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A Pilot Study on the Effects of Aquatic Exercises on Discomforts of Pregnancy

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Objectives: To estimate the impact of an aquatic exercise program on perception of body image, participation in health-promoting behaviors, barriers to health-promoting participation, level of physical discomfort, and mobility.

Design: A two-group, quasi-experimental, pretest/posttest design.

Sample and Setting: A convenience sample of 40 nonexercising pregnant women who were at least 19 weeks gestation were recruited. Sixty percent of the sample was African American. Participants self-selected assignment to either the exercise or nonexercise group. Both groups completed self-report measures and underwent a mobility assessment. The exercise group participated in a 60-minute, 6-week aquatic exercise program three sessions per week. The control group was instructed to continue their normal activities of daily living.

Results: Women who had participated in the aquatic exercise program reported significantly less physical discomfort, improved mobility, and improved body image and health-promoting behaviors as compared to control subjects.

Conclusions: Aquatic exercise during pregnancy may enhance physical functioning, decreasing maternal discomfort, improving maternal body image, and improving health-promoting behaviors.
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Women often express concern about the physical discomforts they experience during pregnancy. These most frequently reported physical discomforts often include low back pain (Davis, 1996; Ireland & Ott, 2000; Wang, Dezinno, & Maranets, 2004), lower extremity edema (Katz, 2003), and leg cramps (Horns, Ratcliffe, Leggett, & Swanson, 1996; Koniak-Griffin, 1994). Exercising has been recommended to decrease the physical discomforts of pregnancy and improve body image, but few studies have evaluated the efficacy of exercise in decreasing the physical discomforts during pregnancy. While the American College of Obstetricians and Gynecologists (ACOG, 2002) advocates the health benefits of swimming for pregnant women, few studies have examined the health-related outcomes from aquatic exercise during pregnancy (Kent, Gregor, Deardorff, & Katz, 1999; Lox & Treasure, 2000).

This pilot study evaluated selected health-related outcomes between women in the 2nd and 3rd trimester of pregnancy engaged in either an aquatic exercise program or a nonexercising control group. The following outcome variables were measured: (a) body image, (b) participation in health-promoting behaviors, (c) level of physical discomfort, and (d) mobility. This study sought to determine whether Pender's Health Promotion Model (HPM) is useful for explaining women's willingness to participate in exercise during pregnancy.

Theoretical Framework

Rooted in social cognitive theory (Bandura, 1998), Pender's HPM uses a variety of individual characteristics and experiences, behavior-specific cognitions, and affects to predict and explain health-promoting behavior. The HPM integrates aspects of theories of health behavior and has demonstrated usefulness in a variety of health promotion behaviors such as physical activity research (Pender, Murdaugh, & Parsons, 2005). The HPM (Pender, 1996), which includes three categories of variables that influence health outcomes, guided the selection of the variables for this research. *Individual characteristics* reflect the unique attributes of the individual that can have a direct and indirect effect on participation in health-promoting behaviors. As represented in the Pender's model (Figure 1), these characteristics fall into three categories: biological (age, body mass index [BMI], gestational age, gravidity), sociocultural (demographics, previous exercise participation), and psychological (body image). *Behavior-specific* affect and cognition are behavioral motivators or barriers to action, such as lack of access to exercise programs and a history of sedentary behavior. *Behavioral outcomes* are changes individuals make that are influenced by commitments to action, attendance at prenatal exercise classes and prenatal education programs. This investigator has adapted the Pender's HPM to include the new dimension of *health outcomes* (Figure 1). It is theorized that changes in health-promoting behaviors should have measurable health outcomes. In this study, the specific health outcomes for pregnant women engaged in physical activity are decrease in maternal discomfort and improved mobility.

