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Investigating the Role of Family Medicine in the Early Detection and Management of Pediatric Obesity

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Abstract
background: Pediatric obesity is a critical global health concern with far-reaching consequences. Family medicine practitioners are uniquely positioned to play a pivotal role in the early detection and management of this complex condition.

Objectives: This study aimed to explore the current practices, challenges, and outcomes associated with the early detection and management of pediatric obesity within family medicine settings in the Al-Ahsa region of Saudi Arabia.

Methods: A cross-sectional observational study was conducted in selected primary health care centers. Participants included children aged 2-18 years, their families, and family medicine practitioners. Data collection involved anthropometric measurements, practitioner surveys on knowledge/attitudes/practices, and family lifestyle questionnaires. Descriptive and inferential statistical analyses were performed.

Results: Among 200 pediatric participants, 57% were classified as overweight, obese or severely obese. While 85% of practitioners recognized the importance of early detection, only 45% felt confident in managing obesity. Poor family engagement (90%) and lack of training (75%) were major barriers identified. Logistic regression revealed practitioner knowledge (OR=2.8), family involvement (OR=3.6), and availability of multidisciplinary teams (OR=2.2) as significant predictors of successful obesity management.

Conclusions: The study highlights the high prevalence of pediatric obesity and the crucial role family medicine can play in early detection and comprehensive management. However, addressing barriers such as inadequate training, limited resources, and poor family engagement is essential to optimize outcomes within family medicine settings.

Keywords: Pediatric obesity, family medicine, early detection, obesity management, primary health care.

Introduction:
Pediatric obesity is a critical and escalating global health concern, characterized by excess body fat that poses a significant risk to a child's health and well-being[1,2]. It is typically diagnosed using body mass index (BMI) percentiles, adjusted for age and sex, with obesity defined as a BMI at or above the 95th percentile for children of the same age and sex [3]. The prevalence of pediatric obesity has alarmingly increased worldwide, affecting children across diverse regions and socio-economic backgrounds. This upward trend signifies not only a widespread public health issue but also highlights the need for urgent and targeted intervention strategies [4–6]. The consequences of pediatric obesity extend beyond the immediate risk of chronic physical conditions, such as type 2 diabetes, asthma, and cardiovascular diseases, to include significant psychological and social implications[7]. Children and adolescents facing obesity are at an increased risk for low self-esteem, social isolation, and depression, which can persist into adulthood, underscoring the multifaceted impact of this condition [8].

The escalating prevalence and multifaceted impact of pediatric obesity underscore the urgency for early detection and comprehensive management strategies [9]. Recognizing pediatric obesity early allows for

timely intervention, which is crucial for preventing the onset of associated health conditions and mitigating long-term consequences. However, despite the clear guidelines for screening and the known benefits of early intervention, challenges persist in the early detection of pediatric obesity[10,11]. These challenges are often compounded by social stigma, variability in growth patterns, and a lack of standardized practices across healthcare settings. Furthermore, the health consequences of pediatric obesity are profound, affecting not just the physical health of children but also their psychological well-being and social development [12]. The condition's persistence into adulthood highlights the critical need for effective management and intervention strategies that address not only the physical but also the emotional and social aspects of pediatric obesity, underscoring the complex interplay between physical health, psychological well-being, and social environment in managing this condition [13,14].

Early detection of pediatric obesity holds paramount importance in the prevention and management of numerous associated health conditions, which if left unaddressed, can lead to significant long-term consequences including diabetes, cardiovascular diseases, and metabolic syndrome [15]. The preventive potential of early detection lies in its ability to intervene before these conditions manifest or progress, offering a critical window for lifestyle interventions and behavior modifications that can significantly alter a child's health trajectory [16]. Recognizing obesity early enables healthcare providers to implement tailored strategies that can mitigate the risk factors associated with obesity, fostering healthier growth patterns and preventing the escalation of comorbidities [17]. Such proactive measures not only contribute to the immediate well-being of the child but also reduce the burden of chronic diseases in adulthood, highlighting the invaluable role of early detection in breaking the cycle of obesity and its related complications[18].
Family medicine practitioners often stand at the forefront of pediatric health care, acting as the primary point of contact for various health concerns, including those related to weight [19]. This position affords them a unique opportunity for the early detection of obesity in children and adolescents. By routinely monitoring growth and development, family physicians can identify potential weight issues before they escalate into more serious health problems [20]. Furthermore, the holistic approach inherent to family medicine, which encompasses physical, emotional, and social health, is particularly effective for addressing complex conditions like obesity [21]. This approach not only facilitates the early identification and intervention of weight issues but also ensures a comprehensive understanding of the factors contributing to obesity [22]. The engagement of the entire family in preventive care and lifestyle modifications is another fundamental aspect of family medicine. By involving families, physicians can foster an environment conducive to sustainable health changes, recognizing that family dynamics and support systems play critical roles in the success of obesity management strategies [23].

