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Culturally Specific Dance to Reduce Obesity in African American Women

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Abstract

This article provides evidence of a culturally specific dance intervention to decrease obesity as measured by body fat and body mass index (BMI) in African American women. A community partnership was formed with two African American churches to develop an intervention to address the issue of obesity. The culturally specific dance intervention was delivered two times per week for 8 weeks, choreographed to gospel music selected by the experimental group participants, and taught by an African American woman. Body fat and BMI were assessed at three time points and revealed significant differences between the two groups. Attending a minimum of 7 classes was enough to show an observed dose effect and the intervention was found to be culturally specific by understanding their roles as African American women. This community partnership was an effective way to promote a church-based, culturally specific dance intervention to improve the health of African American women.

Keywords

culturally specific dance; body fat; body mass index; African American women; church-based programs

African American women have the highest prevalence of overweight (78%) and obesity (51%) of any other racial group in the United States (American Obesity Association, 2005). Moreover, overweight and obesity are leading risk factors for cardiovascular disease (American Heart Association, 2005), type 2 diabetes (Franz, 2004), and hypertension (American Obesity Association, 2005) all of which are more prevalent in African American women (Muenning, Lubetkin, Jia, & Franks, 2006). The national guidelines for physical activity recommend that adults engage in regular, moderate intensity physical activity for at least 30 min per day (USDHHS, 2000). Culturally specific dance, a type of moderate intensity physical activity, may be one way to combat the overweight and obesity epidemic. Studies show that participation in culturally specific dance programs decreased weight (White et al., 1984), decreased body fat (Gillett, White, & Casetra, 1996), and reduced BMI (Shimamoto, Adachi, Takahaski, & Tanaka, 1998); however, none of these studies included African American women. Culturally specific dance may be an effective intervention to combat obesity and reduce negative health outcomes common in African American women.

BACKGROUND

Obesity is a disease influenced by many factors that develops from an interaction between heredity and environment and involves the integration of social, behavioral, cultural, and economic factors (National Institutes of Health, 2000). Obesity is characterized by a percent body fat greater than 35% in females and greater than 25% in males (National Institutes of Health Technology Assessment Conference, 1996). Obesity is often defined by BMI, which is a measure of body fat based on height and weight (kg/m^2) and is a simple measure of an individual's fatness. Also, BMI is traditionally used to classify populations for statistical purposes and to measure obesity trends. An ideal BMI ranges from $18.5 \text{ kg}/\text{m}^2$ to $24.9 \text{ kg}/$

m², overweight is a BMI of 25 kg/m² to 29.9 kg/m², and obesity is a BMI of 30 kg/m² or greater (American Heart Association, 2005). Unfortunately, many African American women are sedentary, which increases their chance of being overweight and obese (Felton, Boyd, & Tavakoli, 2002). Obesity also has an unfavorable effect on African American women's length of life as a BMI of greater than 45 is estimated to equate with 25 years of lost life (Fountaine, Redden, Wang, Westfall, & Allison, 2003). Furthermore, the estimated annual cost attributable to obesity-related diseases is US\$100 billion (Morbidity and Mortality Weekly Report, 2002).

Review of Literature

Few studies have specifically tested interventions to reduce weight in African American women. One study found that weekly group meetings and supervised exercise sessions over a 6-month period resulted in a mean loss of 3.7kg in 66 obese African American women (Karanja, Stevens, Hollis, & Kumanyika, 2002). Also, a 12-week obesity treatment program used a dietary and exercise program to decrease weight in 22 White women and 20 African American women (Sbrocco et al., 2005). Of the 20 African American women, 10 received the dietary and exercise program in a university setting with the 22 White women and the other 10 African American women received the intervention in a church setting. All three groups lost weight and maintained these losses at 12 months. However, the African American church group reported greater weight loss than either university group. The findings suggest that a church setting may be better location for a weight loss program in African American women.