Relevant Literature

The physiological benefits of aquatic therapy are well grounded in scientific principle, but there is a paucity of research regarding the health-related outcomes of aquatic exercise during pregnancy (Katz, 2003; Kent et al., 1999; Smith, 2001). Parker and Smith (2003) conducted a preliminary study to evaluate the effect of aquatic exercises on maternal discomfort and stress-reducing behaviors. This sample consisted of 15 White working women. Exercisers reported significantly (p = .03) less pregnancy-related back pain and a higher level of participation in health-promoting stress management activities ($p < .01$)

Aquatic Exercise During Pregnancy

For pregnant women, aquatic exercise has several advantages over land-based exercise. First, chest immersion in water decreases gravitational pull, resulting in a sensation of feeling lighter. Buoyancy creates a feeling of physical comfort, improves mobility, and facilitates the use of both flexor and extender portions of the muscle groups, which, in turn, decreases postexercise pain (Wolford, 1999). In contrast, land-based exercise utilizes the flexor portion of muscles. This distinction is important for pregnant women who experience back and leg pains. Second, due to changes in the center of gravity, pregnant women are also at risk of falling during land-based exercise (Campbell, D'Aquisto, D'Aquisto, & Cline, 2003). A 3rd beneficial aspect of buoyancy is its effect on hydrostatic pressure changes. During body immersion, hydrostatic pressure is increased in proportion to the depth of the water. Increased hydrostatic pressure causes an increase in venous blood return to the cardiovascular system, and in doing so, increases urinary elimination and reduces edema (Katz, 2003).

Further, evidence suggests that aquatic exercise reduces leg edema and physical discomforts associated with pregnancy. As demonstrated by Katz, McMurray, Goodwin, and Cefalo (1990), pregnant aquatic exercisers experienced greater diuresis and thus less lower extremity edema after aquatic exercise as compared to those after non–weight bearing cycling. Smith's (2001) preliminary investigation

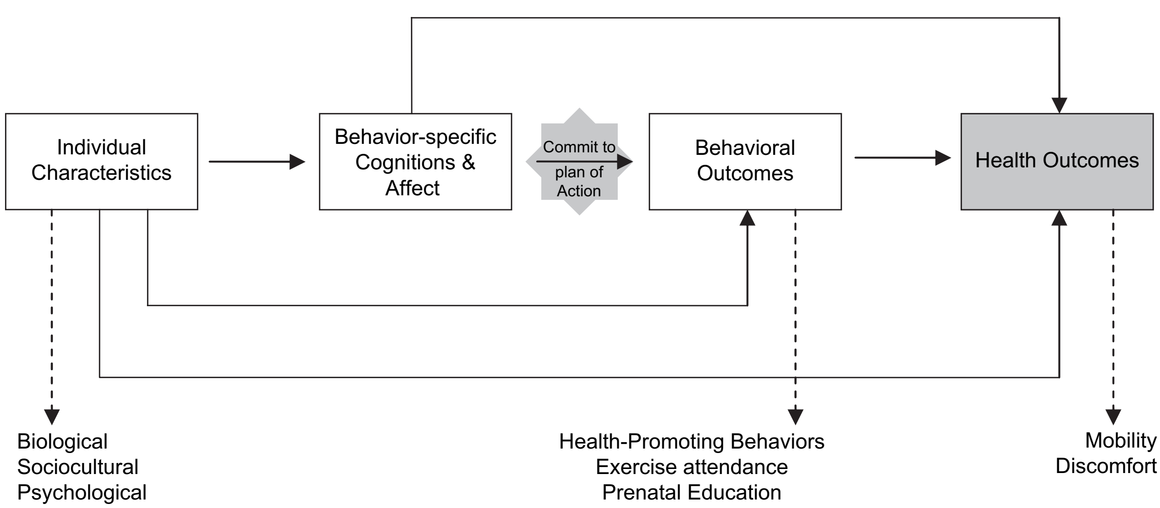

FIGURE 1
Health promotion (adapted from the Pender's Health Promotion Model).

indicated that an aquatic exercise program significantly decreased edema-related discomfort ($p = .03$) and improved mobility ($p = .001$) in pregnant women, compared to those who did not exercise.

Maternal Discomfort

Women may experience a variety of discomforts during their pregnancy, such as fatigue, nausea, ligament pain, or hemorrhoids. The three commonly reported physical discomforts during 3rd trimester pregnancy include lower back pain (Davis, 1996; Wang et al., 2004), lower extremity edema, and leg pain (Katz, 2003; Wang et al.). Only a few studies have examined the impact of exercise in reducing maternal physical discomforts.