Current strategies for managing pediatric obesity predominantly focus on lifestyle interventions, including dietary modifications, increased physical activity, and behavior changes aimed at improving weight outcomes [24]. These strategies often require the collaboration of an interdisciplinary team, including dietitians, physical therapists, and psychologists, to address the multifaceted nature of obesity. Such a comprehensive approach is essential, as it tailors interventions to meet the specific needs of each child, considering their unique circumstances and challenges [25]. However, despite the best efforts of healthcare professionals, these strategies encounter significant limitations, particularly regarding accessibility, effectiveness, and long-term sustainability. Many families face barriers to accessing multidisciplinary care due to geographic, financial, or resource limitations [26]. Additionally, the effectiveness of interventions can vary widely among individuals, and maintaining long-term behavior change remains a pervasive challenge. These limitations underscore the need for innovative approaches within family medicine to enhance the early detection and ongoing management of pediatric obesity, ensuring that strategies are both accessible and capable of producing sustained health improvements[27].

Family medicine practitioners occupy a strategic vantage point for initiating early interventions in pediatric obesity, leveraging their continuous and comprehensive care model to address this growing public health challenge [28]. The accessibility and holistic approach of family medicine allow for the early detection of obesity and the implementation of tailored interventions. Moreover, family-centered care models, a cornerstone of family medicine, offer a unique advantage by engaging both the child and their family in health-promoting behaviors and lifestyle modifications [29]. This approach not only fosters a supportive environment for change but also promotes sustainable health improvements, highlighting the potential of family medicine to enhance outcomes in pediatric obesity through personalized and proactive care [30].

However, despite the critical role family medicine can play in the early detection and management of pediatric obesity, there exists a significant gap in research exploring this potential [31]. Most studies have focused on secondary care interventions or specialized pediatric obesity services, overlooking the integral role that family medicine could play in this arena. Investigating the impact of family medicine in the early stages of obesity management is crucial for developing comprehensive, accessible, and effective strategies to combat pediatric obesity. Such research would provide valuable insights into the feasibility, effectiveness, and sustainability of integrating obesity prevention and management into routine family medicine practice, thereby offering a promising avenue for improving health outcomes in this vulnerable population.

Method

Study Design

The study utilized a cross-sectional observational design to explore the role of family medicine in the early detection and management of pediatric obesity within primary health care (PHC) centers across the Al-Ahsa region of the Kingdom of Saudi Arabia (KSA), from January to June 2023. This method provided a snapshot of current practices, challenges, and outcomes associated with pediatric obesity management in a family medicine setting, allowing for the assessment of variables such as demographic data, health behaviors, and medical practices at a single point in time. The selection of PHC centers aimed to ensure a broad demographic representation, enhancing the study's ability to generalize findings and shed light on the effectiveness of family medicine in combating pediatric obesity.

Setting

The study will be conducted in selected primary health care centers within the Al-Ahsa region, KSA. These centers were chosen due to their accessibility to the general population and the diverse demographic characteristics of their service users, providing a comprehensive understanding of family medicine's role in pediatric obesity within the region.

Sample and Sampling

For this study, the sample comprised children aged 2-18 years, their families, and the family medicine practitioners working at the primary health care (PHC) centers selected for the study. The inclusion criteria for children included being registered patients at one of the selected PHC centers and having a scheduled appointment during the study period, irrespective of their health condition or visit reason. Family medicine practitioners included in the study were those actively practicing and managing pediatric patients at the same centers.

The sampling strategy consisted of two distinct stages:

1. **Selection of PHC Centers:** The first stage involved the purposive selection of PHC centers within the Al-Ahsa region. Centers were chosen based on a set of criteria designed to ensure a comprehensive coverage of the population demographics characteristic of the region. Factors considered included the geographic location of centers, patient volume, and the diversity of patient demographics such as socioeconomic status and ethnic background. This purposive selection aimed to capture a broad spectrum of family medicine practices and patient interactions within the context of pediatric obesity management.

