Tailoring Health Services for Managing Pediatric Obesity: A Proposed, Practice-Based Framework for Working with Families

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Published online: 11 September 2013
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Abstract To optimize the likelihood of success, guidelines for managing pediatric obesity recommend using family-based strategies, focusing on improvements in lifestyle and behavioral factors, and matching health services to families' (children's, adolescents', and parents') motivation to change. To date, there has been little specific guidance for clinicians to operationalize the directive to tailor their counseling to families' motivation (readiness, willingness, and ability) to change obesogenic habits. In this paper, we propose a conceptual heuristic that clinicians can use to tailor intervention approaches to a family's motivation to change obesogenic lifestyle and behavioral factors. Insight regarding families' motivation and developmental capabilities needed to implement changes are the foundation of our proposed model, which is informed by Prochaska's Transtheoretical Model and Stages of Change. This practical framework can help to reduce the complexity of pediatric obesity and to guide clinicians in working with families efficiently and effectively.

Keywords Obesity · Child · Adolescent · Parent · Family · Treatment · Motivation · Transtheoretical Model · Stages of Change · Health services · Canada

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Introduction

Many questions remain unanswered regarding how best to address pediatric obesity, but the magnitude of obesity and obesity-related health risks are clear. For instance, in Canada, approximately one-third of boys and girls are overweight and up to 15 % have obesity [1•]. Longitudinal data from the United States have revealed that the most striking changes in unhealthy weight gain in recent years have impacted children who are already at high health risk because of their excess weight; from 1999–2009, the proportions of individuals classified as overweight or obese remained relatively stable. However, there has been a significant increase in the prevalence of *severe* obesity [2, 3]. This is clinically important, because boys and girls with obesity are very likely to 1) remain obese into adulthood [4] and 2) suffer from adverse metabolic health consequences, including an increased risk of morbidity [5] and mortality [6]. Whereas the cardiometabolic health of children and adolescents with obesity has received extensive attention, pediatric obesity years can negatively impact a number of other areas, including physical function [7] and psychosocial health [8–10], issues that are usually most salient for families. Collectively, this evidence establishes pediatric obesity as a chronic condition that requires targeted, innovative approaches to reduce obesity-related health risks in order to optimize both quantity and quality of life.

Clinical practice guidelines [11] and expert recommendations [12] emphasize the value of taking a long-term, family-centered approach to care, which include making lifestyle and behavioral {AU: British spellings have been changed to American for consistency because more American spellings were used.} changes that are designed to improve dietary quality, increase physical activity, reduce sedentary behaviors, and improve psychosocial and familial health outcomes. Viewing obesity as a chronic care issue [13] is increasingly being used to guide pediatric weight management care [12],

which acknowledges the chronicity of obesity and commonalities between individuals regarding symptomatology, emotional impacts, lifestyle adjustments, and obtaining effective health care. Many families struggle with the physical, psychological, and social demands of obesity with limited help or support [14]. Most often, the help received (while well-intentioned) fails to optimize clinical care or meet families' needs to self-manage obesity. High levels of intervention attrition [15] suggest that clinicians and clinical programs must adapt in order to optimize obesity-related health services for families. In viewing obesity as a chronic condition, health services can evolve to move *away from* a traditional, paternalistic framework (designed historically to manage acute health with clinicians serving as *experts* and patients as passive *recipients* of their knowledge and expertise) *toward* establishing a collaborative, long-term partnership between clinicians and families, one that extends beyond the clinical setting to include community-based resources and supports. Complementing clinical guidelines, practical suggestions for how clinicians can develop and implement health services for managing pediatric obesity are available [16], including recommendations related to procedures for health screening and assessment, multidisciplinary team member composition, organization of physical space, referral mechanisms, marketing, funding, and continuous quality improvement.

As part of a comprehensive assessment before initiating therapy, current recommendations encourage clinicians to assess families' motivational factors [11, 12]. Motivation (used here to mean an *"internal force that moves an organism to engage in a particular behavior"* [17]) is at the core of managing pediatric obesity. Clinically, an assessment of motivation to change obesogenic lifestyle habits in children, adolescents, and parents is vital, because it can inform clinical decision-making, gauge the degree of family engagement and commitment to care, and help to mitigate the risk of program attrition [18]. Because high motivation is linked to treatment adherence [19], and because motivation is dynamic [20] and malleable [21], clinicians can play a valuable role in assessing and enhancing motivational factors in families. Furthermore, when family members possess different levels of motivation to change nutrition and physical activity habits, clinicians can direct treatment to those family members who are most ready and willing to participate in care.