Sternfeld, Quesenberry, Eskenazi, and Newman (1995) studied maternal discomforts among exercising and nonexercising pregnant women who were randomized into four study arms ($n = 398$). The exercise levels included (a) aerobic exercise, not including vigorous walking, with a frequency level of three times weekly; (b) aerobic exercise three times weekly, as well as vigorous walking; (c) aerobic exercise or vigorous walking once a week; and (d) no aerobic exercise consistently. Participants in exercise levels 1 and 2 reported less pregnancy-related discomforts in both the 1st and 2nd trimesters of pregnancy as compared to women at exercise levels 3 and 4. Similarly, Ostgaard, Zetherman, Roos-Hansson, and Svanberg (1994), using an experimental pretest/posttest design, demonstrated that participants who exercised reported a lower incidence of back pain and reduced sick leave absences due to pregnancy-induced back pain.

Mobility

The physiological changes of pregnancy may challenge the pregnant woman's endurance and mobility levels, leading to problems with performing activities of daily living. Mobility-related problems include changes in the center of gravity, which increases the likelihood of falling, and edema of the lower extremities, which can impede walking. These mobility problems invite a sedentary lifestyle, which may further increase the level of maternal discomfort (Clapp, 1998).

Pregnancy-related discomforts challenge women's endurance and mobility levels, leading to problems with performing daily activities.

Literature regarding mobility during pregnancy is scant. Often, mobility is addressed as a problem of inactivity, being sedentary, or having activity intolerance. In the physical therapy literature, research focuses on preventing injury during maternal exercise (Shangold & Mirkin, 1994). Dumas and Reid (1997) studied the physiological response of joint laxity resultant from pregnancy in participants in their 1st trimester who reported a prepregnancy sedentary lifestyle. Knee laxity and anterior and posterior cruciate muscle strength was measured using an arthrometer during each trimester of the pregnancy. The exercise program was designed according to the guidelines from the Fitness and Amateur Sports of Canada. The exercise group participated in a knee-strengthening program throughout their pregnancy. Findings indicated that the sedentary group had an increase in joint laxity as the pregnancy progressed, were more likely to fall, and reported less mobility.

Researchers report that pregnant women tend to decrease or cease their exercise activities around the 20th week of gestation (Clapp, 1998; Ostgaard et al., 1994). This may be due to the physiological changes associated with the 2nd half of pregnancy, such as expanding abdominal girth, changes in center of gravity, and other expected discomforts of pregnancy (Smith, 2000). Clapp lists the following benefits of exercising during pregnancy in his book, *Exercising Through Your Pregnancy*: Women who exercise before and throughout their pregnancy will gain less weight, have fewer discomforts, have shorter labors, and a speedier postpartum recovery.

Body Image

It is evident that body image is an important concern for women, especially during and after pregnancy. Pregnant women often view their bodies as unattractive (Hofmeyer, Marcos, & Butchart, 1990), particularly at 27 to 32 weeks gestation (Richardson, 1990). In contrast, overweight women report a more positive body image at 30 weeks gestation as compared to their prepregnancy state (Fox & Yamaguchi, 1997). Women during postpartum have expressed body image distress due to pregnancy-related residual weight gain (Walker, 1998). Those more distressed included primigravidas and those who started their pregnancy with lower BMI and lower exercise level (Walker).

While these studies provide a descriptive foundation for understanding body image during and after pregnancy, strategies to improve body image remain to be developed. Body image concerns have traditionally been addressed by limiting the amount of weight a pregnant woman should gain (Cunningham, 1997). As suggested by Walker (1998), exercise may also play an important role in alleviating body image distress.

