

Effectiveness of a Parent Health Report in Increasing Fruit and Vegetable Consumption Among Preschoolers and Kindergarteners

Sanita L. Hunsaker, PhD; Chad D. Jensen, PhD

ABSTRACT

Objective: To determine the effectiveness of a parent health report on fruit and vegetable consumption among preschoolers and kindergarteners.

Design: Pre-post open design trial and a randomized controlled trial.

Setting: A university-sponsored preschool and kindergarten.

Participants: A total of 63 parents of preschool and kindergarten students participated in the pre-post open design trial and 65 parents participated in the randomized controlled trial.

Intervention: Parents in intervention groups were given a parent health report providing information about their child's fruit and vegetable intake as well as recommendations for how to increase their child's fruit and vegetable consumption.

Main Outcome Measure: Change in fruit and vegetable consumption.

Analysis: Latent growth curve modeling with Bayesian estimation.

Results: Vegetable consumption increased by 0.3 servings/d in the open trial and 0.65 servings/d in the randomized trial. Fruit consumption did not increase significantly in either study.

Conclusions and Implications: Results from both an open trial and a randomized controlled trial suggested that the parent health report may be a beneficial tool to increase vegetable consumption in preschoolers and kindergarteners. Increases in vegetable consumption can lead to the establishment of lifelong habits of healthy vegetable intake and decrease risk for chronic diseases.

Key Words: fruit, vegetables, intervention study, parents, child (*J Nutr Educ Behav.* 2017; ■:1-7.)

Accepted January 2, 2017.

INTRODUCTION

Dietary patterns established in childhood remain relatively consistent into adulthood.¹ The preschool years are particularly critical in establishing healthy lifelong eating habits.² Increasing fruit and vegetable consumption to at least 5 servings/d during childhood may reduce the probability of developing chronic diseases such as cancer, coronary heart disease, and stroke.³ Therefore, assisting parents in fostering healthy dietary habits for their preschool-aged children may have long-term effects

on children's health. Research supports several parent-directed methods for increasing fruit and vegetable intake in young children including serving them more often, making them readily available and accessible in the home, introducing children to a variety of fruits and vegetables, and consuming fruits and vegetables themselves.^{4,5}

Parent-focused educational interventions have sought to increase fruit and vegetable consumption in a variety of ways ranging from providing resources such as newsletters and workbooks and conducting psycho-

educational telephone calls⁶ to interventions using sing-a-long workbooks and home visits.⁷ The former study resulted in significantly increased vegetable availability in the home⁶ whereas the latter study increased fruit and vegetable consumption among normal weight children by 0.2 servings/d.⁷ One study targeting both the school and home environment by providing teacher training, child education at school, and parent handouts produced increased child vegetable but not fruit consumption.⁸ Taken together, these studies suggested that increasing parents' knowledge of how to improve their child's consumption of fruits and vegetables and encouraging parental modeling of fruit and vegetable intake could result in increased child fruit and vegetable intake. Thus these behaviors were targets of the current intervention.

Although several documented interventions successfully promoted increased fruit and vegetable

Department of Clinical Psychology, Brigham Young University, Provo, UT

Conflict of Interest Disclosure: The authors' conflict of interest disclosures can be found online with this article on www.jneb.org.

Address for correspondence: Sanita L. Hunsaker, PhD, Department of Clinical Psychology, Brigham Young University, Provo, UT 84602; Phone: (801) 422-5458; Fax: (801) 422-0602; E-mail: sanita2806@gmail.com

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<http://dx.doi.org/10.1016/j.jneb.2017.01.002>

consumption in children, limitations to existing research should be noted.⁶⁻⁸ First, these studies were time intensive for parents in that they required parents to engage in telephone or in-home appointments, and thus might have limited effectiveness for parents who may not have as much time to devote to nutrition education.^{6,7} Second, these studies required a significant time investment from interventionists, including developing nutrition education sessions and newsletters and making telephone calls.⁶⁻⁸ Third, these studies used resources such as workbooks and audiocassettes which may become costly when produced in mass, making the intervention more difficult to disseminate.⁶⁻⁸ Finally, previous interventions did not report child diet data to parents to highlight areas for improvement.⁶⁻⁸

