Eating Behaviors 19 (2015) 68–71

Contents lists available at ScienceDirect

Eating Behaviors

Feasibility and Acceptability of Adapting the Eating in the Absence of Hunger Assessment for Preschoolers in the Classroom Setting

Erica G. Soltero [a,*], Tracey Ledoux [a], Rebecca E. Lee [b]

[a] Texas Obesity Research Center, Department of Health and Human Performance, University of Houston, Garrison Gymnasium Room 104, 3855 Holman Street, Houston, TX 77204–6015
[b] College of Nursing and Health Innovation, Arizona State University, 500 N. 3rd Street, Phoenix, AZ 85004

ARTICLE INFO

Article history:
Received 4 March 2015
Received in revised form 19 May 2015
Accepted 24 June 2015
Available online 2 July 2015

Keywords:
Children
Preschool
Feeding Behavior
Eating
Hunger
Internal Cues

ABSTRACT

Eating in the Absence of Hunger (EAH) represents a failure to self-regulate intake leading to overconsumption. Existing research on EAH has come from the clinical setting, limiting our understanding of this behavior. The purpose of this study was to describe the adaptation of the clinical EAH paradigm for preschoolers to the classroom setting and evaluate the feasibility and acceptability of measuring EAH in the classroom. The adapted protocol was implemented in childcare centers in Houston, Texas (N = 4) and Phoenix, Arizona (N = 2). The protocol was feasible, economical, and time efficient, eliminating previously identified barriers to administering the EAH assessment such as limited resources and the time constraint of delivering the assessment to participants individually. Implementation challenges included difficulty in choosing palatable test snacks that were in compliance with childcare center food regulations and the limited control over the meal that was administered prior to the assessment. The adapted protocol will allow for broader use of the EAH assessment and encourage researchers to incorporate the assessment into longitudinal studies in order to further our understanding of the causes and emergence of EAH.

Published by Elsevier Ltd.

1. Introduction

Eating in the Absence of Hunger (EAH) significantly contributes to poor dietary habits and overweight and obesity in preschool children (Birch & Deysher, 1985; Birch, Fisher, & Davison, 2003; Fisher & Birch, 2002). EAH reflects a reduced ability to self-regulate energy intake leading to overconsumption of food in the absence of physiologic hunger (Schachter, 1968; Wardle, Guthrie, Sanderson, & Rapoport, 2001). EAH has been linked to increased levels of adiposity and weight gain over time in preschool children (Birch et al., 2003; Hill et al., 2008; Kral et al., 2012; Shunk & Birch, 2004).

The laboratory assessment developed by Fisher and Birch (1999) is the gold standard for assessing EAH. Children consume a standardized meal until they reach a self-determined level of satiety before they are taken to an observation room where they are given ad libitum access to 10 pre-weighed high energy/low nutrient snack foods for ten minutes (Birch et al., 2003; Fisher & Birch, 1999; Hill et al., 2008). Although the EAH paradigm has high measurement sensitivity and internal validity, it is time consuming, costly, and loses ecologic validity as children may behave differently in a lab setting (Birch, 1998; Madowitz et al., 2014; Mallan, Nambiar, Magarey, & Daniels, 2014).

More recently, Pieper et al. adapted the EAH laboratory assessment for use in the classroom setting for preschoolers with lower executive function (Pieper & Laugero, 2013). Similarly, Mallan et al. implemented the assessment in the home setting for four year old children (Mallan et al., 2014). More studies that evaluate and report on adaptations to the laboratory assessment are needed to increase knowledge of EAH and help develop effective, feasible and ecologically valid methods of measuring EAH (Birch et al., 2003; Esposito, Fisher, Mennella, Hoelscher, & Huang, 2009; Faith et al., 2006; Frankel et al., 2012; Schachter, 1968). This manuscript will provide a detailed description of the adaptation of the laboratory EAH paradigm to the classroom setting and explore the implementation, feasibility and acceptability of the adapted assessment.

2. Methods

Sustainability via Active Garden Education (SAGE) was a physical activity and nutrition garden-based education program for preschool aged children (R21HD073685-01) and was tested in two U.S. cities. Study 1 was conducted in four early childcare education centers (ECECs) in Houston, Texas, and Study 2 was conducted in two ECECs in Phoenix, Arizona. Students ages 3–5 were eligible to participate. All procedures and protocols were approved by the Committee for the Protection of Human Subjects at the University of Houston and the Institutional Review Board at Arizona State University.

* Corresponding author. Tel.: +1 602 496 0194.
E-mail address: erigabsol@gmail.com (E.G. Soltero).

http://dx.doi.org/10.1016/j.eatbeh.2015.06.006
1471-0153/Published by Elsevier Ltd.

2.1. Micro-level Environment Measures

2.1.1. Development and Delivery of EAH Assessment

A protocol was developed using previous variations of the EAH paradigm (Birch et al., 2003; Hill et al., 2008; Pieper & Laugero, 2013).The current protocol relied on strong partnerships with the childcare centers and pre-existing resources in the childcare setting. Research assistants participated in a two-hour, in-class training where they learned and practiced administering the adapted protocol.

In Study 1, the EAH assessment was scheduled 30 minutes to 1 hour after a center provided lunch or breakfast (Cutting, Fisher, Grimm-Thomas, & Birch, 1999). The children were seated at their regular snack tables in the classroom and were told that they were going to be playing a tasting game. The children were first asked if they had consumed a meal prior to the assessment to verify that they had received lunch or breakfast. Research assistants then introduced the children to the tummy dolls (Fig. 1), constructed to reflect an empty stomach, a satisfied stomach and a full stomach (Johnson, 2000).