Health-Promoting Behaviors of Pregnant Women

Recent evidence suggests that aquatic aerobic exercise may play an important role in promoting healthier behaviors and reducing psychological stress during pregnancy. Smith's (2001) utilization of Pender's Health Promotion Lifestyle Profile (HPLP) to assess stress management strategies identified that aquatic aerobic activity promoted a significantly higher level of stress management as compared to the nonexercising group (Parker & Smith, 2003). These findings are consistent with earlier work by Lox and Treasure (2000), in which psychological distress was significantly reduced by aquatic aerobic activity.

Methods

Design

A prospective, two-group, quasi-experimental, pretest/posttest design was utilized.

Sample and Setting

A convenience sample of 40 participants, 20 aquatic exercisers, and 20 nonexercisers was recruited from a metropolitan area. Based on prior exercise research experience, in order to reduce study attrition, participants were allowed to self-select either the control group (nonexercise) or experimental group (aquatic exercise intervention). As recommended by the Aquatic Exercise Association, class size was limited to 20 participants per instructor to provide a safe environment (Sova, 2000). The sample size is adequate to detect moderate to large effects between groups (.9 power) (Cohen 1998).

Because complaints of back pain and leg cramps are often expressed during the late stages of pregnancy (Oga et al., 1995), participants were at least 19 weeks gestation. Additional inclusion criteria were required by the recreational center, included age greater than 18 years, health care provider permission, and height of 5 ft or greater due to the pool depth of 4 ft at its shallowest point. In accordance with the ACOG parameters for safe exercise practices during pregnancy (ACOG, 2002), participants with medical complications, such as multiple pregnancies, history of preterm birth, placenta previa or gestational hypertension, or both, were excluded from the study.

Instruments

Evaluation instruments were selected to measure the major domains of the adapted Pender's HPM: Individual Characteristics, Behavioral Outcomes, and Health Outcome (Figure 1). Demographic data were collected to identify characteristics of the sample individual characteristics and experiences (Table 1). The psychological individual characteristic of body image was measured by the

TABLE 1
Pretest Demographic and Clinical Characteristics Compared by Group (N = 40)

Variable	*Exercise* (n = 20)	*Nonexercise* (n = 20)	*p Value*
Age (years)	25.1 ± 4.9	24.8 ± 5.6	NS
Education (years)	13 ± 2.1	12.7 ± 2.1	NS
Race, *n* (%)			
African American	13 (65)	11 (55)	NS
Asian	0 (0)	1 (5)	NS
White	7 (35)	8 (40)	NS
Medicaid recipient	19 (95)	15 (75)	NS
Primigravida	15 (75)	12 (60)	NS
Prenatal education	7 (35)	5 (25)	NS
Gestational age (weeks)	26 ± 5	27 ± 5	NS
Prepregnant body mass index	31 ± 10.6	29 ± 7.8	NS

Note. NS = not statistically significant.

Pregnancy Body Shape Questionnaire (PBSQ) (Fox & Yamaguchi, 1997). The PBSQ is a 34-item summated, 6-point Likert scale adapted from the Body Shape Questionnaire (Cooper, Taylor, Cooper, & Fairburn, 1987). Higher scores indicate a negative body image attitude. Internal consistency (Cronbach's alpha) has been assessed at .86 for the revised scale.

In order to evaluate the effects of aquatic exercise in promoting healthy behaviors, the HPLP was used. The HPLP, developed by Walker, Sechrist, and Pender (1987), is a 52-item summated scale, which contains six subscales (e.g., self-actualization, health responsibility, physical activity, nutrition, interpersonal relationships, and stress management). Subscale reliabilities ranged from .70 to .90 with high internal consistency estimated for the total instrument (Cronbach's $\alpha = .92$). Higher scores indicate more participation in health-promoting activities. Originally tested using a convenience sample of adults ($N = 952$), the instrument has been utilized with pregnant women (Telleen, 1993). In a preliminary study of effects of exercise on maternal discomfort and health-promoting behaviors ($N = 15$), subscale reliabilities ranged from .74 to .89, with an overall scale reliability of .93 (Smith, 2001).

