Eating Behaviors 18 (2015) 160–178

Contents lists available at ScienceDirect

Eating Behaviors

A systematic literature review and meta-analysis: The Theory of Planned Behavior's application to understand and predict nutrition-related behaviors in youth

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ARTICLE INFO

Article history:
Received 10 March 2015
Accepted 13 May 2015
Available online 16 June 2015

Keywords:
Theory of planned behavior
Youth
Nutrition
Eating behaviors
Diet

ABSTRACT

Background: Efforts to reduce unhealthy dietary intake behaviors in youth are urgently needed. Theory-based interventions can be effective in promoting behavior change; one promising model is the Theory of Planned Behavior (TPB).
Purpose: The aim of this study was to determine, using a systematic literature review, how the TPB has been applied to investigate dietary behaviors, and to evaluate which constructs are associated with dietary behavioral intentions and behaviors in youth.
Methods: Publications were identified by searching electronic databases, contacting experts in the field, and examining an evolving Internet-based TPB-specific bibliography. Studies including participants aged 2–18 years, all TPB constructs discernible and measured with a description of how the variables were assessed and analyzed, were published in English and peer-reviewed journals, and focused on nutrition-related behaviors in youth were identified. Accompanying a descriptive statistical analysis was the calculation of effect sizes where possible, a two-stage meta-analysis, and a quality assessment using tenants from the Consolidated Standards of Reporting Trials (CONSORT) and Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statements.
Results: Thirty-four articles, including three intervention studies, were reviewed. The TPB was most often used to evaluate healthy eating and sugary snack and beverage consumption. Attitude had the strongest relationship with dietary behavioral intention (mean $r = 0.52$), while intention was the most common predictor of behavior performance (mean $r = 0.38$; both $p < 0.001$). All three interventions revealed beneficial outcomes when using the TPB (e.g. $\eta^2 = 0.51$ and $ds = 0.91, 0.89$, and 0.79); extending the Theory with implementation intentions may enhance its effectiveness (e.g. $\eta^2 = 0.76$).
Conclusions: Overall, the TPB may be an effective framework to identify and understand child and adolescent nutrition-related behaviors, allowing for the development of tailored initiatives targeting poor dietary practices

Abbreviations: CI(s), confidence interval(s); CONSORT, Consolidated Standards of Reporting Trials; FFQ, food frequency questionnaire; IIs, implementation intentions; PBC, perceived behavioral control; TPB, Theory of Planned Behavior; TRA, Theory of Reasoned Action; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology.

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http://dx.doi.org/10.1016/j.eatbeh.2015.05.016

in youth. However, support from the literature is primarily from observational studies and a greater effort towards examining these relationships within intervention studies is needed.

Contents

1. Introduction

Childhood overweight and obesity have been associated with a myriad of health conditions (Allcock, Gardner, & Sowers, 2009; Daniels, Jacobson, McCrindle, Eckel, & Sanner, 2009; Freedman, Mei, Srinivasan, Berenson, & Dietz, 2007; Mattsson, Ronnemaa, Juonala, Viikari, & Raitakari, 2008), bullying, depression (Goodman & Whitaker, 2002; Janssen, Craig, Boyce, & Pickett, 2004; Libbey, Story, Neumark-Sztainer, & Boutelle, 2008; Neumark-Sztainer et al., 2002), low self-esteem, and negative body image (Daniels et al., 2009; Mattsson et al., 2008) as well as overweight and obesity in adulthood which has well known comorbidities (Freedman, Khan, Dietz, Srinivasan, & Berenson, 2001). To address youth overweight and obesity theoretically-based frameworks may be more effective than those not grounded in theory (Baranowski, Cullen, Nicklas, Thompson, & Baranowski, 2003; Godin, Belanger-Gravel, Eccles, & Grimshaw, 2008; Painter, Borba, Hynes, Mays, & Glanz, 2008).

The Theory of Planned Behavior (TPB), an extension of the Theory of Reasoned Action (TRA) (Ajzen, 1985; Ajzen, 1991; Fishbein & Ajzen, 1975), is a social psychological theory that attempts to predict and understand why an individual may perform certain behaviors (Ajzen, 1985; Ajzen, 1991; Montano & Kasprzyk, 2008). Behavioral intention is a product of distal constructs attitude, subjective norms (SN), and perceived behavioral control (PBC); (Ajzen, 1985; Ajzen, 1991; Ajzen, 2002; Blue, 1995; Fishbein & Ajzen, 1975) PBC and behavioral intention are thought to directly impact the targeted action (Ajzen, 1985; Ajzen, 1991; Ajzen, 2002; Blue, 1995). Briefly, attitudes can be defined as the positive or negative evaluations of the behavior and its outcomes; SN is the degree to which an individual perceives others close to him/her and society in general values the behavior and how much the individual is willing to comply with such normative beliefs; PBC is defined as the perceived ease or difficulty of completing the behavior (Ajzen, 1991; Ajzen, 2002; Fishbein & Ajzen, 1975). Attitude, SN, and PBC are all hypothesized to predict behavioral intentions, defined as what an individual plans to do, which in turn—and along with PBC—is thought to have a direct relationship with performing the behavior (Ajzen, 1991; Ajzen, 2002; Fishbein & Ajzen, 1975). Attitude and PBC are the most consistent predictors of food choice intentions in young adults and adults (Armitage & Conner, 1999a; Armitage & Conner, 1999b; Godin & Kok, 1996). Research supports the usefulness of the TPB proper in the prediction of intention and performance for a wide variety of health behaviors (Armitage & Conner, 2001; Godin & Kok, 1996; McEachan, Conner, Taylor, & Lawton, 2011).

Children and adolescents may not possess the cognitive maturity or development to rationally attribute their current dietary choices/behaviors to long-term health (Killgore & Yurgelun-Todd, 2005). Further, knowledge may not influence behavior in youth (Spruijt-Metz, 1999). The TPB, which can be modified or extended for specific populations and behaviors (Ajzen, 1991; Ajzen, 2011; Conner & Armitage, 1998) and encompasses behaviors not under total volitional control (Ajzen, 1991; Ajzen, 2002), has displayed acceptable behavior and intention prediction for numerous health behaviors in various groups (Armitage & Conner, 2001; Godin & Kok, 1996; Hardeman et al., 2002; McEachan