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**ORIGINAL ARTICLE****Physicians' Perceptions about the Emergence of Adolescent Overweight in India***Shailaja S. Patil<sup>1\*</sup>, Jamie E. Ports<sup>2</sup>, Mallikarjun C. Yadavannavar<sup>1</sup>, Solveig A. Cunningham<sup>2</sup>**<sup>1</sup>Department of Community Medicine, BLDEUs Shri B M Patil Medical College, Hospital & Research Centre, Vijayapura-5861001(Karnataka) India, <sup>2</sup>Emory University, Atlanta, GA, USA***Abstract:**

*Background:* Overweight is increasing in developing countries even as underweight remains highly prevalent in some communities, leading to a double burden of malnutrition. This study explored physicians' perceptions about the emergence of overweight and its clinical management in a socio-economically developing region of India, where underweight constitutes to be a major health problem among children and adolescents. *Objective:* This study aimed to explore how physicians in the Vijayapura city, India are understanding and managing the emerging double burden of underweight and overweight in adolescents. *Material and Methods:* A semi structured questionnaire was developed consisting of 35 close-ended questions about causes of obesity, gender differences, and treatment practices and three open-ended questions about the main perceived reasons for obesity. One question ranked various reasons for emergence of adolescent obesity. Twenty-five physicians participated in the survey. *Results:* Physicians treated more adolescents for underweight than overweight; however, most said overweight had increased over the past 5 years (72%) while underweight had been steady or decreased (80%). Most desired more training on treating patients for overweight (92%) and under-nutrition (60%). Most agreed that urban dwelling (72%), high socioeconomic status (72%), male gender (84%) and parental obesity (80%) were risk factors for obesity. Almost all

discussed eating habits (100%) and activity levels (80%), and two-thirds ranked environmental factors, like urbanization, globalization, and technology, as most influential. *Conclusion:* Physicians indicated that while the predominant problem among adolescents in this part of India is underweight, overweight is increasing due to various environmental, socio-economic, cultural, and behavioral factors.

**Keywords:** Adolescents, Developing Countries, Health Care Professionals, India, Obesity, Overweight, Physicians

**Introduction**

Overweight and obesity are increasingly common among children and adolescents in developing countries, including India [1]. Adolescent obesity has been linked to poor health outcomes, including type 2 diabetes, hypertension, obstructive sleep apnea, asthma, and psychological problems [2]. Overweight children are more likely than their peers to be overweight-adults, and this relationship is especially pronounced among adolescents [3].

In India, young people from high-income urban families have experienced the most dramatic rise in overweight and obesity, because they are most likely among the first to experience lifestyle changes associated with economic development,

urbanization, and globalization [4, 5]. There is evidence, however, that overweight is now emerging in less affluent communities in India, where underweight remains highly prevalent [4, 6, 7]. This double burden of overweight and underweight complicates public health and medical interventions focused on nutrition [6]. Most studies on overweight and obesity in India have focused on urban settings. Less is known about less developed regions, like Vijayapura city, located in an under developed region of north Karnataka, where physicians must struggle with emerging obesity in the context of high levels of underweight and where resources and training may be limited.

Physicians who work with children and adolescents are in a unique position to assess the problem of overweight, and their experiences can provide insight into the emerging double burden of malnutrition in India [8]. As trusted and influential figures in society, physicians can also play an important role in treatment and prevention of obesity, though research in other countries has indicated that health care professionals often lack adequate resources and training to help their overweight patients [2, 9, 10].

This exploratory survey aimed to document physicians' perceptions about the emergence of overweight and obesity among adolescents in a developing part of India and their practices for managing the double burden of malnutrition. Understanding their perceptions and knowledge will be useful for designing clinical guidelines and interventions to address the emerging double burden of malnutrition.

### **Material and Methods:**

A survey questionnaire was developed for physicians serving children and adolescents in Vijayapura city, Karnataka State, Southern India. Three-quarters of Bijapur population resides in rural areas. The city proper is fast developing with an estimated population of 3,26,360 as per 2011 census [11]. The survey aimed to document physicians' experiences with unhealthy weight in their practices, their perspectives on causes and risk factors for adolescent obesity, and their management of affected patients. This study was part of a larger study exploring unhealthy weight.

