Published in final edited form as:
Res Theory Nurs Pract. 2008 ; 22(3): 192–204.

Self-Efficacy and Social Support as Mediators Between Culturally Specific Dance and Lifestyle Physical Activity

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Abstract

Culturally specific dance has the potential to generate health benefits but is seldom used even among studies advocating culturally specific interventions. This study examined the components of self-efficacy and social support as mediators between culturally specific dance and lifestyle physical activity in African American women ($N = 126$). An experimental design compared intervention and control groups for mediating effects of self-efficacy and social support on lifestyle physical activity. Findings indicated that only outcome expectations and social support from friends mediated effects. Culturally specific dance is a first step in encouraging African American women to become more physically active and improve health outcomes. The implications are that culturally specific dance programs can improve health outcomes by including members of underserved populations.

Keywords

dance; African American women; self-efficacy; social support

Physical activity is a leading health indicator, and lack of it is associated with five of the ten leading causes of death (USDHHS, 2000). Unfortunately, a large percentage of African American women are physically inactive, which increases their chance of developing obesity (Kushner, Racette, Neil, & Schoeller, 1995), cardiovascular disease (American Heart Association, 2005), type 2 diabetes (Cowie, Harris, Silverman, Johnson, & Rust, 1993), and hypertension (Boutain, 1999). Women encounter many obstacles to being physically active across their lifespan as societal, gender, and cultural expectations shape their daily lives and influence their priority for physical activity. They spend very little time participating in organized sports, conditioning exercises, and recreational activities and significantly larger portions of their day engaging in lifestyle physical activities. Lifestyle physical activity is the daily accumulation of physical activity that includes leisure, occupational, household, family care, and moderate-intensity activities that are part of everyday life (Ainsworth, Irwin, Addy, Whitt, & Stolarczyk, 1999; Dunn, Andersen, & Jakicic, 1998). The study's objective was to examine the mediating effects of self-efficacy and social support between culturally specific dance and lifestyle physical activity in African American women.

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LIFESTYLE PHYSICAL ACTIVITY, CULTURALLY SPECIFIC DANCE, AND RELATIONSHIP MEDIATORS

Studies show that interventions to increase lifestyle physical activity typically result in more walking, increased use of the stairs, and more yard work (Blair, Kohl, & Gordon, 1992). Health benefits associated with increased lifestyle physical activity include decreased systolic blood pressure and body fat, improved cardiorespiratory fitness (Dunn et al., 1997), decreased diastolic blood pressure, and significantly increased physical activity (Dunn et al., 1999). Thus, increased lifestyle physical activity can result in significant health benefits, which has particular relevance to African American women.

Culturally specific dance is 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). It requires the movement and coordination of large and small muscle groups and encompasses purpose, intentional rhythm, and culturally shaped sequences of nonverbal body movement that have inherent aesthetic value (Hanna, 1995). It is essential that culturally specific dance interventions be consistent with the shared beliefs, values, and practices of the specific culture (USDHHS, 2000), as it is the cultural and daily experiences that deeply influence how people choose their health behaviors (Eyler, Baker, Cromer, & King, 1998). Studies show that participation in culturally specific dance programs can decrease body weight (White et al., 1984), decrease body fat (Gillett, White, & Casetra, 1996), reduce body mass index (Shimamoto, Adachi, Takahashi, & Tanaka, 1998), decrease falls (Shigematsu et al., 2002), and increase bone mineral density (Kudlacek, Pietschmann, Bernecker, Resch, & Willvonseder, 1997); however, none of these studies included African American women.

Culturally specific dance has played an important role for African Americans as a means of emotional expression, a symbol of traditional African heritage, and a form of interaction, support, and cohesion (Farr, 1997). Culturally specific dance may be an effective intervention to increase lifestyle physical activity in African American women.

Including mediation analyses in intervention studies is important for several reasons. First, their inclusion allows change to be identified in the proposed mediators and subsequent alteration of the intervention to produce change in the unaffected mediator (MacKinnon & Dwyer, 1993). Second, mediation analysis helps build a theory of the causal process for behavior change interventions (MacKinnon, 1994). Theory building helps create a more refined intervention by eliminating mediators unrelated to the expected outcomes and the associated intervention. Finally, more efficient and effective interventions could be developed if mediational analyses were routinely reported (MacKinnon & Dwyer, 1993).

