



Pilot Study of a Computer-Based Parental Questionnaire and Visual Profile of Obesity Risk in Healthy Preschoolers

Marilyn A. Davies, PhD, RN^{a,*}, Lauren Terhorst, PhD^b, Peng Zhang, MS^c,
Amanda J. Nakonechny, BSN, RN^d, Mary Patricia Nowalk, PhD^e

^aDepartment of Health and Community Systems, University of Pittsburgh School of Nursing, Pittsburgh PA

^bDepartment of Occupational Therapy, University of Pittsburgh School of Health and Rehabilitation Sciences, Pittsburgh, PA

^cDuquesne University, Pittsburgh, PA

^dABC Family Pediatricians, Center Valley, PA

^eDepartment of Family Medicine, University of Pittsburgh School of Medicine, Pittsburgh PA

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Purpose This group field-tested a computer-based, parental questionnaire entitled the Childhood Obesity Risk Questionnaire 2–5 (CORQ 2–5) designed to assess obesity risk in healthy preschoolers. CORQ 2–5 generates a profile of seven obesity risk factors.

Results: Field studies provided good internal reliability data and evidence of discriminant validity for the CORQ 2–5. Pediatric nurse clinicians found the CORQ 2–5 profile to be clinically relevant.

Conclusion: The CORQ 2–5 is a promising measure of obesity risk in preschoolers who attend community-based health centers for their wellchild visits and who are not yet obese. CORQ 2–5 is intended to guide provider–parental obesity risk discussions.

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RECENT DATA FROM the 2011–2012 National Health and Nutrition Examination Survey (NHANES) indicate that 16.9% of youth (2–19 years of age) in the United States (U.S.) are obese (defined as a BMI greater than or equal to the age- and sex-specific 95th percentiles of the 2000 Center for Disease control (CDC) growth charts) (Ogden, Carroll, Kit, & Flegal, 2014). This information is a public health concern since the prevalence of obesity in youth has not changed significantly over the last decade (Ogden et al., 2014). However, within the youth population, the prevalence rate for 2–5 year old children (8.4%) indicates a significant decrease from 2003–2004 rate (13.9%) (Ogden et al., 2014), suggesting that efforts to prevent childhood obesity in preschoolers should continue (Wen et al., 2012).

From a public health perspective, childhood obesity remains a major burden on health care costs and resources as obese children have increased risk of disorders such as diabetes (Santoro, 2013), hypertension (Sorof & Daniels, 2002), orthopedic problems (Wills, 2004), and sleep-related disordered breathing (Wing et al., 2003). The annual U.S. obesity-attributable medical expenditures on childhood obesity were estimated at \$75 billion (2003 dollars); without effective prevention programs, health-care costs attributable to childhood obesity are expected to double every decade until 2030 (Wang, Beydoun, Liang, Caballero, & Kumanyika, 2008).

In 2010, the Surgeon General's Vision for a Healthy and Fit Nation stressed the important role that primary care providers have in preventing childhood obesity through comprehensive assessments and the use of best practice guidelines (Services, U. S. D. o. H. a. H., 2010). Unfortunately, a significant care gap exists between childhood obesity prevention practice recommendations,

* Corresponding author: Marilyn A. Davies, PhD, RN.
E-mail address: daviesm@pitt.edu.

guideline awareness and clinical practice decisions among many primary care providers (Cook, Weitzman, Auinger, & Barlow, 2005; McDonald et al., 2012; O'Brien, Holubkov, & Reis, 2004; Tanda & Salsberry, 2013; Wethington, Sherry, & Polhamus, 2011). Reasons given for this gap include time constraints, lack of resources, lack of self-efficacy, and a belief that obesity prevention efforts should be performed at schools and communities rather than primary care offices (Tanda & Salsberry, 2013). Of relevance to this study are the findings of McDonald and associates (McDonald et al., 2012) who attribute this care gap to a lack of health information technology (HIT) that could be used to improve intervention strategies. However, a technological change does not guarantee improvements in primary prevention efforts. For example, the technological change of automatic calculations of body mass index (BMI) has not resulted in improvements in obesity counseling efforts in primary care centers (Shaikh, Nelson, Tancredi, & Byrd, 2010). Therefore, that challenge of finding HIT changes that result in improvements in primary prevention efforts still exists.

