

Risk of food insecurity and readiness to change obesity-preventing behaviors in rural families.

by
Carolyn Jean Booth

A PROJECT

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Oregon State University
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the requirements for the
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Honors Baccalaureate of Science in Nutrition
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Purpose: This study examines the relationship between food insecurity (FI) risk and families' readiness to change obesity-preventing behaviors within rural home-environments.

Methods: Families (n=144) were recruited through six elementary schools (K-5/6) in low-income, rural, Oregon communities. Families completed surveys including a FI risk screener and the Family Stage of Change Survey (FSOC), a measure of readiness to change behaviors that influence child-level nutrition and physical activity (PA) behaviors at home. Logistic regression analyses examined associations between FSOC scores and FI risk.

Results: Families with FI risk (40.2%) were more likely to be non-White (p=0.036), eligible for school meal programs (p<0.001), and have lower adult education levels (p=0.015). Regarding FSOC scores, families who scored higher on family support for children to play actively and do organized PA were 55% less likely to be at-risk for FI. (OR=0.45; p=0.003), after adjusting for demographic variables.

Conclusion: FI risk is associated with rural families' readiness to change PA behaviors. Specifically, lower odds of FI were associated with family support for children to play actively and do organized PA. Family-based efforts for improving child health among under-resourced, rural families may benefit by focusing on realistically accessible and affordable PA opportunities.

Key words: Food insecurity, rural family home-environment, obesity-prevention behaviors, family stage of change.

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I understand that my project will become part of the permanent collection of Oregon State University, University Honors College. My signature below authorizes release of my project to any reader upon request.

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INTRODUCTION

The objective of this study was to examine the relationship between food insecurity (FI) risk and rural families' readiness to change nutrition and physical activity behaviors associated with childhood obesity, within the family home-environment.

The following review of literature provides the background and rationale leading to this research objective. The review includes sections on the prevalence of obesity among rural children, specific factors and populations associated with obesity, and comparisons between rural and urban children. After identifying unique risks for obesity, the contribution of the rural community-environment to prevent or promote obesity risk factors is examined. Next, the family home-environment is explored to better understand what factors impact childhood obesity-prevention. The association between FI risk and environmental obesity risk factors is then examined. Lastly, the review of literature explores stages of behavior change and family readiness to change nutrition and physical activity behaviors.

Weight Status, Obesity Risk, and Physical Activity Behaviors of Rural Children

Childhood obesity is defined as having a body mass index above the 95th percentile for children of the same age and sex (Barlow & the Expert Committee, 2007). Current data from the United States (U.S.) shows that 32% of children (ages 2-11) are overweight or obese and 17% of children are obese (Ogden, Carroll, Kit, & Flegal, 2014). The prevalence of obesity has remained at a generally steady level among children and adolescents in the U.S between 2003 and 2012 (Ogden et al., 2014). However, the most recent review of the National Health and Nutrition Examination Survey (NHANES)

regarding obesity across the U.S. indicated preschool-aged children (ages 2-5) as the only group having a significant decline in obesity rates (Ogden et al., 2014). This decline in obesity prevalence was likely attributable to broad successes in recent public health efforts directed towards childhood overweight and obesity interventions. Yet, children between the ages of 6-11 continue to show high prevalence of obesity.

Not all children have similar risk for obesity, and one category by which differences are observed relates to where children live. Children and adolescents (ages 2-19) in rural areas were shown to have 26% greater odds of obesity compared to their urban counterparts (Johnson, Welk, Saint-Maurice, & Ihmels, 2015). The trend of rural children having higher prevalence of obesity compared to children in metropolitan/urban areas is supported by multiple studies examining different rural areas in the U.S. (Liu et al., 2012; Davis, Bennett, Befort, & Nollen, 2011; Joens-Matre et al., 2008; Lutifyya, Lipsky, Wisdom-Behounek, & Inpanbutr-Martinkus, 2007).

There has been a steady decline in physical activity and fitness levels among children and adolescents over the past few decades (Jin & Jones-Smith, 2015; Anderson & Butcher, 2006; Kaiser, Lamp, Johns, Sutherlin, & Harwood, 2002). Evidence has shown that only 37% of children meet the recommended 60 minutes of moderate to vigorous physical activity (MVPA) daily (Jin & Jones-Smith, 2015; CDC, 2015). In comparing obese and non-obese children regardless of urban or rural residency, significantly fewer obese children met physical activity recommendations ($P < 0.05$; Davis et al., 2011). Though the data are limited, rural children compared to urban children generally face more challenges to physical activity opportunities such as farther traveling distances and limited public transportation, and lower family income levels that hinder

their access to structured physical activity opportunities and can increase sedentary behaviors (Edwards, Theriault, Shores, & Melton, 2014).

Time spent in sedentary activities such as screen time (watching TV, playing video/computer games) is another physical activity factor related to obesity risk (Edwards et al., 2014; Davis et al., 2011). Evidence has shown that significantly more rural obese children watch more than two to three hours of screen time per day compared to urban obese children (Davis et al., 2011; Lutfiyya et al., 2007) and every additional hour per day that children watch TV correlates with a 2% increase in obesity prevalence (Anderson & Butcher, 2006). Children's screen time engagement has generally increased with age, suggesting early exposure may influence the amount of time children engage in screen time (Anderson & Butcher, 2006; Saelens et al., 2002). Few opportunities for physical activity and few entertainment options in rural areas may also contribute to higher rates of screen time among children (Davis et al., 2011). These trends of obesity prevalence, limited physical activity opportunities, and available sedentary behaviors suggest rural environments may have obesogenic characteristics that differ from those of non-rural environments.

The Rural Obesogenic Environment

To date, rural health research has focused on the effectiveness of public health efforts and resources offered by the large-scale community-environment rather than individual-focused efforts in order to target key factors contributing to the weight status and health of rural people (Beauchamp, Backholer, Magliano, & Peeters, 2014; Booth et al., 2001). Access to tangible resources, such as nearby facilities for active playing

opportunities, was one factor shown to have health benefits for children in rural communities (Edwards et al., 2014; Sallis & Glanz, 2009). Other tangible resources that are important for obesity-prevention in rural communities include organized group sports opportunities, grocery stores with produce, and availability of financial, food, or medical services (Story, 2009; Kumanyika, 2008; Kaufman & Karpati, 2007; Lutfiyya et al., 2007; Grilo et al., 2015). These resources support the ability of families to access healthy food or provide adequate opportunities to be active for preventing childhood obesity. However, disparate access to health resources and facilities has been observed in rural areas compared to urban areas. In some cases when rural areas have adequate resources, limited access to community resources due to far traveling distances or limited time availability have been revealed as a barrier to families' and children's obesity-preventing behaviors (Ruel, Garrett, Hawkes, & Cohen, 2010).

The National School Lunch Program (NSLP) is one easily accessible community resource that can provide nutritiously balanced meals and snacks for children at school (Gundersen, Kreider, & Pepper, 2014). The NSLP can also support low-income families to provide food in the home by reducing other food costs, such as the cost of preparing meals for children's school lunches (Gundersen et al., 2014). One study found that of families that have low-incomes, 80% reported health and lifestyle benefits from improved access to federal nutrition services such as the NSLP, Supplemental Nutrition Assistance Program, and programs from Women, Infants, and Children (Nord, 2009). These nutrition programs can be especially helpful to low-income families by helping them stretch their food dollars and encourage families' ability to change health behaviors.

