Scientific Foundation SPIROSKI, Skopje, Republic of Macedonia
Open Access Macedonian Journal of Medical Sciences. 2022 Sep 30; 10(B):2355-2360.
https://doi.org/10.3889/oamjms.2022.10763
eISSN: 1857-9655
Category: *B - Clinical Sciences*
Section: *Endocrinology*

Knowledge and Awareness for the Early Detection and Intervention of Short Stature among Families in Qassim Region 2021–2022: A Cross-Sectional study

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Edited by: Ksenija Bogoeva-Kostovska
Citation: Alharbi MS, Alatni RI, Alhammad RA, Alotaibi MA, Alhatlani AH, Alshaya RH, Alharbi AO. Knowledge and Awareness for the Early Detection and Intervention of Short Stature among Families in Qassim Region 2021–2022: A Cross-Sectional study. Open-Access Maced J Med Sci. 2022 Sep 30; 10(B):2355-2360. https://doi.org/10.3889/oamjms.2022.10763
Keywords: Short stature; Knowledge and awareness; Early detection
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Received: 01-Aug-2022
Revised: 26-Aug-2022
Accepted: 20-Sep-2022

Funding: This research did not receive any financial support.
Competing Interest: The authors have declared that no competing interest exists

Abstract

BACKGROUND: Short stature is a common reason for the referral of children to endocrinology clinics. A study in Saudi Arabia recorded a relatively high frequency of short stature among children and adolescents. This condition is multifactorial and can be influenced by genetic factors, environmental factors, or endocrine diseases. Early detection and intervention are crucial steps in the long-term outcomes and benefits.

AIM: This study aims to evaluate the knowledge and awareness for the early detection and intervention of short stature.

METHODS: A cross-sectional study utilizing a representative random cluster sample of 384 participants living in various cities in the Qassim region, including Buraydah, Unaizah, Alrass, and Riyadh Al Khabra, and in places outside the central region from October 2021 to March 2022. To achieve our goals, we used a self-administered questionnaire that evaluated knowledge and awareness for the timely identification and intervention of short stature among families in the Qassim region.

RESULTS: We received 469 surveys. The overall mean knowledge score was 2.04 (SD 0.92), with poor and good levels of knowledge identified among 68.4% and 31.6%, respectively. Higher knowledge scores were associated with being married, having children, and having a family history of short stature.

CONCLUSION: Based on our data, we conclude that the majority of Qassimi families have poor knowledge about the early detection and intervention of short stature.

Introduction

Short stature is one of the major challenges facing children worldwide. The term “short stature” is applied to a child whose height is more than 2 standard deviations (SDs) below the mean, which corresponds to a height that is below the 2.5th percentile for sex and chronologic age (ideally among the same racial-ethnic group) [1]. In adults, it includes men who are shorter than 166 cm (5 ft 5 in) tall and women who are shorter than 153 (5 ft 0 in) tall. By definition, 97.5% of the population falls under normal and tall stature, whereas only 2.5% of the population has short stature. However, the prevalence rate may vary according to geographical area and race. Short stature is a common reason for the referral of children to endocrinology clinics. However, it’s frequently a condition that is recognized at a late age. In Saudi Arabia, a 2004–2005 study that included 19,372 healthy children and adolescents ages 5–17 years recorded a significant proportion of short stature; for instance, in boys, the researchers reported a short stature prevalence of 1.8% in adolescents and 11.3% in children, whereas in girls, they found 1.2% in adolescents and 10.5% in children [2]. However, in Jordan, a 2016 study that recruited 2702 subjects reported a short stature prevalence rate of 4.9% [3]. This condition may be caused by genetic factors or environmental factors such as dietary intake; it may be symptomatic of syndromes like Down and Turner syndromes; or it may be caused by treatable endocrine diseases such as growth hormone deficiency (GHD), hypopituitarism, or an early presentation of celiac and inflammatory bowel diseases, among which the impact of genetic factors is known to be 70–90% [4], [5]. Despite the fact that familial (genetic) short stature, which accounts for most of the cases, is a normal, non-pathologic variant of growth, individuals with this condition experience various forms of physical and psychological stress in modern society due to the widespread perception of tall individuals being superior to others, which is exacerbated by the media. Studies

