

Native American Youth Obesity: Intervention with Interactive Software

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Abstract

The purposes of the study were to use Dance Dance Revolution, an interactive software, to promote a healthy lifestyle among Native American youth and to assess the effectiveness of the treatment to lower BMI. Participant ages ranged from 6-16 years, and enrollments varied for 12 week sessions held in Summer, Fall, and Spring. Over time, changes in sample size and sporadic attendance to engage with the interactive software created research problems including data collection and analysis. Given the limitations of data, generalizations are not possible. However, there is evidence that continuous participation in such an intervention can have an effect on lowering BMI, hence affecting weight loss. A valuable research lesson was learned. A structured intervention may be at odds with persistent participation and retention of Native American youth. A cultural paradigm which values interdependence of relations takes precedence in most "self" endeavors. Decisions made are superseded by other relevant cultural activities. The implication for research is that cultural factors prove difficult to anticipate; however it is necessary to consider them when implementing interventions with Native American youth. A sensitive eco cultural participatory approach in collaboration with the tribal community must be used for insuring success.

Keywords: Native American, youth, obesity, interactive software, culture, values

INTRODUCTION

Obesity and being overweight have become serious health issues for children and adolescents in the United States and are expected to keep rising (Hedley, Ogden, Johnson, Carroll, Curtin, & Flegal, 2004). Those who studied adolescent obesity by gender and ethnicity found more Native American youth obese than adolescents of other ethnic groups (Popkin & Udry, 1998). While 24.2% of non-Hispanic whites and 20.6% of Asian Americans were obese, 42.4% of Native American adolescents were obese.

Responding to the prevalence of obesity, researchers have focused on factors associated with obesity, and studies indicate several possible causes, such as increased caloric consumption, higher consumption of fast foods and soft drinks, insufficient vigorous physical activity, and genetic factors (Patrick, Norman, Calfas, Sallis, Zabinski, Rupp, & Cella, 2004). There is an association between an increase in soft drink consumption and a decrease in milk consumption, leading to a decrease in calcium intake, which is inversely related to body mass index, BMI (Bray, 2004). Considering the fact that soft drinks are a major source of energy intake among young Native Americans, the consumption of soft drinks may be

one of the factors that contribute to the prevalence of obesity and diabetes among Native Americans (Wharton & Hample, 2004).

According to Jebb and Moore (1999), there is a significant association between hours spent on sedentary behaviors such as watching TV and/or sitting at a computer and body mass index. Armstrong, Salles, Alcaraz, Kolody, & McKenzie (1998) studied the relationship between obesity and TV viewing and found that 6 to 11-year-old children watch TV more than 23 hours per week. There is evidence to suggest that the longer the time children watch TV, the higher the prevalence of obesity, whereas a significant decrease in TV watching as well as video game use contributes to reduction of children's adiposity measures.

Although high caloric intake and low physical activity are two major causes of obesity, a safe dietary approach is also recommended to promote eating healthy food. Research findings indicate that incorporating increased consumption of fresh fruits and vegetables that reduce energy density of diets is beneficial for participants in a weight management program (Rolls, Ello-Martin, & Tohill, 2004). Given findings of previous research on youth obesity, the

focus of the planned intervention was to increase physical activity followed by making available healthy snacks and beverages. With respect for Native American cultural values of autonomy, the implementation plan included the rights of youths to make their own decisions and to self-monitor all aspects of participation in the program.

METHODS

The researchers collaborated with the Ottawa-Chippewa Indian Band in Michigan to forge a program of activities that were culture-sensitive and specific as related to self-monitoring, physical activities, and healthy snacks. This program was based on a participatory design (Phenice, Griffone, Hakoyama, & Silvey, 2009). All phases of the project were approved by the Tribal Council, the Medicine Lodge Director, and the Tribal Administrator/Manager. In addition, the researchers received approval for the project by Michigan State University IRB.