Whereas access to tangible nutrition resources is important, physical activity opportunities have also shown evidence of having associations with childhood obesity (Edwards et al., 2014; Anderson & Butcher, 2006; Popkin & Gordon-Larsen, 2004). Research has shown that rural adolescents' overweight and obesity risk has correlated with proximity to recreational physical activity facilities and that residents in rural neighborhoods with areas available for walking have reduced likelihood of being overweight or obese (Sallis & Glantz, 2009). Interviews with community members (N=30) that have expert knowledge of youth physical activity policies and programs in rural South Carolina described that the lack of conveniently available and accessible facilities and open spaces for active playing are prominent barriers to youth being able to obtain adequate physical activity (Edwards et al., 2014). Rural environments can naturally shape physical activity opportunities with more abundant natural resources but may have fewer built facilities (Edwards et al., 2014). Natural spaciousness may explain a study that found an uncommon result that rural children more frequently engage in at least five days of adequate physical activity per week than children living in urban places (Liu et al., 2012). Although this result contradicts the majority of previous data it shows that rural areas can provide adequate physical activity opportunities of moderate to vigorous intensity (Edwards et al., 2014; Anderson & Butcher, 2006; Popkin & Gordon-Larsen, 2004). However, in order for children to actually be able to access the available opportunities for physical activity in a rural community, parent/caregiver facilitation is often necessary.

The Rural Family Home-Environment

There has been growing research on the significance of smaller-scale environments contributing to health behaviors within larger community settings (Edwards et al., 2014; Wang et al., 2013; Kegler, Escoffery, Alcantara, Ballard, & Glanz, 2008; Kaufman & Karpati, 2007). Whether children are in classrooms, with families, or with friends, these social environments influence the development of children's obesity-preventing behaviors. Young children spend a majority of their time in the home-environment (Rosenkranz & Dzewaltowski, 2008). Yet, the home-environment deserves more attention as there are few reports of the effectiveness of home-environment interventions on improving child obesity-preventing behaviors (Showell et al., 2013; Ruel et al., 2010; Rhee, De Lago, Arscott-Mills, Mehta, & Davis, 2005; Gruber & Haldeman, 2009; Kaufman & Karpati, 2007).

For children in particular, families and the home-environment are the main support group and setting for encouraging obesity-preventing behaviors (Gruber & Haldeman, 2009; Kumanyika, 2008; Crossman, Sullivan, & Benin, 2006). Parents/caregivers act as providers, role models, and supportive counselors for children, helping to initiate behavior changes and encourage long-term, healthy behaviors (Gruber & Haldeman, 2009). Children have limited volition regarding health behaviors. For example they do not determine what is in the pantry or have the ability to drive themselves to organized sports opportunities. Children are reliant on the behaviors of their parents/caregivers, and the quality of the family home-environment likely has many other important factors that influence children's health behaviors.

Positive perceptions about the environment can also influence parenting actions for developing children's obesity-preventing behaviors and supporting their access to organized physical activity. For example, parents/caregivers' perceived safety and viability of existing physical activity opportunities and facilities for children to be active can negatively impact children's access to coordinated group or family physical activity (Edwards et al., 2014; Booth et al., 2001). When physical activity facilities are lacking or perceived as unsafe, this may lead parents/caregivers to hesitate when considering the available opportunities for organized physical activity and may prevent children from using facilities, contributing to sedentary behaviors (Johnson et al., 2012; Sallis & Glanz, 2009; Anderson & Butcher, 2006). Other barriers to accessing organized physical activity include families' schedules and available time to coordinate children's active playing together (Edwards et al., 2014). Organized physical activity opportunities are often supported by facilities and groups sports, but children especially benefit with family involvement, parents/caregivers provision of opportunities, and adequate space to be active (Leung, Epel, Ritchie, Crawford, & Laraia, 2014; Sallis & Glanz, 2009). Furthermore, organized physical activity and group sports have been shown to result in more MVPA for children to achieve and maintain healthy weights (Sallis & Glanz, 2009), especially if they are also supported by healthy diets.

Children's eating behaviors are also influenced by family relationships that offer interactive learning opportunities (Gruber & Haldeman, 2009; Crossman et al., 2006). Studies examining the influence of families on children's eating behaviors have shown that parents pass on ethnic and cultural lifestyles with each meal, normalizing each family's usual food choices and behaviors (Kumanyika, 2008; Sallis & Glanz, 2009;

Rhee et al., 2005; Booth et al., 2001). Other studies of the family home-environment show factors such as access to healthy foods in the fridge or pantry and family meal policies influence family obesity-preventing behaviors (Leung et al., 2014; Gruber & Haldeman, 2009). Although the number of meals children eat away from the home has primarily risen in the past, children are shown to still eat about two thirds of meals and snacks at home (Rosenkranz & Dzewaltowski, 2008). Thus the benefits of community-based or school-based programs can be “undone” in the context of an unsupportive family home setting.

In addition to the make-up of meals, family eating behaviors and engagement with screen time during mealtimes have also been associated with child weight status (Gruber & Haldeman, 2009; Gable, Chang, & Krull, 2007; Crossman et al., 2006). Gable et al. found that lower frequencies of eating meals together as a family was significantly related to the onset of childhood overweight among first and second graders (2007). Electronic entertainment can exacerbate this by creating distractions from mealtime social interaction and can even separate family members into different rooms during mealtimes (Anderson & Butcher, 2006). Less family interaction during mealtimes limits opportunities for parents/caregivers to discuss and observe their children’s food choices and behaviors (Saelens et al., 2002). Furthermore, the frequency of eating while watching or using electronics, especially in bedrooms, has shown an increasing trend as children age and also exposes children to advertisements that may encourage unhealthy food options (Anderson & Butcher, 2006; Saelens et al., 2002). If children’s eating habits are not monitored by families, children may be less able and willing to develop the healthy

food choices and habits that provide adequate nutrition contributing to the risk of weight gain (Gruber & Haldeman, 2009).

When rural families are further challenged by low-income status – particularly with an inability to make food resources last throughout the month – data suggests that families consume more high fat and nutritionally poor convenience foods compared to food secure or more affluent families (Ruel et al., 2010; Leung et al., 2014; Story, 2009). The influence of restaurant options, abundant fast food establishments, limited home-cooked meals, and sometimes the quality of school lunches and snacks have generally led children and adolescents to consume more total fat, saturated fat, sugar, and sodium than is recommended, which are food qualities generally associated with obesity (Leung et al., 2014; Liu et al., 2012; Sallis & Glanz, 2009; Story, 2009; Popkin & Gordon-Larsen, 2004). Children and adolescents have shown steady increases in caloric intake as they age, and even into adulthood (Anderson & Butcher, 2006). Children also show decreased trends of physical activity through less often walking to school, more often traveling in cars, and engaging in sedentary behaviors such as screen time more frequently (Anderson & Butcher, 2006). Increased caloric intake relative to energy expenditure is the primary cause for developing obesity. This can be exacerbated for children by poor family eating and activity behaviors in home-environments that are unsupportive of maintaining healthy weights.

Food Insecurity (FI) in Rural Families

FI is when an individual becomes unable to reliably access a sufficient amount of affordable and nutritious food (USDA ERS, 2015). Factors associated with FI include

overweight and obesity, lower adult education, low-income, limited access to health resources, poor health, lower fitness levels, and increased risk for chronic diseases such as diabetes and hypertension (Edwards et al., 2014; Seligman, Laraia, & Kushel, 2010; Sallis & Glanz, 2009; Kaiser et al., 2002). Overall, about 14% of U.S. households have been identified as FI (Vollinger et al., 2015; Leung et al., 2014). Separate studies show that rural areas in particular show higher prevalence of FI (40%) compared to urban areas (33%; Befort, Nazir, & Perri, 2012; Bauer et al., 2012). Yet another study found that data from a sample population of over 1.6 million elementary and middle school-aged children in rural U.S. areas revealed a greater prevalence of FI, lower income levels, and obesity among families that identified as more than one race/ethnicity compared to families that identified as only White (Jin & Jones-Smith, 2015). These trends reveal the complexity of the relationships between FI risk and obesity among specific populations of rural residents.