2. **Recruitment of Participants:** Within each selected PHC `center, participants were recruited using a convenience sampling technique. This

method was chosen due to its practicality and efficiency in a clinical setting, allowing researchers to recruit participants who were readily available and met the inclusion criteria during the study period. The sample size was targeted at approximately 200 participants, calculated based on the expected prevalence of pediatric obesity in the region and the operational capacity of the selected PHC centers to provide a representative mix of the population.

The multi-stage sampling method was specifically designed to facilitate the examination of family medicine practices across a heterogeneously composed population, enhancing the study's ability to generalize findings and identify effective strategies for the early detection and management of pediatric obesity.

Tools for Data Collection

For this study, a set of standardized and validated tools was carefully selected to ensure the collection of reliable and accurate data. The tools were chosen to address the different components of the study—evaluating pediatric obesity, assessing the knowledge and practices of family medicine practitioners, and examining family behaviors and dynamics related to obesity management.

1. **Pediatric Obesity Measurement**:
   - **Body Mass Index (BMI) Percentiles**: BMI was calculated for each child participant by measuring their height and weight during the visit to the PHC centers. BMI percentiles, which are age and sex-specific, were determined using the World Health Organization (WHO) growth charts. This method is widely recognized and recommended for assessing overweight and obesity in children.

2. **Practitioner Questionnaire**:
   - **Knowledge, Attitudes, and Practices (KAP) Survey**: This survey was developed to gauge family medicine practitioners' knowledge, attitudes, and practices concerning pediatric obesity. The questionnaire included sections on understanding obesity-related health risks, familiarity with obesity screening guidelines, and current practices in managing pediatric obesity. The KAP survey was validated through a pilot study involving a smaller subset of practitioners to ensure its reliability before implementation in the main study.

3. **Family Survey**:
   - **Family Eating and Activity Habits Questionnaire**: Adapted from a validated tool, this questionnaire was used to collect data on family eating patterns, physical activity levels, and lifestyle choices that contribute to pediatric obesity. The questionnaire helped identify key areas where interventions could be targeted to improve health outcomes.

These tools were administered in a structured manner to all participants. Family medicine practitioners completed the KAP survey electronically, ensuring ease of data compilation and analysis. Families filled out the eating and activity habits questionnaire in a paper-based format during their visit to the PHC centers, with assistance provided by the research team when necessary to clarify any doubts and ensure accurate responses.

Data Collection Procedure

Data collection at selected primary health care (PHC) centers in the Al-Ahsa region was carefully organized following ethical approval and participant consent. Trained research assistants first collected biometric data from children, measuring height and weight twice to calculate Body Mass Index (BMI) percentiles using World Health Organization standards. Simultaneously, family medicine practitioners filled out structured questionnaires assessing their knowledge, attitudes, and practices regarding pediatric obesity. Families completed surveys based on the Family Eating and Activity Habits Questionnaire, focusing on dietary and activity behaviors. All data were initially recorded on paper, then digitized through double-entry to ensure accuracy and confidentiality. This process was designed to minimize disruption, maintain data integrity, and respect participant privacy.

Statistical Data Analysis

Data collected in the study were analyzed using SPSS software. Initial analysis involved descriptive

statistics to outline demographic details, pediatric obesity prevalence, and survey responses. Inferential statistics were conducted using chi-square tests to investigate relationships between categorical variables such as obesity rates and family medicine practices. Logistic regression was applied to identify predictors of successful early detection and management of pediatric obesity, adjusting for factors like age, gender, and socioeconomic status. Significance was assessed at a p-value of less than 0.05, and results were further validated through diagnostic tests for multicollinearity and interaction effects, ensuring the reliability of the findings.

Ethical Considerations

The study will adhere to the ethical guidelines provided by King Faisal University. Ethical approval will be sought from the University's Institutional Review Board (IRB). Participation will be voluntary, with informed consent obtained from all practitioners and parents of participating pediatric patients. Confidentiality and anonymity of the participants will be strictly maintained, and participants will be informed of their right to withdraw from the study at any time without any consequences.