Strategies. All members of the research team prepared for the study by being well versed in the Native American culture and diligently worked at promoting “Best Practices”. The team was assisted by a Director who was a tribal member and in charge of the Native American youth programs. She helped in recruiting a sample of youth with parental consent and made arrangements for the purchase and delivery of the TVs and software and dance pads needed for the Dance Dance Revolution interactive physical activity. Her role was to assist in the activities of the research team, be the spokesperson for the tribal families and in general, a mediator for the tribal community.

The PlayStation 2 program Dance Dance Revolution was the interactive software treatment. Access to four play stations with software and dance pads were provided at the Strongheart Center. The intervention also included an educational component with self-monitoring measures to promote healthier eating habits which included fresh fruits, vegetables, and healthier beverages other than soda. These were made available at the snack counter.

Intervention Applications. There were three, twelve week sessions Summer, Fall, and Spring. Dance Dance Revolution Software was integrated into the Centers regularly planned youth activities which included warm-up activities for roughly 30 minutes on the dance mats followed by healthy snacks consisting mainly of fresh fruits, vegetables, yogurt, juice, water, and crackers. The youth were measured for height, weight, flexibility (sit and reach) and BMI during the first week of the program and at the conclusion of each 12 week sessions.

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RESULTS

Summer Pilot Program. This included 25 youths ages 5-12. Although 25 youth participated, only 9 completed the program. As a result of this pilot, much excitement was generated and programmatic issues were identified and modifications made. There were many external factors that impacted the program, such as summer break, family vacations, the summer pow wow circuit, Tribal Olympics, intramural tribal basketball teams and other activities. Because this pilot took place during the summer months, parents of the youth participants had to transport their children to and from the Strongheart Center located on the reservation.

Of the 9 youth who completed the summer program, we were able to collect BMI measures for only 7 of the youth. These 7 youth ranged in age from 9 to 12 years, with BMI measures for 5 out of 7 (71%) were considered overweight or obese, meaning BMI percentiles of 95% or higher. This is congruent with the findings of obesity research and our review of the literature, where studies report the seriousness of this problem for Native American youths.

Fall Program. This included 25 youths, ages 6-13 who were transported directly from school via bus to the Strongheart Center, and after the sessions, parents were responsible for picking their youths up. Of the 22 youth with BMI measures, 9 youth scored at 95% or higher meaning 41% were overweight or obese and 6 youth (27%) scored in the 85%-95% range were at risk of being overweight or obese. In total, 68% of the youth who had BMI measures taken at the beginning of the Fall session was assessed as being overweight or obese, or at risk.

Of the 9 youth rated at 95% or higher for being overweight or obese, at the beginning of the fall program; at the end of the sessions, 7 still remain in this category, therefore a decrease of youth in this category. There was a decline from six to three participants who were at risk of being overweight or obese at the conclusion of the fall session, indicating a 50% decrease in this category.

Spring Program. This included 16 youth, ages 5-11 with 12 youth who had BMI measures taken. Of the 12 youth, 6 (50%) measured in the 95th percentile or higher making them overweight or obese, while 3 (25%) were in the 85th-95th percentile making them at risk for being overweight or obese. At the end of the session none of the participants were those who initially started this program. An indication of the nature of this population was the addition of 2 youths who joined the spring program. Although at the conclusion, there were a total of 18 youth who had BMI measures recorded, they were not matched samples with the original 16 youths who registered. Despite our efforts the issue of persistence and

intentions were difficult problems to overcome as evidenced by the collected data.

DISCUSSION

This study began with an enthusiastic sample of participants, however, at the conclusion we had insufficient data of repeated measures on key variables due to sporadic and unpredictable rates of individual commitment overtime. There is evidence to suggest that individuals who persisted and participated for the full duration of at least one 12 week session experienced a decrease in BMI and weight measures. Initially the motivation to participate was very high, however, what became evident was the lack of persistence among participants and, consequently, the inability of the researchers to follow participants across the sessions let alone the duration of the program.

