Childhood Obesity in a Rural Community: First Steps to Cultivating Change

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Abstract

Purpose: This article describes how the Community Readiness Model was used to assess stage of readiness for childhood obesity prevention in a southern, rural county.

Sample: Ten key informants were interviewed for the qualitative assessment of community readiness for change and 100 county residents completed the attitudes for health promotion and disease prevention survey.

Methods: Using the Community Readiness Model as a guide, key informant interviews were conducted by the investigators in a rural county in the south located in the underserved area known as the Black Belt. An interview template that examined community readiness for childhood obesity prevention was used by the investigators. Questions focused on attitudes

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towards children's physical activity and children's nutrition. In addition, questions regarding confidence in their community's ability to reduce childhood obesity, their schools and community's responsibility to address childhood obesity and who they thought might be interested in participating in a coalition to prevent childhood obesity were asked.

Results: The mean overall community readiness score for the 10 informants was 3.06, which corresponds with the vague awareness stage of readiness. The lowest scores were for knowledge of the issue of childhood obesity, resources available, and community climate in regards to childhood obesity. All of these scored in the denial/resistance stage of change.

Conclusions: Before interventions can successfully be implemented within a community, community readiness for prevention programs and willingness to change must be assessed. The overall CRM scores demonstrate that this county ranged from denial/resistance to vague awareness stages of change. These scores indicate that residents of this community may not be aware of the significance of childhood obesity in their community and efforts to move the community to a more active stage of change must be taken.

***Keywords*:** Childhood obesity, Rural, Community readiness model, Obesity prevention, Community assessment, Rural health disparities

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Childhood obesity is a significant public health concern in the United States, especially in rural areas where rates of obesity are higher than the rest of the country (Befort, Nazir, & Perri, 2012; Hill, You, & Zoellner, 2014; J. E. Jackson, Doescher, Jerant, & Hart, 2005). Approximately 17% of children in the U.S. are considered obese (Ogden et al., 2016). In Alabama, rates of obesity in children are 16.3% for ages 2-4, 18.6% for ages 10-17, and 16.1%

for high school age children (Trust for America's Health & Robert Wood Johnson Foundation, 2016). When compared to other regions of the state, rates of obesity in adults are significantly higher in the Black Belt region which runs through Alabama and includes some of the poorest counties in the country. This region of the state consists of 18 rural counties as defined by the United States Department of Agriculture (USDA) definition using Economic Research Service Rural-Urban Commuting Areas (RUCA) with codes 4-10 (U.S. Department of Agriculture [USDA], 2009). For one of these Black Belt counties childhood obesity rates are not available. However, the rate of obesity in adults in the county (36%) is worse than many other Black Belt counties (Robert Wood Johnson Foundation [RWJF], 2016). This is a troubling trend because obesity is associated with cardiometabolic health conditions such as cardiovascular disease (CVD) and type 2 diabetes (T2D), which are two of the leading causes of death in the United States and the Black Belt region of Alabama (Roger et al., 2011).

There are racial and income disparities associated with obesity in rural dwellers, with African Americans and residents of lower socioeconomic status more likely to be overweight or obese (C.L. Jackson et al., 2013; Wang, 2011; Zhang & Wang, 2004). Children from lower income households have a greater risk of being obese than children from higher income households (Drewnowski, Rehm, Kao, & Goldstein, 2009; Singh, Siahpush, & Kogan, 2010; Skelton, Cook, Auinger, Klein, & Barlow, 2009), and the rate of obesity in African-American preschool children is double that of white preschool children (Ogden, Carroll, Kit, & Flegal, 2012). Because childhood obesity is more common among low-income and minority children in rural areas, effective interventions are particularly needed for this group. However, there have been no effective interventions identified to date that have robust and lasting effects, and even fewer have targeted rural children and their families.

Before effective interventions can successfully be implemented within a community, a community assessment to determine knowledge and attitudes towards health promotion programs and readiness to change must be conducted. This article describes the use of semi structured qualitative interviews to assess one rural community's readiness for childhood obesity prevention programs and a quantitative survey to determine residents' knowledge of and attitudes toward health promotion and disease prevention programs. Although the main focus of this article is to discuss one rural community's readiness for health promotion programs to reduce childhood obesity, key results from the quantitative survey are also presented.

