Original Article :

Knowledge and Awareness among Parents in Al Baha, KSA, about Short Stature in School-Aged Children

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Abstract

Background and Aims:
This study aims to assess the knowledge and awareness of parents in Al Baha, Saudi Arabia, regarding short stature in school-aged children, focusing on their understanding of its causes, implications, and the importance of early medical intervention.

Methods:
A cross-sectional survey was conducted involving 384 parents of school-aged children in Al Baha. Data were collected through an electronic questionnaire assessing sociodemographic factors, knowledge of short stature, and attitudes towards seeking medical advice. Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS), employing both descriptive and inferential statistics.

Result:
This study revealed that 55.1% of parents demonstrated high knowledge regarding short stature, 27.4% had moderate knowledge, and 17.5% showed low knowledge levels. Most participants believed that short stature should be addressed before puberty, with pediatricians and endocrinologists recognized as the most qualified specialists for managing it. Gender differences were noted, with males showing higher knowledge ($p=0.065$). Parental attitudes towards early medical advice were significantly associated with higher knowledge levels ($p=0.016$).

Conclusion:
Although this study demonstrates a high level of knowledge among parents, it also highlights gaps in parental awareness regarding short stature, indicating a need for targeted educational interventions.

Key words:
Short stature, knowledge, children, endocrinology, awareness, Saudi Arabia

Introduction:

Short stature is a common reason for referral to pediatric endocrinologists[1]. It can significantly affect physical, social, and emotional well-being. In children with short stature, while it can be a normal familial variation, it can also be a symptom of an underlying disease, so it is important to make early identification and treatment according to the causes[2]. Short status is defined as height more than two standard deviations (SD) below the mean for age, or less than the 3rd percentile[3]. A child's short stature can be hereditary, idiopathic[4], a variable of gender and race, and also involves nutritional causes, chronic diseases, and a variety of endocrine disorders[5].

An observational study that was conducted in the Al Qassim region in KSA in 2022 investigated parental knowledge about children's short stature. It involved 384 participants and revealed that only around 47% of them had good knowledge6. Another survey of 469 participants in 2022 showed that most respondents (68.4%) had poor knowledge, while 31.6% demonstrated good knowledge. Higher knowledge scores were linked to being married, having children, and having a family history of short stature[7].

This study aimed to determine the parental knowledge and awareness that was essential for recognizing developmental issues like short stature, as well as for assisting in its early detection and proper treatment. The pattern and clinical outcomes of non-diabetic pediatric endocrine disorders have been described in a retrospective analysis from Al-Baha, Saudi Arabia, involving 744 patients between 2018 and 2022, highlighting that thyroid disorders, short stature, obesity, and calcium-phosphate metabolism disorders were the most common conditions[8]. However, no study has specifically focused on the awareness of families regarding short stature in school-aged children.

Methodology:

This study employed a cross-sectional design to assess the knowledge and awareness of parents regarding short stature among school-aged children. The study was conducted in Al Baha, Saudi Arabia. The study was approved by the Institutional Review Board at the Faculty of Medicine at Al Baha University, Al Baha, KSA. The target population for this study included parents residing in Al Baha with school-aged children. Demographic data were collected, including the age, gender, education level, and location of residence. Inclusion criteria for the study were parents or guardians of children residing in the Al Baha region. Exclusion criteria included parents who were healthcare professionals and parents who refused to consent to

participation in the study. The sample size was calculated using the Raosoft online sample size calculator (Raosoft Inc., 2004)[9], which is a widely used tool for determining adequate study samples. The sample size that was determined was 384, with an indicator percentage of 0.50, a margin of error of 5 percent, and a confidence level of 95%. The sample was a representative random cluster sample of 384 participants. The sampling technique was simple random sampling. Data was collected from January 2025 to February 2025 through an electronic, self-administered questionnaire delivered to respondents via WhatsApp. Consent was obtained from all participants. We received 780 responses; of these, 111 were excluded for not meeting the inclusion criteria, and 384 were randomly selected for the study.

