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Research Article

Role of community health fairs in providing health services, improving health of rural residents

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Abstract

Introduction: Obesity (BMI ≥ 30 kg m^{-2}) is epidemic globally and is associated with increased risk for a wide range of physical and mental health comorbidities. This is a particular concern for rural residents who have a greater rate of obesity than urban residents, but are disadvantaged in obtaining care because of a shortage of health care professionals. Community health fairs provide an opportunity for rural residents to receive health care services and education at reduced or no cost. Therefore, this study explored the role of community health fairs for providing health services and improving the health of residents in a rural community where obesity is a serious health concern.

Methods: This study involved a retrospective longitudinal analysis of data collected during community health fairs conducted in a rural western Nebraska, USA community during 2014, 2015, and 2016 (n = 83). The Planned Approach to Community Health (PATCH) framework was used to target health education in this rural community. This approach involved 1. Mobilizing the community (via health fairs), 2. Collecting and organizing data (from consented attendees), 3. Selecting health priorities (obesity), 4. Developing a comprehensive intervention (nutrition and physical activity education), and 5. Evaluating the effectiveness of the framework (declines in measures of obesity over time). Analyses characterized BMI, percent body fat, visceral fat, and BP and explored differences between genders. The sample was recruited by advertising with flyers for health fairs at the College of Nursing. Most booths provided printouts of results for participants in order for them to keep and track their health information. Once potential participants arrived at the health fair site, there were asked if they would like to participate in the study via an invitation letter. They could then decline or sign the consent.

Results: Percent body fat and visceral fat level differed between genders (P = < .001 and .001, respectively). Mean body fat levels (women 39.4%, men 28.8%) were unhealthy. Mean visceral fat level was unhealthy in men (16), but healthy in women (10). BMI and systolic and diastolic blood pressure did not differ between genders. Mean BMI was 31 kg m^{-2}; 33% of participants were overweight, 44% were obese. Mean systolic and diastolic BP were 134 and 78 mg Hg, respectively. Most participants were hypertensive (systolic: men 57%, women 32%; diastolic: men 24%, women 7%) or prehypertensive (systolic: men 21%, women 39%; diastolic: men and women 36%).

Conclusion: Obesity and high BP were common in this rural population, supporting the need for effective education and intervention efforts to address these health issues. Health fairs provide a manner in which to reach community persons needing referrals to local clinics, mental health providers and physicians. Education provided at such events is valuable as well and may in fact be the only health care contact they receive. Though community health fairs provide an economical way for individuals to receive screenings and health information, few men participated and few individuals attended in multiple years. The lack of repeat attendees prevented assessment of the efficacy of the education intervention. Means of enhancing participation, particularly by men and previous attendees, need to be explored. Repeatedly attending health fairs enables participants to monitor their progress, seek physical and mental health screenings and discuss any health concerns and helps researchers assess the efficacy of interventions.

More Information

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Keywords: Blood pressure; Body mass index; Body composition; Community health fairs; Hypertension; Obesity; Percent body fat; Rural health; Mental health

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Introduction

Obesity (BMI ≥ 30 kg m^{-2}) is epidemic globally with prevalence nearly tripling since 1975 [1]. In 2016, 39% of adults worldwide were overweight (> 1.9 billion people) and 13% were obese (> 650 million people) [1]. Obesity increases risk for a wide range of physical and mental health comorbidities, contributing to mortality and decreasing quality of life [2]. Worldwide ≥ 2.8 million people die from being overweight/obese each year [3]. Furthermore, health care costs are approximately 42% greater for obese than for normal weight patients [4].

These trends are particularly concerning for rural residents, who have a greater rate of obesity than urban residents [5], but are disadvantaged in obtaining care because of a shortage of health care professionals. The Rural Healthy People 2020 Survey reflected these concerns, with access to health care and nutrition and weight status identified as the top two priorities [6]. Even when health care services are available, appointments often do not allow enough time for patient education and cost may prevent lower income patients from visiting providers. Community health fairs provide an opportunity for rural patients to receive health care services at reduced or no cost with thorough discussion of their screening results. Data collected during health fairs can also provide insight into the community's health status, potentially leading to better designed interventions. This study explored the role of community health fairs for providing health services and improving the health of residents in a rural community where obesity is a serious health concern.

Methods

Theoretical framework

The Planned Approach to Community Health (PATCH) framework [7] was used to target health education in this rural community. This approach involved 1. Mobilizing the community (via health fairs), 2. Collecting and organizing data (from consented attendees), 3. Selecting health priorities (obesity), 4. Developing a comprehensive intervention (nutrition and physical activity education), and 5. Evaluating the effectiveness of the framework (declines in measures of obesity over time).

Study design

This study was a retrospective longitudinal analysis of data collected during community health fairs conducted in a rural western Nebraska, USA community during 2014, 2015, and 2016. Analyses of body composition measures and BP are reported here.

Health fairs

The health fairs provided free or low cost health screenings. Attendees freely chose the screenings of interest, therefore, sample size differed among variables (n = 57 - 62). Trained and supervised University of Nebraska Medical Center (UNMC) nursing students performed the measurements, discussed results with participants, and provided nutrition and physical activity education. Participants received copies of their screening results and associated information sheets.

Study population

These health fairs were designed for community outreach rather than research, therefore, no sociodemographic or health history data were collected. Residents of this community are primarily non-Hispanic white (62%) or Latino (34%), with 18% having income below the poverty level [8]. Before performing health screenings, potential participants (any attendee regardless of age or health condition) received an invitation letter describing the study. Those choosing to participate were consented and assigned an ID number. Eighty-three participants were consented over the 3 health fairs. Twenty-eight percent of those identifying their gender were men (n = 17) and 72% were women (n = 44). Mean age was 54.6 years (n = 60, range = 9 - 85, SD = 16.7).