Yet few studies have reported the mediating effects of self-efficacy and social support for intervention studies. This is surprising as intervention studies commonly have examined the relationship between an intervention and outcome variables by looking at changes in self-efficacy and social support between experimental and comparison groups (Calfas, Sallis, Oldenburg, & French, 1997; De Bourdeaudhuij & Sallis, 2002; Resnick, 2002; Resnick, Orwig, Magaziner, & Wynne, 2002) without mediation analyses. Based on this, there is a need for mediational analyses of physical activity studies to link the supporting theory with the mediating variables and with the overall success or lack of success of the intervention (Baranowski, Anderson, & Carmack, 1998). To date, there are no studies that examine the effects of a dance intervention using mediation analyses. Thus, the objective of the study was to examine the mediating effects of self-efficacy and social support between culturally specific dance and lifestyle physical activity in African American women.

Conceptual Framework

An individual's self-efficacy is theorized to be an important driver of health-related behavior. The conceptual framework for this study is based on the social cognitive theory (SCT) of self-efficacy, defined as a judgment of one's own capability to accomplish a certain level of performance (Bandura, 1977). Choosing to be physically active is influenced by an individual's belief in the ability to perform the behavior and the consequences of performing the behavior through a set of personal, behavioral, psychosocial, and environmental factors (Bandura, 1997). These factors influence one another, and the success of increasing lifestyle physical activity is based on an individual's ability to regulate behavior in these domains (Pinto, Marcus, & Clark, 1996). For this study, personal factors included body fat, age, comorbidity, and socioeconomic status and were postulated as covariates as they may potentially influence lifestyle physical activity (Andersen et al., 1999; Dunn et al., 1999). The culturally specific dance intervention was the behavioral factor.

Self-efficacy and social support are the psychosocial factors. Self-efficacy is composed of efficacy expectations and outcome expectations. Efficacy expectations are the person's perceived ability to perform a specific behavior, and outcome expectations are beliefs about whether a specific behavior will cause a certain outcome (Bandura, 1977). Self-efficacy hinges on the premise that a person's perceived ability to perform a specific behavior resulting in certain outcomes relies on positive reinforcement through social support (Bandura, 1989). Social support is the comfort, assistance, and information received and shared through formal and informal contacts with others (Wallston, Alagna, DeVellis, & DeVellis, 1983). It provides a sense of belonging to a cultural group that shares similar values and interests (Wallston et al., 1983). Part of social support is the interpersonal interactions that occur during physical activity, especially between those who are similar in age, gender, and health status. The social interactions can serve as a form of social support and have been identified as motivating factors for beginning and continuing a physical activity program in African American women (Clark, 1996; Eyler et al., 1998). There is empirical support for self-efficacy and social support as predictors between exercise interventions and positive health outcomes (Duncan & McAuley, 1993; McAuley, Courneya, Rudolph, & Lox, 1994; McAuley, Shaffer, & Rudolph, 1995).

Environmental factors also play an instrumental role in physical activity participation among African American women. Lack of exercise facilities nearby, unsafe neighborhoods, weather (Nies, Vollman, & Cook, 1999), and lack of an exercise companion (Conn, 1998) are environmental barriers frequently expressed by African American women. However, church settings are preferred as they symbolize a strong sense of community, belonging, and purpose in the lives of African American women (McRae, Carey, & Anderson-Scott, 1998). Successful health promotion programs for African American women have been located in church settings (Peterson, Atwood, & Yates, 2002).

This study provided the opportunity to test SCT as a mediational model for the effects of an intervention (see Figure 1). The culturally specific dance intervention was expected to have a main effect on lifestyle physical activity and functional capacity. Baseline covariates were postulated as potential confounding variables on lifestyle physical activity and functional capacity and were controlled for during statistical analysis. The outcome of culturally specific dance on the main effects of lifestyle physical activity and functional capacity (Murrock & Gary, 2007a) and on weight and body mass index (BMI; Murrock & Gary, 2007b) is presented elsewhere.