Other church-based health promotion programs for African Americans include dietary changes to reduce cancer (Campbell et al., 1999; Campbell et al., 2000), smoking cessation (Voorhees et al., 1996), physical activity programs (Prohaska, Peters, & Warren, 2000), and reduction in hypertension and lipid levels (Doshi et al., 1994; Smith, 1997; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001). In African American women, a church-based health promotion program increased health-seeking behaviors related to breast health (Duan, Fox, Derose, & Carson, 2000). Overall, church-based programs have been found to positively influence health related lifestyle changes in African Americans (Peterson, Atwood, & Yates, 2002) and improve the health and well-being of its members (Ransdell, 1995). In the future, interventions to improve the health of African Americans should consider church settings.

Importance of Dance

The significance of dance in the African American culture reflects an intrinsic cultural orientation toward physical expression and creativity (Farr, 1997). For African Americans, dance plays an important role as a means of emotional expression, interaction, support, and cohesion. Furthermore, dance is symbolic of traditional African heritage (Farr, 1997). Culturally specific dance is defined as a dance within a community or group that serves one or more purposes related to traditional practices, cultural transmission, social acceptance, or connectedness (Jain & Brown, 2001). Culturally specific dance interventions need to be consistent with the shared beliefs, values, and practices of the specific culture in order to be effective (Jain & Brown, 2001).

Culturally Specific Dance in Various Populations

Studies show that culturally specific dance has improved health outcomes in various adult female populations. For example, culturally specific dance reduced stress in American Indian women (Skye et al., 1989); waltzes and other folk dances increased bone mineral density in Viennese women (Kudlacek et al., 1997); and folk dances decreased the risk of falling in elderly Japanese women (Shigematsu et al., 2002). More important, culturally specific dance programs can reach underserved populations as sedentary Latino women

increased their physical activity using salsa, cumbia, quebradita, merengue, Macarena, and other Latin dances (Whitehorse, Manzano, Baezconde-Garbanati, & Hahn, 1999).

CONCEPTUAL FRAMEWORK

The conceptual framework for this study is based on the Social Cognitive Theory (SCT), which posits that physical activity behaviors are acquired and maintained through a complex set of personal, behavioral, psychosocial, and environmental factors (Bandura, 1997). These factors influence one another and the success of increasing physical activity is based on an individual's ability to regulate behavior in these areas. Personal factors included body fat, BMI, age, comorbidity, and socioeconomic status (SES) in a sample of African American women.

Behavioral factors, including both previous and current physical activity patterns, are influential in determining physical capabilities. For example, if a woman has been physically active in the past, has enjoyed it and believes she can be physically active in the future, the chance of her participating in a physical activity program is greatly increased. In this fashion, past and present physical activities are important components of behavioral factors and should be considered when developing physical activity interventions. For this study, culturally specific dance was the type of physical activity.

Psychosocial factors were self-efficacy and social support. Self-efficacy affects an individual's choice of behavior, the amount of effort a person will spend on a particular behavior, and the length of time a person will persist in performing a particular behavior despite barriers. A supportive social environment is another key determinant of beginning and continuing a physical activity program (Bandura, 1997). Participating in a dance program includes the social contact, camaraderie, and laughter that comes with enjoying the company of others (Conner, 2000). The social support inherent in dance programs was found to be an important element for sedentary, obese women who were similar in weight, age, and fitness level (Gillett et al., 1996). Moreover, the social support in dance classes has been postulated to contribute to high attendance rates (Gillett & Eisenman, 1987; Gillett et al., 1996; Moffet, Noreau, Parent, & Drolet, 2000).

An environmental factor that influences physical activity participation is location. For African American women, church settings are favored due to existing social support systems in familiar and safe locations (Prohaska et al., 2000). The church is symbolic of a strong sense of community, belonging, and purpose in the lives of African American women (McRae, Carey, & Anderson-Scott, 1998). African American women participate in and value church experiences and may attend physical activity programs located in churches (Peterson et al., 2002). Thus the purpose of this longitudinal study was to examine a church-based, culturally specific dance intervention to decrease obesity as measured by body fat and BMI in sedentary African American women. The research questions were

Research question 1: Does an 8-week culturally specific dance intervention decrease body fat and BMI in sedentary African American women from baseline to 8 weeks and is it maintained at 18 weeks compared to women who do not receive the intervention?