The questionnaire was developed to assess the knowledge and awareness about the early diagnosis and intervention of short stature among children and was curated by an endocrinology expert. It was adopted from an already pretested questionnaire[7]. The pretested questionnaire was chosen because it had already been validated and used in similar studies, ensuring reliability and clarity of the questions. Also, using a pretested tool may minimize measurement errors and enhance comparability with previous research. It involved multiple-choice questions in two sections: Section one, which included sociodemographic characteristics of participants, consisted of 10 questions. In contrast, the second section included five qualitative questions about knowledge, four of which were developed to measure the knowledge level. Each of these questions was given a score of one, where a score of 0-1 indicated a low knowledge level, a score of 2 indicated a moderate knowledge level, and a score of 3-4 showed a high knowledge level. The definition, causes, best time to consult, relevant medical professionals, and type of intervention were among the main questions.

Statistical Analysis:

A comprehensive statistical analysis was conducted using IBM SPSS (version 29.0.0), which included both descriptive and inferential statistics. The descriptive statistics were used to summarize the participant demographics, including frequencies and percentages for variables such as age, gender, education level, employment status, marital status, and nationality. To examine the associations between the categorical variables, Pearson's Chi-Square Test was primarily employed. Where expected cell counts were <5, Fisher's Exact Test was applied to ensure the statistical validity. The threshold for statistical significance was set at $p < 0.05$. Subsequently, the binary

logistic regression analysis was performed to identify the adjusted predictors of high parental knowledge regarding the short stature in the school-age children. The variables entered into the regression model included the age, gender, education level, job status, marital status, nationality, whether the respondent had children, the age of children, and the family history of short stature. The outcome variable (knowledge level) was dichotomized into "High" vs. "Low to Moderate" based on the pre-established scoring criteria from the questionnaire. The results were reported using the adjusted odds ratios (AOR) with 95% confidence intervals (CI), and the corresponding p-values.

Results:

A total of 384 participants were included to assess Parental Awareness, Knowledge, and Attitudes Toward Short Stature in School-Aged Children. Notably, most participants were female (68.4%). The largest age group was 40-49 years (n=134, 34.7%). In terms of education, the majority had a university degree (76.0%), while only 3.4% had less than secondary education. More than half were employed (58.7%). Nearly all participants were Saudi nationals (98.7%). The marital status indicated that the overwhelming majority were married (87.7%).

Table 1 presents the assessment of parental awareness, knowledge, and attitudes toward short stature in school-aged children (n=384).

Table 1: Assessment of Parental Awareness, Knowledge, and Attitudes Toward Short Stature in School-Age Children (n=384).

		Frequency N (%)
Do you have children?	Have Children (but not Mine)	38 (9.9)
	Yes	346 (90.1)
If you are caring for children (your own or others), select their age.	<12 Years	201 (52.2)
	>12 Years	183 (47.8)
Have you or a family member been diagnosed with short stature?	No	327 (85.1)
	Yes	57 (14.9)
When do you think you should see a doctor about growth problems and short stature in children?	Before Puberty	309 (80.4)
	After Puberty	75 (19.6)
When is a child considered short?	If Shorter than Classmates	103 (26.9)
	If Examined and Labeled by a Specialist Doctor	280 (73.1)

What is the best time to consult a specialist doctor to treat short stature?	As soon as noticed and before Puberty	309 (80.4)
	After Puberty	44 (11.5)
	If Child Express Dissatisfaction of his Short Stature	29 (7.6)
	Others	2 (0.5)
What is the specialty qualified to treat the problem of short stature in children?	Pediatrician	191 (49.6)
	Endocrinologist	143 (37.3)
	Physician (Internal Medicine)	21 (5.5)
	Other	29 (7.6)
How to deal with the problem of short stature in children?	Non-Therapeutic Interventions	11 (2.9)
	Therapeutic Interventions	92 (24.0)
	Both	281 (73.1)

The majority of participants were parents (90.1%). Most participants cared for children under 12 years old (52.2%). A family history of short stature was reported by 57 participants (14.9%), whereas 327 (85.1%) reported no such history. Most parents believed that a child should see a doctor for growth concerns before puberty (80.4%). Regarding defining short stature, 73.1% relied on a specialist's diagnosis. When consulting a specialist, 80.4% preferred early intervention before puberty. The most recognized specialists for managing short stature were pediatricians (49.6%) and endocrinologists (37.3%). Most parents favored a combination of therapeutic and non-therapeutic interventions (73.1%).

Figure 1 presents the assessment of parental knowledge regarding different causes of short stature in school-aged children.