Methods

Sample and Setting

One rural county situated in the Black Belt region of Alabama was chosen for this study. The population of the county is 20,864 and the racial/ethnic breakdown includes 54% white, 39.6% African-American, and 4.9% Hispanic (RWJF, 2016). This county ranked 55th out of 67 counties in terms of health outcomes. Additionally, 27% of residents in the county report their health to be poor to fair, 30% are physically inactive, and only 1% live reasonably close to a location for physical activity, such as parks and recreational facilities (RWJF, 2016). Finally, 14% of residents are uninsured, and 35% of children are in poverty, which increases the risk for obesity in this county. The protocol for this study was approved by the Institutional Review Board at the investigators' institution.

The sample for the qualitative assessment of community readiness for change was comprised of 10 key informants. Key informant interviews are qualitative in-depth interviews with people who know what is going on in the community, and the purpose is to collect information from a wide-range of people, including community leaders, professionals, or

residents who have first-hand knowledge about the community (UCLA Center for Health Policy Research, n.d.). The key informants for these interviews were individuals who have lived in the county all their life and included the editor of the local paper, the county extension program coordinator, a local business owner, a city government official, school administrators, and school personnel. The sample for the quantitative assessment of knowledge of and attitudes for health promotion and disease prevention was comprised of 100 county residents who were recruited from throughout the county and from a variety of backgrounds to provide insight into countywide activities and attitudes. All participants signed an informed consent before the interviews were conducted.

Community readiness for change.

This study utilized the community readiness model (CRM) which was developed at the Tri-Ethnic Center for Prevention Research at Colorado State University (Edwards, Jumper-Thurman, Plested, Oetting, & Swanson, 2000) to assess community readiness for change. This model was originally developed to guide the development of drug and alcohol prevention programs, but has since been applied to other community health problems (Findholt, 2007; Hull et al., 2008; Sliwa et al., 2011; Son, Shinew, & Harvey, 2011). The CRM is based on four premises: (a) that readiness is issue-specific, meaning that a community can be at a high level of readiness to deal with one problem and at a low level of readiness for another problem; (b) that the stage of readiness can be accurately assessed; (c) that community readiness can be increased; and (d) that determining a community's stage of readiness is essential because interventions to move communities to the next stage differ for each stage of readiness and, unless an intervention is consistent with the community's current stage, it is likely to fail (Edwards et al., 2000; Plested, Edwards, & Jumper-Thurman, 2005).

There are nine stages of readiness for prevention identified by the model that are based on the transtheoretical model of individual stages of change and theories of community-level processes and social action to measure progress in group change (Slater et al., 2005; York & Hahn, 2007) (See Table 1).

These stages of readiness are assessed using structured interviews with key informants to obtain information on six community dimensions that influence the community's preparedness to address the issue. These dimensions include: (a) existing prevention efforts, (b) community knowledge of existing efforts, (c) leadership, (d) community climate, (e) community knowledge of the issue, and (f) resources available to support prevention efforts (Plested et al., 2005).

A previously developed interview template used in a study which also examined community readiness for childhood obesity prevention was used by the investigators (Findholt, 2007). The questions were divided into two parts. One part focused on attitudes or programs pertaining to children's physical activity, and the other part focused on attitudes or programs pertaining to children's nutrition. There were also three additional questions included in the template. One question asked the informants how confident they were in their community's ability to reduce childhood obesity. A second question asked them if they believed their schools and community had a responsibility to address the problem. The third question asked the informants who they thought might be interested in participating in a coalition to prevent childhood obesity.

