

Research and Practice Innovations

Impact of Internet vs Traditional Special Supplemental Nutrition Program for Women, Infants, and Children Nutrition Education on Fruit and Vegetable Intake

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ABSTRACT

The purpose of this project was to compare the impact of Internet nutrition education to traditional nutrition education on Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participant fruit and vegetable consumption. Interventions were delivered at 15 WIC clinics after normal WIC clinic operations or delivered online. A total of 692 and 872 participants from eight WIC agencies self-enrolled into two phases. A quasi-experimental design using an interrupted time series to determine the impact of two methods of nutrition education and follow-up nutrition counseling was used. Data were collected online and at Michigan WIC clinics during 2005-2007 at 3-month intervals during a 9-month period (per phase). Two Internet nutrition education modules were compared to WIC traditional nutrition education, which included either group classes or a self-guided nutrition education information mall. All interventions were based on the same program learning objectives. Optional motivational negotiation counseling followed 3 months post-intervention. Stage of change progression, belief in ability to change, and fruit and vegetable consumption were measured at baseline, immediately after the intervention, and 3 and 6 months post-intervention. Significance ($P < 0.05$) was analyzed using independent

samples t tests, χ^2 distribution, and sample tests for differences in binomial proportions. The Internet group experienced substantial positive differences in stage of change progression, perception that the intervention was helpful and easy to use, and fruit and vegetable consumption. Traditional nutrition education required follow-up counseling to achieve fruit and vegetable consumption levels similar to the Internet nutrition education group. Based on these findings, this study supports Internet nutrition education as a viable alternative to traditional nutrition education for increasing fruit and vegetable consumption in some WIC clients.

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Half of all infants and one fourth of all children in the United States, aged 1 through 4 years, participate in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The number of WIC clients receiving benefits each month reached approximately 9.3 million during the final quarter of 2009 (1). WIC is the largest and most visible program providing services to improve the nutritional status of pregnant women and young children, and therefore, has the greatest potential to influence the health and well-being of a portion of the US population.

Nutrition education is central to the core mission of WIC. Many approaches for offering nutrition education exist, with the most successful being client-centered with feedback mechanisms (2-5). At the same time, there is greater support for the need for behavior-change education using models such as the Transtheoretical Model (6,7). This model is based on the premise that long-term behavior change can be achieved by identifying clients' current stage of readiness to change and then helping them progress along the stage of change continuum. This educational approach helps clients start where they are behaviorally, avoid boredom and failure by providing lessons that are tailored to their interest and needs, and avoid setbacks that might cause them to slip into a previous stage (8,9).

Nestor and colleagues reported that WIC participants are not always satisfied with the nutrition education they receive (10). In addition, there has been growing concern about the inability to provide effective nutrition counseling in the current WIC program structure. Numerous challenges include the infrequency of clinic attendance by

working WIC clients, increasing use of paraprofessionals and limited resources for training them, absence of outcome measures to assess program effects, and extra demands placed on programs for other non-WIC-related services (eg, screening for immunizations, educating about substance abuse, and registering voters) (11). WIC staff reported nutrition education was also compromised by lack of time, human resources, client-tailored information, diversity of staff, and ability to make nutrition education available outside of normal clinic operating hours (11).

Increased use of the Internet during the past decade has opened the door for a variety of ways to address public health issues, including behaviorally based nutrition education (12-14). In particular, nutrition-related issues, such as improving fruit and vegetable consumption and reducing cardiovascular risk factors, have become a growing focus (15,16). Furthermore, WIC clinics in numerous states are currently using the Internet to provide nutrition education to promote healthy food choices and eating behavior (17-19).