Research question 2: Was the culturally specific dance intervention acceptable to the African American women?

METHOD

Design

A quasi-experimental design with repeated measures was used to accommodate the 8-week and 18-week observation periods. This design controlled for the main and interaction effects of testing the intervention and increased the generalizability of the findings by testing the intervention in a natural setting (Campbell & Stanley, 1963). To control for diffusion of treatment, two Baptist churches in the local African American community were randomly assigned to either the experimental or comparison group protocols based on a blind draw of sealed envelopes that contained either the word experimental group or comparison group. The experimental group received the dance intervention and the comparison group continued with their daily routines. The ministers were aware that a blind draw determined which church received either the experimental or comparison group protocols. Permission was obtained from each minister and approval was received from University Hospitals of Cleveland Institutional Review Board.

Intervention Development

Forming a community partnership with the African American Baptist churches required planning that focused on being culturally relevant, respectful of their beliefs and values, and involved church leaders in a meaningful manner. The ministers and church leaders were interested in developing an exercise program to address the issue of healthy weight loss and not focus on disease prevention. The ministers and church leaders were aware that obesity, hypertension, heart disease, and diabetes are rampant in the African American community. Too often these health conditions are explained in morbidity and mortality statistics with little attention paid to quality of life or daily life experiences of the members of the congregation. By highlighting the culturally specific dance intervention as a way of integrating physical, mental, and spiritual health of the women, the ministers and church leaders understood the cultural relevance and fully supported the study. This community partnership was an effective way to promote a culturally specific dance intervention to reach African American women in the comfort of their own neighborhood and familiar church environment.

During the recruitment phase, a respected woman from each church was chosen by her minister to serve as a liaison between the congregation and research team. At each church, the study was announced every Sunday morning 1 month prior to the beginning of the study and was advertised weekly in the church bulletin. During this time, research team members attended the church services and were available before and after each church service to answer questions. Recruitment began during the month prior to implementation of the study at the participant's own church and lasted 4 weeks. Baseline data were collected prior to implementing the 8-week dance intervention and 8 and 18 weeks later. The 8-week data collection occurred at the completion of the 8-week dance intervention (Figure 1).

Sample and Setting

The setting consisted of two African American Baptist churches located in a large, urban Midwestern city that were matched on important characteristics such as membership (500+ members), ethnicity (100% African American), number of women aged 35 years and older, and having served the community for approximately 40 to 50 years. A convenience sample of African American women who volunteered and met the study criteria (a) 35 years of age and older, (b) membership in either study church, (c) written medical clearance from a health care provider, and (d) a signed, written informed consent form. Informed consent was obtained and data were collected at both churches by research team members who were

trained in providing the study protocol. Being approximately 5 miles apart, the two churches were not aware of other churches involved in the study.

The sample size calculation was based on a power of .90, alpha of .05, and a medium effect size of .35, and included a 15% attrition rate which yielded a sample of 101 participants, or 52 participants per group. A final sample size of 126 participants (66 in the experimental group and 60 in the comparison group) was achieved. The overall retention rate for the entire sample was 77% (97/126). The experimental group's retention rate was 70% (46/66) and the comparison group's retention rate was 85% (51/60).

Study Protocols

To involve the women in a meaningful manner, the principal investigator met with the church secretary to determine the days and times that the dance intervention could be scheduled without competing with other church activities. Two different schedules were available (Monday–Saturday or Tuesday–Thursday) and the majority of women selected the Monday–Saturday schedule during baseline data collection. Also, the women met with the dance instructor to select the gospel songs to be used during the dance sessions.