Results:

Table 1 provides a comprehensive demographic overview of the study participants. It shows a predominance of older children (12-18 years) who make up 46% of the sample, suggesting higher engagement with healthcare services as children grow. The gender distribution is nearly balanced, with a slight majority of males (53.5%). Socio-economic data reveal an even spread across low, middle, and high categories, facilitating an analysis of SES impacts on obesity management outcomes. The majority of participants are Arab (81%), reflecting the regional demographic, which is crucial for examining cultural influences on health behaviors. Family sizes predominantly range from 3-5 members, highlighting typical family dynamics that may affect obesity management strategies. Regarding family medicine practitioners, males are more prevalent (65%), and most have 5-10 years of experience, indicating a mature yet diverse professional cohort capable of addressing complex pediatric conditions like obesity

Table 1: Participant Demographics

Demographic Characteristic	Category	Frequency	Percentage (%)
Age of Children (years)	2-5	35	17.5%
	6-11	73	36.5%
	12-18	92	46%
Gender of Children	Male	107	53.5%
	Female	93	46.5%
Socio-economic Status	Low	58	29%
	Middle	84	42%
	High	58	29%
Ethnicity	Arab	162	81%
	Non-Arab	38	19%
Number of Family Members	3-5	117	58.5%
	6+	83	41.5%

Practitioner Gender	Male	13	65%
	Female	7	35%
Practitioner Experience (years)	<5	6	30%
	5-10	9	45%
	>10	5	25%

The results from Table 2 show the distribution of weight categories among pediatric patients in the study, highlighting the prevalence of obesity within this cohort. Out of the 200 surveyed children, 43% were classified as normal weight, indicating that more than half of the sample experienced some level of excess weight. Specifically, 21% of the children were classified as overweight, 26% as obese, and 10% as severely obese. This distribution underscores a significant prevalence of pediatric obesity and severe obesity, which together affect 36% of the sampled population

Table 2: Prevalence of Pediatric Obesity

Obesity Classification	**Frequency**	**Percentage (%)**
Normal Weight	86	43%
Overweight	42	21%
Obese	52	26%
Severely Obese	20	10%

Table 3 presents a detailed overview of the knowledge and attitudes of family medicine practitioners regarding the management of pediatric obesity. A strong consensus is evident in the recognition of early detection as crucial for effective management, with 85% of respondents agreeing or strongly agreeing. Similarly, the necessity of family involvement is overwhelmingly affirmed, with 95% supporting its critical role in successful outcomes. Conversely, confidence in managing pediatric obesity among practitioners appears moderate, with only 45% agreeing or strongly agreeing that they feel capable. This may correlate with the identified gaps in training, as 50% of practitioners either disagree or strongly disagree that sufficient training is available, reflecting a significant area for potential improvement in educational resources. Regular discussions on nutrition and physical activity, essential components of obesity management, are reported positively by 70% of respondents, indicating proactive engagement. However, the assertion that obesity should be addressed by a multidisciplinary team, while supported by 80%, highlights the need for integrated care approaches, which could be further explored to optimize management strategies.

Table 3: Family Medicine Practitioners' Knowledge and Attitudes

Statement	**Strongly Agree (n, %)**	**Agree (n, %)**	**Neutral (n, %)**	**Disagree (n, %)**	**Strongly Disagree (n, %)**

Early detection of pediatric obesity is crucial for effective management.	11 (55%)	6 (30%)	2 (10%)	1 (5%)	0 (0%)
I feel confident in my ability to manage pediatric obesity.	4 (20%)	5 (25%)	7 (35%)	3 (15%)	1 (5%)
There is sufficient training available on pediatric obesity management.	2 (10%)	4 (20%)	4 (20%)	6 (30%)	4 (20%)
Family involvement is essential for the successful management of pediatric obesity.	14 (70%)	5 (25%)	1 (5%)	0 (0%)	0 (0%)
I regularly discuss nutrition and physical activity with patients.	6 (30%)	8 (40%)	3 (15%)	2 (10%)	1 (5%)
Pediatric obesity should be addressed by a multidisciplinary team.	8 (40%)	8 (40%)	3 (15%)	1 (5%)	0 (0%)

Table 4 offers an insightful snapshot of family lifestyle behaviors crucial to managing pediatric obesity. Most families report only average dietary habits (37%), suggesting significant potential for interventions aimed at improving nutrition. In contrast, a positive aspect is observed in the frequency of family meals, with 58% of families having good to excellent mealtime cohesion, which can facilitate healthier eating practices. Physical activity levels are suboptimal, with 35% of families falling into the very poor to poor range, underscoring the importance of enhancing physical activity initiatives. Additionally, high screen time is prevalent, with 48% of families reporting poor to very poor control, indicating another critical area for behavioral intervention.

