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A Culturally-Specific Dance Intervention to Increase Functional Capacity in African American Women

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Abstract

This study examined a culturally-specific dance intervention on functional capacity in African American women at three time points. The intervention was two times per week for 8 weeks using two African American churches randomly assigned to either the experimental or comparison group, had 126 participants, ages 36–82 years. Analysis of covariance revealed that both groups improved over time and the only significant difference between groups was at 18 weeks. The increase at 18 weeks in the experimental group remained when controlling for baseline covariates. This study supported culturally-specific dance as an intervention to improve functional capacity in African American women.

Keywords

African American Women; Dance Intervention; Functional Capacity

The significance of dance in the African American culture reflects an intrinsic cultural orientation toward physical expression and creativity (Farr, 1997). Dance has the potential to generate health benefits but is seldom used as an intervention even among studies advocating culturally-specific interventions. Functional capacity is the ability to walk for a distance and reflects the capability to carry out day-to-day activities, such as climbing stairs, carrying objects, performing household tasks, and occupational skills (Masse et al., 1998). Unfortunately, approximately 68% of African American women are sedentary, which is defined as not engaging in any structured physical activity in the past month (National Institutes of Health, 1996). A sedentary lifestyle decreases functional capacity. Functional capacity also tends to decrease with age, increased body fat, co-morbidity, and low socioeconomic status (SES) (American Heart Association, 2005). Therefore, the purpose of this study is to provide empirical data about a culturally-specific dance intervention to increase functional capacity in sedentary African American women.

BACKGROUND AND SIGNIFICANCE

Dance plays an important role for African Americans as a means of emotional expression, is symbolic of traditional African heritage, and is a means of interaction, support, and cohesion (Farr). The African American inclination toward a physical and aesthetic expression of feeling provides an intrinsic cultural affinity with dance as a therapeutic medium (Farr). 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

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connectedness (Jain & Brown, 2001). Culturally-specific dance includes those activities having a cultural or regional influence or those choreographed to cultural music. For a culturally-specific dance intervention to be effective, it must be consistent with the shared beliefs, values, and practices of the specific culture as it is the cultural and daily experiences that deeply influence how people choose their health behaviors (Jain & Brown). Culturally-specific dance is especially important to women as it includes social contact and companionship and does not always require a partner (Conner, 2000). It can be altered to match the age and health status of individuals without reducing the psychological and physiological benefits. Culturally-specific dance can capture the imagination of individuals in ways that other forms of physical activity cannot due to its symbolic qualities (Conner).

Culturally-specific dance may serve as a formal or informal means of health promotion through positive lifestyle change. Only one study was found that used culturally-specific gospel music to increase physical activity in African American women (Turner, Sutherland, Harris, & Barber, 1995). Studies of culturally-specific dance interventions reveal decreased trait anxiety in American Indian women (Skye, Christensen, & England, 1989), increased bone density in older Viennese women (Kudlacek, Pietschmann, Bernecker, Resch, & Willvonseder, 1997), and decreased falling risk in elderly Japanese women (Shigematsu et al., 2002). Culturally-specific dance was also a vehicle for cultural transmission of beliefs, values, and traditional healing in African (Farr), Hispanic (Whitehorse, Manzano, Baezconde-Garbanati, & Hahn, 1999), Egyptian (El Guindy & Schmais, 1994), Middle Eastern (Trevelyan, 1996), and Chinese cultures (Hong, Li, & Robinson, 2000).

Functional capacity is defined as the ability to walk for a distance and is important to everyday activities like shopping, caretaking, domestic activities, and errands. Changes in functional capacity are assessed by improvement in timed walking tests, graded exercise tests, or cycle ergometer tests. Improved functional capacity is a key outcome indicating the benefits of an exercise intervention. One dance intervention study documented increased functional capacity in rheumatoid arthritis participants that included mostly older Caucasian women (Moffet, Noreau, Parent, & Drolet, 2000). Thus, studies specifically about functional capacity changes in African American women who have completed a culturally-specific dance intervention are limited.

The research questions for this study were: (1) Does the 8-week culturally-specific dance intervention increase functional capacity from baseline to 8 weeks in the experimental group compared to the comparison group? (2) Is there a difference in functional capacity between the experimental group and the comparison group at 18 weeks? and (3) What are the differences in functional capacity at 18 weeks when controlling for the covariates of baseline body fat, age, co-morbidity, and socioeconomic status when compared to those who do not receive the intervention?

