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Mobile Health Unit for Obesity Education: Attitudes and Perceptions Among Local Homeless Residents

Angelica Soberon, L. Brown, and José Rodríguez
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ABSTRACT

Objective: Poverty is a risk factor for obesity. Using homelessness as a marker for poverty, we examined the prevalence of obesity in Leon County, Florida’s homeless population to determine their attitudes and perceptions towards the disease.

Methods: Our medical team equipped a mobile health unit with educational material before visiting homeless shelters, health fairs and shopping areas in Northwest Florida. Participants at these sites completed a short survey and our staff calculated Body Mass Index (BMI). The team also distributed lifestyle modification and obesity patient education. BMI and survey responses were compared and analyzed using statistical software.

Results: Subjects were assigned to one of two groups: the homeless group or the “all others” group. The homeless group’s responses and BMIs were compared to the “all others” group. Weight status in the homeless group was distributed as follows: normal weight (48.3%), overweight (39.7%) and obese (12.1%). The distribution among all other participants was: normal weight (34.8%), overweight (25.8%), and obese (39.3%). Homeless participants overestimated their BMI category as often as all others, were less likely to participate in weight loss interventions, and less likely to recognize overweight and obesity as a problem.

Conclusion: Medical practitioners need to recognize the role of patients’ attitudes about weight loss and clarify definitions of exercise. Obesity is less prevalent among the homeless; however, the same obesity trends exist. In addition, we learned that the homeless are eager to learn about obesity and healthy lifestyles, but may not be as willing to attempt interventions that have worked in other populations. Mobile health units can be used to reach out to them.

INTRODUCTION

A recent study of Americans suggests that one in two will be overweight or obese during their lifetimes.(1) It is probable the percentages will be even higher among ethnic and racial minority groups.(2,3) Moreover, research suggests that obesity prevalence increases as income decreases. About two thirds of Florida’s adult population is overweight or obese, and Tallahassee is no exception.

Tallahassee is a diverse city and almost half its population is African American or Latino. Since the majority are overweight, residents may perceive people with a normal BMI as too thin, as reported in other communities.(6) It is also possible this could be a result of residents’ lack of knowledge about the health effects of obesity.

The first documented obesity mobile health unit was operated in the Bronx, New York in 2004, and was sponsored by the Jacobi Medical Center and Albert Einstein College of Medicine.(9) In the present study, we implemented a mobile health unit or Vehicle Assisted Nutrition (VAN) in cooperation with medical students from Florida State University College of Medicine (FSUCOM). After obtaining permission, we used the model, logo, name, and design of the original Bronx VAN. We designed the VAN to serve the community by offering information on lifestyle modification and weight loss assistance. In addition, our staff solicited community attitudes about exercise and weight loss. Given the high prevalence of obesity, we hypothesized that homeless residents viewed being overweight as normal and acceptable. This article seeks to determine whether homeless and some other residents in Tallahassee, Florida view being overweight as a problem, and whether they are interested in taking steps to change their eating and/or exercise behaviors.

Methods

One student (AMS) chose to work on the VAN as a summer, 2006 research project between her first and second years of medical school. She received a FSUCOM fel-
lowship to compensate for her time, and recruited other students to help. She and a faculty member (JR) donated the use of their vehicles which were decorated with the VAN logo, and avoided identifying obesity as the problem.

The VAN was staffed by a physician (JR), medical student (AMS) and volunteers, and visited heavily transited areas of Tallahassee, Florida. Tables were set up to encourage interaction between staff and the community. Patient recruitment efforts targeted homeless shelters, the Neighborhood Health Service (a center serving uninsured adults) and community shopping areas, and carefully avoided any attempt to preferentially recruit obese people. Participants’ BMI measurements were calculated and a survey of eight questions was administered. (Table 1) We distributed educational pamphlets in English and Spanish on the subjects of diet, weight loss and lifestyle modification that were developed by medical students. These materials were subsequently made available online for use by patients and medical providers. (10) Survey participants were invited to enroll in a free weekly Health Not Cosmetics class run by the students and author (JR). The class explained concepts found in the materials and was especially helpful for functionally illiterate participants.

Health Not Cosmetics is a comprehensive lifestyle modification program designed to help patients lose weight. (11) Weekly group visits were arranged at a local community health center where medical students and volunteers taught and modeled lifestyle modification principles for patients. Group visits consisted of nutrition, exercise education and support.

Admission to VAN events was free and participants were encouraged to complete the survey and participate in the screenings.