Existing reports have highlighted evidence to inform intervention foci to increase the likelihood of family success in managing pediatric obesity, but challenges remain in translating evidence into everyday clinical practice. This represents a fundamental gap, because most families access health services in real-world, clinical settings. With this limitation in mind, our report articulates a proposed, practice-based framework that can be used to tailor health services for managing pediatric obesity in children, adolescents, and their parents.

Operationalizing the Transtheoretical Model (TTM) and Stages of Change (SoC) for Managing Pediatric Obesity

From psychological and behavior change perspectives, the Transtheoretical Model (TTM) and Stages of Change (SoC) [22, 23] provide a heuristic of the change process that has been applied to weight management and numerous other health behavior domains [24]. Briefly, the SoC model includes five sequential stages (Precontemplation, Contemplation, Preparation, Action, and Maintenance) that an individual goes through when changing from a less healthy to a more healthy behavior (e.g., reducing intake of sugar-sweetened beverages; increasing time spent in moderate-to-vigorous physical activity). For clinicians using the SoC, this includes exploring and assessing readiness to change as a means of tailoring health services and counseling. Although clinicians can assess readiness to change based on their clinical acumen, a structured assessment also can be completed using 10-point *Readiness to Change Rulers* [25] to conceptualize readiness to change obesogenic lifestyle habits (e.g., nutrition, physical activity, sedentary activity, sleep hygiene) with scores ranging from 1 (*definitely not ready to change*) to 10 (*definitely ready to change*). These rulers are used commonly in clinical practice and represent a practical means of representing the degree of readiness to change a behavior [26, 27]. Other constructs (e.g., importance, confidence) also can be probed using similar scales to examine different elements of motivation.

Just as interventions change to match the clients' stage of change, clinicians' roles also evolve. For clients in both Precontemplation and Contemplation stages, clinicians assume the role of a motivational coach rather than a prescriber of information. Because clients in these stages are not yet ready to make changes, prescriptions will likely not be followed, which can be frustrating for clinicians and disheartening for clients. This role adaptation can be challenging for some clinicians, because it represents a shift from the traditional health care role with clinician as *expert*. For clients in Action and Preparation stages, clinicians can assume the role of a facilitator by providing clients with lifestyle recommendations but require clients to choose strategies that best suit their needs. Clinicians become supportive guides and clients take the responsibility for progress in lifestyle change. Ultimately, appropriately matched interventions are intended to help clients move toward Action (and Maintenance) in making healthier lifestyle behaviors, which are needed to achieve weight management success. However, lifestyle changes are less likely and attrition is more likely when there is a mismatch between clients' stage of change and clinicians' recommended intervention. For each stage of change, tailored interventions are recommended to help clients move forward in making healthy lifestyle changes [25].

The TTM and SoC approach applies well when clinicians work with individuals, but there are two fundamental problems with its direct application to pediatric obesity. First, as is the case for all pediatric health services, children and adolescents may be the clients, but they exist within the family unit, a reality that forms the basis of family-centered care [28, 29]. The evidence is clear that family-centered interventions that include parents in leadership roles within the family lead to superior treatment outcomes in managing pediatric obesity [30, 31]. However, one of the challenges in working with several members of the same family is interpersonal differences in stages of change. For instance, parents may be in one stage of change while children are in another. When such differences exist, it is possible that any lifestyle and behavioral changes made at home may not be successful. Indeed, understanding the social context, including relationships between family members and communication patterns within the family, can help clinicians to work more effectively with families [32]. Furthermore, authoritative parenting (warm and engaged, but firm) is connected to greater success in pediatric weight management, and strong family understanding of illness and treatment is linked to better adherence [33, 34]. We acknowledge that limited research has examined the families' stage of change as a variable in weight management, although one recent report showed that a change in parents' stage of change was inversely related to improved weight status in adolescents [35]; it remains unclear how the match between parent and child stage of change impacts treatment success.

Second, variability exists in children's appropriateness for being held responsible for lifestyle management. As highlighted above, most lifestyle and behavioral interventions for managing pediatric obesity involves improving dietary quality, increasing physical activity, and decreasing sedentary time. While children possess the ability to make choices in these areas, their choices and understanding of how their choices impact their health are influenced by their social environment and developmental capacity [34, 36]. For example, many dietary changes require delay of gratification, impulse control, and future thinking, all of which are cognitive processes that begin to appear in later adolescence and early adulthood. For adolescents, normal social development is accompanied by the emergence of peers as increasingly important and influential with parents taking a secondary role. Therefore, changing obesogenic lifestyle habits can diverge from peer group norms, so parents who are ready, willing, and able to make healthy changes themselves or within the family can be met with substantial resistance from adolescents. Many parents of adolescents maintain a high degree of responsibility for making and maintaining dietary changes [37], a division of responsibility that is appropriate for managing pediatric obesity.