For this study, the mediational model guided the hypothesis that self-efficacy and social support were mediators between the 8-week culturally specific dance intervention and

lifestyle physical activity. Self-efficacy and social support were important in the design of the intervention as they were hypothesized to be the mechanisms by which the dance intervention influenced behavior. Self-efficacy was enhanced by choreographing dance steps that were easy to learn and master. Thus, successful mastery of the dance steps was considered the most effective means of influencing self-efficacy (Bandura, 1998). Conducting the dance intervention within the intimacy of the church environment, in a safe and familiar location and in a group of all women, was expected to capitalize on an existing social support system. Thus we hypothesized mediation from social support. As a result, proposed mediators were drawn from SCT, expected to be changed by the intervention, and were measured as part of the evaluation of the effects of the intervention.

METHODS

Design and Sample

A quasi-experimental design accommodated the longitudinal intervention. To control for diffusion of treatment, two churches in the local African American community were randomly assigned to either the experimental group or the comparison group protocols. Power analysis using hierarchical regression was conducted. Using a power of .90, alpha of .05, a medium effect size of .15, and three predictors, analysis yielded a sample size of 100 participants or 50 per group (Faul & Erdfelder, 1992). The final sample of 126 participants (66 in the experimental group and 60 in the comparison group) was recruited and resulted in an observed power of .97 and a medium effect size of .14. Permission was obtained from the minister of each church and approval for the study was obtained from University Hospitals of the Cleveland Institutional Review Board (IRB).

Recruitment

Recruitment began during the month prior to the study implementation at the participant's own church and lasted 4 weeks. The study was announced every Sunday morning and advertised each week in the church bulletin at both churches. Baseline data were collected prior to beginning the culturally specific dance intervention and at the completion of the 8-week dance intervention. A convenience sample of African American women was recruited who volunteered and met the following study criteria: (a) 35 years of age and older, (b) ability to speak and read English, (c) membership in either study church, (d) written medical clearance from a health care provider to participate in the study, and (e) a signed, written informed consent form.

Experimental and Comparison Group Protocols

An experienced African American female dance instructor led each dance session twice a week for 8 weeks and for a total of 16 sessions. Each dance session lasted 45 minutes and included a 5-minute warm-up period, 30-minute dance segment, and 10-minute cool-down period. The dance protocol consisted of simple dance steps that were easy to learn and master. Mastery of the simple dance steps was viewed as a source of enhancing efficacy and outcome expectations for increasing physical activity. The dance routines were choreographed to gospel music, and the same gospel music and dance routines were used in each dance session. The dance routine was choreographed to have one foot in contact with the floor at all times and involved repetitive movement of the legs and trunk and intermittent movement of the arms. Leg movement included extension, flexion, abduction, adduction, and rotation of the leg and foot to perform forward, backward, and sidestepping movements. Other leg movements included placing one foot to the front, side, and behind the other foot, heel rises, and forward and side lunges. All 16 dance sessions were held in the fellowship hall of the church, which comfortably accommodated the dance participants. When the 8-week dance intervention was finished, the participants received a free dance video of the

gospel music and dance routines so they could continue to dance on their own. The comparison group continued its normal daily activities and routines and received health information mailings about African American women and heart disease, obesity, type 2 diabetes, and hypertension.

Data Collection

For both groups, data were collected in two face-to-face interviews at baseline and after 8 weeks corresponding with the end of the dance intervention. The interviews were conducted in a private area of the participant's church at her convenience and took approximately 45 minutes. Baseline data were collected on demographics, body fat, comorbidity, lifestyle physical activity, efficacy expectations and outcome expectations, and social support from friends. The 8-week data collection period consisted of body fat, lifestyle physical activity, efficacy expectations and outcome expectations, and social support from friends.