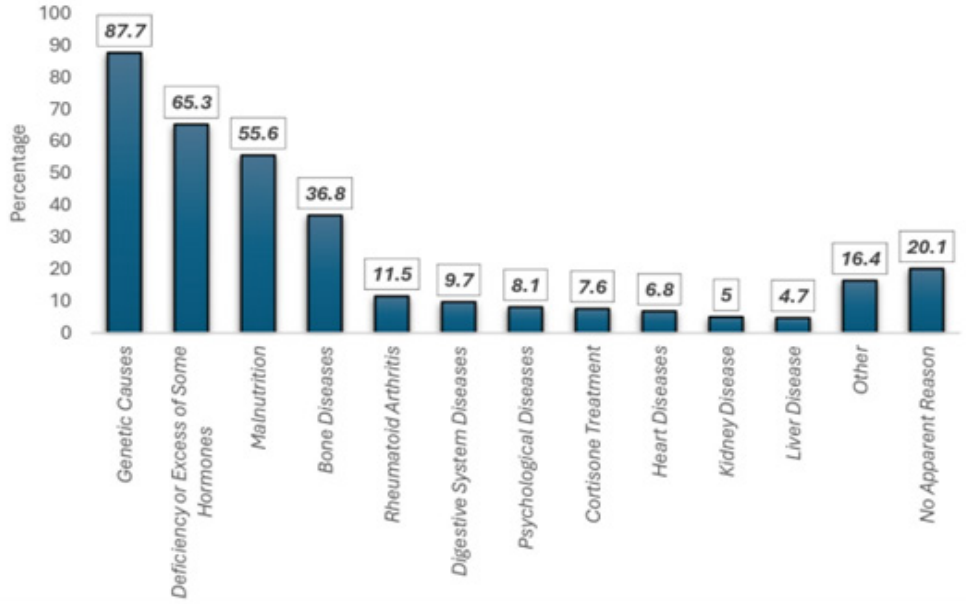


Figure 1: Assessment of parental knowledge about different causes of short stature in school- aged children (N = 384)..

The majority of parents identified genetic causes (87.7%) as a primary reason for short stature, followed by deficiencies or excesses of certain hormones (65.3%) and malnutrition (55.6%). Less than 10% of parents linked short stature to conditions such as heart disease, kidney disease, or liver disease. Additionally, 16.4% mentioned "other" causes, while (20.1%) believed short stature could occur without an apparent reason.

Figure 2 shows the overall knowledge level of parents regarding short stature in school-age children.

confidence among consultants. For vaccine safety, the confidence differences are also notable. Residents exhibit significantly lower confidence compared to specialists (mean difference = -1.014, p = 0.001). Although the differences between other ranks are not statistically significant, the trend suggests varying levels of confidence across different professional ranks.