The research assistants explained the significance of the tummy dolls and led the class in two practice examples to ensure understanding. The research assistants then asked the children to identify their level of satiety by pointing to the tummy doll that best described their level of hunger or fullness.

Next, children were presented with two pre-weighed in plastic snack bags. One bag contained a salty snack of pretzels (20 g, 71 kcals) and the other bag contained a sweet snack of unwrapped M&Ms (28 g, 136kcals). After administering the snack bags, research assistants introduced the children to the cartoon "yummy, yucky, and just okay" faces (Fig. 2) (Kral et al., 2012). They explained the significance of the faces and led the children in two examples to ensure understanding. The children were instructed to taste one piece of each snack and rate their preference by selecting a yummy, yucky, or just okay face to ensure that the snacks were acceptable and palatable to them.

The EAH assessment in Study 2 was also scheduled 30 minutes to 1 hour after a school provided lunch or breakfast. The same protocol used in Study 1 was used in Study 2. However, due to center regulations on nutrition and parent concerns regarding the acceptability of the use of pretzels and M&Ms, the snacks in Study 2 were changed. Instead, children received two pre-weighed snack bags of Cheezit crackers (30 g, 136.8 kcals) and animal crackers (30 g, 150 kcals). After rating their preference, the children were told that they could continue snacking or they could choose to color using a provided coloring sheet and crayons (Pieper & Laugero, 2013).

Snack bags in both studies were re-weighed twice using a food scale and the average of both readings was used to indicate the final weight of the snack bag in grams to the nearest tenth. The pre-assessment weight was subtracted from the post- assessment weight to calculate the grams of snack that had been consumed by each child during the assessment. Kilocalories (kcals) consumed by each participant were calculated using calorie and serving information found on the nutrition label of the snacks. The number of calories per gram was multiplied by the number of grams consumed.

3. Results

3.1. Feasibility and Acceptability

The EAH assessment took 30–45 minutes to complete in the classroom. One research assistant could assess up to six children at once. In contrast, the laboratory and home assessment requires children to schedule individual appointments and takes one and a half to two hours to complete (Birch et al., 2003; Mallan et al., 2014). Adapting the assessment to the classroom substantially decreased the time burden of the assessment and allowed the research team to administer the test to a larger sample of children then would have been feasible using the laboratory assessment.

The classrooms in both studies had snack tables where the children could be seated during the assessment. The children were comfortable in this setting as they consume their daily snacks at these tables. This may have reduced feelings of self-consciousness that may arise in the laboratory setting if the child detects that they are being observed (Birch et al., 2003; Madowitz et al., 2014).

The adapted EAH assessment also reduced the need for extensive food resources as schools provided the meal prior to the assessment and a smaller range of snacks was used. In the laboratory and home assessment, a pre-weighed meal is provided at the cost of the research team and ten snacks including popcorn (15 g), potato chips (58 g), pretzels (39 g), nuts (44 g), fig bars (51 g), chocolate chip cookies (66 g), fruit-chew candy (66 g), chocolate bars (66 g), ice cream (168 g) and frozen yogurt (168 g) are used (Birch et al., 2003; Harris, Mallan, Nambiar, & Daniels, 2014; Mallan et al., 2014). Providing these ten snacks for a sizeable sample can be costly. In Study 1, children had two options, Pretzels (20 g) and M&Ms (28 g), and in Study 2, Cheezit Crackers (30 g) and Animal crackers (30 g). The adapted snacks were acceptable to the children with almost all participants (96%) indicating that at least one of the snacks were "yummy."

In Study 1, the average number of kcals eaten in the absence of hunger was 80.63 kcals ($SD = 60.54$). In Study 2, the average number of kcals eaten in the absence of hunger was 54.62 kcals ($SD = 54.78$).

3.2. Challenges

Selecting the snack foods to be used in the assessment was an initial challenge. In Study 1, the children had high preference for M&Ms and moderate preference for pretzels; however, these snacks were not acceptable among parents and childcare centers. All centers were

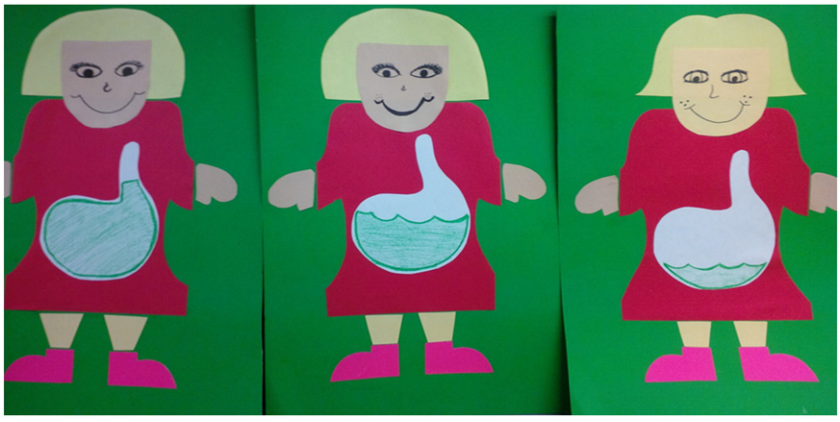

Fig. 1. Tummy dolls used to guide children in identifying their level of satiety.