on the features of children with short stature reported that the stunted children were at higher risk for being mentally intimidated, easily frustrated, and less happy than non-stunted children [6]. While there has been much research on the prevalence of short stature in children and adolescents [2], [7], few have focused specifically on family knowledge and awareness of short stature. The increasing number of endocrinology clinic visits by children, including those of average height, to seek evaluation for short stature suggests that families are highly aware of the concern. However, the extent of their knowledge is unclear, as is how they gathered the knowledge they do have and how they approach short stature, including the timing for seeking a referral for their child to pediatric and endocrine specialty clinics for evaluation. In North Lebanon, a study conducted by Hayek *et al*. [8] focused on an awareness campaign for the early recognition of growth disorders in public schoolchildren. The researchers concluded that screening campaigns indicate the necessity of more awareness about the significance of early detection of growth disorders. Family awareness of short stature is the most essential step for the early detection and treatment of this condition and the prevention of its complications. Therefore, this community-based cross-sectional study that includes 384 participants intended to assess families' knowledge regarding causes of short stature and the awareness of short stature as a medical condition in children among families in the Qassim region.

Methodology

Data were collected by primary means from a representative sample of Qassim society. A cross-sectional design using a questionnaire was the most appropriate choice to achieve our aim in this study. The research was approved by the Regional Research Ethics Committee. A cross-sectional design was used to accomplish the aim of the study. This study was conducted in Qassim region cities, including Buraydah, Unaizah, Alrass, and Riyadh Al Khabra, and outside the central region from October 2021 to March 2022. We received 469 responses. The sample was a representative random cluster sample of 384 participants living. The choice of participants was based on the inclusion criteria: Residents of Qassim region, parents of growing children, and parents\families with no children. A questionnaire (Appendix 1) was the instrument used to collect the data to evaluate knowledge and awareness about the early detection of and intervention for short stature. The questionnaire was developed by an endocrinology consultant who had reviewed the related literature. It was in the form of multiple-choice questions in two categories: Sociodemographic data and qualitative questions regarding knowledge. The sociodemographic characteristics of participants were asked about were age, gender, level of education, employment status, career of working participants, residency area, nationality, and marital status, whether they have children or not, age of children if any, family history of short stature, and timing of intervention if applicable. Knowledge assessment questions were: When is a child considered to have short stature? What are the reasons for short stature in children? What's the best time to consult a doctor regarding short stature? Which medical specialist is the most qualified for children's short stature consultation? What's the nature of the intervention for short-statured children? The scoring of the level of knowledge (Table 1) is classified as: Poor and good. All ethical issues in conducting the research were monitored by the researchers. Informed consent was obtained from the participants. The participants were informed that participation in this study was voluntary and they could withdraw at any time during the study without giving reasons. The researchers explained the aim of the study to all participants in the studied sample. The participants were assured that any obtained information would be strictly confidential. After obtaining ethical approval, researchers explained the aim of the study to the participants and then initiated data collection from those who agreed to take part. An online questionnaire was sent to the representative sample to fill out voluntarily. Each participant spent an average of 5 min filling out the questionnaire.

Statistical analysis

Categorical and numerical variables were summarized using frequency, proportion (%), mean, and SD. The knowledge of participants about the early detection and intervention of short stature was assessed using a four-item questionnaire where the correct answer had been identified and coded with 1 while the incorrect answer was coded with 0. The total knowledge score was obtained by adding scores of all four items. A score range from 0 to 4 was generated; it indicates that the higher the score, the higher the knowledge about the early detection of and intervention for short stature. The total knowledge score was divided into two categories. A score of 0–2 was classified as poor knowledge level, while a score of 3–4 was classified as good knowledge level. The mean knowledge score was compared with the sociodemographic characteristics of participants using the Mann–Whitney Z-test and Kruskal–Wallis H-test. $p = < 0.05$ (two sided) was used to indicate statistical significance. A normality test was performed using the Shapiro–Wilk test. As the knowledge scores followed a non-normal distribution, non-parametric tests were applied. All relevant data analyses were carried out using the Statistical Package for the

Software Sciences version 26, Armonk, New York, IBM Corporation.