Table 1

Description of the Nine Stages of Community Readiness [a] *with corresponding score*

Stage of Readiness	**Description**	**Score**
No awareness	Community: no knowledge of , local efforts to address, and no concern for issue Leadership: believes issue is not a concern Resources: none available to deal with issue	1
Denial	Community & Leadership: issue not a concern and cannot be addressed Community: incorrect knowledge of efforts to address issue; only a few members have knowledge of the issue Resources: community and leadership do not support using available resources	2
Vague awareness	Community: a few members have heard of local efforts but know little about them; members have only vague knowledge of issue Community & Leadership: believe that issue may be a concern in the community Resources: limited resources have been identified to address the issue	3
Preplanning	Community: some members have heard about local efforts to address issue but know little about them; limited knowledge of issue Community & Leadership: acknowledge issue is a concern Resources: limited resources are available to further efforts to address issue	4
Preparation	Community: most members have heard about local efforts and have basic knowledge of issue; concerned about issue and wants to do something about it Leadership: actively supports continuing or improving current efforts Resources: Some resources have been identified that could be used; community members and leaders are actively working to secure resources	5
Initiation	Community: most members have basic knowledge of efforts; basic knowledge of issue and aware it occurs locally Leadership: plays key role in planning efforts to address problem Resources: have been obtained and/or allocated to support further efforts	6
Stabilization	Community: most members have more than basic knowledge of local efforts and about issue; have taken responsibility Leadership: actively involved in ensuring or improving the long-term viability of efforts Resources: resources are from sources expected to provide continuing support	7
Confirmation	Community: most members have considerable knowledge of efforts; more than basic knowledge of issue and have significant knowledge about local prevalence; majority of community strongly supports efforts Leadership: plays a key role in expanding and improving efforts Resources: considerable part of allocated resources are expected to provide continuous support; community members looking for additional support	8
Community Ownership	Community: most members have considerable and detailed knowledge of local efforts; have detailed knowledge about the issue; highly supportive and actively involved Leadership: continually reviewing evaluation results and modifying financial support Resources: diversified resources and funds are secured; efforts expected to be ongoing	9

[a] Adapted from Plested et al., 2005

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Interviews were conducted at times and locations convenient to the informant. The interviews lasted approximately one hour. Interviews were audio taped, and field notes were also taken to record respondents' remarks. Each interview was transcribed verbatim by a trained transcriptionist. Per the community readiness model's instruction handbook, the transcriber was given a copy of the interview questions. Each interview was transcribed word for word, including things such as laughter.

Knowledge of and Attitudes toward Health Promotion and Disease Prevention

A previously developed survey (Pennay, 2007) was used to assess community members' knowledge of existing health promotion and disease prevention initiatives in the county, as well as their attitudes towards such programs. Items in this survey assessed such things as individuals' perceptions of health promotion and disease prevention, responsibility for population health, government spending priorities, and perceived seriousness of specific health conditions. In order to assess knowledge of health promotion and disease prevention programs, individuals were asked about specific health promotion campaigns. To assess attitudes toward health promotion and disease prevention, they were asked if they approve or disapprove of specific initiatives. The interviewers traveled to various locations throughout the county to recruit participants and to administer the surveys. The surveys were read to individuals, and they were provided a flip chart with the responses so they could read them as they were being read aloud. This was done to ensure that individuals who could not read or did not understand certain terms had the opportunity to complete the surveys. Survey administration lasted approximately 30 minutes.

Analysis

To determine community readiness for change the transcribed interviews were scored independently by research assistants who were trained to use the procedure specified by the Tri-Ethnic Center (Plested et al., 2005). The two investigators also scored the interviews to verify the results. In instances when there was a disagreement in scores, the interviews were re-reviewed to reach consensus on scores for each dimension. Within each interview, each of the dimensions was rated based on the CRM's rating scales. Scores for each dimension range from 1 (no awareness) to 9 (high level of community ownership). The individual dimension scores are totaled for all interviews and then divided by 10 to get the average dimension score. To obtain the calculated scores for each dimension, the total for that dimension is divided by the number of interviews. The total readiness score for each dimension was calculated by averaging the consensus scores for each dimension across all interviews. The average of the five final dimension scores was calculated in order to obtain the overall community readiness score (Table 2). The stage of readiness was determined by rounding down the average score to the previous stage. Descriptive statistics were utilized to assess knowledge of and attitudes toward health promotion and disease prevention.