Tailoring Counseling Approaches to Family Members' Stage of Change

In developing a tailored, stage-matched approach, we created a heuristic for clinicians to apply with two types of readiness to change levels (children/adolescent and parents). Table 1 highlights this cross-informant grid to conceptualize intervention approaches for managing pediatric obesity. For the purpose of this heuristic, Preparation and Action stages have been combined, because families tend to be more committed to making lifestyle changes at these stages compared with the two preceding stages (Precontemplation and Contemplation) in which families are unaware of the problem or ambivalent about change. Maintenance has not been included in this heuristic for simplicity given that many of the strategies for families in this stage of change are similar to those in the Action stage. One half of the grid is designed for use with children (5–12 years old) and the other half represents approaches to use with adolescents (13–17 years old). By intersecting children's/adolescents' stage of change and parents' stage of change, clinical approaches to providing care were developed and based on a family-based treatment approach to pediatric obesity that considers developmental capabilities. We should note that the model can be conceptualized according to specific lifestyle habits rather than obesity management *per se*. For example, different conceptualizations of the heuristic can be created according to families' specific individual habits (e.g., diet, physical activity, sedentary activity).

Strategies for Working with Children and Parents

Type C1 strategies are recommended when parents are in Precontemplation and children are in either Precontemplation or Contemplation. In this scenario, counseling strategies are directed primarily toward parents to raise awareness of the problem (e.g., provide information about pediatric obesity, explore the impact of weight on health and day-to-day activities, and probe for information about current family lifestyle habits). No prescriptive recommendations are discussed at this time. It is critical for parents to be a focus of care, because any future intervention will require their leadership and because children do not have the ability to connect their lifestyle choices with short- and long-term health consequences. Whereas the concept of health can motivate parents to change, children's behaviors are more likely to reflect those created and modeled by the parents.

Type C2 strategies are recommended when parents are in the Contemplation stage and children are in the Precontemplation or Contemplation stages. Primarily, strategies remain directed at parents to help them progress to Preparation and Action. If the parents' stages of change progress, there is a greater likelihood that family-based lifestyle changes can be made. At this stage,

Table 1 Matrix of family members' stages of change and corresponding counseling strategies according to the Transtheoretical Model

PARENT Stage of Change	CHILD (C) Stage of Change		ADOLESCENT (A) Stage of Change			
	Precontemplation	Contemplation	Preparation/Action	Precontemplation	Contemplation	Preparation/Action
Precontemplation	<i>Type C1</i> Enhance child and parent awareness	<i>Type C1</i> Address child ambivalence; enhance parent awareness	<i>Type C3</i> Seek external supports for child health; enhance parent awareness	<i>Type A1</i> Enhance adolescent and parent awareness	<i>Type A2</i> Address adolescent ambivalence; enhance parent awareness	<i>Type A3</i> Work with adolescent to achieve reasonable lifestyle change; enhance parent awareness
	<i>Type C2</i> Enhance child awareness; address parent ambivalence	<i>Type C2</i> Address child and parent ambivalence	<i>Type C3</i> Seek external supports for child health ; address parent ambivalence	<i>Type A1</i> Enhance adolescent awareness; address parent ambivalence	<i>Type A2</i> Address adolescent and parent ambivalence	<i>Type A3</i> Work with adolescent to achieve reasonable lifestyle change; address parent ambivalence
Preparation/Action	<i>Type C4</i> Enhance child awareness; work with parent as family leader ad supportive communicator	<i>Type C4</i> Address child ambivalence; work with parent as family leader and supportive communicator	<i>Type C4</i> Work with child as participant and parent as family leader and supportive communicator	<i>Type A4</i> Enhance adolescent awareness; work with parent as family leader and supportive communicator	<i>Type A4</i> Address adolescent ambivalence; work with parent as family leader and supportive communicator	<i>Type A5</i> Work with adolescent and parent as partners in lifestyle change

While the terms child and adolescent are used to denote boys and girls from ages 5–12 years (child) and 13–17 years (adolescent), we acknowledge that counseling approaches will vary family-to-family depending on several factors (e.g., family member relationships and interactions, children's developmental capacity, culturally determined roles and responsibilities)

parents are aware of the problem but are unsure if they want to make changes, so clinicians can apply motivational interviewing and values clarification (children can participate in this process, but the emphasis remains on the parents). By clarifying values within the family, clinicians can use more global values to bring worth to the changes. For instance, weight management itself may not be a value for families, but quality family time may be important. If this quality family time is achieved by eating meals together as a family or being physically active together, lifestyle interventions can align with family values.