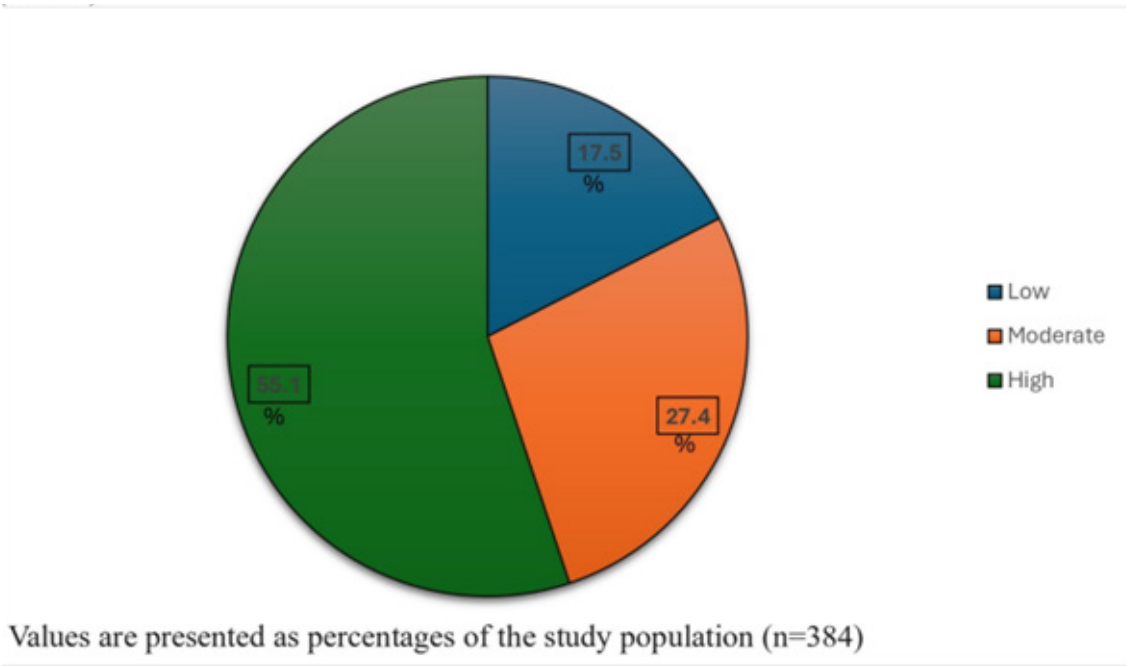


Figure2: overall knowledge level of parents regarding short stature in school-age children (N= 384).

The majority of parents demonstrated high knowledge (55.1%), while 27.4% had a moderate level of knowledge, and 17.5% exhibited low knowledge. These results indicate that more than half of the parents have a strong understanding of short stature, including its causes and management.

Table 2 shows the association between parents' attitudes toward seeking medical advice or possible interventions for short stature with different sociodemographic and familial factors.

Table 2: Association between parents' attitudes toward seeking medical advice or possible interventions for short stature with different features.

		Need to See Doctor		Sig. Value
		Before Puberty (N %)	After Puberty (N %)	
Age	20-29 Years	57 (74.0%)	20 (26.0%)	**0.194[b]**
	30-39 Years	66 (79.5%)	17 (20.5%)	
	40-49 Years	106 (79.7%)	27 (20.3%)	
	50-59 Years	69 (86.3%)	11 (13.8%)	
	>60 Years	10 (100.0%)	0 (0.0%)	
Gender	Female	202 (77.1%)	60 (22.9%)	**0.016[a]**
	Male	106 (87.6%)	15 (12.4%)	
Education Level	Less than Secondary	10 (76.9%)	3 (23.1%)	**0.881[b]**
	Secondary	37 (84.1%)	7 (15.9%)	
	University	232 (79.7%)	59 (20.3%)	
	Higher Education (Master's/PhD)	29 (82.9%)	6 (17.1%)	
Job Status	Unemployed	88 (78.6%)	24 (21.4%)	**0.725[a]**
	Employee	184 (81.8%)	41 (18.2%)	
	Students	36 (78.3%)	10 (21.7%)	
Nationality	Non-Saudi	4 (80.0%)	1 (20.0%)	**1.000[b]**
	Saudi	304 (80.4%)	74 (19.6%)	
Marital Status	Widower	5 (62.5%)	3 (37.5%)	**0.410[b]**
	Single	32 (82.1%)	7 (17.9%)	
	Married	271 (80.7%)	65 (19.3%)	
Do you have children?	Have Children (but not Mine)	29 (76.3%)	9 (23.7%)	**0.519[b]**
	Yes	279 (80.9%)	66 (19.1%)	
If you are caring for children (your own or others) select their age.	<12 Years	162 (81.0%)	38 (19.0%)	**0.764[a]**
	>12 Years	146 (79.8%)	37 (20.2%)	
Have you or a family memberbeen diagnosed with short stature?	No	260 (79.8%)	66 (20.2%)	**0.434[a]**
	Yes	48 (84.2%)	9 (15.8%)	

(a) Chi-Square Test, (b) Fisher's Exact Test

Notably, age did not significantly influence attitudes (p=0.194). The gender difference was significant (p=0.016), with more males (n=106, 87.6%) favoring early consultation compared to females (n=202, 77.1%). Education level, job status, and nationality did not show significant associations with parental attitudes. Parents with children under 12 years were slightly more likely to seek early consultation than those with older children, but the difference was not significant (p=0.764). A family history of short stature did not significantly impact attitudes, although those with a diagnosed

family member (84.2%) were slightly more likely to favor early intervention.

Table 3 presents the association between parents' knowledge level about short stature and various sociodemographic and familial parameters.

Table 3: Association between parents' knowledge level about short stature with sociodemographic and familial parameters.