Table 2
County Community Readiness Model Consensus Scores

Dimensions	**Interviews**											
	1	2	3	4	5	6	7	8	9	10	**Average**	**Stage of Readiness**
Knowledge of Efforts	4	2.5	3	3.5	1.5	5	5	4	3.5	5	3.70	Vague awareness
Leadership	4	3.5	3	4	2.5	3	3.25	4	4	3	3.425	Vague awareness
Community Climate	3.5	2.5	3	3.5	1.75	3.5	2.5	3	4	2.5	2.975	Denial/resistance
Knowledge of Issue	3	2.5	3	2	1.25	2.5	2.25	2	3	3	2.45	Denial/resistance
Resources	3.5	3	3.5	2	1.5	2.5	3.5	2.5	4	1.5	2.75	Denial/resistance
Overall Community Readiness Score											**3.06**	**Vague awareness**

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Results

Demographics

The sample of key informants (n = 10) was evenly split between males and females and African American and white. This is representative of the county, which is 50.6% female, 49.4% male, 39.9% African American, and 54.7% white.

The sample that completed the quantitative survey (n = 100) was not as equally split with 91% of respondents being female and only 9% male, and the majority were African-American. Age of respondents ranged from 23 to 88 years old. Thirty-eight percent of respondents graduated from high school or had a GED, and only 13% were college graduates. Almost half of the respondents were employed (48%), and 51% reported an income less than $20,000.

Community Readiness for Change

The mean overall community readiness score for the 10 informants was 3.06, which corresponds with the vague awareness stage of readiness. Scores for each dimension ranged from 2.45 to 3.70. The lowest scores were for knowledge of the issue (mean, 2.45; range, 1.25 - 3.0; SD, 0.59), resources (mean, 2.75; range, 1.5 - 4.0; SD, 0.89), and community climate (mean, 2.975; range, 1.75 - 3.5; SD, 0.67). All of these dimensions corresponded to the denial/resistance stage of change. Knowledge of efforts had the highest score with the most variance (mean, 3.70; range, 1.5 - 5.0; SD, 1.15). Both this score and the leadership score (mean, 3.425; range, 2.5 - 4.0; SD, 0.55) correspond to the vague awareness stage.

In addition to scoring the interviews to determine stage of readiness for obesity prevention, the investigators analyzed the responses to determine if there were any consistent themes throughout the interviews. The only community effort to promote physical activity that was named by the majority of the informants was the fitness center in one of the communities in the

county. Few members were aware of any other efforts. Those informants that were able to name additional efforts were unclear of their purpose or who was eligible to participate in them. All of the informants agreed that obesity was an issue in their community. However, most felt that other health issues (i.e., cancer), low socioeconomic status of residents, and lack of resources were more pressing concerns. Overall, informants felt that there was a need for increased physical activity programs. They also expressed a concern in changes made to the school lunch program in the county. They stated that children did not like the food so much of it was going to waste. Finally, the consensus was that although leadership in the county recognized the need to implement programs to address obesity, they were not doing anything about it.

Knowledge of and Attitudes toward Health Promotion and Disease Prevention

Only 17% of those interviewed think health should be a priority for government spending. When asked specifically what they thought the government should focus on, the answer given most was health insurance/making health care affordable. Responsibility for population health is seen as shared by the government, individuals, schools, and parents. While 94% agree that individuals do need to take full responsibility for their own health, there is also agreement that the government (57%), schools (98%), and parents (59%) play a role in promoting good health.

When asked about health promotion campaigns and activities that come to mind, the most commonly mentioned campaigns and activities included those related to exercise (68%), cancer screening (65%), diet and nutrition (63%), and obesity (52%). The majority of residents approved or strongly approved of spending public money on health promotion (85%), and 84% either agreed or strongly agreed that health promotion was effective in improving population health. However, the majority (49%) either disagreed or strongly disagreed that the government was doing enough in the area of health promotion.

Disease prevention was viewed somewhat differently by the residents of the county. Residents viewed health promotion in terms of health behavior education and programs. Disease prevention was seen as a clinical intervention with most respondents naming screenings and medical tests when asked what comes to mind when they hear "disease prevention." As with health promotion, most residents (83%) either approved or strongly approved of spending public money on disease prevention, and 90% responded that disease prevention was an effective way to improve population health. Unlike in the area of health promotion, more respondents (37%) believe that the government was doing enough in the area of disease prevention as opposed to those who do not (34%).