Demographics and comorbidity were obtained by self-report, and body fat was measured using a segmental bioelectrical impedance analyzer (BIA), a noninvasive method of estimating body composition. Lifestyle physical activity was assessed with the Physical Activity Scale for the Elderly (PASE), as it included leisure, household, occupational, and volunteer activities common in African American women ages 40 and over. The PASE was a 10-item scale that assessed physical activity during the past 7-day time frame (Washburn, Smith, Jette, & Janney, 1993). Frequency of leisure activity assessed how often the participant engaged in the activity over the past week. Responses were recorded using a 4-point scale of 0 = never, 1 = seldom (1–2 days/week), 2 = sometimes (3–4 days/week), and 5 = often (5–7 days/week). Duration was assessed by the recorded amount of time spent on the activity in the past week. Responses were categorized on a 4-point scale of 1 = less than 1 hour, 2 = 1–2 hours, 3 = 2–4 hours, and 4 = more than 4 hours. Household activities (indoor, outdoor, and caring for others) were recorded as 1 = no and 2 = yes responses; the frequency and duration of household activities were not measured by the PASE instrument. Occupational activities were work for pay or volunteer (1 = no, 2 = yes). Average daily frequency was computed by dividing the number of hours worked in the past week by 7. The total PASE score was computed by multiplying the amount of time spent in each activity (hours/week) by the item weights and summed to provide an estimate of an individual's physical activity level. Higher scores indicated greater lifestyle physical activity. For this study, Cronbach's alpha was 0.79.

Self-efficacy was measured with the Self-Efficacy for Exercise Scale (SEE) and the Outcome Expectations for Exercise Scale (OEE). The SEE scale was a 9-item instrument that asked participants to rate expectations in their ability to dance two times per week for 30 minutes (Resnick & Jenkins, 2000). Participants ranked expectations of their ability to dance on a 10-point Likert scale from "Not confident" (1) to "Very confident" (10). The scale was scored by summing the numerical ratings for each item on the scale and dividing by the total number of items comprising the scale. Higher scores indicated stronger efficacy expectations for dancing. Cronbach's alpha was .91. The OEE scale was a 9-item instrument that measured the perceived physical and mental benefits of dancing (Resnick, Zimmerman, Orwig, Furstenberg, & Magaziner, 2000). Five items assessed the physical benefits of dancing (feel better, less tired, stronger muscles, more endurance, strengthen bones) and four items assessed the mental health benefits (better mood, enjoy dancing, personal accomplishment, mentally alert). Participants indicated their level of agreement on a 5-point Likert scale ranging from "Strongly disagree" (1) to "Strongly agree" (5). The scale was scored by summing the numerical ratings for each item on the scale and dividing by the total number of items comprising the scale. Higher scores indicated strong outcome expectations for dancing. Cronbach's alpha was 0.95.

The mediating variable of social support was measured using the Social Support for Exercise Scale (SSES; Sallis, Grossman, Pinski, Patterson, & Nader, 1987). This 10-item instrument measured support from friends for dancing on a 5-point Likert scale from 1 (none) to 5 (very often) with a range of scores from 1 to 5. High scores indicated strong support for dancing and low scores indicated weak support for dancing. Cronbach's alpha was 0.95.

Data Analysis

All data obtained from the measures were examined for completeness prior to entry into the Statistical Package for Social Sciences (SPSS) version 14.0 database. Intent-to-treat analysis was used as all participants' data were used regardless of attendance at dance classes. Missing data were imputed using the posttest mean value of the group to which the participants with missing data were assigned. Missing data from the PASE were analyzed as no activity. Before proceeding with the tests of mediation, an overall analysis of the assumptions for hierarchical linear regression was met. Furthermore, there were no problems of multicollinearity or influential data points. Because the study used a quasi-experimental design, the intervention and comparison groups were compared on all baseline measures to examine initial group equivalence.

Following Baron and Kenny's (1986) recommendation for testing mediation, hierarchical linear regression analyses were performed to determine whether the independent variable (dance) had a significant effect on the dependent variable (lifestyle physical activity) through the mediating variables (efficacy expectations, outcome expectations, social support from friends). Three conditions must occur for a variable to be a mediator: For the first test of mediation, the independent variable must affect the mediating variable; in the second test, the independent variable must affect the dependent variable; for the third test, the mediating variable must strongly affect the dependent variable, and the effect of the independent variable on the dependent variable must become nonsignificant (Baron & Kenny, 1986).

