

Decision Support to Promote Healthy Weights in Children

Bonnie Gance-Cleveland, PhD, RN, Kevin Gilbert, PhD, Lynn Gilbert, PhD, RN, Danielle Dandreaux, PhD, and Natalie Russell, BA

ABSTRACT

Using health information technology to facilitate decision support and consumer engagement is a major component of federal electronic health record meaningful use (MU) criteria. Health information technology has the potential to improve primary care and track outcomes in the persistent problem of childhood obesity. We describe a computerized decision support tool we developed to gather patient information, raise family awareness of risks, facilitate patient-centered counseling, and implement clinical quality measures for childhood obesity. It has bilingual capacity, can be used in community screening and pediatric primary care, and provides tailored patient education materials that promote patient engagement.

Keywords: child obesity, clinical guidelines, comparative, decision support, effectiveness, implementation, meaningful use

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The prevalence of overweight and obese children and the associated implications for health, a shortened life span, and health care costs make it a prominent public health concern. One third of children and adolescents in the United States are overweight or obese, and research shows a high likelihood that this will persist into their adulthood.^{1,2} Childhood weight status has significant implications for present and future health such as cardiovascular risks, diabetes, work productivity, and quality of life in addition to health care costs. A recent systematic review found the aggregate national cost of overweight and obesity combined was \$113.9 billion in 2008.³

Inadequate identification and assessment in pediatric primary care has impeded prevention and treatment efforts to address the obesity epidemic. Health maintenance or well-child visits are opportunities for primary care providers to work with families to reduce cardiovascular risk and improve future health, emphasizing early prevention and detection. In 2011, Child Trends reported that 89% of children under 6 years had a well-child check-up in the preceding year.⁴ This rate varied with health insurance, ethnicity, age, and other factors. A study

screening preschool-aged children for cardiovascular risk factors showed approximately 90% had at least 1 identifiable risk (eg, body mass index [BMI], blood pressure, excessive sedentary time, percent calories from fat, passive smoke exposure, or a family history of early cardiovascular event).⁵ Other studies report that calculating and documenting BMI percentiles in pediatric primary care is not common practice despite national clinical guidelines.⁶⁻⁸ Despite the significant prevalence of children with BMIs > 85th percentile, several studies have reported that less than 30% of parents of overweight and obese children indicated that they had been told by a health care provider that their child's weight status was problematic.^{9,10}

Reluctance to address overweight and obesity in clinical encounters has been attributed to many factors, including time constraints, provider discomfort, lack of skill, and reimbursement issues. Story et al¹¹ investigated the many barriers that practitioners face in addressing childhood obesity. These factors included items that could be addressed with technology (patient motivation, parent involvement, clinician time, clinician knowledge, connection to support services, and treatment futility) and some obstacles less easily addressed by technology (eg, lack of

reimbursement and lack of treatment and referral resources). Implementing elements of national clinical obesity guidelines with the aid of technology in the pediatric primary care setting is the focus of this article.

NATIONAL CLINICAL GUIDELINES FOR CHILD OBESITY

Recognizing obesity as a national concern and the need for practical guidance for providers in the care of these children, professional organizations convened experts in 2006 to review the evidence and update the 1998 Expert Panel Recommendations.^{12,13} The updated guidelines aimed at the prevention, assessment, and treatment of overweight in children. The experts acknowledged that the traditional prescriptive, acute care approach to counseling was not working to treat this epidemic. Based on literature reviews and their clinical expertise, these expert panels drafted developmentally focused and culturally adapted obesity prevention guidelines. These guidelines are relationship focused, encouraging the use of motivational interviewing (MI), a collaborative counseling technique, to collaborate with and support families in adopting healthier nutrition and activity patterns. In addition, the use of the chronic care model was encouraged to guide providers in promoting healthy weight in children.^{13,14} Unfortunately, the dissemination of guidelines and recommendations has historically not changed provider behavior.^{7,15-20}

HEALTH INFORMATION TECHNOLOGY AND CLINICAL DECISION SUPPORT

Health information technology (HIT) that provides clinical decision support has potential for helping providers implement these guidelines through efficient collection, calculation, and communication of relevant data in the pediatric primary care setting. HIT can facilitate a more effective discussion aimed at the prevention and treatment of childhood obesity through mechanisms such as tailored patient education materials, motivational interviewing algorithms, mobile health applications to support behavior change, and Web-based dissemination of findings. A growing body of literature shows HIT decision support, self-management, and behavior change programs have the potential to increase physical activity, improve nutrition, and reduce sedentary time.²¹⁻²³ These programs

build on extensive literature showing that using computer algorithms to tailor education based on user data can make information more relevant, engaging, and effective.²¹⁻²³ HIT literature also shows that computerized tools can facilitate decision support for both clinicians and patients.²⁴⁻²⁷

Obesity is more prevalent in less educated and minority populations. Individuals with limited literacy and/or limited English proficiency can face significant challenges in dealing with the health care system. The Institute of Medicine National Research Council²⁸ identified the critical role of information technology in designing a health system that provides care that is safe, effective, patient centered, timely, efficient, and equitable, with the potential of reducing health disparities in underserved populations.²⁹ Projects such as Baby CareLink and the Columbia University Informatics for Diabetes Education and Telemedicine Project^{30,31} have shown the feasibility and acceptability of e-health interventions for populations typically considered underserved.

Computerized decision support has been developed to promote the use of current guidelines by helping to identify and assess overweight/obese children and facilitate clinical decision making. Technology support uses evidence-based algorithms to match patient risk factors to patient-specific recommendations. A systematic review of 100 controlled trials on computer-assisted decision support for a variety of clinical problems including systems focused on computer diagnostics, reminders, disease management, and prescribing suggested that decision support systems improved the provider performance in 62 (64%) of the 97 studies.²⁵ Many of the trials assessed patient outcomes but lacked sufficient power to detect significant differences. These studies looked promising but had inconsistent findings and remain understudied.

One of the strengths of technology is the ability to tailor materials for each person based on risk factors, health behaviors, language, age, and other characteristics. Based on this patient-specific information, HIT can use an automated system to provide recommendations for change that are more relevant to individuals and families. A feasibility study of a computer-tailored intervention to increase physical activity in adolescents in the school setting revealed

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