Results

In total, 469 surveys were received. Table 1 describes the sociodemographic characteristics of participants. The most common age group was 20–29 years old (42.6%), with females being dominant (83.6%). Participants who had bachelor's degrees constituted 79.7%. Unemployed participants constituted 40.1%, while employed participants constituted 36.2%. Of those who were employed, the majority were either teachers or professors (44.7%). Approximately one-third (33.9%) were living in Unaizah, and most participants had Saudi nationality (98.3%). More than half (53.9%) were married, and a similar proportion had children (52.2%). Of those who were parents, 53.4% had children aged 12 years or less. In addition, a positive family history of short stature was reported by 9.6%. Of those, 60% (n = 27) had received medical intervention for a child with short stature before the child was 12 years old.

Figure 1 depicts the knowledge of participants about the reasons for short stature in children. The study revealed that participants believed that the most common cause of short stature among children was genetics (91.7%) followed by hormonal factors (51.2%) and bone diseases (33.8%). Only a few participants believed that psychological diseases were a cause (2.1%).

Table 2 shows that 63.5% of respondents were aware that a child was considered as having a short stature after thorough examinations and calculations by an attending physician. Respondents were also aware that, when short stature is noticed, a doctor's visitation is necessary for consultation on the child before puberty. However, only 34.5% knew that the most common specialty for diagnosing children's short stature was endocrinology. Only 26% believed that drug therapy was the most common intervention for short-statured children. Based on the above statements, the overall mean knowledge score was 2.04 (SD 0.92), with poor and good knowledge levels being identified among 68.4% and 31.6%, respectively.

When measuring the association between the knowledge scores and the sociodemographic characteristics of participants, it was found that a higher knowledge score was associated with being married ($Z = 2.324$; $p = 0.005$), having children ($Z = 2.324$; $p = 0.020$), and having a family history of short stature ($Z = 2.255$; $p = 0.024$), while there were no significant differences in knowledge scores based on age group, gender, level of education, and employment status ($p > 0.05$) (Table 3).

Discussion

Short stature is a common problem in children worldwide, especially in the developing countries. It is defined as when children have a slow growth rate for their age and gender, with height