One potentially time-limited, simple, and low-cost way to engage parents in influencing their children's health behavior is through a parent health report. This approach has been used to increase parental awareness of their child's weight status.⁹ Parents in an intervention group received a personalized health report that included information about the child's height, weight, weight status, and physical fitness test results as well as tips to reduce screen time and increase physical activity and fruit and vegetable intake. Results showed that parents with overweight children in the intervention group had a greater awareness of their child's weight status and were more likely to initiate weight control activities such as seeking medical services or engaging in dietary change or physical activities than were groups that did not receive the personalized health report. This study suggested that providing parents with a health-related report that targeted specific health behaviors might be an effective way to increase awareness of the health behavior and promote behavior change.

Consistent with the Theory of Planned Behavior,¹⁰ the current study sought to affect behavior change by altering parents' behavioral intention, by targeting their subjective norms, attitudes, and perceived behavioral control. Subjective norms were targeted by reminding parents about

the recommendation of 5 fruits and vegetables per day¹¹ and showing them how their child's consumption compared with these recommendations. Revealing discrepancies between the child's intake and recommendations altered parental attitudes. Finally, providing parents with simple recommendations increased their perceived control. Together, these factors were hypothesized to promote parental behavior change. The researchers conducted 2 studies to evaluate the effectiveness of the parent health report intervention, a pre-post design open trial to provide proof of concept and a randomized trial to assess the effectiveness of the health report compared with a robust control condition.

METHODS

Open Trial (Study 1)

Participants. A total of 63 children (38 male and 25 female; median age [SD], 5 [0.5] years) of 120 students enrolled in a university-based preschool during the 2012–2013 academic year (52%) and their parents participated in this study. Children attended school 3 h/d and received 1 snack during the school day. The parent who self-identified as most responsible for preparing the child's meals was invited to complete the surveys. Preschool personnel sent an e-mail inviting parents to consent to participate. Consent was obtained through an online survey. Parents received a \$10 gift card for completing 2 online surveys.

Measures. Body weight was measured using a digital scale (Seca 869, SECA Corporation, Chino, CA) and height was measured in inches using a portable stadiometer (Seca 217, SECA Corporation) with participants wearing light clothing and no shoes. Measurements were conducted at the school. The standard Centers for Disease Control and Prevention formula¹² was used to calculate standardized body mass index (BMI) scores.

The researchers used the National Cancer Institute (NCI) Fruit and Vegetable Screener Questionnaire¹³ to ascertain children's fruit and vegetable consumption over the previous month. This measure was originally

developed for use with adults; the researchers adapted the survey to facilitate parent report of the child's diet (ie, they changed the referent from you to your child.) In every other respect the measure was identical to the original. This measure asked parents to report all fruits and vegetables consumed by the child, including those that were raw and cooked, eaten as snacks and at meals, eaten at home and away from home, and eaten alone and mixed with other foods. The item assessing fried potato consumption was not included in the analysis because potatoes are energy dense and nutrient poor and have been associated with an increased intake of snack products and lower fruit intake.¹⁴ Parents were asked to rate the frequency of consumption of each fruit or vegetable per day over the past month. Although no validation studies have been conducted in children, the NCI screener correlates moderately well with 4 24-hour fruit and vegetable intake recalls in adults ($r = .51$ and $.66$ for females and males, respectively).¹³

GT3X + accelerometers (Actigraph, Pensacola, FL, 2013) were employed to assess physical activity. Fifteen-second sampling epochs were used to establish intensity categories based on previously validated cutoff points¹⁵; total moderate to vigorous physical activity over 3 days comprised the physical activity variable.

Procedures. The authors' institutional review board approved all study procedures. Parents completed the NCI Fruit and Vegetable Screener Questionnaire as an online survey. Each child's average daily fruit and vegetable consumption was provided to parents along with the guideline that children should consume 5 fruits and vegetables per day.¹¹ Parents were also given a standardized set of recommendations for increasing fruit and vegetable intake provided by the US Department of Agriculture on choosemyplate.gov.¹⁶ The report was sent to parents via e-mail at the end of the week when the baseline data were collected. A month after baseline data were collected, parents again completed the NCI Fruit and Vegetable Screener Questionnaire to

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