The development of the questionnaire for survey was based on a literature review and by the experience of the first and third authors, who are local physicians. A brainstorming session was held with the group of 10 pediatricians to elicit a list of reasons for the emergence of adolescent obesity. The final instrument consisted of 39 questions: 35 closed-ended, 3 open-ended and 1 ranking.

Closed-ended questions included five-point Likert scales ('strongly disagree' to 'strongly agree'). Items were designed to capture practitioners' perceptions about contributing factors (e.g., 'Obesity is more of a risk for adolescents living in poor families than it is for those living in rich families'), gender differences (e.g., 'Adolescent girls are more likely to be overweight in comparison to boys in Vijayapura'), and practice (e.g., 'Pediatricians/doctors need more training on how to treat patients with obesity').

Open-ended questions focused on perceived causes (e.g., 'What do you think are some of the main reasons for adolescents becoming obese?' and treatment. Respondents were asked to rank, from among the items identified during the brain storming session, the factors they believed most influenced adolescent obesity. The questionnaire was pretested with 10 pediatricians for content and structure and then modified according to the identified problems.

The study was conducted with institutional ethical committee approval and informed consent was obtained from the participants. Excluding the 10 paediatricians, who were involved in brain storming and pre testing of the questionnaire, Thirty physicians were invited to participate in the study. Selection was purposive representing the range of practitioners who interact with adolescents in their practice. The heads of the pediatric departments from two local medical college hospitals assisted in identifying physicians with adolescent patients in their practices. The 25 respondents included twelve paediatricians, one general practitioner, three general physicians and nine gynecologists. Among participants 64% were men, 68% were above 40 years of age, and 68% had been practicing for 10 or more years. Survey questionnaire was delivered and collected in person by a member of the research team. Physicians were asked to complete the surveys within two days.

Three authors read participants' responses to the open-ended questions and sorted them into

categories through an iterative process. These categories were then used to create themes, which were reviewed and agreed upon by the authors. To ensure inter-rater reliability, responses were reviewed a second time to identify any inconsistencies in the coding. Inter-rater reliability was calculated using Cohen's Kappa and found to be satisfactory (73.8%).

### **Results:**

Two-thirds of surveyed physicians estimated that more than 40% of their adolescent patients were treated for underweight-related issues while less than 10% were treated for overweight/obesity. However, a large majority (80%) opined that the prevalence of adolescent underweight had remained steady or decreased a little over the last 5 years, while adolescent overweight/obesity had become more prevalent (72%).

Responses to questions regarding treatment, parental attitudes, gender differences, and risk factors have been summarized in Table 1. Eighty percent reported that they routinely prescribe diet and exercise to overweight and obese adolescents. However, 40% noted that nutrition and exercise counseling were difficult to do because it is time-consuming. Sixty percent expressed a lack of confidence in advising diet and exercise as treatment for obese and overweight adolescents. The majority of surveyed physicians (92%) expressed that they needed more specialized training on how to treat patients for overweight and obesity; 60% believed further training was needed on how to treat under-nutrition as well.

Table 1: Physicians' Perceptions of Adolescent Overweight/Obesity in Rural India (n=25)

Statement	Disagree/ Strongly Disagree (%)	Uncertain (%)	Agree/ Strongly Agree (%)
Doctors routinely prescribe diet and exercise as part of the treatment plan for adolescent patients who are overweight/obese	20	0	80
Nutrition and exercise counseling are time consuming and so it is difficult to allocate time	56	4	40
Doctors are trained and feel confident to tell adolescents how to exercise and eat properly to achieve healthy weight	36	24	40
Underweight adolescents are more likely than overweight/obese adolescents to go to the doctors for advice about their weight	8	8	84
Physicians need more training on how to treat patients for obesity	4	4	92
Physicians need more training on how to treat patients for under-nutrition	28	12	60
Most parents of adolescents do not think overweight/obesity is a problem, unless they are very obese and face difficulty in doing everyday activities.	8	4	88
Obesity is more of a risk for adolescents living in urban areas than it is for those living in rural areas.	24	4	72
Obesity is more of a risk for adolescents living in poor families than it is for those living in rich families.	72	12	12
Parents would prefer their sons to be moderately obese, rather than skinny or of average size.	0	16	84
Parents would prefer their daughters to be moderately obese, rather than skinny or of average size.	36	20	44