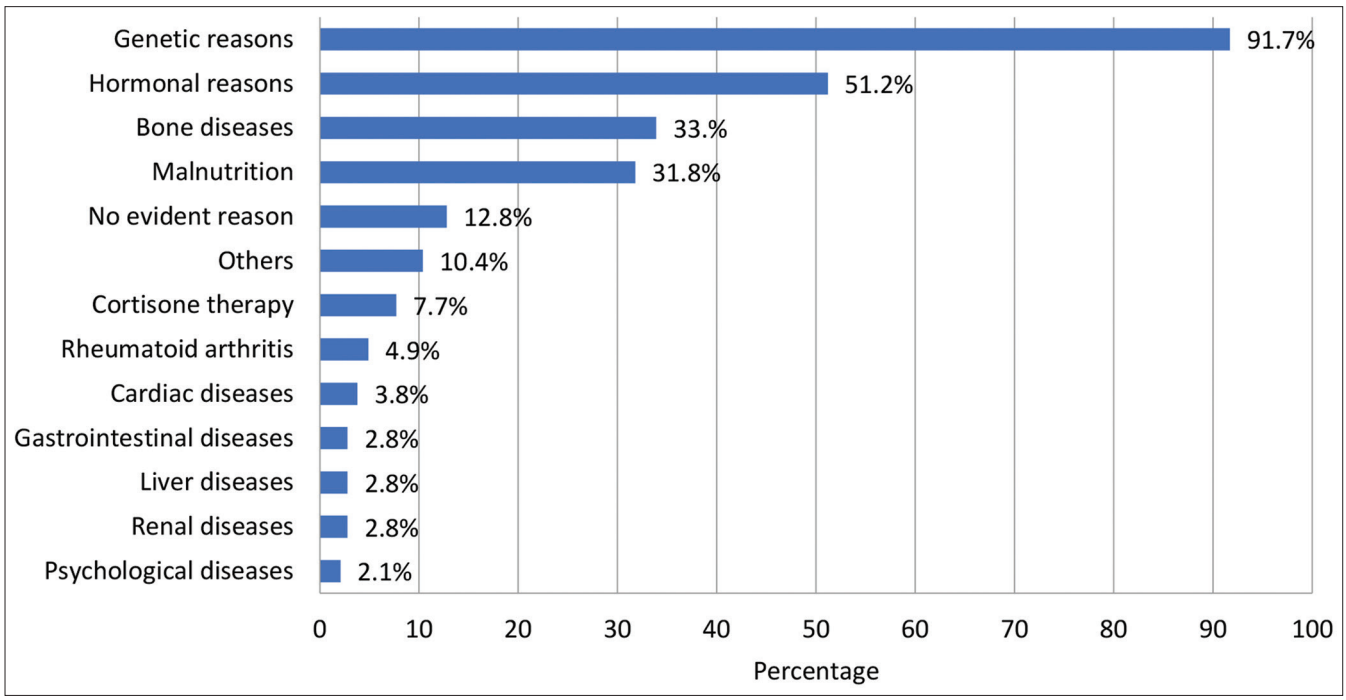

Figure 1: Reasons for short stature in children

Table 1: Sociodemographic characteristics of participants (n = 469)

Study variables	N (%)
Age group	
20–29 years	200 (2.6)
30–39 years	78 (16.6)
40–49 years	65 (13.9)
50–59 years	102 (21.7)
≥60 years	24 (05.1)
Gender	
Male	77 (16.4)
Female	392 (83.6)
Level of education	
Less than secondary school	15 (03.2)
Secondary school	51 (10.9)
Bachelor's degree	374 (79.7)
Higher education	29 (06.2)
Employment status	
Student	111 (23.7)
Employed	170 (36.2)
Unemployed	188 (40.1)
Career of working participants (n=170)	
Teacher/professor	76 (44.7)
Manager	17 (10.0)
Administration	28 (16.5)
Educational sector	18 (10.6)
Others	31 (18.2)
Residency area	
Buraydah	84 (17.9)
Unaizah	159 (3.9)
Alrass	127 (7.1)
Riyadh Al Khabra	63 (13.4)
Outside central region	36 (07.7)
Nationality	
Saudi	461 (98.3)
Non-Saudi	08 (01.7)
Marital status	
Single	186 (39.7)
Married	253 (53.9)
Divorced or widowed	30 (06.4)
Having children	
Yes	245 (52.2)
No	203 (43.3)
Yes, but they are not my children	21 (04.5)
Age of children (n=251)	
>12 years old	117 (46.6)
≤12 years old	134 (53.4)
Family history of short stature	
Yes	45 (09.6)
No	424 (90.4)
If yes, when was the medical intervention for that case initiated? (n=45)	
Before 12 years old	27 (60.0)
After 12 years old	18 (40.0)

below the 2.5th percentile [1]. This study highlighted the knowledge and awareness of the Qassim region population regarding short-statured children. It investigated the population's understanding of the crucial nature of early intervention and of the most qualified medical specialist for diagnosing and treating short stature conditions. Regarding those elements, we can see in Table 2 that 63.5% believed that a child is considered to be short statured when diagnosed by a doctor using calculations. This indicates that more than half of the participants knew the appropriate way to determine a child's short stature status. In addition, 79.5% believed that the best time to intervene is when the condition is noticed, even if the child has not reached puberty. Yet only 34.5% selected endocrinology as the appropriate medical specialty for evaluating and treating short stature, with the highest percentage (52%) of participants choosing pediatrics. These percentages can be explained by the fact that the pediatrician is the physician that families consult when they are concerned about their child's health. Nonetheless, only 26% of the respondents believed that drug therapy is the appropriate intervention for short-statured children, while most respondents (68%) selected both therapeutic and non-therapeutic interventions. We believe that this result stems from the well-known physiotherapeutic practices and exercises for short-statured individuals. Overall, with a total knowledge score (mean ± SD) of 2.04 ± 0.92, the results revealed that the level of knowledge among the population studied using random sampling was 68.4% with poor knowledge levels and 31.6% with good knowledge levels. Contributing to good knowledge levels, as demonstrated in Table 3, was as the following: Being married, having children, and having a family history of short stature. These results are discordant with a study conducted in Egypt by Ahmed and Abd Elsalam, which investigated mothers' knowledge and perception about the short stature of their children and concluded that the majority of mothers of short-statured children felt that their children had normal height and were unconcerned about the effect of short stature problems on their

