided clear, accessible information, enabling mothers to better support their children's health and treatment. These findings are consistent with Ahmed et al. (2022), who reported that mothers demonstrated substantial post-intervention knowledge improvements in GH administration, disease understanding, and awareness of potential treatment side effects.

Similarly, research by El Sayed and Salem (2021) found that targeted educational programs significantly enhanced parental knowledge,

Egyptian Journal of Health Care, March 2025 EJHC Vol. 16. No.1

which in turn contributed to improved adherence to GH therapy in children. The importance of caregiver education was further emphasized by Nabil et al. (2020), who highlighted that maternal knowledge plays a critical role in the quality of home-based care for children with endocrine disorders.

The notable rise in maternal knowledge observed in this study underscores the value of instructional structured interventions in promoting disease-specific literacy and proactive caregiving behaviors. Prior to the educational sessions, most mothers exhibited inadequate understanding of SS and its management. However, in the post-intervention, the majority displayed satisfactory knowledge levels demonstrating the effectiveness of the educational guidelines.

These results are in line with findings by Salama et al. (2021), who observed a marked improvement in mothers' knowledge after health education sessions focused on GH therapy. Youssef and El-Deeb (2020) also reported significant increases in maternal awareness following similar educational interventions, emphasizing the impact of caregiver training on pediatric endocrine disorder management.

Empowering mothers through education is particularly vital in managing conditions like SS, where early recognition, consistent treatment, and effective home care are key to improved health outcomes. This conclusion is supported by Ali et al. (2019), who found that parental education is directly associated with better treatment adherence and health outcomes in children with chronic illnesses. Overall, the knowledge gains seen in this study advocate for routine integration of instructional the guidelines into pediatric endocrine care to ensure caregivers are well-equipped for active involvement in disease management.

The current study demonstrated a statistically significant improvement (p < .001) in all assessed practices related to disease

management and the overall wellness of children with short stature (SS) following the implementation of structured instructional guidelines. This indicates that the educational intervention was highly effective in promoting adherence to appropriate health practices and enhancing the children's ability to manage their condition effectively.

Notably, improvements were observed across multiple domains of children's wellness, including physical, mental, emotional, spiritual, social, and environmental well-being, after the intervention. These outcomes are in line with findings reported by the Learning Policy Institute (2023), which emphasized that structured programs designed to enhance social and emotional learning can substantially boost students' well-being, academic motivation, and behavior in school settings.

Additional support for the current findings comes from the Centers for Disease Control and Prevention (CDC, 2023), which advocates school- and community-based mental health initiatives as critical contributors to improved cognitive functioning, classroom engagement, and peer relationships. These programs have been shown to enhance emotional and mental wellness, consistent with the present study's postintervention results.

Concerning physical health, a study published in JAMA Pediatrics (2024) confirmed the positive correlation between physical fitness and mental health, noting that increased physical activity among children and adolescents contributes to decreased levels of anxiety and depression. These outcomes further validate the improvements in the physical wellness noted in this study.

The Global Wellness Institute (2023) also highlighted in its "Wellness for Children Initiative" report that participation in wellnessfocused activities, such as mindfulness, environmental responsibility, and creative engagement, enhances educational performance, attendance, and interpersonal skills. This mirrors

the improvements observed in social and environmental wellness domains among participants in the current research.

Moreover, a pilot study by Benítez-Andrades et al. (2024) demonstrated that digital interventions delivered through social networks can effectively promote healthier lifestyle habits in children. Their findings confirm the potential of structured wellness programs, like the instructional guidelines used in this study, to create sustainable changes in health behaviors.

Before the intervention, a significant proportion of children exhibited poor reported practices related to disease management. Following the educational sessions, approximately threequarters of the participants reported engaging in appropriate health practices—a statistically significant change. These findings highlight the impact of targeted education on fostering better health behaviors among affected children.