The experimental protocol consisted of the culturally specific dance intervention offered twice a week for 8 weeks to encourage participation among a sedentary population. Dance interventions held twice a week achieved higher attendance rates (Moffet et al., 2000) and lower incidence of joint pain (Noreau, Martineau, Roy, & Belzile, 1995; Perlman et al., 1990). An experienced African American female dance instructor from the community led each dance session two times a week for 8 weeks, totaling 16 sessions. Each dance session included a 5-min warm-up, 30-min dance segment, and 10-min cool-down segment. The dance protocol consisted of simple dance steps choreographed to gospel music and movement of the legs included extension, flexion, abduction, adduction, and rotation of the leg and foot to perform forward, backward, and sidestepping movements. Other leg movements were placing one foot to the front, side, and behind the other foot, rising up on the heels, and forward and side lunges. The same gospel music and dance routines were used each dance session. Many dance steps were modified to have more intensity for those who elected to pick up the pace and altered to reduce intensity for those with physical limitations, such as pain, arthritis, or hip or knee discomfort. Because the intervention was not proposed to improve maximal aerobic capacity or other measures of aerobic fitness, the women chose their own intensity level. Research team members were on site during all dance sessions and a first aid kit was available. The participants received a free video of the dance routines at the end of the 8-week dance intervention to enable them to continue dancing. Furthermore, the experimental group took ownership of the intervention by hiring the dance instructor once a week for another 16 weeks and two women volunteered to be trained by the dance instructor to continue the dance program at their church.

The comparison group continued their daily activities and routines and received health information mailings specifically for African American women. The mailings included information on heart disease, obesity, type 2 diabetes, and hypertension. They received the same free culturally specific dance video as the experimental group after the 18-week data collection.

Measures

For both groups, data were collected in three interviews at baseline, 8 weeks, and 18 weeks. The interviews took approximately 45 min and were conducted in a private area of the participant's own church. Data were collected on age, marital status, education, SES, and comorbidity. In addition, weight, height, body fat, BMI, and the Physical Activity Scale for

the Elderly (PASE) were obtained. The PASE was a 10-item scale that assessed physical activity during the past 7-day time frame (Washburn, Smith, Jette, & Janney, 1993). The PASE was chosen as it had the most culturally appropriate assessment of leisure, household, occupational, and volunteer activities common in African American women. The dependent variables of body fat and BMI were measured with a segmental bioelectrical impedance analyzer (Omron Body Fat Analyzer, Model HBF-306, Bannockburn, IL). To ensure accurate measures at all three time points, the principal investigator trained research team members about the procedures and correct use of the scales and Omron HBF-306 according to an established training protocol. Weight was measured with a standard physician beam scale using the Detecto Model 349 (Cardinal Scale Mfg. Co., Webb City, MO) with attached height rod measuring the participant in street clothes without shoes. Age and SES were assessed by self-report. Comorbidity was measured using the Charlson Comorbidity Scale, an instrument that used a weighted sum of comorbid conditions (heart disease, peripheral vascular disease, stroke, ulcers, shortness of breath, diabetes, kidney disease, cancer, leukemia, liver disease, and immunodeficiency diseases) that mirror the functional burden of illness conditions (Charlson, Pompei, Alex, & MacKenzie, 1987).

Data Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 14.0 statistical software. Analysis of relevant statistical assumptions was performed and all assumptions were met. Because the study used a quasi-experimental design, the intervention and comparison groups were compared on all baseline measures. Descriptive, correlational, univariate ANCOVA and repeated measures MANCOVA analyses were used to answer the study question.

Results

The convenience sample of 126 African American women (aged 36 to 82 years) had no significant difference in age, comorbidity, weight, body fat, or BMI between the experimental ($n = 66$) and the comparison groups ($n = 60$) at baseline. Moreover, there were no significant group differences in marital status, SES, and education. Ninety-seven participants ($n = 46$ experimental; $n = 51$ comparison) completed all three data collection time points. The baseline mean body fat of the experimental group was 41.6% and decreased to 40.2% by the end of the study. The baseline mean body fat of the comparison group was 41.9% and increased to 42.9% by the end of the study. For BMI, the experimental group started at 31.7 kg/m² and decreased to 30.8 kg/m² at 18 weeks and the comparison group started at 32.8 kg/m² and increased to 33.3 kg/m² at 18 weeks. The means and differences of body fat, BMI, and PASE for both groups at all three time points are listed in Table 1. Because there was approximately a 30% dropout rate for the experimental group, body fat and BMI of those who dropped out were compared to those who remained. The body fat of those who dropped out was 40.5% compared to 42.1% of those who remained; the BMI of those who dropped out was 31.2 kg/m² compared with 31.9 kg/m² of those who remained in the study.