The survey also measured community perceptions of the perceived seriousness of specific health conditions and risk factors. Based on mean scores on a 10-point scale, the most serious health conditions were: cancer (8.74), diabetes (8.52), heart disease (8.35), and childhood obesity (7.57). The risk factors perceived to have the greatest influence on health included: the type of food a person eats (8.20), a person's mental and emotional state (8.16), a person's level of stress (8.11), and the amount of physical activity a person does (7.85).

Because this community assessment was conducted to inform the development of interventions to target childhood obesity, the survey also included items to measure support for a range of health promotion initiatives targeting childhood obesity. Of the options offered to respondents, those that received the highest levels of support were building more cycling and walking paths (91%), increasing the amount of physical activity in the school curriculum (89%), removing soft drinks from school cafeterias and vending machines (69%), and making the food industry reduce the portion sizes of fast foods (62%). Less support was evident for banning television advertising of high fat and high sugar content foods during children's viewing hours

(57%) and banning television advertising of high fat and high sugar content foods altogether (47%).

In order to assist with targeting health promotion campaigns, this study also addressed how residents obtained health-related information. The majority of residents reported their main source of health-related information comes from their primary care physician (56%). This was followed by television (16%) and the Internet (10%). Only 48% of respondents reported Internet access, and of those with access, half said they do not use it to look for health information.

Discussion

The overall CRM scores demonstrate that the rural county assessed ranged from denial/resistance to vague awareness stages of change. These scores, along with the quantitative data, indicate that residents of this community are not aware of the significance of childhood obesity in their community and they perceive other health conditions are currently more pressing issues. Few studies have used the CRM to assess a community's readiness for obesity prevention (Findholt, 2007; Kesten, Cameron, & Griffiths, 2013; Pradeilles, Rousham, Norris, Kesten, & Griffiths, 2016; Sheldon, Lyn, Bracci, & Phillips, 2016; Sliwa et al., 2011), and methods of reporting results varied. Our finding that the community assessed in this study was in the vague awareness stage is consistent with two of the communities assessed in Georgia (Sheldon et al., 2016). However, other communities assessed have been in the no awareness stage (Findholt, 2007), the denial/resistance stage (Pradeilles et al., 2016; Sheldon et al., 2016), the preplanning stage Sheldon et al., 2016; Sliwa et al., 2011), and the preparation stage (Sheldon et al., 2016). Residents also are unaware of any prevention efforts that are currently in place or that may be planned for future implementation but believe that health screenings and low-cost health care are two of the most pressing needs. Our finding that this community had little

knowledge of prevention efforts is consistent with other studies as well (Pradeilles et al., 2016; Sheldon et al., 2016; Sliwa et al., 2011).

The scores for community climate, knowledge of issue, and resources put these dimensions in the denial/resistance stage of change. This indicates that key informants believe that childhood obesity is a problem in general, but they do not believe that it is a concern among members of the community in general or that it cannot or should not be addressed (Plested et al., 2005). Additionally, this stage of change indicates that key stakeholders have limited or no knowledge about the issue of childhood obesity, or there may be misconceptions about the issue. The knowledge and attitudes survey, which was administered to residents throughout the county, confirms this belief since most rated cancer, diabetes, and heart disease as more significant health concerns.

Key informants were not in support of using available resources to address childhood obesity. Many of the key stakeholders indicated they were aware that childhood obesity was a national public health problem, but few were aware of obesity among the children in the county because county-level childhood obesity data has not previously been available. They also stated that they believed most residents of the county held the opinion that if they thought their child was overweight or obese he or she would "grow out of it," and it would not have long-term health consequences. The key informants also indicated that they thought resources should be directed to other health promotion efforts, especially those aimed towards senior citizens, rather than to childhood obesity prevention programs. These key informants may hold these views because of the lack of childhood obesity data for the county and the cultural view that caring for senior citizens in the county is a priority. However, results of the community-wide survey indicated that the majority of residents were in favor of using public spending for health

promotion and disease prevention programs and would support measures aimed at reducing childhood obesity.