DESIGN AND SAMPLE

A quasi-experimental design was used to accommodate the 8-week and 18-week observations. Two African American churches in the local metropolitan community were randomly assigned to either the culturally-specific dance intervention or the comparison group protocols to control for diffusion of treatment. Random assignment to study protocols was based on a blind draw of sealed envelopes. The ministers of each church were informed that a blind draw would determine which church would receive either the experimental or comparison group protocols. The two churches were approximately 5 miles apart and were unaware of other churches participating in the study. A convenience sample of African American women who met the inclusion criteria of: (1) 35 years of age and older, (2) ability to speak and read English, (3) membership in the church, (4) not currently engaged in an

exercise program, (5) having written medical clearance from their physician, and (6) having signed the written informed consent form. Exclusion criteria included those women who verbalized participating in an exercise program 2–3 times per week or were confined to a wheelchair. Informed consent was obtained from each participant by the principal investigator as they were enrolled. A power of .90, alpha of .05, and a medium effect size of .35, yielded a required sample of 88 participants, or 44 per group (Faul & Erdfelder, 1992). Based on other physical activity studies that involved African American women (Prohaska, Peters, & Warren, 2000; Psaty et al., 1994; Wierenga & Wuethrich, 1995), a 15% attrition rate was calculated into the projected study sample size, resulting in a sample of 101 participants, or 52 participants per group to maintain power. A total sample size of 126 participants (66 in the experimental group and 60 in the comparison group) was recruited, ages ranged from 36 to 82 years.

PROCEDURE

Permission was obtained from the minister of each church and Human Subjects Approval was obtained from University Hospitals of Cleveland Institutional Review Board (IRB). The study was announced from the pulpit and advertised in the church bulletin at each church. African American women were recruited from the church over a one-month recruitment period. Participants' data were collected at both churches by members of the research team who were trained in administering the study protocol. The research team consisted of five members: the principal investigator, three African American undergraduate nursing students, one African American Exercise Physiologist, and one African American registered nurse.

An experienced African American female dance instructor led the dance sessions, twice a week for 8 weeks, for a total of 16 sessions. Each dance session lasted for 45 minutes and included a 5-minute warm-up period, 30-minute dance segment, and 10-minute cool-down period. The culturally-specific dance intervention was of moderate intensity, choreographed to have one foot in contact with the floor at all times. The dance routines consisted of simple dance steps that were easy to learn and master and involved repetitive movement of the legs and trunk and intermittent movement of the arms. Movement of the legs included: extension, flexion, abduction, adduction, and rotation of the leg and foot to perform forward, backward, and side stepping movements. Other leg movements included placing one foot to the front, side, and behind the other foot, heel rises, and forward and side lunges.

The dance routines were choreographed to gospel music selected by the African American women and the same gospel music and dance routines were used in each dance session. Many dance steps were modified to increase intensity for those who elected to "pick up the pace", or at a lower intensity for those with physical limitations, such as pain, arthritis, or hip/knee discomfort. The women chose their own intensity level as the intervention was not proposed to improve maximal aerobic capacity or other measures of aerobic fitness that are typically measured in exercise interventions held three to five times per week. Dance sessions were held in the fellowship hall of the church to comfortably accommodate the dance participants.

At the end of the 8-week culturally-specific dance intervention, the participants received a free video of the dance routines to enable them to continue dancing on their own. The comparison group continued their normal daily activities and routines and received health information mailings about African American women: (1) heart disease at 2 weeks, (2) obesity at 6 weeks; (3) type 2 diabetes at 10 weeks; (4) and hypertension at 14 weeks during the study. After the 18-week data collection period, they received the same free dance video as the experimental group.

MEASURES

The participants completed three face-to-face interviews (baseline, 8 weeks, and 18 weeks) for assessment of functional capacity, which was performed in a private area of their own church scheduled at their convenience. For all three measurement points, participants wore appropriate clothing and shoes that helped to assure accurate measures of functional capacity and body fat. Functional capacity was assessed with the 6-minute walk test by having the participants walk as far as possible around a pre-measured area of their church at their own pace for 6 minutes. They were informed that they could rest if necessary. The distance walked in 6 minutes was measured in feet precisely with a rolling measurement instrument (DigiRoller Plus II, Model 6425, Carson City, NV). Time was measured with a digital stopwatch. Body fat was measured using a segmental bioelectrical impedance arm-to-arm analyzer (BIA), a non-invasive method of estimating body composition (Omron Body Fat Analyzer, Model HBF-306, Bannockburn, IL). Each participant's hands and fingers griped the sensor electrodes on the handles of the device while standing erect, feet shoulder width apart, arms parallel to the ground, and elbows extended. The arm-to-arm analyzer is comparable to hydrostatic weighing and has high validity coefficients for women (r=.83) (Gibson, Heyward, & Mermier, 2000).