Table 4: Family Lifestyle Behaviors

Lifestyle Behavior	Very Poor (Frequency, %)	Poor (Frequency, %)	Average (Frequency, %)	Good (Frequency, %)	Excellent (Frequency, %)
Dietary habits (healthy eating)	24 (12%)	36 (18%)	74 (37%)	44 (22%)	22 (11%)
Frequency of family meals	14 (7%)	26 (13%)	68 (34%)	58 (29%)	34 (17%)
Physical activity (weekly hours)	28 (14%)	42 (21%)	66 (33%)	38 (19%)	26 (13%)
Screen time per day (hours)	38 (19%)	58 (29%)	52 (26%)	32 (16%)	20 (10%)

Participation in structured sports	16 (8%)	24 (12%)	56 (28%)	64 (32%)	40 (20%)
Sleep duration (hours per night for children)	18 (9%)	38 (19%)	76 (38%)	46 (23%)	22 (11%)

Table 5 presents the results of logistic regression analysis examining factors influencing early detection and management of pediatric obesity in family medicine. Variables such as Practitioner Knowledge Level (OR=2.8, p=0.001), Family Involvement in Care (OR=3.6, p<0.001), and Availability of Multidisciplinary Team (OR=2.2, p=0.003) demonstrate significant associations with improved outcomes. Frequency of Lifestyle Discussions (OR=1.9, p=0.02) also shows significance. Child's Age (OR=1.2, p=0.007) exhibits significance, while Gender of Child and Socio-economic Status show trends, yet not statistically significant. These findings underscore the crucial role of practitioner knowledge, family engagement, and collaborative care models in enhancing pediatric obesity management within family medicine settings.

Table 5: Factors Influencing Early Detection and Management of Pediatric Obesity

Variable	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Practitioner Knowledge Level	2.8	1.5 - 5.2	0.001
Family Involvement in Care	3.6	2.1 - 6.0	<0.001
Frequency of Lifestyle Discussions	1.9	1.1 - 3.3	0.02
Availability of Multidisciplinary Team	2.2	1.3 - 3.7	0.003
Child's Age	1.2	1.1 - 1.4	0.007
Gender of Child (Male = 1, Female = 0)	0.8	0.4 - 1.6	0.5
Socio-economic Status (High = 1, Low = 0)	1.5	0.9 - 2.5	0.1

Table 6 presents the barriers identified by family medicine practitioners in effectively managing pediatric obesity. The data reveal that the most common challenges include poor family engagement or compliance (90%), indicating a significant obstacle in implementing treatment plans. Additionally, a considerable proportion of practitioners (75%) reported a lack of adequate training in obesity management, highlighting the need for further professional development in this area. Lack of patient motivation (70%) emerged as another significant barrier, underscoring the importance of addressing motivational factors in treatment strategies. Other notable barriers include insufficient time during consultations (60%), limited access to specialized resources such as dietitians and exercise programs (50%), and inadequate follow-up care (55%). Recognizing and

addressing these barriers is essential for enhancing the effectiveness of obesity management within family medicine practices and ultimately improving patient outcomes.

Table 6: Barriers to Effective Management of Pediatric Obesity

Barrier	Frequency	Percentage (%)
Lack of adequate training in obesity management	15	75%
Insufficient time during consultations	12	60%
Limited access to specialized resources (e.g., dietitians, exercise programs)	10	50%
Poor family engagement or compliance	18	90%
Inadequate reimbursement for obesity management services	8	40%
Cultural stigmas associated with obesity	6	30%
Lack of patient motivation	14	70%
Insufficient follow-up care	11	55%

Discussion

The findings of this study provide valuable insights into the pivotal role that family medicine can play in the early detection and management of pediatric obesity. By examining current practices, challenges, and outcomes across primary health care centers in the Al-Ahsa region, the study identifies key areas for improvement and opportunities to enhance the effectiveness of family medicine in combating this pressing public health issue.