The project described in this article studied the relative effectiveness of Internet nutrition education compared to traditional nutrition education methods (ie, group education, self-guided nutrition education information malls) normally provided in WIC clinics. Two fruit and vegetable Internet modules were developed based on wichealth.org, a nutrition education system shown to be a highly popular and viable method for impacting movement in stage of change with a number of parent-child feeding issues (17,18). This Web site is currently used to provide stage of change-based nutrition education to WIC clinics in 15 states (18). It uses the model of client-centered nutrition education by first determining where participants are behaviorally, and then allowing them to choose lessons tailored to their interests and needs. This system further facilitates participants' movement along the stage of change continuum by helping them to identify barriers to change. Through feedback mechanisms that include empowering statements, clients remain engaged in the educational process, further aiding in the prevention of setbacks and minimizing the chance of reverting to a previous stage (20). Extensive evaluation found this approach to have promise in assisting clients' movement along the readiness to change continuum, especially from earlier stages (ie, precontemplation, contemplation, and preparation) to action (17).

The purpose of this article is to share findings associated with differences observed between Internet and traditional nutrition education in the WIC clinic setting related to the following educational outcomes: intent, perceptions, and beliefs associated with fruit and vegetable consumption; WIC client movement along the stages of readiness to change continuum; changes in fruit and vegetable consumption; and the additive effect of follow-up nutrition counseling.

METHODS

This project was based on a quasi-experimental design using an interrupted time series to determine the impact of two methods of education and follow-up nutrition counseling on fruit and vegetable consumption among WIC participants. The theory-driven Internet nutrition educa-

tion modules used in this study were designed to influence client intent to increase intake of fruits and vegetables, specifically the number of fruit, vegetable, and fruit juice servings per day. The project also incorporated staff training and use of follow-up motivational negotiation counseling skills (an abbreviated counseling version of motivational interviewing adapted for the WIC setting) to facilitate client movement in fruit and vegetable consumption from a planned behavioral intent to active engagement (4).

Study participants were recruited from 15 clinics in eight Michigan WIC agencies, representing the broader racial demographic characteristics of all Michigan WIC clinics. Clients who met inclusion criteria (non-high-risk, one or more WIC-eligible children) were invited by WIC staff to participate in the study during their normal visit to the WIC clinic. All participants were existing WIC clients who had not yet received formal nutrition education associated with fruit and vegetable consumption. Participants self-selected to be part of either an Internet nutrition education group or a traditional nutrition education group. Internet nutrition education followed the established models and practices currently being implemented in the behavior-based wichealth.org Internet nutrition education system (18). Traditional nutrition education was either in the form of group nutrition education classes at the WIC clinic, using a standard fruit and vegetable education lesson, or a self-guided nutrition education information mall consisting of applicable educational material displayed on a bulletin board. As the focus of the study was to compare an Internet nutrition education approach to the standard practice currently being used in WIC clinics, agencies had the choice of using their own nutrition education materials, as long as the lessons met the learning objectives used for both methods of intervention. All participants were given the option to receive follow-up nutrition counseling provided by WIC clinic staff using motivational negotiation counseling techniques. WIC staff received training on motivational negotiation available via a CD-ROM or Internet-based self-tutorial (21). This self-study training program was approved for 2 hours (continuing professional education units [CPEU] level 2) continuing education credit by the Commission on Dietetic Registration.

Data were collected online and at Michigan WIC clinics during 2005-2007. Two 9-month intervention phases were used to determine overall impact. Phase I focused on adult (caregiver) fruit, vegetable, and fruit juice consumption, while phase II focused on child consumption of the same. Each phase consisted of baseline data collection (obtained at the initial WIC certification visit) and three post-test surveys. Identical protocols for data collection were implemented and monitored by WIC staff in all study agencies.

The surveys consisted of up to 12 items, using a mix of "mark all that apply," "select the best answer," and categorical data type questions. All participants completed a baseline survey at enrollment. A post-test survey was administered immediately after each educational intervention (occurring up to 3 months after the baseline survey). The Internet group completed the survey online at the end of the educational session, and the traditional nutrition education group completed the same survey in a

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