Measures

Height: Participants' height (used in determining BMI and body composition measures) was the average of 2 heights (cm) measured with a stadiometer.

Body mass index: BMI [calculated by the Tanita Body Composition Analyzer, model SC-250 (Tanita BCA)] was included because it is a standard used by WHO and the Centers for Disease Control and Prevention, despite its limitations (only accounts for height/weight; disregards body symmetries, muscle vs fat composition, differences in body proportions) [9,10]. BMI values < 25 kg m^{-2} were considered normal, those ≥ 25 kg m^{-2} and < 30 kg m^{-2} were considered overweight, and those ≥ 30 kg m^{-2} were considered obese [1].

Percent body fat: This variable (assessed using bioelectrical impedance analysis, Tanita BCA) was included because medically, obesity is defined as the excess accumulation of body fat that may impair health [1] and because it is more closely associated with health outcomes than BMI [9,10]. Though a useful guide, BMI may not correspond to the same level of fatness in different individuals [1]. Body fat levels < 33% for women and < 22% men were considered healthy.

Visceral body fat: This variable (rating determined by the Tanita BCA) was included because visceral adiposity is associated with greater cardiometabolic risk [11,12]. Visceral fat ratings < 12 were considered healthy.

Blood pressure: One BP reading (typical of screening events) was measured using a Dynamap Blood Pressure Monitor while the participant was seated. Diastolic readings ≤ 80 mm Hg were classified as normotensive, 81-90 mm Hg as prehypertensive, and ≥ 91 mm Hg as hypertensive [13]. Systolic readings ≤ 120 mm Hg were classified as normotensive, 121-140 mm Hg as prehypertensive, and 141 mm Hg as hypertensive [13].

Data analysis

Mann-Whitney U tests were used to compare outcome measures between genders. Data from all three health fairs were pooled for these analyses. Few participants attended the health fair in multiple years, precluding assessment of change over time. Analyses were performed using the Statistical Package for the Social Sciences Version 25 (IBM; http://www.spss.com) with significance at $p = .05$.

Ethics approval

This study was conducted in accordance with UNMC Institutional Review Board protocol # 714-15-EP.

Results

Body mass index

Only 23% of participants (2 men, 11 women) had normal BMI values, 33% (7 men, 12 women) were overweight, and 44% (7 men, 18 women) were obese. BMI values did not differ between genders (U = 289, z = -.693, $p = .488$). Mean BMI was 31 kg m^{-2} ($n = 57$, SD = 7.6), similar to mean values during previous health events in this community (29.3 kg m^{-2}, 32 kg m^{-2})[14,15].

Percentage of body fat

As expected, percent body fat differed between genders (U = 529.5, z = 3.579, $p = < .001$) and was greater in women (mean = 39.4, SD = 9.44, $n = 41$) than in men (mean = 28.8, SD = 7.58, $n = 16$). Mean levels in both genders were in the unhealthy range. The mean value for women was similar to that found in previous health events in this community that only included women (40%) [14-16]. It is concerning that only 19% of participants (1 man, 10 women) had healthy levels of body fat.

Visceral fat

Visceral fat level differed between genders (U = 137, z = -3.404, $p = .001$) and was greater in men (mean = 16, SD = 5.6, $n = 16$) than in women (mean = 10, SD = 4.0, $n = 41$). The mean level for men was in the unhealthy range; only 5 men (31%) had healthy levels. In contrast, the mean level for women was in the healthy range, reflecting that 66% of women ($n = 27$) had healthy levels.

Blood pressure

Mean systolic BP was 134 mg Hg ($n = 62$, SD = 19.2), within the prehypertensive range, and mean diastolic BP was 78 mg Hg ($n = 62$, SD = 11.7), within the normotensive range. Based on data from the 42 participants who recorded their gender (14 men, 28 women), systolic and diastolic BP did not differ between genders (U = 143.5, z = -1.402, $p = .163$). Based on the systolic reading, 57% of men ($n = 8$) and 32% of women ($n = 9$) were hypertensive and 21% of men ($n = 3$) and 39% of women ($n = 11$) were prehypertensive. Based on the diastolic reading, 24% of men ($n = 3$) and 7% of women ($n = 2$) were hypertensive and 36% of both men and women ($n = 5$ and 10, respectively) were prehypertensive. Previous studies in this area also found that the majority of participants (all women) were hypertensive or prehypertensive (systolic mean = 130 and 132 mm Hg, diastolic mean = 78 mm Hg) [15,16].

Conclusion

Community health fairs provide an economical means for rural residents to assess their health status and receive information to address their health concerns. Data from these health fairs revealed that obesity and high BP were prevalent in this population, increasing affected individual's risk for cardiovascular disease and their need for/cost of health care. These findings support the need for effective education and intervention efforts to address obesity and hypertension in this rural area. Attendance at the health fairs was modest and not all attendees chose to participate in the study. It is concerning that few men attended the health fairs and few individuals attended in multiple years. The lack of repeat attendees prevented assessment of the efficacy of the education intervention. The timing, location, and promotion of the health fairs need to be re-evaluated to improve participation, particularly by men and previous attendees. Repeatedly attending health fairs enables participants to monitor their progress and discuss any health concerns and helps researchers assess the efficacy of interventions.

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