Although minimal research has examined specific environmental factors of FI risk in rural communities (Showell et al., 2013; Ruel et al., 2010), the available data suggest that being at-risk for FI is associated with poor access to grocery stores and safe food storage, limited physical activity opportunities and facilities, inadequate transportation, and insufficient funds for buying food (Arteaga & Heflin, 2014; Corman, Noonan, & Reichman, 2014; Edwards et al., 2014; Leung et al., 2014; Ruel et al., 2010; Rosenkranz & Dzewaltowski, 2008; Cook et al., 2004). One study explored resource perceptions between rural, urban, and suburban residents and found that 50% of food pantry clients from rural areas felt their community had inadequate grocery stores and supermarkets compared to the store perceptions of urban clients' (22%) or suburban clients' (13%;

Garasky, Morton, & Greder, 2004). Access to affordable food resources has reduced some challenges of families experiencing FI (Arteaga & Heflin, 2014).

Research involving low-income families with elementary school-aged children participating in the NSLP has shown that “paying full price for school lunch increased the probability of [FI]” and, in contrast, that FI was significantly reduced with participation in the NSLP ($p < 0.01$; Arteaga & Heflin, 2014). These data were gathered from a sample of roughly 5500 children entering kindergarten and examined if NSLP participation led to changes in families’ FI prevalence based on nutrition and food purchasing behaviors over the prior 12 months (Arteaga & Heflin, 2014). Data have also shown NSLP participation correlates with reduced FI risk, obesity, and poor health (Gundersen et al., 2012). Specifically, participation in the NSLP has been shown to reduce families’ risk for FI by 6%, childhood obesity by 21%, and overall poor family health by 33% (Gundersen et al., 2012). These findings reinforce nutrition assistance programs such as the NSLP as effective strategies for healthy eating and nutrition support for children in families facing FI and further suggest that these programs may buffer the risk for obesity.

Family Readiness to Change and Stages of Change

Parents/caregivers are one of the most influential role models for enabling children’s readiness to improve healthy behaviors (Johnson et al., 2012; Gruber & Haldeman, 2009). Desirable enablement to prevent obesity would involve guiding children toward healthy food and physical activity choices by offering healthy foods at home for meals and snacks and offering sufficient opportunities to be physically active. As such, if families are insufficiently knowledgeable, or inadequately resourced to

provide healthy food and physical activity options at home, or if unhealthy behaviors such as unlimited screen time are not monitored, children will be at increased risk for unhealthy weight gain (Johnson et al., 2012).

Besides determining children's exposure to healthy nutrition and physical activity opportunities early in life through behaviors and provision of healthy food and opportunities for physical activity, family health status is another factor that can shape the outcome of children's health. For example, obese parents/caregivers and older siblings increase younger children's risk for obesity (Crossman et al., 2006; Rhee et al., 2005). But, few family-level interventions have been identified as effective toward these outcomes (Showell et al., 2013; Ruel et al., 2010; Rhee et al., 2005; Gruber & Haldeman, 2009; Kaufman & Karpati, 2007). It may be that we are not intervening on the most relevant factors, or in the case of low-income rural families, that they are simply unable to make changes due to the challenges of living in a rural place and having inadequate resources. Once these factors are identified, applying and evaluating them in the context of health behavior theory is warranted.

One model of behavior change that may be relevant to family obesity-prevention is the Transtheoretical Model (TTM; Sarkin, Johnson, Prochaska, & Prochaska, 2001). This model of behavior change has effectively characterized "readiness to change" by examining behavioral intent to change current behaviors. The TTM divides readiness to change into five stages: pre-contemplation, contemplation, preparation, action, and maintenance stages. Each stage of the TTM is associated with different behaviors and individual perspectives that call for different intervention approaches to effectively

encourage change. The importance of understanding readiness relates to how intervention strategies are selected by interventionists and received by participants.

To examine family readiness to change obesity-preventing behaviors, the Family Stage of Change Survey (FSOC) was developed (Gunter, Abi Nader, Klein, & John, 2014). The FSOC was intended to identify areas of the family home-environment for public health intervention strategies to more effectively improve families' obesity-preventing behaviors and reduce childhood obesity. The FSOC scores families' readiness to change obesity-preventing behaviors on a categorical scale of 1-5. Categories range from pre-contemplation (1; not even thinking about change), to Maintenance (5; made the change and have been engaging in the healthy behavior for at least six months). Based on the TTM theory, different intervention strategies apply at different stages of readiness, and selecting a stage-appropriate strategy is critical to successful behavior change. For example, individuals in the pre-contemplation or contemplation stages have been shown to benefit most from interventions that provide knowledge about healthy behaviors (e.g. giving evidence and information that physical activity supports health); whereas those in preparation or action stages may benefit most from tangible supports to enact the behavior.

Developing healthy nutrition and physical activity behaviors in childhood helps prepare children for maintaining these behaviors as they age, especially if encouraged by a healthy home-environment. Parents have the ability to provide influential guidance as children develop health behaviors through behavior modeling (Gruber & Haldeman, 2009). However, among low-income rural families there may be barriers that affect parents/caregivers' ability to model optimal health behaviors and provide the type of

supports children need to enact these behaviors for themselves. Since children in rural areas show high risk of developing obesity due to environmental qualities (Edwards et al., 2014; Sallis & Glanz, 2009), how can the family home-environment be supported for improving children's nutrition and physical activity behaviors? Furthermore, to what extent might being at-risk for FI play a role in rural families' readiness to change nutrition and physical activity behaviors for maintaining healthy weights among children? These are the questions addressed through this Honors College thesis.

Statement of Purpose

The objective of this study was to examine the relationship of FI risk and rural families' readiness to change obesity preventing nutrition and physical activity behaviors within the family home-environment. In order to measure these factors we used the Family Stage of Change Survey (FSOC) instrument (Gunter et al., 2014) and a validated two-question index of FI risk (Hager et al., 2010).

Applying the FSOC to the family home-environment provided insight into the family's ability to support children to regularly engage in obesity-preventing behaviors. An assumption of this study was that being at-risk for FI would be associated with families' readiness to change obesity-preventing behaviors as measured by the FSOC. We sought to examine the nature of the relationships between FSOC and FI risk variables in a sample of rural families, each with at least one elementary school-age child. We believe this research is important to inform the development of intervention strategies for childhood obesity-prevention in rural areas.

This study was relevant and pertinent for public health professionals striving to reduce childhood obesity in rural areas through working with families. This study was approved by the Oregon State University Institutional Review Board under a larger, five-year, multi-level study examining childhood obesity in rural areas.

METHODS

Study Design

This thesis used data collected as part of an ongoing United States Department of Agriculture (USDA) supported five-year, multi-level research project entitled Generating Rural Options for Weight – Healthy Kids and Communities (GROW HKC). The GROW HKC project takes place in three rural Oregon counties. GROW HKC examines characteristics of the community-, school-, and family home-environments to identify strategies to prevent childhood obesity in rural areas. This thesis focused on the family home-environment to examine the relationship between families' risk for FI and readiness to change nutrition and physical activity behaviors that contribute to childhood overweight and obesity. The data presented in this thesis are cross-sectional and represent aggregated baseline data collected from families during fall 2013.

Participants

Families (n=144) were recruited from each of the six low-income elementary schools (K-5/6) in the GROW HKC communities. In order to be eligible, families had to reside within one of six targeted rural communities, have a child attending one of the participating elementary schools, and be enrolled in the GROW HKC study.

Data Collection and Measures

Two validated surveys, described below, were used to measure family risk for FI and family stage of change regarding obesity-preventing behaviors (nutrition and

physical activity). Two other surveys measured general demographic information: Family Information Form (FIF; appendix 1) and Child Information Form (CIF; appendix 2). Surveys were mailed to participants or distributed online via the survey hosting website Qualtrics. Survey data were scored and entered into a data management system (i.e., excel) by trained research assistants and cross-checked for accuracy.