Table 2: Assessment of the knowledge toward early detection and intervention of short stature (n = 469)

Statement		N (%)
1.	When is the child considered to have a short stature?	
•	When the doctor examines the child and proves the short stature by calculations *	298 (63.5%)
•	If the child is shorter than his/her class colleagues	149 (31.8%)
•	Others	22 (04.7%)
2.	What's the best time to consult a doctor regarding short stature?	
•	When it's noticed even before puberty*	373 (79.5%)
•	When the child displays resentment about his/her short stature	21 (04.5%)
•	After puberty	63 (13.4%)
•	Other	12 (02.6%)
3.	What's the most qualified medical specialty for children's short stature consultation?	
•	Internal medicine	11 (02.3%)
•	Endocrinology*	162 (34.5%)
•	Pediatric	244 (52.0%)
•	Other	52 (11.1%)
4.	What's the nature of intervention for short-statured children?	
•	Therapeutic intervention*	122 (26.0%)
•	Non-therapeutic intervention	28 (06.0%)
•	Both	319 (68.0%)
Total knowledge score (mean±SD)		2.04±0.92
Level of knowledge		
•	Poor	321 (68.4%)
•	Good	148 (31.6%)

*Indicates correct answer.

Table 3: Statistical association between the knowledge score and the sociodemographic characteristics of participants (n = 469)

Factor	Knowledge Total score (4) Mean ± SD	Z/H-test	p-value
Age group[a]			
<40 years	2.03 ± 0.90	Z=0.534	0.591
≥40 years	2.05 ± 0.94		
Gender[a]			
Male	1.95 ± 0.89	Z=0.795	0.427
Female	2.05 ± 0.92		
Level of education[a]			
Secondary or below	1.67 ± 0.72	Z=1.427	0.153
Bachelor's or higher	2.03 ± 0.94		
Employment status[b]			
Student	1.96 ± 0.88	H=0.863	0.650
Employed	2.08 ± 0.96		
Unemployed	2.04 ± 0.90		
Marital status[a]			
Unmarried	1.92 ± 0.90	Z=2.790	**0.005****
Married	2.14 ± 0.92		
Having children[a]			
Yes	2.12 ± 0.95	Z=2.324	**0.020****
No	1.93 ± 0.86		
Family history of short stature[a]			
Yes	2.33 ± 0.88	Z=2.255	**0.024****
No	2.00 ± 0.92		

[a]p-value has been calculated using Mann–Whitney Z-test. [b]p-value has been calculated using Kruskal–Wallis H-test. **Significant at $P<0.05$ level.

children [9]. As we can see, having children and a family history of short stature increases the awareness of this condition, the knowledge of its causes, and the therapeutic options. Nevertheless, we cannot conclude with certainty that the general knowledge and awareness level of the Qassim population is poor, as 39.7% of the participants were not married, 43.3% of the participants did not have children, and only 9.7% of participants had a family history of diagnosed short stature condition. Thus, the factors contributing to good knowledge levels were not prevalent in our sample, which can be considered a limitation of this study. Regarding the etiological factors, the survey indicated that 91.7% of participants believed that genetics is major contributors to short stature condition followed by hormonal concerns (51.2%). A minority believed that short stature is caused by psychological diseases (2.1%). These results are consistent with a study conducted by Al-Ruhaily and Malabu who found that the most common cause of short stature in adult endocrine clinics in Saudi Arabia was GHD and normal variant short stature [10]. The fact that hormonal reasons were selected as the second most common cause by participants is an indicator of fair knowledge about the etiology of short stature condition among the Qassim population.