Prevalence and Early Detection of Pediatric Obesity: The high prevalence of overweight and obesity among the pediatric participants in this study is a concerning observation that aligns with global trends. With over half of the children surveyed (57%) falling into the overweight, obese, or severely obese categories, the urgency of early intervention and prevention strategies is highlighted. This finding is consistent with the escalating rates of pediatric obesity worldwide, as reported by the World Health Organization (WHO), which estimates that nearly 40 million children under the age of 5 were overweight or obese in 2020 [32]. The consequences of childhood obesity are well-documented, including an increased risk of chronic diseases such as type 2 diabetes, cardiovascular disorders, and certain types of cancer [33]. Early detection and intervention are crucial for mitigating these risks and promoting healthier growth trajectories [34]. Family medicine practitioners, with their close relationships and continuous care model, are strategically positioned to identify weight issues during routine well-child visits and initiate early interventions [35].

Role of Family Medicine Practitioners: The study's results reveal both strengths and areas for improvement in the knowledge, attitudes, and practices of family medicine practitioners regarding pediatric obesity management [36]. The overwhelming recognition of the importance of early detection (85%) and the necessity of family involvement (95%) demonstrates a strong foundation of awareness among practitioners. This aligns with the recommendations from the American Academy of Pediatrics (AAP) and the Endocrine Society, which emphasize the need for routine screening and

the engagement of families in obesity prevention and treatment efforts [37,38].

However, the moderate confidence levels (45%) in managing pediatric obesity and the perceived lack of sufficient training (50%) suggest a need for enhanced educational resources and professional development opportunities. This finding is consistent with previous studies that have identified gaps in medical education and training related to obesity management [39,40]. Addressing these gaps is crucial, as evidence suggests that healthcare providers' knowledge and self-efficacy are critical factors influencing the effectiveness of obesity interventions [41].

The study also highlights the practitioners' acknowledgment of the value of multidisciplinary teams (80%) in addressing the complex interplay of physical, emotional, and social factors contributing to pediatric obesity. This aligns with the recommendations from the American Academy of Pediatrics (AAP) and the Endocrine Society, which advocate for a comprehensive, multidisciplinary approach involving healthcare professionals from various disciplines, such as dietitians, exercise specialists, and mental health counselors [42]. Collaboration with such specialists can augment the comprehensive care provided by family physicians, ensuring a holistic approach to obesity management.

Family Lifestyle and Engagement: The study's findings on family lifestyle behaviors underscore the importance of targeted interventions and education. The suboptimal dietary habits, inadequate physical activity levels, and excessive screen time observed among families are consistent with the challenges faced in addressing pediatric obesity worldwide [43]. These findings highlight the need for tailored guidance and support to promote healthier behaviors within the family unit.

The positive aspect of families having good to excellent frequency of family meals (58%) presents an opportunity for family medicine practitioners to leverage this existing strength and promote healthier eating habits. Research has shown that regular family meals are associated with improved dietary intake, better weight management, and stronger family connections [44]. By capitalizing on this positive aspect, family medicine practitioners can reinforce healthy eating habits and foster a supportive environment for sustainable lifestyle changes.

The logistic regression analysis further reinforces the significance of family involvement in care as a crucial factor influencing successful early detection and management of pediatric obesity. This finding aligns with the principles of family-centered care, which emphasize the involvement of families in decision-making and treatment planning [45]. By actively engaging families and incorporating their perspectives, family medicine practitioners can foster a collaborative approach that acknowledges the unique challenges and strengths of each family unit. This collaborative approach has been shown to enhance adherence to treatment plans and promote long-term behavior change [46].

Barriers and Facilitators: The study identifies several barriers that impede the effective management of pediatric obesity within family medicine settings. The most prevalent barrier reported by practitioners is poor family engagement or compliance (90%), highlighting the need for strategies to enhance family participation and adherence to treatment plans. This finding is consistent with previous research that has identified family engagement as a significant challenge in obesity management [47]. Addressing this challenge may involve incorporating motivational interviewing techniques, setting achievable goals, and providing ongoing support throughout the weight management journey [48].

Lack of adequate training in obesity management (75%) and insufficient time during consultations (60%) are additional barriers that must be addressed to optimize care delivery. These findings align with previous studies that have highlighted the need for comprehensive training and education for healthcare providers in obesity management, as well as the time constraints often faced in primary care settings [49].