Food Insecurity Screening Tool

Families were identified as at-risk or not at-risk for FI using a 2-item validated screening tool (Hager et al., 2010), included in the FIF. Families were considered at-risk for FI if they responded “Sometimes True” or “Often True” to either of the two statements: 1) Within the past 12 months we worried if our food would run out before we got money to buy more, and 2) Within the past 12 months the food we bought just didn’t last and we didn’t have money to get more. If participants responded with the third option of “Never True” to both questions, then they were categorized as not at-risk for FI. This screening tool was validated to show that responding affirmatively to either of two statements has 97% sensitivity and 83% specificity for accurately measuring FI risk (Hager et al., 2010).

Family Stage of Change Survey (FSOC)

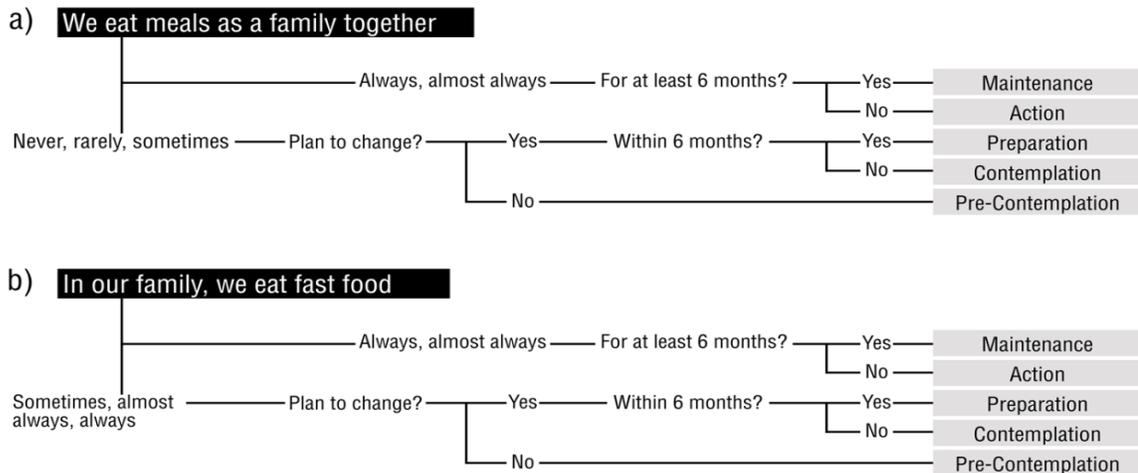
A new assessment tool called the Family Stage of Change Survey (FSOC; appendix 3) was developed and validated for the GROW HKC project (Gunter et al., 2014). FSOC statements are listed in Table 1. The FSOC measures families’ readiness to change childhood obesity-preventing practices in the home-environment. These practices

include family eating behaviors (nutrition domain; items 1-6) and physical activity, sleep, and screen time behaviors (physical activity domain; items 7-12). The Transtheoretical Model of Behavior Change (Sarkin et al., 2001) provided the theoretical basis for the FSOC. The items measured were derived from the Family Nutrition and Physical Activity (FNPA) screening tool, which has been shown to predict children’s risk for obesity (Ihmels, Welk, Eisenmann, & Nusser, 2009). Figure 1 shows a sample question depicting how the FSOC questions identify the stage of change relative to a particular practice or behavior. The stages of change include pre-contemplation, contemplation, preparation, action, and maintenance. The stages of contemplation and preparation relate to having plans for behavior change within the next six months whereas the action and maintenance stages relate to having consistent healthy habits.

Table 1. FSOC Statements

FSOC Statements
Nutrition Domain
1) We eat meals as a family together.
2) In our family, we limit eating of chips, cookies, and candy.
3) Our family eats meals and/or snacks while watching TV/computer, or playing electronic games.
4) In our family, we eat fast food.
5) In our family we eat microwavable or ready-to-eat foods.
6) In our family we use candy/sweets as a reward for good behavior.
Physical Activity Domain
7) In our family we encourage our children to be active every day.
8) In our family we make time for physical activity. We also provide support so our children can play actively and do organized physical activities and/or sports.
9) In our family we find ways to be active together.
10) In our family we limit the time children can spend watching TV/computer and playing electronic games.
11) In our family we allow children to watch TV/computer, or play electronic games in their bedroom.
12) In our family we have a daily bedtime routine for our children.

Figure 1. Scoring Guidelines for the FSOC with Examples of a “Support Statement” (a) and “Barrier Statement” (b) (Gunter et al., 2014).



Family and Child Demographics

Family and child demographic data included participant sex, race (American Indian/Native Alaskan, Asian, Black/African American, Native Hawaiian/Other Pacific Islander, and White), ethnicity (Latino and Non-Latino), child grade level (K-6), adult education level (high school graduate, 1-3 years of college completed, and 4+ years of college completed), and the number of adults and children in each family. Families were able to identify as mixed-race by selecting multiple race categories whereas a single response was required for the ethnicity variable. Family eligibility for free or reduced-cost school meals via the National School Lunch Program (yes/no) was also measured as part of the FIF. Since parents/caregivers were the survey respondents and are the primary enablers of children’s health outcomes, adults’ demographic data were used to represent family race/ethnicity in analyses.

Statistical Analysis

Descriptive statistics were examined for all variables. Due to low responses across all race categories except “White”, data were collapsed to create a dichotomous variable with categories of “White” (those who indicated White race only) and “non-White”. Chi-square tests were used to examine whether risk for FI was associated with sample demographic characteristics. Specifically we applied chi-square tests to determine whether the proportion of individuals who identify in each of the demographic categories differs among families who are at-risk for FI and families who are not at-risk for FI. When the number of individuals in any one cell (response category) was ≤ 5 , we applied the Fisher Exact test which has no minimum cell value requirement.

In order to test for differences in mean FSOC domain and item scores by FI risk, we conducted independent t-tests on FSOC continuous variables. For binary items, we used chi-square tests to determine the relationship with FI risk.

In order to determine the association between FI risk and families’ readiness to change obesity-preventing behaviors, we used logistic regression to examine the odds of being at-risk for FI, adjusted for demographic variables. This allowed us to understand how certain predictor variables from the FSOC were potentially associated with the odds of being at-risk for FI. Separate regression models were run for each of the FSOC items whether significant or not in the t-test analyses. We controlled for the demographic variables identified as significantly different between families at-risk for FI and families not at-risk for FI (race, ethnicity, adult education, and school meal eligibility). All data analyses were performed using Stata (version 13, 2013, StataCorp). Statistical significance for the final models was set at $\alpha = 0.05$.

RESULTS

Sample Demographic Characteristics

The final sample included 144 families from three rural Oregon counties. Demographic variables of particular interest included family race and ethnicity, adult education level, and eligibility to receive free or reduced-cost school meals. Sample characteristics are presented in Table 2, stratified by at-risk for FI status.

Adults primarily identified their race as White (94%). Adult ethnicity results showed 13% of adults identifying as Latino. Education level responses indicated that approximately 19% of adults were high school graduates (completed grade 12 or GED) or less, 55% completed 1-3 years of college, and the remaining 26% completed four or more years of college. Adults identified children's race and ethnicity as similar to adults overall. Approximately 90% of children identified as White and a small number of children (2.8%) were Native Hawaiian or other Pacific Islander (data not shown). Approximately 11% of children were Latino. Roughly half of enrolled families reported having more than one child (data not shown).