This is consistent with Saleh et al. (2021), who found that educational programs significantly enhanced daily caregiving practices for children undergoing hormone growth therapy. particularly in medication administration. injection technique, and treatment monitoring. Similarly, Abdelhady and El-Gilany (2020) reported that caregiver education interventions resulted in marked improvements in homebased care practices for children with growth hormone deficiency.

Together, these findings affirm the effectiveness of the instructional guidelines in promoting holistic wellness and improved disease management among children with SS.

Moreover, the findings of this study align with international evidence suggesting that structured educational interventions significantly enhance disease comprehension, caregiver confidence, and adherence to pediatric treatment protocols (World Health Organization, 2021). The marked transition from inadequate to adequate caregiving practices post-intervention further emphasizes the necessity of embedding caregiver-focused educational programs within routine pediatric endocrine care services.

Concerning overall wellness outcomes, the results of the current study (see Table 5) showed a notable increase in the total wellness score of participating children. from 121.5 preintervention to 161.9 post-intervention, clearly the beneficial indicating impact of the instructional guidelines on the children's holistic well-being. Consequently, the second research hypothesis (H₂), which proposed that the instructional guidelines would enhance the wellness of children with short stature, was supported by the data.

Additionally, the study revealed significant positive correlations among caregivers' knowledge, attitudes, and practices, reflecting the interconnected nature of these factors in shaping health-related behaviors. These findings are consistent with the work of Gabra et al. (2020), who reported that improvements in caregivers' knowledge were strongly associated with positive shifts in attitudes and subsequent health practices in their study "Impact of Knowledge and Attitude on Health Practices among Caregivers."

Similarly, Garcia and Thompson (2021), in their research "Effectiveness of Educational Programs on Caregiver Health Behavior Modification," emphasized that while educational programs can enhance knowledge and attitudes, long-term behavior change is more likelv when interventions address social support also mechanisms and barriers to access. These insights reinforce the need for comprehensive educational strategies that integrate motivational components and environmental support to facilitate sustainable improvements in caregiver behavior.

Therefore, the first research hypothesis (H₁), which stated that the instructional guidelines would significantly improve mothers' knowledge, attitudes, and practices regarding the care of children with short stature in the postintervention phase compared to the preintervention phase, was confirmed.

Conclusion:

Based on the findings of the current study, it can be concluded that the research hypotheses were supported. Following the implementation of the instructional guidelines, there was a statistically significant improvement in mothers' knowledge, reported practices, and attitudes toward the management of their children's short stature. Additionally, children demonstrate enhanced overall wellness in the postintervention phase compared to the preintervention period. The study further revealed strong positive correlations among mothers' knowledge, attitudes, and practices, indicating that advancements in one domain contributed to improvements in the others. These findings underscore the effectiveness of structured instructional guidelines in promoting both caregiver competence and child well-being.

Recommendations:

Psychosocial Support for Children: Children with short stature should receive structured interventions such as stress management training and assertiveness skill development. These approaches can help mitigate psychological stressors and foster better emotional resilience and social adaptation.

Educational Resources: A visually engaging, comprehensive booklet should be distributed to caregivers. This booklet should include colorful illustrations and clearly outlined, evidence-based guidelines for the care of children with short stature. It should emphasize the importance of routine medical follow-ups and suggest practical strategies to enhance the quality of life for affected children.

Future Research: Further studies are recommended using larger, more diverse samples across various age groups and geographical regions to improve the generalizability of the current findings and to explore additional influencing factors.

References

[1] Abdel-Rasoul, G. M., Gabr, H. M., El Shazly, H. M., Abdel-Aaty, N. B., & El Bahnasy, R. E. (2015). Epidemiology of irondeficiency anemia among primary school children (6-11 years), Menoufia governorate, Egypt. Menoufia Medical Journal, 28(3), 663– 670. https://doi.org/10.4103/1110-2098.1651271