Knowledge of efforts and leadership fell into the vague awareness stage of change. This stage of change indicates that a few community members have at least heard about local efforts to address obesity, but they know little about them (Plested et al., 2005). Leadership and community members believe that childhood obesity may be a concern in the county, but they are not motivated to act. Many of the respondents indicated that they knew of efforts that were in place or were being planned, but they were not sure when those programs were offered or who was receiving them. They also stated they believed leaders in the community did want to address the problem of childhood obesity, but that they needed outside expertise to assist them with developing prevention programs.

Because community climate, knowledge of the issue, and resources had the lowest scores, these are the dimensions that need to be addressed first to increase readiness. The CRM handbook provides examples of actions and interventions to implement in each stage of readiness (Plested et al., 2005). Efforts to raise awareness and move the community from denial/resistance to vague awareness should reach various audiences and include: one-on-one visits with community leaders and members to provide information regarding the issue in the community and the health and financial benefits of prevention programs, visiting existing and established unrelated small groups to inform them of the issue, collecting stories of local people who have been affected by this issue in this community and find creative ways to disseminate their stories, and conducting an environmental scan to identify the community's strengths, weaknesses, opportunities, and threats (Plested et al., 2005). Various stakeholders, such as schools, youth organizations, county extension offices, health care providers and hospitals, and

churches, could combine efforts to send a focused and consistent message regarding obesity prevention and health promotion programs (Son et al., 2011). Based on the information gathered in the knowledge and attitudes survey regarding how residents' obtain health-related information, health care providers could be encouraged to share more information regarding childhood obesity and its long-term consequences during routine patient visits. Few residents reported obtaining health-related information from the Internet or local paper. However, if they could get health promotion information that was tailored to their community, they may utilize these sources more frequently. The county has an active Facebook page and a local paper, both of which are willing to incorporate county-specific health-related information and articles free of charge. In addition, information could also be disseminated through church bulletins, local newsletters, and television and radio PSAs. Highlighting the problem of childhood obesity in the county to influencers and opinion leaders is also necessary.

In order to increase the stage of readiness of knowledge of efforts and leadership from vague awareness to preplanning the actions mentioned above need to be continued and additional actions must be taken. Possible strategies can include: presenting information on childhood obesity at local community events and unrelated community groups using visuals and stories; posting flyers, posters, and billboards; initiating events to present information on the issue; and publishing editorials and articles in newspapers and on other media with general information that relates to the local situation (Plested et al., 2005). These types of strategies have been shown to be successful in creating awareness of and preventing childhood obesity (Bell et al., 2013; Evans, Christoffel, Necheles, & Becker, 2010; GreenMills, Davison, Gordon, Li, & Jurkowski, 2013

One limitation of this study is the use of a convenience sample for the quantitative data collection. Because of this, women and African Americans were a large majority of the responses for the quantitative survey. Including more men and other races/ethnicities may have elicited different responses. Another limitation is the lack of inclusion of economic and social factors in the community readiness model. Because of its application in a small, rural county, these factors may be key contributors to the community's readiness for obesity prevention and the development of obesity prevention programs. Other possible limitations may include response bias by the key informants and the transient nature of readiness not being suited to measurement at a single point in time.

Conclusion

Results of this study provided significant insight into awareness of childhood obesity in a southern, rural county and provided guidance to the investigators regarding the necessary next steps to increase the community's readiness for obesity prevention. Based on the CRM scores and qualitative feedback gathered during the interviews, health education programs aimed at increasing residents' understanding of cardiovascular risk factors and the impact of childhood obesity on long-term cardiovascular health are currently being developed. Members of the community coalition have agreed to post information on their Facebook page and in local newsletters, the Head Start and county preschool programs have agreed to disseminate information to parents and help organize educational events, and the editor of the local paper has agreed to include informational pieces that highlight the issue of obesity in the county. The community readiness model was a useful tool for initiating discussion of the issue of childhood obesity in this county and generating interest in developing prevention programs.

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