Conclusion and Recommendations

Based on our data, we conclude that the majority of Qassimi families have poor knowledge levels about the early detection of and intervention for short stature. Three factors were associated with a higher knowledge score: Being married, having children, and having a family history of short stature. Our screening study confirms the need for more awareness of the importance of the early detection of short stature. Our future goal is to raise awareness about who should consult a physician and how and when to do so.

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Appendices

Appendix 1: Questionnaire

نحن مجموعة من طالبات كلية الطب البشري في جامعة القصيم نعمل على هذا البحث كجزء من التدريب، و تسرنا مشاركتك في هذا البحث.

يهدف البحث إلى **دراسة وتقييم المعرفة حول التشخيص المبكر والتدخل العلاجي لقصر القامة لدى الأطفال في منطقة القصيم.** يتلزم الباحث بالسرية التامة بالمعلومات المقدمة له واستخدامها فقط لغرض هذا البحث. مشاركتك في تعبئة هذا الاستبيان تعتمد على رغبتك بدون فرضها عليك ولكن مشاركتك مرحب بها للغاية، بمشاركتك في الإجابة على هذا الاستبيان فإنك تعطي موافقتك على المشاركة في هذه الدراسة.

- البيانات الاجتماعية:

1 العمر:
() 20 – 29
() 30 – 39
() 40 – 49
() 50 – 59
() ستون عامًا وأكبر

2- الجنس:
() ذكر() أنثى

3- مستوى التعليم:
() غير متعلم
() أقل من الثانوي
() ثانوي
() جامعي
() تعليم عالي: ماجستير او دكتوراه

4-الحالة الوظيفية:
() طالب
() موظف .....:
() غير موظف

5- مكان الإقامة:
()الرس ()بريدة ()عنيزة
() أخرى .....:

6- الجنسية:
() سعودي
() غير سعودي

7- الحالة الاجتماعية:
() بـزعأ
() جوزتـم
() قلـطم
() لـمرأ

8- هل لديك أطفال ؟
() نعم
() لا
() أرعى أطفال لكنهم ليسوا أطفالي

9- اذا كنت ترعى أطفال (سواء ابناءك أم غير ذلك), اختر عمرهم:
() عمرهم أكثر من 12 سنه
() عمرهم أقل من 12 سنه

10- باعتقادك متى يجب أن تتجه الى الطبيب فيما يتعلق بمشاكل النمو وقصر القامة لدى الأطفال ؟
() لفـطلا غولـب لـبـق
() لفـطلا غولـب دعـب

11- متى يعتبر الطفل قصيرا ؟
() اذا فحصه طبيب مختص وأثبتت الحسابات ذلك
() اذا كان الطفل أقصر من زملائه في الصف
أخرى.

12- (ما هي أسباب قصر القامة لدى الأطفال ؟ (بإمكانك اختيار أكثر من إجابة
() أسباب جينية
() نقص أو زيادة في بعض الهرمونات
() سوء التغذية
() أمراض العظام
() التهاب المفاصل الرماتويدي
() أمراض الكلى
() أمراض الكبد
() أمراض القلب
() أمراض الجهاز الهضمي
() أمراض نفسية
()بلا سبب واضح
() العلاج بالكورتيزون
أخرى.

13- ما هو الوقت المفضل لأخذ رأي الطبيب المختص لعلاج قصر القامة ؟
()فور ملاحظته وقبل البلوغ
() اذا ابدى الطفل استياء من قصر قامته
()بعد البلوغ
أخرى.

14- ما هو الاختصاص المؤهل لعلاج مشكلة قصر القامة لدى الأطفال؟
() طب الباطنة
() الغدد الصماء
() طب الأطفال
أخرى.

15-كيف يتم التعامل مع مشكلة قصر القامة لدى الأطفال ؟
() تدخل علاجي
() تدخل غير علاجي
() كلاهما