RESULTS

The sample of 126 African American women ranged in age from 36 to 82 with no significant difference in age, comorbidity, body weight in kilograms and pounds, body fat, or body mass index (BMI) between the experimental group ($n = 66$) and the comparison group ($n = 60$). Furthermore, there was no significant difference in marital status, socioeconomic status (SES), and education between the two groups at baseline. Even though there were no differences in covariates between groups at baseline, they were controlled for during the tests of mediation. At the 8-week data collection period, 101 participants (46 intervention group and 55 comparison group) completed all measures. The overall retention rate was 80% (101/126), with a 70% retention rate for the intervention group (46/66) and a 92% retention rate for the comparison group (55/60). Twenty participants dropped out of the intervention group due to health concerns, family issues, changes in their work schedule, or because they were lost to follow-up. Five participants dropped out of the comparison group due to deaths in their families, job changes, or because they were lost to follow-up. There was no difference in baseline characteristics between those who dropped out and those who completed the study. Personal and family situations were the main reasons for dropping out in both groups. The implications of higher attrition in the experimental group may have resulted from the time required to participate in the dance intervention.

In the first test of mediation, the mediating variables (efficacy expectations, outcome expectations, social support from friends) were regressed on the independent variable (dance) controlling for baseline covariates. Efficacy expectations ($\beta = -.031$, $t(99) = -.31$, $p = .76$) were not significant when regressed on the independent variable of dance. Therefore,

no further tests of mediation were conducted on this variable as dance did not strongly affect efficacy expectations. However, outcome expectations (β = .33, $t(99) = 3.52$, $p = .001$) and social support from friends (β = .22, $t(99) = 2.30$, $p = .02$) were significant for the first test of mediation when regressed on dance. This test showed that there was a moderate direct effect between dance and both outcome expectations and social support from friends, controlling for baseline covariates. For the second test of mediation, the dependent variable of lifestyle physical activity was regressed on dance, controlling for baseline covariates. This test revealed that the moderate direct effect of dance on lifestyle physical activity was also significant (β = .25, $t(99) = 2.60$, $p = .01$), controlling for baseline covariates.

For the third test of mediation for outcome expectations, lifestyle physical activity was regressed on outcome expectations and dance, controlling for baseline covariates. The effect of dance on lifestyle physical activity was nonsignificant (β = .12, $t(98) = 1.17$, $p = .24$), and the effect of outcome expectations on lifestyle physical activity remained statistically significant (β = .21, $t(98) = 2.06$, $p = .04$). This supported the third condition of mediation as the mediating variable affected the dependent variable and the effect of the independent variable on the dependent variable became nonsignificant. For the third test of mediation of social support from friends, lifestyle physical activity was regressed on social support and dance, controlling for baseline covariates. The effect of dance on lifestyle physical activity was nonsignificant (β = .17, $t(98) = 1.76$, $p = .08$), and the effect of social support on lifestyle physical activity remained statistically significant (β = .21, $t(98) = 2.16$, $p = .03$). Again, the third condition of mediation was supported as social support strongly affected the lifestyle physical activity and the effect of dance on the lifestyle physical activity became nonsignificant. Therefore, both outcome expectations and social support from friends mediated the effects of a culturally specific dance intervention on lifestyle physical activity in African American women at 8 weeks compared to women who did not receive the intervention.

DISCUSSION

This study examined whether culturally specific dance affected lifestyle physical activity and if efficacy expectations, outcome expectations, and social support mediated the relationship between culturally specific dance and lifestyle physical activity in African American women. The mediators were drawn from SCT and were incorporated into the design of the study. Following Baron and Kenny's (1986) method for testing mediation, the results indicated that only outcome expectations and social support were mediators as they affected lifestyle physical activity. This effect remained when culturally specific dance was included in the model.

SCT implies that individuals with high efficacy expectations and outcome expectations are more likely to initiate and continue a specific exercise behavior. The findings were not entirely consistent with the theory as the participants were not confident in their ability to initiate a dance program (efficacy expectations) but did agree with the physical and mental benefits of dancing (outcome expectations). One explanation could be that the women's gender roles, work obligations, and social demands were not conducive to initiating an exercise program on their own. Attending the dance intervention allowed the dance instructor to initiate the dance classes and enabled the women to get away from their home responsibilities and focus on themselves and their own needs. Another explanation could be that efficacy expectations were influential in their decision to join the dance intervention and, once they joined, efficacy expectations were no longer in effect. The results showed that the participants agreed with the outcome expectations of dancing. Furthermore, they hired the dance instructor to continue the dance classes once a week for another 16 weeks after the 8-week intervention was completed. Previous studies reported that outcome

expectations indirectly affected exercise behaviors (Resnick, 2001; Resnick, Palmer, Jenkins, & Spellbring, 2000) and are important components of adoption (Prohaska, Walcott-McQuigg, Peters, & Li, 2000) and maintenance (Banks-Wallace & Conn, 2002) of exercise in African American women. The study findings support this relationship as well.