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Statement	Disagree/ Strongly Disagree (%)	Uncertain (%)	Agree/ Strongly Agree (%)
Adolescent girls are more likely to fast and avoid specific food items due to religion-based food practices, as compared to boys.	16	8	76
Adolescent girls are more likely to think that being thin is healthier than being normal-weight/overweight, compared to adolescent boys.	28	8	60
Overweight/obese adolescent girls are more likely to adopt unhealthy weight reducing habits, as compared to boys.	4	4	92
A child with obese parents is more likely to become obese themselves, as compared to children with non-obese parents.	0	20	80
Environmental and social factors contribute more to adolescent obesity, than genetic and biological factors contribute.	8	8	84

Most of the surveyed physicians in their practice observed parental perceptions about adolescent overweight and obesity and interpreted that parents did not recognize obesity as a health problem unless it hampered their children's everyday activities. Most observed that adolescents were more likely to seek a doctor's advice about underweight than overweight and obesity. Participants consistently agreed that male gender, parental obesity, urban dwelling, and high socio-economic status were risk factors for overweight and obesity.

Physicians listed as causes of adolescent overweight/obesity (Table 2): eating practices and habits (100%), exercise and activity levels (80%), social technology and media (44%), money and

finances (40%), infrastructure (36%), academics (24%), mechanization (20%), gender (16%), health knowledge (12%), and occupational roles (8%).

Two-thirds of physicians ranked environmental factors, including urbanization, globalization, and technological advances, as the most important risk factors for obesity among adolescents. Socio-economic factors like income, occupation, and education were considered the next most influential, followed by genetic and biological predispositions. Cultural factors, such as religion, changing gender roles and beliefs about health, and psychological factors, such as mental health and eating disorders, were ranked lowest in importance.

**Table 2: Physicians' Descriptions of Factors Contributing to Adolescent Overweight/Obesity in Rural India**

<b>Theme</b>	<b>Different contributing factors for adolescent overweight /obesity as mentioned by physicians</b>	<b>Sample Quotes under each theme</b>
<b>Eating practices and habits</b>	<input type="checkbox"/> junk food consumption <input type="checkbox"/> beverages <input type="checkbox"/> homemade foods <input type="checkbox"/> healthy foods <input type="checkbox"/> frequency of eating	<ul style="list-style-type: none"> <li>● Increase in junk food used as snacks</li> <li>● Milk and curds replaced by Pepsi/Cola</li> <li>● Bad food eating habits</li> </ul>
<b>Exercise and activity levels</b>	<input type="checkbox"/> activity (e.g., sports, cycling, exercise) <input type="checkbox"/> sedentary lifestyle	<ul style="list-style-type: none"> <li>● Decrease in active sports like team sports and traditional sports</li> <li>● Inactivity due to indoor play activities like TV viewing, video games, mobile games</li> </ul>
<b>Social technologies and media</b>	<input type="checkbox"/> phones <input type="checkbox"/> TV <input type="checkbox"/> computers/laptops, video games	<ul style="list-style-type: none"> <li>● Excessive TV viewing, chatting and talking on cell phones</li> <li>● Widespread preoccupation in social media sites</li> </ul>
<b>Money and finances</b>	<input type="checkbox"/> pocket money <input type="checkbox"/> money, income, wealth, affordability of items/foods	<ul style="list-style-type: none"> <li>● Increase in the trend of giving pocket money to children</li> <li>● Rising affluence</li> </ul>
<b>Infrastructure</b>	<input type="checkbox"/> park space <input type="checkbox"/> buildings <input type="checkbox"/> commercialization	<ul style="list-style-type: none"> <li>● Mushrooming of buildings no space to play</li> <li>● Poor infrastructure for adolescents to play</li> </ul>
<b>Academics</b>	<input type="checkbox"/> emphasis on academics (e.g., tuition, coaching, studying, grades) <input type="checkbox"/> academic competition <input type="checkbox"/> expectations	<ul style="list-style-type: none"> <li>● Increased academic stress</li> <li>● Lot of competition in academics creating stress</li> <li>● No time to play due to coaching /tutoring classes</li> </ul>
<b>Mechanization and machine labor</b>	<input type="checkbox"/> use of household tools for chores <input type="checkbox"/> vehicles	<ul style="list-style-type: none"> <li>● Sophisticated facilities like washing machines, mixer/grinders</li> <li>● Huge increase in two wheeler and four wheelers</li> </ul>