Repeated measures MANCOVA assessed the significance of change in body fat and BMI by group, by time, and interaction of group by time. The covariates were age, SES, and comorbidity. The dependent variables were highly correlated making repeated measures MANCOVA a better statistical choice for reducing the risk of Type I error. The MANCOVA revealed a significant group difference in at least one of the dependent variables, Pillai-Bartlett Trace = .05, $F(1, 91) = 4.46$, $p = .04$, $\eta^2 = .05$, a nonsignificant time effect, Pillai-Bartlett Trace = .01, $F(2, 90) = .66$, $p = .52$, $\eta^2 = .02$, and a nonsignificant interaction, Pillai-Bartlett Trace = .03, $F(2, 90) = 1.54$, $p = .22$, $\eta^2 = .03$. Observed power was .97.

Post-hoc univariate ANCOVA tests were then conducted separately on each dependent variable controlling for baseline measures of body fat, BMI, and covariates. Analysis of covariance revealed significant reduction in body fat by group at 8 weeks, $p = .005$; $F(1,90) = 8.46$; $\eta^2 = .09$ and at 18 weeks, $p < .001$; $F(1, 90) = 19.19$; $\eta^2 = .18$. Also ANCOVA showed a significant reduction in BMI by group at 8 weeks, $p < .05$; $F(1,89) = 5.80$; $\eta^2 = .06$ and at 18 weeks, $p < .001$; $F(1, 89) = 28.47$; $\eta^2 = .24$. The results of this study were similar to the dance intervention studies that demonstrated decreased body fat in Caucasian women (Gillett, White, & Casetra, 1996) and reduced BMI in Japanese women (Shimamoto, Adachi, Takahaski, & Tanaka, 1998).

Program Evaluation

Attendance was recorded at each dance class and the participants fell into several categories, namely, never attended (8%), attended 1 to 6 dance classes (22.5%), attended 7 to 11 dance classes (22.5%), or attended 12 to 16 dance classes (47%). The sum of the number of dance classes attended by each participant was used to assess the dose effect of the culturally specific dance intervention. Prior to beginning the study, it was postulated that the participants needed to attend 12 to 16 dances classes in order to show a dose effect (Gillett et al., 1996). Forty-six participants attended 7 to 16 classes and positive changes were noted in weight, body fat, BMI, and PASE scores from baseline to 8 weeks even in those who attended only seven sessions. Thus, attending a minimum of 7 sessions over the 8-week dance intervention was enough to show an observed dose effect. A correlation of attendance and body fat, BMI, and PASE scores are located in Table 2.

To assess acceptability of the culturally specific dance intervention, participants in the experimental group completed a questionnaire during the final interview. Overall, the participants agreed that the dance intervention was culturally specific by understanding the importance of church in their life, the importance of spirituality, their values and beliefs, dancing with other African American women, and their role as an African American woman. Furthermore, the participants reported that the culturally specific dance intervention provided a positive arena for talking about their health concerns, helped them feel good about themselves, was taught by a qualified teacher, and was carried out by research team members who respected and cared about them.

DISCUSSION

The culturally specific dance intervention significantly decreased body fat and BMI in sedentary African American women from baseline to 8 weeks and was maintained at 18 weeks when compared to the participants who did not receive the intervention. Other dance studies reported decreased body fat and BMI in sedentary, obese women who danced two to three times per week for 12 weeks (Shimamoto et al., 1998) and for 16 weeks (Gillett et al., 1996).