To ensure accurate measures at all three time points, the principal investigator trained research team members about the correct use of the DigiRoller Plus II and the Omron HBF-306 according to the manufacturers' guidelines. The covariates of age, SES, and comorbidity were assessed by self-report during the baseline interview. Co-morbidity was measured using the Charlson Scale, which uses a weighted sum of co-morbid conditions that mirror the functional burden of illness conditions (Charlson, Pompei, Alex, & MacKenzie, 1987). The co-morbid conditions included heart disease, peripheral vascular disease, stroke, shortness of breath, ulcers, diabetes, kidney disease, cancer, leukemia, liver disease, and immunodeficiency diseases.

DATA ANALYSIS

All data obtained from the measures were screened for completeness prior to entry into the Statistical Package for the Social Sciences (SPSS, Version 14.0) database. Because the proposed study used a quasi-experimental design, the intervention and comparison groups were compared on all baseline measures to evaluate equivalence for descriptive and interpretive purposes. Descriptive, correlation, univariate analysis of covariance (ANCOVA) analyses, and hierarchical regression were used to answer the study questions. Underlying assumptions of ANCOVA and regression were assessed and met prior to proceeding with that statistical test.

RESULTS

There were no significant differences in covariates at baseline (See Table 1 and Table 2). Univariate ANCOVA was used to assess the difference between groups for functional capacity at 8 weeks and 18 weeks while controlling for the baseline measure of functional capacity. All assumptions for ANCOVA were met and the Bonferroni statistic was used to control for Type I error. Univariate ANCOVA revealed significant improvement in functional capacity over time for both groups at 8 weeks ($p<.001$; $F=74.44$; $\eta^2=.45$) and at 18 weeks ($p<.001$; $F=63.67$; $\eta^2=.41$) and significant difference between groups only at 18 weeks ($p=.04$; $F=4.20$; $\eta^2=.04$). Research question 1 was not supported as both groups improved over time but there was no significance difference between groups from baseline to 8 weeks. Research question 2 was supported as there was a significant difference in

functional capacity at 18 weeks for those women who received the culturally-specific dance intervention compared to the women who did not receive the intervention (See Table 3).

To answer the third question, hierarchical multiple regression was conducted to determine the differences between the study groups on functional capacity at 18 weeks. The covariates of baseline body fat, age, SES, and co-morbidity were added in the first step and group was added in the second step. The overall hierarchical regression equation was significant ($p<.001$; $F=11.89$) and the variables explained 45% of the increase in functional capacity at 18 weeks. Of these variables, body fat ($\beta=-.19$), age ($\beta=-.42$), and group ($\beta=.35$) were significant ($p=.02$, $p<.001$, and $p<.001$, respectively). Therefore, functional capacity remained at 18 weeks in those women who received the intervention when controlling for the covariates compared to those who did not receive the intervention (See Table 4). As a result, the women who participated in the culturally-specific dance intervention had a significant increase in functional capacity. Age and body fat had the most relative influence at 18 weeks when compared to those who did not receive the intervention.

DISCUSSION

This study provided empirical data about a culturally-specific dance intervention to improve functional capacity in sedentary African American women. Functional capacity was measured using a timed walking test that was sensitive enough to detect significant changes in those who completed the intervention compared to those who did not. Previous studies supported significant changes in functional capacity after completing a dance program in women (Noreau, Martineau, Roy, & Belzile, 1995; Perlman et al., 1990), but included few African American women. The culturally-specific dance intervention was within their own community, taught by a respected member of their community, to gospel music selected by the women. The dance steps were altered to match the age and health status of the women without reducing the health benefits. Also, modifying the intensity of the dance steps incorporated the needs of those who wanted greater intensity and those who had physical limitations. The women chose their intensity which respected their ability to make choices about their own bodies and health conditions. Furthermore, the culturally-specific dance intervention was held twice a week to encourage participation among a population that tends to have a high rate of comorbidity and functional limitations.

LIMITATIONS

Randomization of the church groups and not the individual participants limited the generalization of the results even though the groups were matched on similar characteristics. Because of the convenience sample, those who volunteered may have been different from those who did not or could not participate. Since the participants lived in one city, generalization to other African American women who attend church may be limited, but still possible with the culturally-specific dance intervention as the results were because of the intervention and not due to the church attended.