This paper presents the development, initial field testing and clinical relevancy of an HIT tool designed to improve obesity prevention efforts of primary care providers who see children aged 2–5 years with BMIs that fall between the 75th–95th percentiles of the 2000 CDC growth charts for their age and gender. Notably, the children in our project were not obese. Their BMIs fell within the 75th–85th percentile (classified for this project as “above normal”), or they fell within the 85th–95th percentile (classified by the CDC as “overweight”). We selected to focus on children within these BMI ranges because we believe that primary care providers should assess obesity risk and initiate obesity prevention efforts well before a preschooler crosses over the BMI threshold of obesity.

The technology for this project involves a computer-based questionnaire that asks parents of the healthy preschoolers their perceptions of multiple risk factors for childhood obesity. The questionnaire generates a unique, multi-factorial profile of obesity risk for each preschooler. The long-term goal for developing the profile is to provide a resource to primary care providers that assist them in their obesity prevention efforts during well-child visits (Elwyn et al., 2012; Vine, Hargreaves, Briefel, & Orfield, 2013).

Methods

This project occurred from 2009 to 2012 and involved six steps: 1) selection of a vulnerable population, 2) literature review and development of a conceptual framework, 3) initial questionnaire construction and field testing, 4) questionnaire reformulation, 5) obesity risk profile construction, and 6) a clinical relevancy study.

Selection of a Vulnerable Population

Preschoolers were selected for study, as many lifetime health behaviors and patterns are established during the preschool years (Andrews, Silk, & Eneli, 2010; Anzman, Rollins, & Birch, 2010; Brotman et al., 2012). In addition, because the project

focused on primary prevention efforts, the preschoolers were not obese; their BMIs fell between the 75th–95th percentiles of the 2000 CDC growth charts for their age and gender. Lastly, the project focused on preschoolers who attended a community-based health center. Community-based health centers serve millions of children in the U.S., and children attending these centers represent low income populations, the uninsured, families experiencing homelessness, and those living in public housing (<http://bphc.hrsa.gov/about/>). The Pediatric Nutrition Surveillance System (PedNSS) 2009 data on over 3 million low-income children between the ages of 2–5 years in federally funded child health programs indicated that 16.4 percent were overweight, and almost 15 percent were obese (Anonymous, 2009). Settler and colleagues found that, regardless of race/ethnic or geographic characteristics, children aged 2–5 years who used community-based health centers in the US had a much higher prevalence of childhood obesity compared with a representative sample from a national survey (Stettler, Elliott, Kallan, Auerbach, & Kumanyika, 2005).

Literature Review and Conceptual Framework

The goal of the literature review was twofold: 1) to determine which risk factors were associated with overweight/obesity in children aged 2–5 years, and 2) to determine which risk factors could be addressed by a primary care provider during a well-child visit. The primary literature search sites were Pub Med and the Cochrane database; dates of interest were years 2000–2012. Search keywords included *childhood overweight*, *childhood obesity*, *prevention*, *risk for childhood obesity* and *risk for childhood overweight*. Results indicated that childhood overweight and obesity had a multi-factorial etiology. Risk factors included genetic predisposition (Walley, Blakemore, & Froguel, 2006; Yamada et al., 2006), embryonic and fetal environment (Salsberry & Reagan, 2005, 2007), socio-demographic factors (i.e. ethnicity and gender) (James, 2005; Martin & Ferris, 2007; Thompson, Rafiroiu, & Sargent, 2003), socioeconomic factors (Kumanyika & Grier, 2006; Vieweg, Johnston, Lanier, Fernandez, & Pandurangi, 2007), history of breastfeeding (Goldfield, Epstein, Kilanowski, Paluch, & Kogut-Bossler, 2001; Koletzko, 2006), rapid growth between birth and age two years (Karaolis-Danckert et al., 2006; Monteiro & Victora, 2005), lifestyle factors (i.e., diet, physical activity, and sedentary activity) (Merchant, Dehghan, Behnke-Cook, & Anand, 2007; Dehghan, Akhtar-Danesh, & Merchant, 2005), child sleep habits (Cappuccio et al., 2008; Currie & Cappuccio, 2007), parental behaviors around eating (Agras, Hammer, McNicholas, & Kraemer, 2004; Faith & Kerns, 2005; Francis, Ventura, Marini, & Birch, 2007; Keller, Pietrobelli, Johnson, & Faith, 2006; Nelson, Gordon-Larsen, North, & Adair, 2006), child temperament (Wasser et al., 2011; Wu, Dixon, Dalton, Tudiver, & Liu, 2011), food security (Gooze, Hughes, Finkelstein, & Whitaker, 2012; Gundersen, Lohman, Garasky, Stewart, & Eisenmann, 2008), and the built environment (Oreskovic, Winickoff, Kuhlthau, Romm, & Perrin, 2009; Rahman, Cushing, & Jackson, 2011).

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