Contd...

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Theme	Different contributing factors for adolescent overweight /obesity as mentioned by physicians	Sample Quotes under each theme
<b>Gender</b>	girls don't play outside	<ul style="list-style-type: none"> <li>• No freedom for girl children to play outside</li> <li>• Parents think girls should be thin, especially nearing marriageable age</li> </ul>
<b>Health knowledge</b>	lack of knowledge beliefs about obesity (e.g., fat is healthy, importance of weight gain)	<ul style="list-style-type: none"> <li>• Parents don't have knowledge about healthy foods</li> <li>• Parents don't think overweight and or obesity are a health problem</li> </ul>
<b>Occupational roles</b>	□parents working outside of the home and changing social roles	<ul style="list-style-type: none"> <li>• Both parents working outside home</li> <li>• Less time for cooking and household activities</li> </ul>

**Discussion:**

Indian cities are experiencing major increases in overweight [6], but less is known about overweight in less urbanised areas of the country [7]. This exploratory study documented physicians' experiences with adolescent overweight and obesity in a remote, developing town. Physicians indicated that the predominant problem among adolescents continues to be underweight, but some are beginning to see overweight/obesity among their adolescent patients. Physicians attributed the emergence of overweight and obesity to urbanization and globalization, to diet and activity patterns, and to a lesser extent to cultural factors, beliefs, and gender biases. Some physicians mentioned biological factors as contributing to adolescent weight, but few named specific conditions such as polycystic ovarian disease. Psychological factors were infrequently identified.

Physicians indicated that, they prescribed diet and exercise to overweight and obese patients, but that they struggled to find sufficient time to do so and that they lacked training and resources to manage both overweight and underweight. These patterns are consistent with physicians' perceptions elsewhere: in a meta-analysis of 11 studies conducted in U.S., France, and Israel, less than a third of physicians rated themselves as competent in treating childhood obesity; many desire additional training and those who had relevant training rated their competence in treating obesity significantly higher [10]. Physicians in prior studies also expressed concern about devoting time and resources to diet and activity counseling for which they could not bill [12].

The small, non-random sample limits our ability to generalize these results to health practitioners in Vijayapura or to physicians in other parts of India.

A study of physicians across India would provide a valuable assessment of physicians' knowledge and identify health practitioners' needs for addressing overweight in the context of persistent underweight.

This study highlights that the emergence of overweight among adolescents is a concern but not a major problem in a developing region of India. Physicians are in a unique position to witness the changes occurring in the health landscape and to address the issue of emerging obesity issue in their young patients. However, they need specialized training, time and resources to tackle this new challenge to health systems, policy and programs.

#### Acknowledgements:

We thank the Head and faculty of the Department of Pediatrics of Shri B M Patil Medical College for their inputs in finalizing the survey instrument and recruiting the participating physicians. We thank Dr. G.V. Krishnaveni for suggestions and critical edits and Erin Staab for assistance in literature searches. This project was supported by Award Number 3D43HD065249-03S1 from the Eunice Kennedy Shriver National Institute of Child Health & Human Development, by a grant from Emory University's Global Health Institute, and by BLDE University's Shri B M .Patil Medical College. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funders.

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\***Author for Correspondence:** Dr Shailaja S. Patil, Department of Community Medicine, BLDEUs Shri B M Patil Medical College, Hospital & Research Centre, Bangaramma Sajjan campus, Solapur road Vijayapura-5861001, Karnataka, India.  
Email: shailaja.dr@gmail.com Cell: 09448820464