Social support from friends was an important psychosocial factor for the participants similar in age, body fat, comorbidity, and SES. Many of the women were friends or became friends as they got to know one another during the dance intervention and offered verbal encouragement to one another during each dance class. Furthermore, anecdotally some women formed carpools and made child care arrangements with each other so they could participate in the dance intervention. Previous studies show that social support from friends was important for African American women engaging in exercise programs (Felton, Boyd, & Tavakoli, 2002) and may have contributed to the high retention rate. Thus, the inherent social support of the dance intervention in a church setting may have been more important in understanding physical activity behavior than relying on each participant's judgment of her dancing capability.

There are several limitations to this study. First, 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 baseline differences between groups. Second, the higher attrition rate in the experimental group, likely related to the time requirements of the intervention, may have resulted in findings that were different for those who continued throughout the entire period as compared to those participants who did not continue. Third, the PASE does not measure frequency and duration of household activities and thus may have missed some lifestyle physical activity undertaken by the women in the study. Finally, there was no long-term follow-up to determine if women who participated in the intervention were likely to continue their dance group. Future studies should incorporate ways to help participants keep dancing once the intervention is complete. Examples could include providing the participants with a free dance video of the dance steps or teaching the participants to lead the dance classes and having them practice leading before the intervention is complete.

In summary, reporting mediational analysis results helps build a theory by linking mediating variables with the effects of the intervention. Improving health outcomes through a dance intervention depends on more than just an individual's perceived ability to perform a specific behavior and the belief that a specific behavior will cause a certain outcome. It is important to include the relationship of social support for a specific behavior, a location in an environment that is relevant for a specific population, and a group consisting of individuals of similar age, gender, body composition, and health status. The relationship among personal, behavioral, psychosocial, and environmental factors is important when developing and testing dance interventions in specific populations. The results of this study can be helpful when developing interventions for other cultural groups.

Acknowledgments

The authors wish to acknowledge the National Institutes of Health, National Institute of Nursing Research, Ruth L. Kirschstein National Research Service Award, F31-NR009344–01, and the Frances Payne Bolton School of Nursing Alumni Research Award for funding this study.

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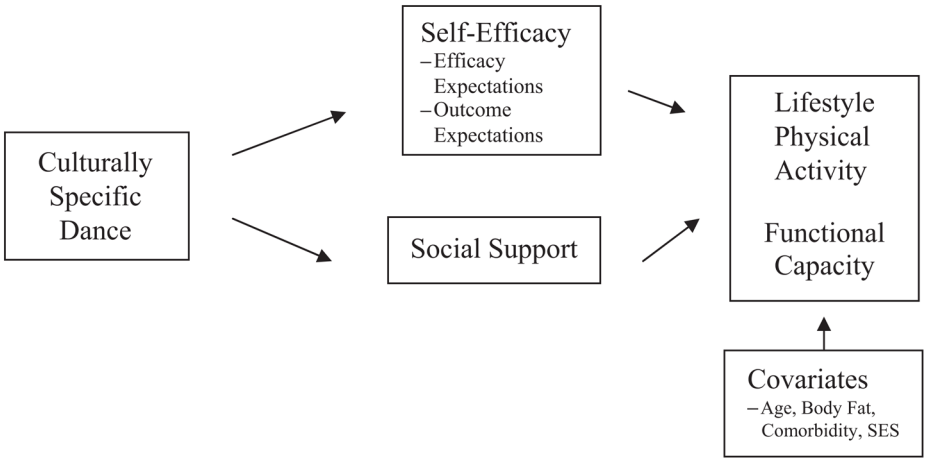

Figure 1.
Conceptual model of the study.