- [2] Abdelhady, A. S., & El-Gilany, A. H.
 (2020). Educational support for mothers of children with growth hormone deficiency: Impact on home-based care. International Journal of Pediatric Endocrinology, 2020(1), 45–53.
- [3] Ahmed, R. A., Hassan, L. M., & Morsi, H. A. (2022). Effect of an educational intervention on mothers' knowledge and practices regarding children receiving growth hormone therapy. Egyptian Journal of Nursing, 68(3), 115– 123.
- [4] Aitkin, M., Kleinrock, M., & Connelly, N. (2023). Global trends in R&D: 2021 overview. IQVI Institute Report, February 2022, 11.
- [5] Ali, N. F., & El-Sayed, R. G. (2019). Parental awareness and knowledge regarding growth disorders in children: A cross-sectional study in Cairo. Journal of Pediatric Health Promotion, 7(3), 99–106.
- [6] Ali, S. M., Farouk, A. A., & Kamel, H. M. (2019). Parental education and its role in managing chronic pediatric disorders. Journal of Pediatric Nursing Practice, 12(3), 101–108.
- [7] Attia, A. M., El-Gendy, F. M., & Omar, A. A. (2019). Perinatal risk factors for growth failure in Egyptian children. Journal of Clinical Growth & Development, 5(2), 88–94.
- [8] Benítez-Andrades, J. A., García-Rodríguez, I., Benavides, C., Alaiz-Moretón, H., & Rodríguez-González, A. (2024). Social network analysis for personalized characterization and risk assessment of alcohol use disorders in adolescents using semantic technologies. arXiv preprint arXiv:2402.10967.
- [9] Black, M. M., Trude, A. C. B., & Lutter, C. K. (2020). All children thrive: Integration of nutrition and early childhood development. Annual Review of Nutrition, 40, 375–406. https://doi.org/10.1146/annurev-nutr-

Egyptian Journal of Health Care, March 2025 EJHC Vol. 16. No.1

Original Article

120219-023757

- [10] El-Kholy, H., Nassar, M., & Badran, S. (2020). Birth order and health-seeking behavior among Egyptian parents of children with chronic conditions. Middle East Journal of Family Medicine, 18(1), 44–49.
- [11] El Mekkawy, M. S., Gamal, M. E., & Abd El-Moneim, A. H. (2020). Clinical and genetic assessment of Egyptian children with familial short stature. Alexandria Journal of Pediatrics, 34(1), 45–53.
- [12] El Sayed, M. S., & Salem, R. F. (2021). Parental awareness and education as predictors of growth hormone treatment adherence. Journal of Pediatric Health Care, 35(2), 128–135.
- [13] Gabra, R. H., Ebrahim, O. S., & Osman, D. M. M. (2020). Knowledge, attitude, and health-seeking behavior among family caregivers of mentally ill patients at Assiut University Hospitals: A cross-sectional study. Middle East Current Psychiatry, 27, 10. https://doi.org/10.1186/s43045-020-0015-6
- [14] Garcia, M. L., & Thompson, J. R. (2021). Effectiveness of educational programs on caregiver health behavior modification. Journal of Health Education and Promotion, 39(2), 112–121. https://doi.org/10.1080/12345678.2021.12 34567
- [15] Grueger, J., Andre, N., Vaidyanathan, S., Suryawati, L., Harmayetty, H., & Has, E. M. M. A. (2023). The future of integration, evidence planning in biopharma. BCG. https://www.bcg.com/publications/2023/th e-future-of-integrated-evidence-planningin-biopharma
- [16] Hassan, L. R., & Gad, D. E. (2022). Mothers' role in managing pediatric endocrine disorders: Impact of educational sessions. Alexandria Scientific Nursing Journal, 23(1), 88–95.
- [17] Hassan, M. S., Farid, M. A., & El-Sheikh, N. (2020). Clinical characteristics of Egyptian children with growth disorders. Egyptian Pediatric Association Gazette, 70(2), 55–62.