Table 2. Family Characteristics by Total Sample and At-Risk for Food Insecurity

	Total Sample n=144	Not At-Risk for FI n=86	At-Risk for FI n=58
Family-Level Variables			
Adult Race			
White	93.5%	64.8%	35.2%
Non-White	6.5%	22.2%	77.8%
Adult Ethnicity			
Latino	12.7%	7.1%	21.1%
Non-Latino	87.3%	92.9%	78.9%
Adult Education			
High School Graduate or less	19.2%	11.8%	30.4%
College 1-3 years	55.3%	57.6%	51.8%
College 4+ years	25.5%	30.6%	17.8%
School Meal Eligibility			
Eligible	56.1%	36.6%	84.2%
Not Eligible	43.9%	63.4%	15.8%
Food Insecurity Risk			
At-Risk	40.3%	-	-
Not At-Risk	59.7%		

Mean Differences in FSOC Scores by At-Risk for FI

Differences in mean FSOC item scores, stratified by FI risk, are shown in Table 3. Independent t-test results showed only one significant difference in mean FSOC scores; item 8 from the physical activity domain. Specifically, families at-risk for FI had lower mean readiness scores related to family support for children to play actively and have organized physical activity or sports opportunities ($p=0.0001$). There were no other significant differences in mean FSOC scores between families at-risk and not at-risk for FI. Families not at-risk for FI tended to report higher mean readiness scores for encouraging children to be active every day (item 7; $p=0.0573$). However, this finding was not statistically significant.

Table 3. FSOC Readiness Scores* for Families At-Risk and Not At-Risk for FI (n=144)

FSOC Domains and Items	Not At-Risk for FI		At-Risk for FI		At-Risk vs. Not At-Risk p-values
	n	Mean (SD)	n	Mean (SD)	
FSOC Total Score (Items 1-12)	86	49 (7.2)	58	50 (6.3)	0.48
Nutrition Domain (Items 1-6)	92	23 (4.7)	63	24 (3.8)	0.25
1) We eat meals together as a family.	105	4.5 (1.0)	74	4.6 (0.8)	0.69
2) In our family we limit eating of chips, cookies, and candy.	101	3.8 (1.5)	77	4.0 (1.2)	0.46
3) Our family eats meals and/or snacks while watching TV/computer or playing electronic games.	105	3.3 (1.6)	78	3.3 (1.4)	0.94
4) In our family we eat fast food.	98	3.9 (1.6)	72	3.8 (1.2)	0.81
5) In our Family we eat microwavable or ready-to-eat foods.	104	4.1 (1.5)	73	4.2 (1.3)	0.63
6) In our family we use candy/sweets as a reward for good behavior.	104	3.8 (1.8)	74	4.1 (1.4)	0.17
Physical Activity Domain (Items 7-12)	102	14 (1.9)	71	13 (2.8)	0.08
7) In our family we encourage our children to be active every day.	105	4.8 (0.7)	79	4.6 (0.9)	0.06
8) In our family we make time for physical activity. We also provide support so our children can play actively and do organized physical activities and/or sports.	105	4.8 (0.6)	79	4.3 (1.2)	=0.0001
9) In our family we find ways to be active together.	102	4.0 (1.3)	73	4.0 (1.2)	0.88
10) In our family we limit the time children can spend watching TV/computer and playing electronic games.	102	4.0 (1.4)	78	4.2 (1.2)	0.57
11) In our family we allow children to watch TV/computer or play electronic games in their bedroom.	103	3.6 (1.8)	73	3.5 (1.7)	0.59
12) In our family we have a daily bedtime routine for our children.	101	4.9 (0.5)	72	4.8 (0.7)	0.11

* FSOC readiness scores range from 1-5 per statement corresponding with different stages of behavior change according to the Transtheoretical Model (1=pre-contemplation; 2=contemplation; 3=preparation; 4=action; 5=maintenance; Sarkin et al., 2001; Gunter et al., 2014).

Relationship between Food Insecurity Risk and Family Stage of Change

Table 4 displays the significant findings of multivariable logistic regression analyses examining the association between FSOC items and being at-risk for FI. After adjusting for demographic variables, results indicated that family support of opportunities for children's physical activity (FSOC item 8) and the total physical activity domain score (FSOC items 7-12) were associated with lower odds of being at-risk for FI (Table 4). Specifically, for every one unit increase in the FSOC score related to family provision of/support for physical activity (i.e., moving one stage higher in readiness to change this family physical activity behavior, such as from preparation to action) families were 55% less likely to be at-risk for FI ($p=0.003$). The total physical activity domain score also showed a significant relationship with being at-risk for FI. Specifically, for a one unit increase in the total physical activity domain score families were 18% less likely to be at-risk for FI ($p=0.042$). Eligibility for free or reduced-cost school meals remained significantly associated with family risk for FI in both models.

Table 4. Logistic Regression Models Predicting the Odds of FI from FSOC Scores, adjusted for family race and ethnicity, adult education level, and school meal eligibility (n=144) **

	Families At-Risk for FI			
Model 1 Variables	OR	p-value	Std Err	95% CI
Physical Activity Item 8 ("In our family we make time for physical activity...")	0.45	0.003	0.12	0.26 - 0.76
Adult Race Non-White	0.26	0.164	0.25	0.04 - 0.76
Adult Ethnicity Latino	0.83	0.815	0.66	0.18 - 3.92
Adult Education College 1-3 years	0.43	0.181	0.27	0.13 - 1.48
College 4+ years	0.49	0.301	0.34	0.13 - 1.88
School Meal Eligibility Eligible	8.35	<0.001	4.24	3.08 - 22.6
Model 2 Variables	OR	p-value	Std Err	95% CI
Physical Activity Domain Score (Items 7-12)	0.82	0.042	0.08	0.68 - 0.99
Adult Race Non-White	0.28	0.148	0.25	0.05 - 1.58
Adult Ethnicity Latino	0.79	0.771	0.63	0.17 - 3.72
Adult Education College 1-3 years	0.47	0.211	0.28	0.14 - 1.54
College 4+ years	0.48	0.272	0.32	0.13 - 1.77
School Meal Eligibility Eligible	7.87	<0.001	3.84	3.01 - 20.5

** Only the results of significant logistic regression models are shown in this table.

DISCUSSION

The objective of this study was to examine how being at-risk for FI may relate to rural families' readiness to change nutrition and physical activity behaviors that are associated with reduced risk of childhood obesity. The importance of understanding readiness to change behaviors relates to how health intervention strategies are selected by interventionists and received by participants.

Our findings suggest that higher FSOC scores on variables in the physical activity domain (items 7-12, collectively), and specifically item 8, were significantly associated with lower odds of family FI risk. Specifically, a higher FSOC score related to family provision of/support for physical activity (i.e., moving one stage higher in readiness to change this behavior, such as from preparation to action) was associated with lower odds of being at-risk for FI. This finding suggests that families with greater readiness to change behaviors that are related to making time for physical activity and providing opportunities for children to play actively and do organized physical activity may have lower odds of being at-risk for FI. For both families at-risk and not at-risk for FI, mean scores on item 8 suggest that families were in the action stage of change for this particular behavior (Table 3). This suggests that the rural families in our study would most benefit from resources that promote continued provision of family physical activity since categorization in the action stage indicates that families have knowledge about this behavior. A higher score in the total physical activity domain score also showed a significant relationship with having lower odds of being at-risk for FI. This finding suggests that if rural families show higher readiness to change physical activity behaviors for children to play actively or do organized sports, such as monitoring sedentary screen

time, making time for physical activity, and utilizing physical activity facilities (playgrounds, fields, recreational sports centers), families' may have lower odds of being at-risk for FI. However, given that many of our rural families were low income and at-risk for food insecurity, it may be that families are under-resourced and therefore unable to make a behavior change.