Type C3 strategies apply when parents are in the Precontemplation or Contemplation stages and children are in the Preparation or Action stages. This can be a challenging scenario, because children often are ready to change while their parents lag behind. In this situation, children should not be given too much responsibility for lifestyle changes given their limited developmental capacity and absence of parental support. Furthermore, in the event that parents are not ready to change, they should not be prescribed changes. A particular concern in this stage is the detrimental impact of negative social interactions related with body form, where children who feel responsible for their weight status are subjected to weight-based teasing by their peers, which often diminishes their sense of self-worth and self-efficacy and may have impede future attempts to make healthful lifestyle changes [38, 39]. *Type C3* strategies remain focused on increasing parents' readiness to change by using stage-appropriate strategies (e.g., awareness raising to help parents advance from Precontemplation to Contemplation); however, in this category, parents can be encouraged to identify external sources of support (e.g., school breakfast program, community recreation/sport program) that enable children to adopt healthy lifestyle habits. Such support are beneficial, because parents can serve as facilitators of healthy lifestyle choices for their children without feeling overwhelmed or pushed to make changes that they are not ready for. Clinicians can provide positive reinforcement about the healthy lifestyle choices being made and continue to work with parents to enhance their motivation to participate in family-based lifestyle changes.

Type C4 strategies are appropriate when parents are in Preparation or Action. At this stage, clinicians work with parents to help them become leaders in the family regarding nutrition and physical activity habits, which can include increasing commitment to change, preparing for changes, finding alternatives for current less healthy behaviors, coping techniques, stimulus control, rewards and reinforcement, and support for new behaviors. This stage includes building parenting skills, which are needed to implement and sustain healthy family changes effectively. Parents can be encouraged to *do more* and *talk less* rather than talking with children about reasons for changing or trying to motivate children to change, because they will benefit from healthy family changes regardless of their individual readiness to change. Clinicians can work with parents to provide a healthy lifestyle environment, be an

active role model and make changes themselves, and create opportunities for children to make healthy choices. If children are in the Preparation or Action stages, they can participate in, for instance, the preparation of meals and make choices from the options presented to them. By focusing on parents' changes, clinicians allow recommendations to be met in a way that best fits the child's interests and developmental needs while avoiding the potential for stigmatizing children.

Strategies for Working with Adolescents and Parents

Adolescence represents a period of transition in which boys and girls begin to make more autonomous decisions about their lifestyle activities and spend an increasing amount of time with their peers. Despite this growing independence, cognitive development remains ongoing until late adolescence. Adolescents often are able to talk about future consequences, but their choices can be disconnected from the long-term consequences of their actions, meaning that decisions will be made regarding choices that feel good in the present, regardless of whether they benefit their health in the future. Parents' control over adolescents' environments (e.g., school, social/community) decreases during this time, although parents can continue to set the tone in the family environment. Family beliefs and values remain important to most adolescents, but they themselves become increasingly responsible for their choices outside of the family setting.

An important difference between children and adolescents in our model includes a greater focus on adolescents' stage of change, which reflects the greater degree of control they yield over their environments and lifestyle choices. Adolescents who feel restricted or pushed into making changes they are not ready for may rebel, which can lead to, for example, sneaking and hoarding forbidden foods. These behaviors are obviously detrimental to managing pediatric obesity. For this reason, it is vital for care to proceed at the pace of the adolescent so that they feel respected and valued as individuals.

Type A1 interventions are for use when adolescents are in the Precontemplation stage and parents are in the Precontemplation or Contemplation stages. Clinicians' efforts to emphasize the importance of making changes that positively impact future health outcomes are unlikely to be fruitful, because this is an abstract concept to most adolescents. Alternatively, clinicians should explore how health and weight influence the day-to-day lives of adolescents and base their counseling from that point of reference. Parents should participate in clinicians' efforts to raise awareness in order to strengthen family-based care.

Type A2 interventions should be used when adolescents are in Contemplation and parents are in Precontemplation or Contemplation. Clinicians can work with adolescents to resolve ambivalence to change and with parents to either raise awareness or address ambivalence. The key is to focus on adolescents' stage

of change. If there is concordance between the adolescent's and parents' stages, family-based care can proceed; if there is a mismatch in stages, parents can play a secondary role while clinicians concentrate their efforts on the adolescent's stage of change. This should not result in the parents being neglected, so clinicians will need to work to keep both parties engaged and moving forward at an appropriate pace.