Twenty participants dropped out of the experimental group due to health concerns, family issues, or changes in work schedule. Nine participants dropped out of the comparison group as a result of death in their families or job changes. The retention rate was substantially higher than other intervention studies conducted in African American churches reporting retention rates of 40% (Kumanyika & Charleston, 1992), 57% (Prohaska et al., 2000), and 60% (Oexmann et al., 2000). This may be due to the fact that the study was conducted in the participants' own church, on days of the week selected by the participants, and at a time most convenient for their schedules. Additionally, the culturally specific dance intervention was taught by a respected member of their community, using gospel music chosen by the women, and designed to focus on their health.

Randomization of the churches, not the participants, limited the generalization of the results even though the churches were matched on similar characteristics. Because of the convenience sample, those who volunteered may have differed from those who did not or could not participate, even though there were no significant differences between groups in covariates and demographics at baseline. Since the participants lived in one city, generalization to African American women living in other cities may be limited; however, there exists the possibility that the beneficial results were due to the intervention rather than the church attended.

This community partnership was an effective way to promote a church-based, culturally specific dance intervention to improve the health of the African American women. An important lesson learned was that by including the ministers, church officials, and the women in the development, implementation, and evaluation phases, the dance program was meaningful to all those involved in this study. Furthermore, future studies in African American communities or other cultural groups should seek to form partnerships to identify the health concerns important to those specific communities. Community partnerships enable everyone involved to work together to develop interventions to address the important health concerns that are consistent with the beliefs and values of that specific community.

CONCLUSIONS

This study has implications for the development of culturally specific dance interventions in African American women to improve health outcomes. First, modifying the dance steps and allowing the women to choose their own intensity enabled them to make decisions about their bodies instead of treating the entire group as a whole. Second, dancing two times per week may be easier for women to work into their schedules and child care arrangements. Many African American women find it difficult exercising two to five times a week because of social, gender, and cultural expectations. Dancing two times per week may be part of the reason for such a high retention rate in this study. Third, dance interventions should include dance steps that are easy to learn, choreographed to culturally appropriate music, and taught by someone within the community. Finally, not every woman is affiliated with a church so culturally specific dance interventions could be located in outpatient settings or other community settings frequently attended by women. Culturally specific dance may be a beginning step to encourage African American women to become more physically active and improve health outcomes.