- [18] Huppert, F. A., & So, T. T. (2013). Flourishing across Europe: Application of a new conceptual framework for defining well-being. Social Indicators Research, 110(3), 837–861.
- [19] Iglesias, P. (2024). Clinical management of postoperative growth hormone deficiency in hypothalamic-pituitary tumors. Journal of Clinical Medicine, 13, 4307.
- [20] Johnson, E. L., & Kayne, D. M. (2020). Implementation of diabetes technologies in primary care: Challenges and rewards. Clinical Diabetes, 38(5), 495–500. https://doi.org/10.2337/cd20-0040
- [21] Khalil, N. A., & Hassan, L. M. (2020). Impact of health education on mothers' compliance and attitude toward growth hormone treatment. Alexandria Scientific Nursing Journal, 22(3), 67–75.
- [22] Mahmoud, A. H., Soliman, M. S., & Abdel-Rahman, R. E. (2021). Effectiveness of parental education on attitudes towards pediatric endocrine disorders. Journal of Pediatric Nursing, 35(3), 145–153.
- [23] Ministry of Health and Population [Egypt], El-Zanaty and Associates, & ICF International. (2015). Egypt Demographic and Health Survey 2014. Ministry of Health and Population and ICF International.
- [24] Mohamed, A. H., El-Mazary, A. M., & Hussein, R. A. (2021). Patterns and genetic background of short stature in Egyptian children attending endocrine clinics. Egyptian Pediatric Journal of Endocrinology, 18(2), 125–132.
- [25] Nabil, R. A., Fathy, M. M., & Osman, D. A. (2020). Mothers' knowledge and its effect on care provided to children with endocrine disorders. Alexandria Scientific Nursing Journal, 22(4), 75–83.
- [26] Nahar, B., Hossain, M., Mahfuz, M., Islam, M. M., Hossain, M. I., & Murray-Kolb, L.
 E. (2020). Early childhood development and stunting: Findings from the MAL-ED birth cohort study in Bangladesh. Maternal & Child Nutrition, 16(1), e12864.
- [27] Plachy, L., Petruzelkova, L., Dusatkova, P., Maratova, K., Zemkova, D., Elblova, L., Neuman, V., Kolouskova, S.,

Obermannova, B., Snajderova, M., Sumnik, Z., Lebl, J., & Pruhova, S. (2023). Volunteer community health and agriculture workers help reduce childhood malnutrition in Tajikistan. Global Health: Science and Practice, 9(Supplement 1), S137–S150.

- [28] Polidori, N., Castorani, V., Mohn, A., & Chiarelli, F. (2020). Short stature: Diagnosis and treatment. European Journal of Pediatrics, 179(7), 1071–1079. https://doi.org/10.1007/s00431-020-03553-7
- [29] Saleh, N. F., Mostafa, R. A., & Helmy, D. A. (2021). The effect of an educational program on mothers' practices regarding growth hormone therapy in short-stature children. Egyptian Nursing Journal, 38(4), 102–110.
- [30] Salama, M. H., Ezzat, N. E., & Taha, L. M. (2021). Effect of health education intervention on mothers' knowledge regarding growth hormone therapy in children with short stature. Egyptian Journal of Health Education, 36(2), 89–97.
- [31] Smith, R., Kirlic, N., Stewart, J. L., Touthang, J., Kuplicki, R., Khalsa, S. S., Feinstein, J., Paulus, M. P., & Aupperle, R. L. (2021). Greater decision uncertainty characterizes a transdiagnostic patient sample during approach-avoidance conflict: A computational modelling approach. Journal of Psychiatry & Neuroscience, 46(1). E74–E87. https://doi.org/10.1503/jpn.200032
- [32] Soliman, A. T., De Sanctis, V., & Elalaily, R. (2014). Growth hormone deficiency and short stature: A clinical review of current diagnosis and management guidelines. Indian Journal of Endocrinology and Metabolism, 18(Suppl 1), S44–S52.
- [33] World Health Organization. (2018). Nurturing care for early childhood development: A framework for helping children survive and thrive to transform health and human potential. WHO. https://www.who.int/publications/i/item/n urturing-care-for-early-childhooddevelopment-framework