		Knowledge Level		Sig. Value
		Low to Moderate (N %)	**High Level (N %)**	
Age	20-29 Years	39 (50.6)	38 (49.4)	0.665[b]
	30-39 Years	38 (45.8)	45 (54.2)	
	40-49 Years	59 (44.4)	74 (55.6)	
	50-59 Years	33 (41.2)	47 (58.8)	
	>60 Years	3 (30.0)	7 (70.0)	
Gender	Female	126 (48.1)	136 (51.9)	0.065[a]
	Male	46 (38.0)	75 (62.0)	
Education Level	Less than Secondary	6 (46.2)	7 (53.8)	0.968[a]
	Secondary	19 (43.2)	25 (56.8)	
	University	130 (44.7)	161 (55.3)	
	Higher Education (Master's/ PhD)	17 (48.6)	18 (51.4)	
Job Status	Unemployed	56 (50.0)	56 (50.0)	0.434[a]
	Employee	96 (42.7)	129 (57.3)	
	Students	20 (43.5)	26 (56.5)	
Nationality	Non-Saudi	3 (60.0)	2 (40.0)	0.661[b]
	Saudi	169 (44.7)	209 (55.3)	
Marital Status	Widower	5 (62.5)	3 (37.5)	0.637[b]
	Single	17 (43.6)	22 (56.4)	
	Married	150 (44.6)	186 (55.4)	
Do you have children?	Have Children (but not Mine)	17 (44.7)	21 (55.3)	0.982[a]
	Yes	155 (44.9)	190 (55.1)	
If you are caring for children (your own or others), select their age.	<12 Years	93 (46.5)	107 (53.5)	0.513[a]
	>12 Years	79 (43.2)	104 (56.8)	
Have you or a family member been diagnosed with short stature?	No	140 (42.9)	186 (57.1)	0.065[a]
	Yes	32 (56.1)	25 (43.9)	

(a) Chi-Square Test, (b) Fisher's Exact Test

Age was not significantly associated with knowledge level (p=0.665), though knowledge tended to increase with age, with 70.0% of those above 60 years demonstrating high knowledge. Gender differences were almost insignificant

(p=0.065), as males (62.0%) had higher knowledge levels compared to females (51.9%). Education level did not significantly impact knowledge, though those with higher education (51.4%) had slightly greater knowledge levels. Employment status was not significantly associated (p=0.434), though employed individuals had slightly higher knowledge levels (57.3%) than unemployed individuals (50.0%). Notably, parents with a family history of short stature were more likely to have low to moderate knowledge (56.1%), compared to those without such a history (42.9%), though this trend did not reach statistical significance (p=0.065).

Table 4 presents the adjusted predictors of high knowledge level about short stature using logistic regression analysis.

Table 4: Adjusted Predictors of High Knowledge Level about Short Stature (Binary Logistic Regression).

	B	Sig.	Ex-p(B)	95% CI	
				Lower	Upper
Age	.099	.272	1.104	.925	1.316
Gender (Male)	.323	.178	1.381	.864	2.208
Higher Education level	-.144	.455	.866	.594	1.263
Job Status (Employee)	.223	.281	1.250	.833	1.875
Nationality (Saudi)	.451	.639	1.571	.238	10.368
Marital Status (Married)	.210	.491	1.233	.679	2.240
Have Children (Yes)	-.224	.631	.800	.321	1.992
Caring for children (>12 years old)	.003	.991	1.003	.627	1.603
You or a Family Member Diagnosed with Short Stature?	-.513	.080	.598	.337	1.064
Constant	-.504	.666	.604		

While no predictors achieved statistical significance, there were indications that males had 38.1% higher odds of having high knowledge compared to females, although this association was not significant (B=0.323, p=0.178). Age was not a significant predictor (B=0.099, p=0.272), but the odds of having high knowledge increased slightly with age (Exp(B)=1.104). Higher education did not significantly associate with knowledge and employment status, and also showed no significant effect. Interestingly, individuals with a family history of short stature had lower odds of high knowledge (B=-0.513, p=0.080), though this association was not statistically significant.

Discussion:

This study aimed to assess the knowledge, awareness, and attitudes of parents in Al Baha, Saudi Arabia, regarding short stature in school-aged children. The findings

revealed that 55.1% of the participants demonstrated a high level of knowledge, while 27.4% had moderate knowledge and 17.5% showed low knowledge. This indicates a generally good awareness among the community.

When asked about the causes of short stature, the majority of participants identified genetic factors as the primary cause (87.7%). This was followed by a large number who believed that hormonal imbalances (65.3%) and malnutrition (55.6%) were significant contributors. Fewer participants mentioned bone diseases (36.8%), while only a small portion recognized causes like rheumatoid arthritis, digestive issues, and psychological conditions, indicating some gaps in deeper understanding.