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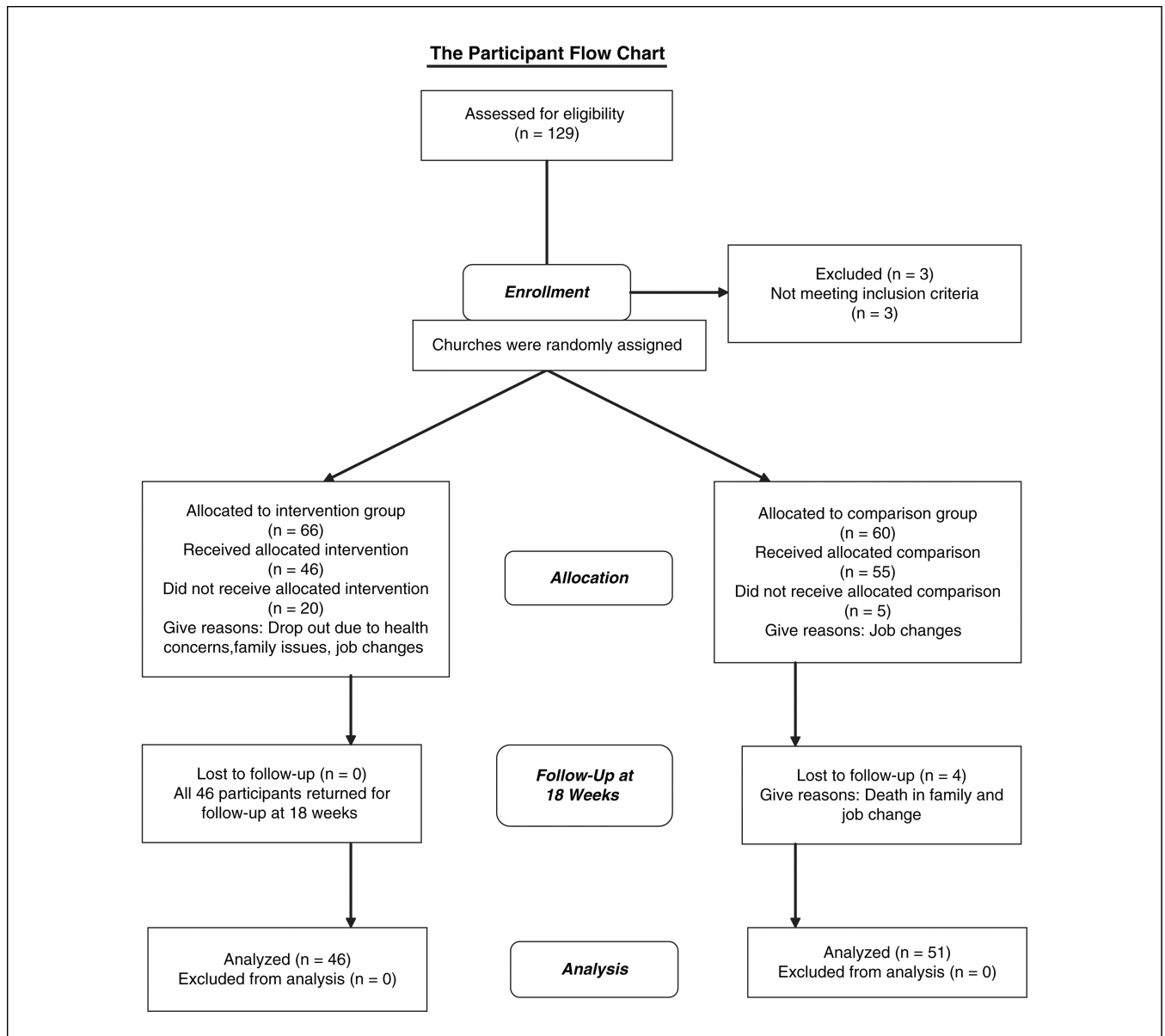


FIGURE 1.
Flow of Participants Through Each Stage of the Study

TABLE 1
Means and Differences of Body Fat and BMI at Each Time Point for the Experimental and Comparison Groups

Variables	Experimental Group M (n)	SD	95% CI	Comparison Group M (n)	SD	95% CI	F	p
%BF1	41.6 (66)	6.7	39.9–43.2	41.9 (60)	5.4	40.5–43.4	1.2	.72
%BF2	41.2 (46)	5.6	39.5–42.9	42.2 (55)	5.6	40.7–43.7	0.2	.39
%BF3	40.2 (46)	5.5	38.5–41.8	42.4 (51)	5.5	40.8–43.9	0.02	.06
BMI1	31.7 (66)	7.3	29.9–33.5	32.8 (60)	6.1	31.2–34.4	0.9	.39
BMI2	31.7 (46)	7.4	29.4–33.9	32.6 (55)	5.8	31.0–34.1	2.1	.49
BMI3	30.8 (46)	7.4	28.7–33.1	33.3 (51)	6.1	31.6–35.1	0.9	.08
PASE1	179.9 (66)	81.5	159.9–199.9	150.5(60)	84.3	128.7–172.3	3.9	.05
PASE2	201.5 (46)	79.3	178.0–225.1	160.5 (51)	78.9	139.1–181.8	6.8	.01
PASE3	179.6 (46)	69.8	158.9–200.4	165.7 (51)	76.2	144.2–187.1	0.88	.35

NOTE: BF = body fat; BMI = body mass index; PASE = physical activity scale for the elderly.

TABLE 2

Correlation Matrix of Attendance, Body Fat, Body Mass Index, and Physical Activity Scores at 8 Weeks

	Attendance	%BF	BMI2
%BF2	-.23		
BMI2	-.16	.82**	
PASE2	.15	-.03*	-.02

NOTE: BF = body fat; BMI = body mass index; PASE = physical activity scale for the elderly.

*
 $p < .05$.**
 $p < .001$