Notably, item 8 was the only individual physical activity variable with a significant association to family risk for FI in the independent t-tests. This singularly significant item suggests that the physical activity domain score's significant relationship with having lower odds of FI risk in logistic regression analyses is largely due to the influence of behaviors targeted in item 8. If other items contributed to the physical activity domain score then other individual items would have likely showed significant associations with FI risk in independent t-tests.

The FSOC responses from families both at-risk and not at-risk for FI suggest that these families already practice encouraging children to be physically active (indicated by the action stage). Based on this stage of change, intervention strategies of providing more time and support for accessing resources for regular physical activity could benefit children's obesity-preventing behaviors in family home-environments. However, with a focus of families at-risk for FI, considerations of financial ability and economic status likely play a role in families being able to access available physical activity opportunities. Even if opportunities and facilities are provided for encouraging regular physical activity, having these resources easily accessible without detrimental effects on family economic status or financial situations may be key in encouraging behavior change for preventing childhood obesity among rural families with FI risk.

The physical activity behavior findings from this study align with previous research exploring the health behaviors of rural families (Edwards et al., 2014; Gruber & Haldeman, 2009; Kegler et al., 2008; Powell, Slater, Chaloupka, & Harper, 2006). The facilitation of opportunities for physical activity seems to require more attention for encouraging obesity-preventing behaviors in some rural communities (Edwards et al., 2014; Kegler et al., 2012). Families living in rural areas commonly face barriers to accessing opportunities that support children to be active in reasonable and safe environments including having few available facilities, family financial and time constraints, and far travel distance (Edwards et al., 2014; Kegler et al., 2008). The availability of facilities with organized physical activity options has been recognized as an area of rural community health that deserves more exploration (Powell et al., 2006).

Compared to unstructured playing, organized physical activity and sports opportunities – which are supported by the availability of facilities – can provide more moderate to vigorous intensity of physical activity (Sallis & Glanz, 2009) which helps build strong bones and a healthy heart (Ogden, Carroll, Kit, & Flegal, 2012). Organized physical activity opportunities can be especially challenging to achieve when coordinating multiple families' availability. Family schedules and time conflicts can hinder families' ability to coordinate children's sports and/or organized physical activity opportunities (Kegler et al., 2008). Organized physical activity or sports programs can encourage collaboration amongst families to coordinate family schedules and support more regular opportunities for children to be physically active (Leung et al., 2014; Sallis & Glanz, 2009). Limited availability of after-school programs with late busses and public transportation, for example, seem to be barriers to children's adequate physical activity

(Edwards et al., 2014). Additionally, far traveling distances lead to more sedentary commuting time (Edwards et al., 2014). Children participating in GROW HKC have been shown to spend between 14 and 125 minutes when traveling to or from school (Gunter, Abi Nader & John, 2015). Furthermore, physical activity of higher intensities that can provide greater health benefits only amount to 5% of the school day (Gunter et al., 2015). These studies found that community-, school-, and family home-environments in rural areas tended to have limited physical activity opportunities, which may have been a factor for rural families in this study, and particularly those at-risk for FI.

Intervention strategies that could be especially effective in these rural areas include renewing or providing physical activity facilities as well as creating community or school physical activity support groups to help manage opportunities for organized physical activity/sports for children to actively play in structured ways. Additionally, supports for transportation, such as late busses or availability of public transportation, may be beneficial in cases where parents/caregivers have limited time to drive children to opportunities for physical activity due to work and other obligations. Besides availability of resources, realistic accessibility and affordability for regular physical activity among children may be a consideration for families with challenging financial situations.

The FSOC nutrition variables showed no significant relationships with odds of being at-risk for FI among families in this study. These results may suggest that FI risk may not influence family intention to practice healthy behaviors. An alternative interpretation may be that families are simply unable or challenged to change due to socioeconomic factors rather than having low motivation to change. This interpretation may be more appropriate for identifying relevant health intervention strategies among a

low income, food insecure population. Nutrition behaviors show evidence of contributing to obesity-preventing behaviors among rural families by influencing food choices, mealtime routines, and eating behaviors (Arteaga & Heflin, 2014; Leung et al., 2014; Story, 2009; Kegler et al., 2012; Kumanyika, 2008). Nutrition behaviors related to individuals being at-risk for FI include more often eating microwavable, convenience, or fast foods; drinking more sugar-sweetened beverages; having lower intakes of dairy, fruits, and vegetables; and eating fewer meals than individuals that are not at-risk for FI (Leung et al., 2014; Story, 2009). Future assessment of odds of FI risk and family readiness to change nutrition behaviors may require additional methodological approaches such as interviews to interpret families' ability to change targeted behaviors when facing financial challenges or perhaps a more extensive quantitative survey for examining associations between FI risk and specific food access, choices, and behaviors.

Strengths and Limitations

The variety of risk factors measured by the FSOC makes it a convenient and low burden assessment tool for examining obesity-preventing behaviors in the family home-environment, although further evaluation of the FSOC would benefit future use of this tool. Examining readiness to change nutrition and physical activity health behaviors across a range of topics (family policies and practices, behaviors, and barriers) provided a variety of potential correlations with FI risk that could support future research to identify more relevant nutrition- and physical activity-based intervention strategies. While few individual FSOC items showed significant associations with family risk for FI, the FSOC may better be able to assess rural family home-environments with a larger or more varied

sample population. Finding predominantly one significant result may suggest a variety of confounding factors existed, limiting this study's ability to identify intervention strategies. Also, FSOC scores were fairly high, which limits discussion about possible implications of lower readiness scores. While we encouraged participants to describe their most usual behavior patterns, results may have been subject to social desirability and/or recall bias.

While the family home-environment contributes to children's health behaviors, limitations of its influence do exist. For example, the family home-environment does not solely contribute to children's health behaviors. Other environments' such as the community- and school-environments were not explored in this study, although these environments have factors that influence health behaviors as well.

The counties selected for this study were spread across the state to get a greater understanding of nutrition and physical activity behaviors of rural residents. However, a limitation was that demographics were narrowly distributed. This quality limited this study's ability to explore racial disparities, for example, of family risk for FI. With a more diversified sample population further associations may have been identified. Also, using demographic responses from adults instead of children as the overall families' characteristic may have overlooked subtle differences of child and adult demographics.

The use of surveys to assess family readiness to change health behaviors and demographic traits provides a consistent means of gathering comparable data. Although, solely using survey responses may have also excluded valuable, open-ended insight about family readiness to change. Some participant responses had to be excluded due to incomplete or incoherent survey responses; but follow up attempts were periodically made to collect missing data. Further research on the influence of home-environmental

factors that encourage or hinder family readiness to change health behaviors would help public health efforts evaluate to what extent different environments influence the development of children's obesity-preventing behaviors.

Summary

The findings from this study show that higher scores on the FSOC physical activity domain score, attributable to a single item about families making time and providing support for organized physical activity, were significantly associated with lower odds of being at-risk for FI. Eligibility to receive free or reduced-cost school meals was also associated with higher odds of families being at-risk for FI, which may represent effects of income influencing families' ability to provide nutritious foods or opportunities for organized physical activity.

These findings reveal areas for public health strategies to assist family readiness to change physical activity behaviors. Based on these data, intervention strategies that help enable rural families to make time for and support opportunities for organized physical activity and sports programs may be related to lower odds of being at-risk for FI. These types of strategies could facilitate children to be active every day and maintain obesity-preventing behaviors throughout life, particularly if supportive resources are made accessible and affordable so as to avoid detrimentally impacting family economic status or financial situations. These findings reinforce the use of the FSOC assessment tool to identify family readiness to change obesity-preventing behaviors and how readiness to change may or may not differ among families at-risk and not at-risk for FI.

