

Perceptions of Adolescents with Overweight and Obesity for the Development of User-Centered Design Self-Management Tools within the Context of the Chronic Care Model: A Qualitative Study



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ABSTRACT

Background The Chronic Care Model (CCM) is helpful to illustrate multiple levels of influence in the management of chronic disease, such as overweight and obesity in adolescents. Unfortunately, various constraints create gaps in the management process activities performed within the CCM. Consumer health technologies (CHT) may serve as a linkage between adolescents with overweight or obesity, their parents, and their pediatricians.

Objective To conduct formative research to qualitatively identify views of adolescents with overweight and obesity on use of consumer health technologies to manage weight loss across chronic care management settings.

Design As part of a multi-perspective qualitative study, 10 focus groups were conducted with adolescents with overweight and obesity.

Participants/setting Forty-eight adolescents (15 male, 33 female) aged 12 to 17 years who were current participants of an intensive lifestyle change camp in the summer of 2012 participated in focus groups. All adolescents were classified as overweight (21%) or obese (79%) according to body mass index (BMI) for age charts published by the Centers for Disease Control and Prevention.

Analysis All focus groups were recorded, transcribed verbatim, and checked for accuracy. Predefined and open coding were used to analyze transcripts for emerging themes.

Results Adolescents perceive CHT, with its functional requirements of assistance with restaurant food selection, teaching cooking skills, and providing encouragement and motivation, to be helpful with overweight and obesity self-management. Desired features to carry out these functional requirements included avatars, self-monitoring capabilities, social networking, and rewards.

Conclusion Our findings largely agree with previously reported parental perceptions of the benefit of CHT for adolescent overweight and obesity self-management and strengthen support for the design and implementation of CHT within the CCM.

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ADULTHOOD CHRONIC MEDICAL CONDITIONS (EG, diabetes and heart disease) showing increasing occurrence in pediatric and young adult populations are a grave public health concern.¹⁻⁶ Addressing chronic illness is complex and requires a multitude of resources. The Chronic Care Model (CCM) is a synthesis of best practices that lead to improved outcomes in chronic disease, including—but not limited to—obesity.^{7,8} A system interlinking medical care, family support, and self-management help define the CCM.^{7,8} As shown in [Figure 1](#), the components of the CCM for adolescent obesity⁸ encompass multiple levels of influence of behavior change that can be found in ecological models of health behavior (individual, interpersonal, and

organizational).⁹ Ecological models recognize multiple, interacting levels of influence of behavior and that multilevel interventions are most effective for changing behavior.⁹

A strong, proactive family is recognized as an important interpersonal level component of the CCM.^{7,8} In particular, frequency of family meals has been associated with lower prevalence of disordered eating patterns and extreme methods of weight control in some adolescent populations¹⁰ and has been found to be protective of obesity in non-Hispanic white populations.¹¹ In an analysis of studies examining associations between family meal frequency and overweight status,¹² the authors concluded that children and adolescents sharing three or more family meals per week