The staff computed BMI based on participants’ self-reported height and weight. Individual BMI measurements were analyzed for trends using SPSS software. A Chi-square test identified the association between the BMI groups and the eight questions, and a Pearson correlation coefficient explained the direction and magnitude of the association. Only those who responded to individual questions were included in the analysis. A t-test demonstrated the statistical difference between the mean BMI of respondents to individual questions. The significance level for the statistical tests was p=0.05.

RESULTS

We surveyed 236 people at seven sites. The homeless group consisted of 58 (24.6%) and the “all others” group consisted of 178 (75.4%). National Heart, Lung and Blood Institute definitions were used to determine the BMI groups of normal weight, overweight and obese. (12) (Table 2)

Of the homeless participants, 48.3% were normal weight, 39.7% overweight, and 12.1% obese. Only 19% of homeless respondents felt that their weight was a problem. (Figure 2) When asked to predict their BMI group, 8.6% estimated they were underweight, 74.1% normal weight, 13.8% overweight, and 3.4% did not respond. None of the participants predicted they were obese. (Figure 4) An average of 18.1% inaccurately predicted their BMI category, over 56% indicated they wanted to do something about their weight, and 6.9% did not respond. Almost 52% of homeless respondents indicated they would modify their eating habits; 47% indicated they would increase their exercise, and 44.8% indicated they would take medication. Over half (55.2%) of homeless respondents stated that they exercised regularly, but less than a quarter (24.1%) indicated their interest in attending our classes.

Of all other respondents, 34.8% were normal weight, 25.8% overweight, and 39.3% obese. About 40% of all other respondents felt that their weight was a problem. Almost 4% predicted they were underweight, 50.6% predicted normal weight, 38.8% predicted over-

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Homeless Chi Square</th>
<th>All Others Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is your weight a problem?</td>
<td>p=0.004</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Circle the weight category that</td>
<td></td>
<td></td>
</tr>
<tr>
<td>applies to you:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Normal weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you willing to do anything</td>
<td>p=0.197</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>about it?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modify your eating habits?</td>
<td>p=0.083</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Modify amount of exercise?</td>
<td>p=0.103</td>
<td>p=0.022</td>
</tr>
<tr>
<td>Take medication?</td>
<td>p=0.691</td>
<td>p=0.031</td>
</tr>
<tr>
<td>Do you exercise regularly?</td>
<td>p=0.484</td>
<td>p=0.261</td>
</tr>
<tr>
<td>=&gt;3 times/week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you interested in taking</td>
<td>p=0.078</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>our classes?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Survey Questions With Statistical Analysis
weight, and 6.2% of all other respondents predicted they were obese. An average of 16.4% inaccurately predicted their BMI category. A majority of respondents (73%) indicated they wanted to do something about their weight. About 75% of all other respondents indicated they would modify their eating habits and/or increase their amount of exercise. A little more than a third (34.3%) of all other respondents said they would take medication. Only 46.6% of all other respondents stated that they exercised regularly. Less than half (42.7%) of all other respondents indicated they were interested in attending our classes.

STATISTICAL ANALYSIS

Homeless Respondents

For the question, “Is your weight a problem?” there was a statistically significant positive association with BMI. There was also a statistically significant positive association between predicted and actual BMI (p<0.05). There was no statistically significant difference in the BMI groups that said they would change their eating and exercise habits, or take medication to change their weight. There was also no significant relationship between homeless BMI groups and exercise, nor between homeless BMI groups and desire to attend our classes.

All Others

As BMI measurements increased, there was a statistically significant association by the remaining respondents who felt that their weight was a problem. There was also a statistically significant relationship between predicted and actual BMI. Unlike the findings in the homeless group, there was a significant relationship in the “all others” group between their BMI measurement and their willingness to do something about it. As BMI increased, a higher percentage of respondents said they were interested in our classes.

DISCUSSION

Applying the Transtheoretical Model of Behavior Change, patients are in the pre-contemplation, contemplation, preparation, action, or maintenance phase.(13) Pre-contemplators do not see a need for change, contemplators may see a need but have not acted upon it, and those in the action phase have begun to change their behavior. Only 34% of the overweight homeless and 28% of the obese homeless indicated their weight was a problem. The all others group was more promising, with 34% of overweight and 70% of the obese people recognizing their weight as a problem. These are the groups for whom an obesity prevention and treatment intervention could be most effective. It is difficult to motivate people to change if they do not recognize a problem. This possibly indicates that the obese homeless are in the pre-contemplation state which may be due to their circumstances. Many may not