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APPENDIX

Appendix 1. Family Information Form (FIF)

GROW Healthy Kids & Communities Family Information Form (FIF)

1a. What is <u>your</u> name? Last: _____ First: _____ Middle: _____		
2a. Which of the following describes your ethnicity? <input type="checkbox"/> Hispanic or Latino <input type="checkbox"/> Not Hispanic or Latino	2b. Which one or more of the following describes your race? <u>(Check all that apply)</u> <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black or African American <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> White	
3. List the number of other adults that live in your home and care for your elementary age child. _____ Do not include yourself in this number.		
4. Of all adult caregivers living in your family home, what is the <u>highest</u> year of school completed?		
<input type="checkbox"/> Never attended school <input type="checkbox"/> Grades 1 through 8	<input type="checkbox"/> Grades 9 through 11 <input type="checkbox"/> Grade 12 or GED (High school graduate)	<input type="checkbox"/> College 1 to 3 yrs (Some college or technical school) <input type="checkbox"/> College 4 yrs or more (College graduate)

Please tell us about your family's ability to access food resources.

5. Are the children in your household eligible to receive free or reduced meals at school? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I Don't Know		
6. Within the past 12 months we worried if our food would run out before we got money to buy more. <input type="checkbox"/> Never True <input type="checkbox"/> Sometimes True <input type="checkbox"/> Often True		
7. Within the past 12 months the food we bought just didn't last and we didn't have money to get more. <input type="checkbox"/> Never True <input type="checkbox"/> Sometimes True <input type="checkbox"/> Often True		

School: [Insert School Name]

Family# _____

Appendix 2. Child Information Form (CIF)

GROW Healthy Kids & Communities Child Information Form (CIF)

<p>1. What is <u>your child's</u> name? Last: _____ First: _____ Middle: _____</p>	
<p>2. What is <u>your child's</u> gender? <input type="checkbox"/> Female <input type="checkbox"/> Male</p>	
<p>3. What is your child's date of birth? ____/____/____ (month/day/year)</p>	
<p>4. What is your child's grade in school? <input type="checkbox"/> Kindergarten <input type="checkbox"/> 1st grade <input type="checkbox"/> 2nd grade <input type="checkbox"/> 3rd grade <input type="checkbox"/> 4th grade <input type="checkbox"/> 5th grade <input type="checkbox"/> 6th grade</p>	
<p>5. What is the name of your child's classroom teacher? Last: _____ First: _____</p>	
<p>6a. Which of the following describes your child's ethnicity? <input type="checkbox"/> Hispanic or Latino <input type="checkbox"/> Not Hispanic or Latino</p>	<p>6b. Which one or more of the following describes child's race? <u>(Check all that apply.)</u> <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black or African American <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> White</p>
<p>7. Does your child spend time living in more than one household? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	
<p>8. About how much time does your child live in <u>your</u> home? <input type="checkbox"/> 100% <input type="checkbox"/> 75% <input type="checkbox"/> 50% <input type="checkbox"/> 25% <input type="checkbox"/> Less than 25%</p>	

School: [Insert School Name]

ID# _____

Appendix 3. Family Stage of Change (FSOC) Survey

Please fill out the FSOC Survey questions while considering your usual FAMILY habits.

Instructions:

- For each statement below, check the box in the first row to mark your answer .
- If you check a **purple box** in the first row, answer the rest of the questions that appear in **purple** (see Example A). If you check a **green box** in the first row, answer the rest of the questions that appear in **green** (see Example B).
- Answer ALL **blue** questions. See Examples A and B below.

Example A

Statement 1: We eat meals as a family together.

Never	<input type="checkbox"/>	Rarely	<input checked="" type="checkbox"/>	Sometimes	<input type="checkbox"/>	Almost always	<input type="checkbox"/>	Always	<input type="checkbox"/>
• Does your family plan to eat more meals together?									
Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>						
• Does your family plan to eat more meals together in the next 6 months ?									
Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>						
• Has your family been eating most or all meals together as a family for at least 6 months ?									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• Check how many meals you eat together in an average week .									
0 meals	<input type="checkbox"/>	1-7 meals	<input checked="" type="checkbox"/>	8-13 meals	<input type="checkbox"/>	14 or more meals	<input type="checkbox"/>	I Don't Know	<input type="checkbox"/>

Example B

Statement 1: We eat meals as a family together.

Never	<input type="checkbox"/>	Rarely	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>	Almost always	<input checked="" type="checkbox"/>	Always	<input type="checkbox"/>
• Does your family plan to eat more meals together?									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• Does your family plan to eat more meals together in the next 6 months ?									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• Has your family been eating most or all meals together as a family for at least 6 months ?									
Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>						
• Check how many meals you eat together in an average week .									
0 meals	<input type="checkbox"/>	1-7 meals	<input type="checkbox"/>	8-13 meals	<input checked="" type="checkbox"/>	14 or more meals	<input type="checkbox"/>	I Don't Know	<input type="checkbox"/>

Family Healthy Eating Behaviors

Instructions: We want to know about healthy eating habits in your **family home**. Read each statement below. Check the answers that best fit how your family behaves.

Statement 1: We eat meals as a family together.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>
• Does your family plan to eat more meals together?				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			
• Does your family plan to eat more meals together in the next 6 months ?				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			
• Has your family been eating most or all meals together as a family for at least 6 months ?				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			
• Check how many meals you eat together in an average week .				
0 meals <input type="checkbox"/>	1-7 meals <input type="checkbox"/>	8-13 meals <input type="checkbox"/>	14 or more meals <input type="checkbox"/>	I Don't Know <input type="checkbox"/>

Statement 2: In our family, we limit eating of chips, cookies, and candy.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>	
• Does your family plan to limit eating chips, cookies, and candies more than you do now ?					
Yes <input type="checkbox"/>	No <input type="checkbox"/>				
• Does your family plan to limit eating chips, cookies, and candies more than you do now in the next 6 months ?					
Yes <input type="checkbox"/>	No <input type="checkbox"/>				
• Has your family been limiting eating chips, cookies, and candies in your family for at least 6 months ?					
Yes <input type="checkbox"/>	No <input type="checkbox"/>				
• Check how often members of your family eat chips, cookies, and candy in an average week .					
Never <input type="checkbox"/>	1-3 times <input type="checkbox"/>	4-6 times <input type="checkbox"/>	7-9 times <input type="checkbox"/>	10 or more times <input type="checkbox"/>	I Don't Know <input type="checkbox"/>

Family Healthy Eating Behaviors Continued

Instructions: We want to know more about healthy eating habits in your **family home**. Read each statement below. Check the answers that best fit how your family behaves.

Statement 3: Our family eats meals and/or snacks while watching TV/computer, or playing electronic games.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>	
• Does your family plan to eat less often while watching TV/ computer, or playing electronic games?					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• Does your family plan to eat less often while watching TV/ computer, or playing electronic games in the next 6 months ?					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• For at least 6 months , our family has rarely or never eaten meals or snacks while watching TV/computer, or playing electronic games.					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• Check how often members of your family eat meals or snacks while they watch TV/computer, or play electronic games in an average week .					
Never <input type="checkbox"/>	1-3 times <input type="checkbox"/>	4-6 times <input type="checkbox"/>	7-9 times <input type="checkbox"/>	10 or more times <input type="checkbox"/>	I Don't Know <input type="checkbox"/>

Statement 4: In our family, we eat fast food.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>	
• Does your family plan to eat fast food less often than you do now?					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• Does your family plan to eat fast food less often in the next 6 months ?					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• For at least 6 months , our family has rarely or never eaten fast food.					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• Check how often members of your family eat fast food in an average week .					
Never <input type="checkbox"/>	1-2 times <input type="checkbox"/>	3-4 times <input type="checkbox"/>	5-6 times <input type="checkbox"/>	7 or more times <input type="checkbox"/>	I Don't Know <input type="checkbox"/>

Family Healthy Eating Behaviors *Continued*

Instructions: We want to know more about healthy eating habits in your **family home**. Read each statement below. Check the answers that best fit how your family behaves.