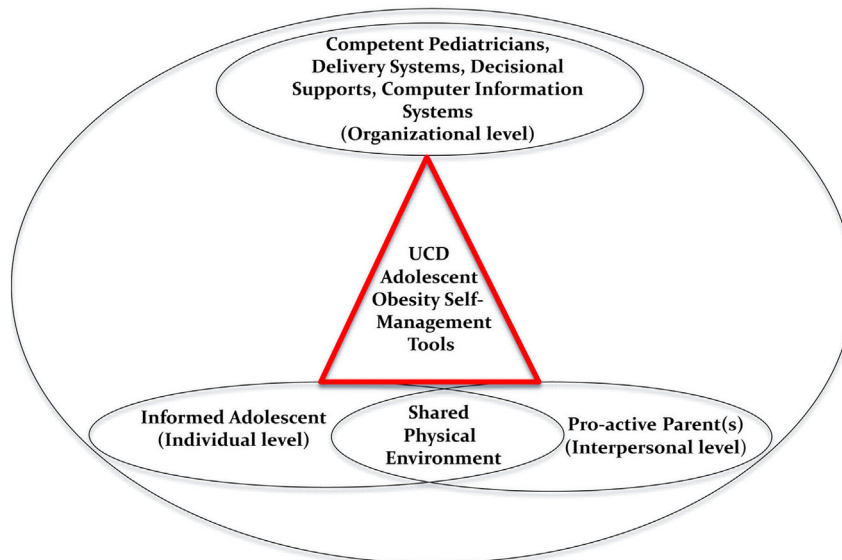


Figure 1. Conceptual model for ecological assessment of user-centered design (UCD) technologies within the chronic care model.

were 12% less likely to be considered overweight. Updated obesity prevention guidelines from the American Academy of Pediatrics further support a proactive family with strong parental recommendations related to the food environment, physical activity, and screen time.¹³

Another level of behavioral influence in ecological models, including the CCM, is that of the organization. Effective organizational-level systems are necessary to implement adolescent obesity self-management tools and to improve interactions with patients and families. At the organizational level of the CCM, improvement in identification, assessment, and prevention of overweight and obesity in pediatric settings has been subject to intervention.¹⁴ As shown at the organizational level in Figure 1, this has been done primarily through enhancements in decisional supports and computer information systems.

Self-management of chronic illness is an essential component of the CCM. Self-management training focuses on self-identified problems and problem-solving skills for improved self-efficacy rather than provider-identified problems and technical information.¹⁵ Such an approach promotes individuals as active self-managers of their care and can lead to more productive interactions with health care providers.⁷ Brief interventions outside of the medical setting (focused on developing self-management skills) are superior to traditional methods of didactic education.⁷

Consumer Health Informatics is a discipline that is used to analyze consumers' needs as well as preferences for obtaining information related to health needs through the use of technology.¹⁶ Consumer Health Informatics is an applied science borrowing concepts from health communication and education, behavioral medicine, and social network theories.¹⁶ Electronic applications are designed to directly interact with the consumer with or without the presence of health care.¹⁷ Electronic applications used in this manner are known as consumer health technologies (CHT). Such technologies are ideal for chronic conditions such as obesity that require medical oversight as well as individual self-management and,

therefore, have a place within the CCM. Research indicates that CHT can be beneficial in self-management of obesity¹⁸⁻²⁰ and obesity-related comorbidities²¹⁻²⁴ in adult populations. However, research into the role of technologies for obesity self-management in younger populations is limited. Recent literature has looked at usability features of mobile phone applications for adolescents with overweight and obesity.²⁵ Another study found a mobile phone application to be helpful in increasing fruit and vegetable intake and in decreasing sugar-sweetened beverage intake in at-risk adolescents, but the short intervention did not find changes in body mass index (BMI).²⁶ Although these studies are promising, they lack design and functionality input from the end user (adolescents). Because parents have a unique role and responsibility in supporting adolescent behaviors and lifestyle choices, we propose that self-management can be enhanced through the development of CHT that targets adolescents with overweight and obesity as primary users and their parents as secondary users. Given the interlinked context of the CCM, and as conceptualized in Figure 1, such CHT systems also should share some information with pediatricians.

The development of CHT that includes input from target user populations (adolescents in this case) as well as parents and pediatricians as secondary users is best served by a user-centered design (UCD) approach.²⁷ Although published research does not provide comprehensive insight into adolescent use of technologies for self-management of overweight and obesity, the role of parents as potential secondary users of CHT has recently been explored. As part of the UCD process for the development of CHT for adolescents with overweight and obesity, a recent study reported formative research findings on parental perceptions of self-management to benefit this adolescent population.²⁸ Results of this study demonstrated that parents of adolescents with overweight and obesity who had recently completed a fee-based weight management intervention would be willing to use CHT with their adolescent, especially if their adolescent were interested in sharing. The study further found that

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