<table>
<thead>
<tr>
<th>Category</th>
<th>Body Mass Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal weight</td>
<td>18.5 to 24.9 kg/m²</td>
</tr>
<tr>
<td>Overweight</td>
<td>25 to 29.9 kg/m²</td>
</tr>
<tr>
<td>Obese</td>
<td>30 kg/m² or above</td>
</tr>
</tbody>
</table>

Table 2: National Heart Lung & Blood Institute's Definition of Obesity

![Figure 2: Homeless Survey Responses by BMI](image1)

![Figure 3: All Others Survey Responses](image2)
have the ability to do anything about their problem. The same groups (homeless overweight 75%, homeless obese 65%, and other overweight 65%, other obese 95% respectively) indicated their willingness to do something about their weight, which suggests they were in a contemplation phase. This contradiction indicates the need to better understand how individuals define “excessive weight.” The questions of “When” and “Why” being overweight are a problem and how the decision to act is made, need further investigation.

Data demonstrates that exercise can be beneficial in weight maintenance and has a significant role in weight loss.(14 15, 16) While the prevalence of obesity was large in our sample, so was exercise. More than 50% in both the overweight and obese categories reported regular exercise. Their most common exercise activity was walking. We suspect that most of this consisted of routine short walks to parking lots and bus stops, especially in the homeless groups who depend on public transportation. This large variance in exercise participation could account for the lack of statistically significant association with BMI. Secondly, participants do not understand the concept of exercise for weight maintenance or health.

The majority of overweight and obese participants expressed their interest in wanting to lose weight; however, few VAN participants attended the Health Not Cosmetics classes. The group visits were effective in educating patients about obesity and weight loss, and many patients lost weight.(6) However, more outreach is necessary to ensure that community residents are aware of Health Not Cosmetics.

LESSONS LEARNED

In general, the results have clarified the misconceptions held by people regarding their weight and indicate that treating obese homeless individuals will be more challenging. It also indicates this group needs more education about treating weight problems. Many homeless participants stated they had few food and exercise options. Many students were challenged to come up with modifications about portion sizes and incorporating walking into their daily activities for the homeless group.

Due to the expressions of disbelief on overweight and obese individuals’ faces after being weighed, we believe more education is needed for them to have a better understanding of Body Mass Index.

The term “regular exercise” is too general. While most participants reported regular exercise, it is clear that its relationship to weight loss was not understood. More explanation is needed about intensity, duration, and types of exercise. The Health Not Cosmetics curriculum was modified to explain this need. Multiple exercise videos have been produced by medical students for distribution during future VAN outings. Patients also practice exercising with providers in the Health Not Cosmetics group visits. Patients are also encouraged to continue their existing exercise and are taught ways to increase it (i.e. walking to the next bus station instead of the one that is closest to your home or shelter).

The most valuable information derived from the VAN survey was that the majority of the overweight and obese patients wanted help losing weight. Medical school curricula throughout the country do not adequately address this issue. The Health Not Cosmetics program is the only place in the Albert Einstein College of Medicine and Florida State University College of Medicine curriculum where students can find, create, and practice using real tools to assist patients with weight loss. We are currently developing more tools to help patients recognize overweight and obesity as serious health problems, and we are also designing effective physical activity tools.

Our study does have limitations. The survey questions are very general and can mean different things to different people. We concentrated on attitudes using a short survey of people with the means to shop, or who were at the homeless shelters. This excluded people who did not have the means to shop, as well as homeless individuals who did not live in shelters. The use of self-reported height and weight values may affect the BMI measurement’s accuracy. The study is based on self-reported attitudes and perceptions.
Our project’s impact on the community has yet to be quantified. As more participants in the VAN project enroll in the Health Not Cosmetics group visits, we will be able to quantify if we made such a difference. This project did make a difference in the lives of many medical students(17) and has been measured objectively through project evaluations.(18) Students were able to communicate with the homeless population and gather their perspectives. Overall, students found this to be an enlightening experience that provided a better understanding of the homeless population and their attitudes toward obesity.

In future, we plan to take the VAN to other sites and reach other segments of the population. It will be difficult to determine individual changes in BMI from follow up studies as completed surveys were anonymous. To further strengthen our study, we plan to obtain exact height and weight measurements and introduce a validated behavioral change questionnaire for better understanding of patient attitudes. ■

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About the Authors
Dr. Rodriguez is an expert in weight loss and non-pharmacologic obesity management. He is a Board-certified family physician and Associate Professor at the newly created Florida State University College of Medicine.

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