IMPLICATIONS

This study has implications for the development of future culturally-specific dance interventions in sedentary African American women to improve health outcomes. Modification of the dance steps and allowing each participant to choose their own intensity enabled them to make their own decisions instead of treating the entire group as a whole. For many African American women exercising 3–5 times a week is difficult because of social, gender, and family expectations. Dancing two times per week may be a good starting point for African American women as it might be easier to work into their schedules and child care arrangements. Dance interventions should be taught by a respected member

within the community, to dance steps basic enough to acquire with minimal skill, and choreographed to culturally appropriate music. Also, the culturally-specific dance interventions could be located in community or outpatient settings to reach those who are not affiliated with a church.

There is very little research about culturally-specific dance and positive health outcomes in African American women. Given the prevalence of obesity, type 2 diabetes, and hypertension in the African American community, culturally-specific dance intervention studies should consider body fat, body weight, blood glucose, and high blood pressure management as dependent variables. For instance, a study could ascertain the effects of a culturally-specific dance intervention on blood glucose, or how weight loss after the dance intervention might mediate blood pressure management. Future studies ought to include different physiological measures associated with independent living such as range of motion, strength, balance, sit and stand test, and flexibility. Furthermore, studies should include psychological (mood, anxiety, stress, depression, and loneliness) and spiritual measures to assess the mental health benefits associated with culturally-specific dance. 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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Table 1

Comparison of Covariates at Baseline of Experimental Group (n=66) and Comparison Group (n=60)

	Experimental Group (n=66)		Comparison Group (n=60)			
Variables (range)	**M**	**SD**	**M**	**SD**	**t**	**P**
Age (yrs) (36–82 yrs)	58.05	10.18	59.43	11.9	.71	.48
Charlson (0–7)	.74	1.15	.95	1.58	.85	.40
Body Weight (kg) (48.8–146.8)	83.13	21.86	87.73	17.21	1.30	.20
Body Weight (pounds) (107–323)	183.34	47.89	192.95	37.92	1.25	.21
Body fat (bia %) (26.5–60.8)	41.60	6.67	41.98	5.38	.36	.72
Body mass Index (bmi kg/m^2) (21–51.7)	31.75	7.31	32.79	6.11	.86	.39

Charlson=co-morbidity scale.

Note.

** p<.001,

* p<.05

Table 2

Comparison of Marital Status, SES, and Education at Baseline of Experimental Group (n=66) and Comparison Group (n=60)

	Experimental Group n=66		Comparison Group n=60		Chi Squared X^2	P
	N	%	N	%		
Marital Status						
Single	12	18.2%	16	26.7%		
Married	34	51.5%	19	31.7%	10.087	.073
Divorced	16	24.2%	14	23.3%		
Widowed	4	6.1%	6	10%		
Separated	0	0	2	3.3%		
Other	0	0	3	5%		
SES						
Under 10,000	2	3.6%	6	10%		
10,001–20,000	8	12.1%	14	23.3%		
20,001–30,000	8	12.1%	4	6.7%		
30,001–40,000	10	15.2%	8	13.3%		
40,001–50,000	7	10.6%	9	15%	13.487	.263
50,001–60,000	9	13.6%	7	11.7%		
60,001–70,000	2	3%	2	3.3%		
70,001–80,000	2	3%	0	0		
80,001–90,000	3	4.5%	1	1.7%		
90,001–100,000	2	3%	0	0		
Over 100,000	3	4.5%	0	0		
Education						
Did not finish	1	1.5%	3	5%		
high school	15	22.7%	14	23.3%		
Some college	19	28.8%	19	31.7%	3.089	.798
Associate/Technical	7	10.6%	6	10%		
Bachelor’s degree	13	19.7%	13	21.7%		
Master’s degree	9	13.6%	4	6.7%		
PhD	2	3%	1	1.7%		

Note.

** $p<.001$,

* $p<.05$

Table 3

Analysis of Covariance of Functional Capacity by Group at 8 weeks and 18 weeks.

Source	F	P	Eta squared
Distance			
8 weeks	74.44	**	.45
18 weeks	63.67	**	.41
Group			
8 weeks	.06	.81	.00
18 weeks	4.20	*	.04

Note.

** p<.001,

* p<.0

Table 4

Hierarchical Regression Analyses: Change in Functional Capacity at 18 weeks when controlling for Covariates

Variables	β	Beta	
Step 1			
Body fat	−10.49	−.19 *	
Age	−14.07	−.47 **	
SES	24.15	.25 *	
Charlson	−26.79	−.11	
Step 2			F=11.89 **, Adjusted R^2=.45
Body fat	−10.74	−.19 **	
Age	−12.51	−.42 **	
SES	14.56	.15	
Charlson	−16.38	−.07	
Group	237.76	.35 **	

SES=Socioeconomic Status;

Note.

** p<.001,

* p<.05