Research Article

Barriers and Facilitators to Improve Fruit and Vegetable Intake Among WIC-Eligible Pregnant Latinas: An Application of the Health Action Process Approach Framework

Amber Hromi-Fiedler, PhD, MPH[1]; Donna Chapman, PhD, RD[2]; Sofia Segura-Pérez, MS, RD[3]; Grace Damio, MS, CD/N[3]; Pamela Clark, MPH, RN[4]; Josefa Martinez, MHS[1]; Rafael Pérez-Escamilla, PhD[1]

ABSTRACT

Objective: Identify barriers and facilitators to improve prenatal fruit and vegetable (F&V) intake among *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC)-eligible Latinas using the Health Action Process Approach framework.

Design: Qualitative data were collected via audiotaped in-depth interviews as part of a larger study to design an intervention to increase prenatal F&V intake.

Setting: Hartford, Connecticut.

Participants: Forty-five WIC-eligible Latinas completed the study. Included women were: ≥ 18 years old; in 2nd or 3rd trimester; having a singleton pregnancy; overweight or obese (ie, pregravid body mass index ≥ 25); not on a restricted diet; nonsmokers.

Phenomenon of Interest: Prenatal factors that promote and hinder F&V intake.

Analysis: Transcripts were independently read and coded, and a consensus was reached about emerging themes.

Results: Ten factors influenced prenatal F&V intake: social support, family structure, F&V access, F&V preferences, F&V knowledge, F&V health outcome expectations, self-efficacy, intentions, F&V action/coping planning strategies, and maternal health status.

Conclusions and Implications: Social support from family/friends emerged as the primary distal factor driving prenatal F&V intake. Interventions designed to empower pregnant Latinas to gain the access, confidence, knowledge, and strategies necessary to consume more F&Vs must consider strengthening support to achieve the desired outcome.

Key Words: Latina, pregnancy, fruits, vegetables, diet (*J Nutr Educ Behav*. 2016;48:468-477.)

Accepted April 24, 2016.

INTRODUCTION

Optimal fruit and vegetable (F&V) consumption has been recognized as one of the cornerstones of a healthy diet for decades. F&Vs provide key nutrients essential to promoting and maintaining health. An abundance of evidence shows that diets rich in F&Vs reduce chronic disease risk, including coronary heart disease, stroke, and asthma.[1-3] The recent Scientific Report of the 2015 Dietary Guidelines Advisory Committee underscores the crucial link between F&V intake and health by identifying F&Vs as the only consistent dietary components recommended for improving every health outcome evaluated by the committee.[4]

Despite the undisputed health benefits, only about 10% and 15% of the overall US population consume the recommended daily amounts of vegetables and fruits, respectively.[4] National F&V consumption trends have changed little since 2001, with vegetable consumption declining slightly and fruit intake remaining low but stable.[4] Although F&V consumption trends in the US are low overall, recent survey findings suggest that there are

[1]Department of Chronic Disease Epidemiology, Yale School of Public Health, Yale University, New Haven, CT
[2]Exercise Science and Sports Studies Department, Springfield College, Springfield, MA
[3]Hispanic Health Council, Hartford, CT
[4]Women's Ambulatory Health Services, Hartford Hospital, Hartford, CT

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

Address for correspondence: Amber Hromi-Fiedler, PhD, MPH, Department of Chronic Disease Epidemiology, Yale School of Public Health, Yale University, 135 College St, Suite 200, New Haven, CT 06510; Phone: (203) 785-3516; Fax: (203) 764-4353; E-mail: amber.hromi-fiedler@yale.edu

http://dx.doi.org/10.1016/j.jneb.2016.04.398

racial/ethnic disparities in F&V daily intake. Minority groups, especially Latinos/Latinas, are less likely to consume the recommended daily intake of F&Vs compared with non-Latino whites.[5]

Inadequate F&V consumption has unintended consequences, especially during critical life-course stages, such as pregnancy. Pregnancy reflects a unique period when maternal dietary intake has implications for both the mother and the developing fetus. Suboptimal maternal dietary intake during pregnancy is associated with adverse pregnancy outcomes, including gestational diabetes and hypertension[6] and poorer birth outcomes.[7] Evidence suggests that improving prenatal F&V intake can promote optimal pregnancy and birth outcomes. Higher maternal F&V intake before or during pregnancy is associated with a decreased risk of miscarriage,[8] pre-eclampsia,[9,10] and upper respiratory infections[11] and protects against gestational diabetes[12] in the mother. Infant birthweight improves with higher maternal F&V intake, with stronger associations seen among women living in less developed countries.[13]