Investing in professional development programs and exploring alternative care models, such as group visits or dedicated obesity clinics within primary care settings, could help alleviate these challenges[50].

Moreover, the study underscores the importance of multidisciplinary teams and specialized resources, as limited access to these resources (50%) was identified as a barrier by practitioners. This finding is consistent with the recommendations from professional organizations, such as the American Academy of Pediatrics (AAP) and the Endocrine Society, which emphasize the need for collaborative care models involving various healthcare disciplines [51]. Fostering collaborative partnerships with dietitians, exercise specialists, and mental health professionals can enhance the comprehensiveness and effectiveness of obesity management strategies within family medicine practices [52].

Implications for Practice: The findings of this study have several significant implications for enhancing the role of family medicine in the early detection and management of pediatric obesity:

1. Professional Development and Education: Investing in comprehensive training programs and educational resources for family medicine practitioners is crucial to bolster their knowledge and confidence in managing pediatric obesity. Continuing medical education initiatives, workshops, and access to evidence-based guidelines can equip practitioners with the necessary skills and strategies to effectively address this complex condition. This aligns with the recommendations from organizations such as the American Academy of Family Physicians (AAFP) and the American Board of Family Medicine (ABFM), which advocate for ongoing professional development and training in obesity management.
2. Integrated Care Models: Establishing multidisciplinary teams within family medicine practices or fostering collaborations with specialized obesity management services can facilitate a holistic approach to care. By leveraging the expertise of various healthcare professionals, such as dietitians, exercise physiologists, and mental health counselors, family medicine practitioners can provide comprehensive and tailored interventions that address the multifaceted aspects of pediatric obesity. This approach aligns with the recommendations from the American Academy of Pediatrics (AAP) and the Endocrine Society, which emphasize the importance of multidisciplinary teams in obesity management
3. Family Engagement and Support: Developing strategies to actively involve families in the weight management process is essential for achieving sustainable lifestyle changes. Family medicine practitioners can implement family-centered counseling techniques, promote shared decision-making, and provide resources to support families in creating a healthier home environment. Engaging the entire family unit can foster a sense of accountability and ensure a supportive network for children and adolescents throughout their weight management journey. This approach is supported by research that highlights the positive impact of family involvement on treatment adherence and long-term health outcomes
4. Community Outreach and Prevention: Extending the reach of family medicine beyond clinic walls can contribute to the prevention and early detection of pediatric obesity. Community outreach programs, partnerships with schools and local organizations, and the promotion of healthy lifestyle initiatives can raise awareness, encourage positive behaviors, and facilitate early intervention before obesity-related complications manifest. This aligns with the recommendations from organizations such as the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO), which emphasize the importance of community-based interventions

and population-level strategies for addressing obesity

5. Advocacy and Policy Support: Family medicine practitioners can leverage their unique position as primary care providers to advocate for policies and initiatives that support the prevention and management of pediatric obesity. This may include advocating for increased funding for obesity-related services, promoting environmental and systemic changes that encourage healthy behaviors, and collaborating with policymakers to develop evidence-based strategies at the population level. Such advocacy efforts align with the recommendations from organizations like the American Academy of Family Physicians (AAFP) and the American Public Health Association (APHA), which recognize the role of healthcare providers in promoting public policies that address obesity and related chronic diseases.

Conclusion:

The findings of this study highlight the critical role that family medicine can play in combating the escalating prevalence of pediatric obesity. By leveraging their holistic approach, continuous care model, and family-centered perspectives, family medicine practitioners are well-positioned to identify weight issues early and initiate comprehensive interventions.

However, the study also underscores the need for enhanced professional development, multidisciplinary collaboration, and family engagement to optimize the management of pediatric obesity within family medicine settings. Addressing barriers such as inadequate training, limited resources, and poor family compliance is crucial for achieving sustained and positive outcomes. Moving forward, a concerted effort involving family medicine practitioners, healthcare organizations, policymakers, and communities is essential to develop and implement effective strategies for the early detection and management of pediatric obesity. Investing in professional development programs, fostering collaborative care models, and prioritizing family engagement can empower family medicine practitioners to play a pivotal role in addressing this complex public health challenge. By leveraging the unique strengths of family medicine, including its holistic approach, continuous care model, and family-centered focus, practitioners can not only identify and address weight issues early but also promote sustainable lifestyle changes that can profoundly impact the long-term health and well-being of children and their families.

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