The unique features of this study were the potential sources of invalidity or subject attrition of the original sample, and the interest to control for this source of invalidity. One of the potential source of invalidity was subject attrition, and clearly a problem with this study. However, the more important and unusual event, unique to this study, was an actual subject accretion, the opposite of subject attrition.

An unanticipated outcome was the diffusion of this intervention using Dance Dance Revolution Software to local and nonlocal tribes as well as to other public schools. Thus, an important feature of our project became innovation diffusion. What started as a straightforward intervention and evaluation of a program for Native American youth became the basis for a far-reaching diffusion of educational programming. In essence, while the goals of the original project were not met, the actual implementation of this interactive strategy was even more important. The question of whether the innovation diffusion will lead to positive changes in youth has yet to be studied.

In effect, the population expanded as variants of the original program were delivered to other groups of youth. We have no data about the persistence of youth at the other sites or the effects of the intervention on their behavior.

A question emerges from this study. To what extent was it logical to expect that there would be a change in the behavior of these Native American youth? Is it reasonable to expect that there would be a culture change? What we initially overlooked as researchers was the clear value of autonomy within the Native American traditional cultural value among Native American youth. We implemented the program with a strict protocol consisting of timetables and schedules, and Dance Dance Revolution software and dance pad for each of four TV video setups. The

program was fully supported by the tribal community and was housed in a newly built community/ gymnastic recreational center filled with gymnastic equipment. A tribal coordinator was assigned to work with the team and she interfaced with the community and the research team. The research team made regular visits to the site to discuss issues as they arose. It became very clear that this was to be a participatory design if we were to accomplish the study.

What we found was that Native American youth were highly motivated and enthusiastic regarding participation in the study. However, they did not maintain an intention of persistence that would have been necessary to follow through with the program to its conclusion. In reflection after the study was completed, we believe that we may have overlooked the importance and dominance of a traditional cultural heritage residual. There is evidence in the literature of Native American Indians that traditionally the value of personal autonomy and the importance of interdependent behaviors are like two sides of a coin. It may be that these values are practiced even today in this generation of Native American youth. We assume that these young people are brought up to be autonomous in decision making, and therefore, the immediacy of other socially interdependent activities may present a built-in barrier for their persistent participation in this or any other regulated program.

Although the events were carefully planned due to our interest in avoiding subject attrition and in avoiding other threats to internal validity as well, we had not planned for this irregular participation pattern. The issues for Native American youth are time, autonomy, and regulation. Although they are living in the present day, they may be influenced by the cultural legacy of traditional Native American culture. Participation in a highly structured and regimented intervention such as the one we designed may simply be at odds with consistent predictable participation. Thompson, Johnson-Jennings, and Nitzarim (2013) studied the persistence attitudes among Native American college students. Their analysis supported the prediction of culturally relevant non-cognitive variables related to persistence intentions. We believe that this study of persistence intentions among college Native American Students sheds some light on the persistence attitude and behavior of younger Native American Youth. These patterns may in fact be reflections of non-cognitive outcomes and suggests the impact of a sociocultural perspective of autonomy and interdependent behavioral patterns. Youth are faced with making their own decisions and at the same time being influenced to be a part of a group especially in activities related to social relationships

LIMITATIONS

Despite careful planning and consideration of issues associated with intervention practices with Native American youth, the processes of conducting the research and the outcomes varied considerably from what was expected. There were constant adjustments to the design. Throughout the processes of negotiations with the tribal director and delivery about the need to maintain a stable sample, youths entered, exited, and re-entered the program at various times. Despite our efforts the issue of persistence and intentions were difficult problems to overcome as evidenced by the collected data. Implementing a planned intervention is not realistic given the cultural values of autonomy and interdependence. Education and research activities must include the greatest degree of design flexibility.

CONCLUSIONS

The use of interactive software to increase Native American youth physical activity is a viable treatment to lower BMI, hence weight loss. A well designed intervention model such as a controlled experimental design, is not recommended when working with indigenous populations. Participatory designs are recommended with emphasis placed on education and research activities that include the greatest degree of design flexibility.

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