Regarding medical consultation, the majority of parents believed that children should visit a doctor for growth concerns before reaching puberty (80.4%), showing strong awareness of the value of early intervention. Pediatricians (49.6%) and endocrinologists (37.3%) were the most frequently chosen specialists to manage such cases. In terms of treatment, most parents preferred a combined approach using both therapeutic and non-therapeutic interventions (73.1%), reflecting a well-rounded and thoughtful attitude toward managing the condition.

These findings reflect a promising level of parental health literacy in Al Baha region, which can support timely diagnosis and appropriate management of short stature in children.

In this study, the most significant finding was that 55.1% of parents demonstrated a high level of knowledge regarding short stature in school-aged children. In contrast, a study in the Al Qassim region, KSA, reported only 31.6% of parents with high knowledge levels[7]. This difference could be attributed to regional disparities in awareness campaigns and health education initiatives. Moreover, the widespread use of social media and digital health platforms may also contribute to improved parental understanding.

Another notable result in this study is that 87.7% of parents identified genetic factors as the main cause of short stature. This percentage aligns with previous studies, as genetic causes were the most recognized cause in Alharbi et al.[7]. in 2022, Alhumaidi et al.[1]. in 2023. However, awareness of less common causes, such as digestive system diseases (9.7%), psychological disorders (8.1%), and cortisone use (7.6%), was relatively low, which is similar to the findings of Alharbi et al.[7], 2022 who also reported low recognition rates for these less frequently acknowledged causes. This suggests a shared knowledge gap

across different populations regarding rare or complex causes of short stature, highlighting the need for more inclusive and detailed educational efforts.

In terms of attitudes, this study revealed that 80.4% of parents preferred seeking medical advice before puberty in concerns of short stature. This is similar to the figure of 79.5% reported in a study by Alharbi et al[7]. in 2022, but higher than the 65.6% reported in Alhumaidi et al1., in 2023. This may indicate a shift toward early intervention awareness. The difference may reflect a growing public understanding of the importance of early diagnosis and treatment.

Despite these positive results, some of them were unexpected. Notably, the study revealed that there is no significant association between parental education level and their knowledge about short stature. This is opposite to the expectations, as some people believe that higher educational levels will lead to a greater awareness of health conditions. One potential explanation is that the broad availability of medical information on social media and other online platforms could be one reason, since it could bridge the knowledge gap between parents with formal education and those with less formal education.

Additionally, families with a history of short stature were not linked to having high knowledge, though this association was not statistically significant. This finding aligns with a study done by Alharbi 2024[6], which suggested that knowledge about short stature was seemingly independent from reporting a family history of short stature. This could be because these families believe that short stature is a normal variation within a population.

From a gender-based perspective, there was a statistically almost insignificant difference in attitudes by gender, with men more likely to support early medical consultation than women (87.6% vs. 77.1%). These are aspects that are less emphasized in prior studies. Nonetheless, limitations include the use of an online questionnaire, which may have restricted participation from certain groups. This difference could also reflect cultural differences in the region or a greater reliance on male decision-making in healthcare matters in some households.

The strengths of the present study include a good sample size (n = 384), systematic data collection, and the use of both descriptive and inferential statistical analyses through SPSS software. Moreover, the inclusion of a diverse demographic profile enhances the relevance of the findings for regional public health planning.

The study does, however, have limitations.

The results might not be entirely applicable to other parts of Saudi Arabia because they are limited to the Al Baha region. Recall bias is a risk associated with using self-reported data; also, the cross-sectional design prevents any causal inferences from being made about the factors influencing knowledge or attitudes.

Conclusion:

In conclusion, this study underscores the generally high level of knowledge and awareness among parents in Al Baha regarding short stature in school-aged children, with 55.1% demonstrating a strong understanding of the condition. Parents showed substantial awareness of genetic causes and the importance of early medical consultation, though gaps remained in recognizing rarer causes like digestive or psychological conditions. Interestingly, no significant correlation was found between parental education levels and knowledge, suggesting that widespread online information may bridge traditional educational divides. These findings underscore the need for targeted health campaigns to address existing knowledge gaps, while prompting further reflection on digital health literacy's role and cultural influences in medical decision-making.

Conflict of interest:

The authors confirm no conflict of interest exists.

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