Pregnancy is a crucial life-cycle phase that can be a powerful "teachable moment."[14] During pregnancy, women may be more committed to adopting healthier behaviors, such as consuming more F&Vs, to minimize health risks to themselves and their unborn babies.[14] Yet, achieving recommended intake levels of F&Vs, especially during pregnancy, can be challenging. Limited access, higher cost, poor quality, lack of transportation, low perceived self-efficacy, and low social support influence healthy eating behaviors, including F&V consumption, among low-income women.[15,16] Surmounting these barriers and effectively changing behavior to increase F&V intake during pregnancy requires bridging the gap between the intention to change (ie, wanting to increase F&V intake) and the action of behavior change (ie, improving F&V intake). The Health Action Process Approach (HAPA) is a health behavior social change model that includes mediator variables, which help to describe the gap between intentions and actual behavior.[17,18] This theory is particularly relevant to changing prenatal F&V intake behaviors, because women often intend to change dietary behaviors during pregnancy, with the intent of providing a healthy environment for their unborn child.[14] However, pregnancy-related changes such as cravings, morning sickness, and heartburn as well as lower motivation and exhaustion can inhibit behavior change. Situational barriers as well as resources can also influence behavior change by providing an environment that can hinder or encourage the adoption of healthy behaviors.[17,18] For example, social support can create an enabling environment for prenatal F&V behavior change (ie, spouse eats F&Vs together with his pregnant partner) or a hindering environment that discourages prenatal F&V behavior change (ie, spouse/partner consumes junk food while his partner struggles to consume F&Vs). Thus, the HAPA identifies key areas in the adoption and maintenance of health behaviors (ie, intentions, coping planning, and action planning)[17,18] that have typically been ignored in prenatal nutrition behavior change interventions.

Previous research has documented the need for culturally appropriate prenatal F&V interventions among low-income pregnant Latinas. Low-income pregnant Latinas are at increased risk of suboptimal F&V intake, consuming median daily servings intakes of F&Vs of 1.3 and 2.0, respectively.[19] Additionally, birth outcomes are poorer among some Latina subgroups such as Puerto Rican Latinas, compared with non-Latina whites,[20,21] indicating a need to address nutrition-related factors during pregnancy.

This study is one of the first to utilize the HAPA model to develop a conceptually sound behavioral change model to serve as a foundation for culturally appropriate interventions to improve prenatal F&V intake among low-income, *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC)-eligible Latinas. Given that the HAPA model has not been used before in prenatal nutrition, a qualitative approach can effectively identify: (1) both previously documented as well as new emerging factors that facilitate F&V behavior change among this population and (2) action/coping planning strategies that can lead to the adoption and maintenance of behaviors that increase prenatal F&V intake. Identifying factors that facilitate behavior change among this population is key for developing effective interventions to improve prenatal F&V intake among low-income Latinas.

METHODS

Study Design

Data were analyzed from 45 in-depth interviews collected as part of a larger study conducted to design an intervention to increase F&V intake among WIC-eligible pregnant Latinas living within Hartford county, Connecticut. Three phases comprised this larger study: focus groups (phase 1), prenatal maternal survey (phase 2), and taste testings (phase 3). Women enrolled in phase 2 of the study completed a maternal prenatal baseline survey and were invited to participate in a follow-up prenatal assessment, the latter of which included the in-depth interview. The HAPA model guided the data collection and data analysis for this study, leading to the development of a conceptually sound behavior change model based on the HAPA framework. The HAPA framework is a solid model to guide this project because it helps identify what is needed to move individuals from intentions to behaviors through action and coping planning.

Participants and Recruitment

A convenience sample of participants who met the study's specific inclusion criteria for phase 2 was recruited. This sampling approach was needed because the resources needed to conduct probabilistic sampling were not available for this study. However, all mothers participating in the maternal survey (phase 2) were invited to participate in this qualitative study. Recruitment occurred from August 2013 through August 2014 at the Women's Ambulatory Health Services (WAHS) clinic at Hartford Hospital, a local hospital within Hartford, which serves some of the poorest residents in the state. Women were invited to participate if they were (1) ≥ 18 years old; (2) in the 2nd or 3rd trimester; (3) WIC-eligible; (4) Latina; (5) with a singleton pregnancy; (6) overweight or obese (ie, pregravid body mass index ≥ 25); (7) not on a restricted diet; and (8) nonsmokers. Of the 130 eligible women who were recruited for phase 2, 74