Type A3 interventions are applied when adolescents are in Preparation or Action and parents are in the Precontemplation or Contemplation stages. Similar to *Type C3* interventions for children, clinicians walk a fine line when working with these families. Adolescents will have a greater likelihood of weight management success if parents are active participants in care; however, if adolescents are motivated and parents are not, adolescents can still attempt to make healthy changes without full family support. These changes may involve seeking parent support for structures to support healthy activities, such as structured physical activity or bringing certain foods into the house, that do not require parents to change the home environment. Adolescents also can be encouraged to seek out healthy environments or peers who can support their efforts. Clinicians should focus on helping adolescents to identify roadblocks to lifestyle change and work to manage these or find different targets if managing the roadblocks is not possible or age appropriate. For instance, if a barrier to healthy eating includes limited finances and/or parent food preferences, adolescents will not be able to take responsibility for these issues. Behavior change goals will need to be adjusted to focus on issues within the control of adolescents (e.g., limiting portion size, avoiding distractions while eating).

Type A4 interventions are utilized when adolescents are in the Precontemplation or Contemplation stages and parents are in the Preparation or Action stages. This is a common clinical scenario whereby parents bring adolescents to treatment to be *fixed*. At this point, however, it is detrimental to prescribe lifestyle change for adolescents, because they do not perceive a problem and by consequence will not be committed to change. Clinicians can work with adolescents to deepen their insight into their lifestyle habits and their impact on weight, as well as their commitment to change, which can help them to progress to the Preparation and Action stages. With parents, clinicians can help them to identify and change the things that are within their control (e.g., role modeling, setting limits for physical activity and sedentary time at home). Clinicians also can help parents to see that they do not control the choices adolescents make outside the home when parents are not around. Parents can be taught communication skills to help adolescents to increase their awareness, examine values, and resolve ambivalence [40]. Engaging parents as caregivers to bolster their adolescents' readiness for change and limit their nagging of their dietary and physical activity habits can help parents to cope with their anxieties about their adolescents' health while providing an environment to enable healthy behavior changes.

Type A5 interventions may be considered *textbook* interventions for adolescents with obesity. In this case, both adolescents and parents are ready to make lifestyle changes, so clinicians can focus on exploring changes they are ready, willing, and able to make, specifying family member responsibilities, and addressing roadblocks. Developmentally, parents should continue to be responsible for creating a healthy home environment while adolescents are responsible for choosing healthy options (within and beyond the home environment). Clinicians should be aware that impulsivity and immediate gratification will be issues for adolescents to address when outside of the home.

Limitations and Future Directions

A key element of this framework is the inclusion of family members' (children, adolescent, and parents) motivation to change obesogenic lifestyle habits and how the TTM and SoC [22] can be operationalized by clinicians. However, we acknowledge that despite its general appeal to clinicians, TTM and SoC have been critiqued in the health behavior change literature as being overly simplistic representations of complex behaviors and that stage progression does not always translate into behavior change [41]. However, a recent systematic review of TTM-based interventions for managing obesity in adults suggests that their impact may be most useful for helping to guide improvements in obesogenic lifestyle habits [42•]. The limited data on applying TTM in managing pediatric obesity suggest that it may hold promise [43]. In lieu of customizing intervention strategies based on the degree of pediatric obesity (defined according to body mass index percentile), our proposed model tailors intervention strategies based on families' readiness, willingness, and capabilities, an approach that is consistent with other contemporary, practice-based behavior change approaches [44].

Our model helps to reduce some of the complexity when working with families, but additional complexity is introduced when parents are at different stages of change from one another (e.g., mother in Preparation or Action; father in Precontemplation or Contemplation). This situation requires clinicians to apply their acumen to work with both parents in finding common ground; otherwise, families will struggle in making sustainable lifestyle changes. Although not explicit in our model, in such circumstances, it should be helpful for clinicians to identify primary care providers to work with. Secondary care providers who are less ready to support change can assume an accommodating or, at a minimum, neutral role, which can vary from family-to-family depending on family dynamics and structure.

Conclusions

Our proposed, practical model for working with families builds on fundamental elements of behavior change theory as well as clinical practice guidelines and expert recommendations for managing pediatric obesity. In exploring and understanding motivational factors in children, adolescents, and parents, clinicians can identify areas of strength for families to work on to improve healthy lifestyle habits and successfully manage obesity.

Compliance with Ethics Guidelines

Conflict of Interest Rachel A. Keaschuk and Geoff D.C. Ball declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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