Statement 5: In our family we eat microwavable or ready-to-eat foods.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>	
• Does your family plan to eat microwavable or ready-to-eat foods less often ?					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• Does your family plan to eat microwavable or ready-to-eat foods less often in the next 6 months ?					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• For at least 6 months , our family has rarely or never eaten microwavable or ready-to-eat foods.					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• Check how often members of your family eat microwavable or ready-to-eat foods in an average week .					
Never <input type="checkbox"/>	1-3 times <input type="checkbox"/>	4-6 times <input type="checkbox"/>	7-9 times <input type="checkbox"/>	10 or more times <input type="checkbox"/>	I Don't Know <input type="checkbox"/>

Statement 6: In our family we use candy/sweets as a reward for good behavior.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>	
• Does your family plan to use candy/sweets as a reward for good behavior less often than you do now?					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• Does your family plan to use candy/sweets as a reward for good behavior less often in the next 6 months ?					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• For at least 6 months , our family has rarely or never used candy/sweets as a reward for good behavior.					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
• Check how often members of your family use candy/sweets as a reward for good behavior in an average week .					
Never <input type="checkbox"/>	1-2 times <input type="checkbox"/>	3-4 times <input type="checkbox"/>	5-6 times <input type="checkbox"/>	7 or more times <input type="checkbox"/>	I Don't Know <input type="checkbox"/>

Family Healthy Physical Activity Behaviors

Instructions: We want to know about physical activity habits in your **family home**. Read each statement below. Check the answers that best fit how your family behaves.

Statement 7: In our family we encourage our children to be active every day.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>
<ul style="list-style-type: none"> Does your family plan to encourage children to be active every day more often than you do now? 				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			
<ul style="list-style-type: none"> Does your family plan to encourage children to be active every day more often in the next 6 months? 				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			
<ul style="list-style-type: none"> Has your family almost always or always encouraged children to be active every day for at least 6 months? 				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			

Statement 8: In our family we make time for physical activity. We also provide support so our children can play actively and do organized physical activities and/or sports.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>
<ul style="list-style-type: none"> Does your family plan to increase time for physical activity and support for children to play actively and do organized physical activity and/or sports? 				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			
<ul style="list-style-type: none"> Does your family plan to increase time for physical activity and support for children to play actively and do organized physical activity and/or sports in the next 6 months? 				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			
<ul style="list-style-type: none"> For at least 6 months, our family has almost always or always made time for physical activity and provided support for children to play actively and do organized physical activity and/or sports. 				
Yes <input type="checkbox"/>	No <input type="checkbox"/>			
<ul style="list-style-type: none"> Check the things your family does to be physically active and support children being physically active. 				
<input type="checkbox"/> Provide active toys or sport equipment	<input type="checkbox"/> Fish together	<input type="checkbox"/> Enroll kids in sport/physical activity programs		
<input type="checkbox"/> Play sports together	<input type="checkbox"/> Garden together	<input type="checkbox"/> Provide/arrange travel for children to sport or physical activity programs		
<input type="checkbox"/> Hike together	<input type="checkbox"/> Bowl together	<input type="checkbox"/> Bicycle together		
<input type="checkbox"/> Dance together	<input type="checkbox"/> Family walks together	<input type="checkbox"/> Other _____		
	<input type="checkbox"/> Play actively together			

Family Healthy Physical Activity Behaviors *Continued*

Instructions: We want to know more about physical activity habits in your **family home**. Read each statement below. Check the answers that best fit how your family behaves.

Statement 9: In our family we find ways to be active together.

Never	<input type="checkbox"/>	Rarely	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>	Almost always	<input type="checkbox"/>	Always	<input type="checkbox"/>
• Does your family plan to find more ways to be physically active together?									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• Does your family plan to find more ways to be physically active together in the next 6 months ?									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• Has your family almost always or always been physically active together for at least 6 months ?									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• Check how often your family is physically active together in an average week .									
Never	<input type="checkbox"/>	1-3 times	<input type="checkbox"/>	4-6 times	<input type="checkbox"/>	7 or more times	<input type="checkbox"/>	I Don't Know	<input type="checkbox"/>

Family Healthy Screen Time Behaviors

Instructions: We want to know about child and family sitting and screen time in your **family home**. Read each statement. Check the answers that best fit how your family behaves.

Statement 10: In our family we limit the time children can spend watching TV/computer and playing electronic games.

Never	<input type="checkbox"/>	Rarely	<input type="checkbox"/>	Sometimes	<input type="checkbox"/>	Almost always	<input type="checkbox"/>	Always	<input type="checkbox"/>
• Does your family plan to limit the amount of time children watch TV/computer and/or play electronic games?									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• Does your family plan to limit the amount of time children watch TV/computer and/or play electronic games in the next 6 months ?									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• For at least 6 months , our family has almost always or always limited the amount of time children watch TV/computer and/or play electronic games.									
Yes	<input type="checkbox"/>	No	<input type="checkbox"/>						
• Check how many hours your children watch TV/computer and/or play electronic games in an average week .									
Never	<input type="checkbox"/>	1-7 hours	<input type="checkbox"/>	8-14 hours	<input type="checkbox"/>	15 or more hours	<input type="checkbox"/>	I Don't Know	<input type="checkbox"/>

Family Healthy Screen Time Behaviors Continued

Instructions: We want to know more about child and family sitting and screen time in your **family home**. Read each statement. Check the answers that best fit how your family behaves.

Statement 11: In our family we allow children to watch TV/computer, or play electronic games in their bedroom.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>	
<ul style="list-style-type: none"> Do you plan to make rules that will not allow children to watch TV/computer and/or play electronic games in their bedrooms? 					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
<ul style="list-style-type: none"> Do you plan to make rules that will not allow children to watch TV/computer and/or play electronic games in their bedrooms in the next 6 months? 					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
<ul style="list-style-type: none"> For at least 6 months, our family has almost always or always had rules that do not allow children to watch TV/computer and/or play electronic games in their bedrooms. 					
Yes <input type="checkbox"/>		No <input type="checkbox"/>			
<ul style="list-style-type: none"> Check how many hours your children watch TV/computer and/or play electronic games in their bedrooms in an average week. 					
Never <input type="checkbox"/>	1-3 hours <input type="checkbox"/>	4-6 hours <input type="checkbox"/>	7-9 hours <input type="checkbox"/>	10 or more hours <input type="checkbox"/>	I Don't Know <input type="checkbox"/>

Family Healthy Sleep Behaviors

Instructions: We want to know about sleep and bedtime habits in your **family home**. Read each statement below. Check the answers that best fit how your family behaves.

Statement 12: In our family we have a daily bedtime routine for our children.

Never <input type="checkbox"/>	Rarely <input type="checkbox"/>	Sometimes <input type="checkbox"/>	Almost always <input type="checkbox"/>	Always <input type="checkbox"/>
<ul style="list-style-type: none"> Does your family plan to have a daily bedtime routine for your children? 				
Yes <input type="checkbox"/>		No <input type="checkbox"/>		
<ul style="list-style-type: none"> Does your family plan to have a daily bedtime routine for your children in the next 6 months? 				
Yes <input type="checkbox"/>		No <input type="checkbox"/>		
<ul style="list-style-type: none"> For at least 6 months, our family has almost always or always had a daily bedtime routine for our children. 				
Yes <input type="checkbox"/>		No <input type="checkbox"/>		
<ul style="list-style-type: none"> Check how many hours of sleep your children get in an average night. 				
Less than 5 hours <input type="checkbox"/>	6-8 hours <input type="checkbox"/>	9 or more hours <input type="checkbox"/>	I Don't Know <input type="checkbox"/>	