Mobility was evaluated using the Timed Get Up and Go Test, which was originally designed to measure mobility in older adults (Podsiadlo & Richardson, 1991). Reliability has been estimated from .92 to .96 in samples of older adults and pregnant women (Podsiadlo & Richardson; Smith 2001). Prior to completing the test, a demonstration was given and starting procedures were discussed with each participant. Each participant was asked to sit in a standard chair without arms (approximately 46 cm seat height). On the verbal command "go," the participant was asked to stand up and walk 3 m (a red line was marked on the floor), turn, walk back to the chair, and sit down again. The test was timed with a digital watch to prevent timing errors.

Physical discomfort was assessed by Smith's Pregnancy Discomfort Intensity Index (SPDII), developed by Smith in her preliminary work (Smith, 2001). The SPDII is a 6-item summated Likert scale that measures the intensity of physical discomforts experienced during pregnancy. Higher scores reflect a greater intensity of reported physical discomfort. Reliability of the index was assessed at .89 in a sample of pregnant women (n = 15) participating in an aquatic exercise program (Smith). Additionally, this scale was administered to nurses at obstetric clinics to determine content validity.

Procedures

Institutional Review Board (IRB) approval was obtained prior to the initiation of the study. Participants were recruited from local health care providers (e.g., physicians and health departments). All participants completed the IRB-approved informed consent. The aquatic exercise program was a 6-week program, with three sessions per week. Each class was conducted at the recreation center pool and lasted 60 minutes. The exercise program was taught by an experienced obstetric nurse and two graduates of the women's health nurse practitioner program. The investigator, a certified prenatal aquatic instructor, developed the exercises and trained the instructors. The university's School of Allied Health Professions, Department of Physical Therapy, approved these exercises.

Aquatic Exercise Program

The first 10 minutes of the class involved warm-up exercises and stretches. Next, the continual movement phase lasted 25 to 30 minutes. During this portion of the class, exercises targeted large muscles of the body, such as the legs and buttocks. Participants were instructed to self-monitor their level of exercise intensity using the Perceived Level of Exertion Scale (PLES) (Borg, 1982). The PLES is a visual analog scale ranging from 6 to 20, with the safe intensity range for pregnant women between 12 and 16. The last phase of class (10-15 minutes) was designed to strengthen the abdominal muscles, stretch the muscles of the lower portion of the back, and promote flexibility. After this, a warm-down, stretch-out, and relaxation session concluded the class.

Pretesting and Posttesting

Pretesting of both control and intervention groups were scheduled at the School of Nursing 2 days prior to the start of the exercise program. Participants' height and weight were measured on a digital calibrated balance scale to compute BMI. Participants completed the pretest research instruments, which included a demographic form, SPDII, PBSQ, HPLP, and Timed Get Up and Go Test. The test administrator was not aware of participant group assignment. Prior to leaving the testing area, participants were given instructions regarding posttesting. After pretests were completed, each participant received a $10 grocery store gift certificate.

Prior to the 1st exercise session, the prenatal aquatic instructor gave a demonstration of the prenatal aquatic exercises. Participants were familiarized with the safety guidelines and the sign-in procedure for the aquatic exercise attendance record. Transportation bus tickets or parking passes were given to assist participants' attendance.

Data Analysis

Statistical analyses were performed using SPSS version 12 for Windows; demographic and clinical characteristics were evaluated to detect group differences at the initiation of the study and during posttesting. The distributional characteristics of the health-related outcome variables were examined. No extreme values, outliers, or skewedness were detected. Therefore, the distributions are assumed to be approximately normal and meet the assumptions of analysis of covariance (ANCOVA). Internal consistency estimates (Cronbach's alpha) were evaluated for each instrument. Independent t tests were analyzed to detect pretest group differences across all instruments and subscales of the HPLP. Posttest scale and subscale scores were evaluated by ANCOVA to detect group differences. Maternal discomfort level was thought to be a biasing factor in self-selection. The significance level was set at alpha $\leq$ .05.

Results

Twenty participants were recruited and retained in the exercise intervention and control groups. The exercisers' average attendance was two times per week, with Friday sessions least attended. The mean attendance rate was 75%, indicating surpassed Pender's stage of commitment to action.

Pretest Group Comparisons

The individual characteristics of the sample represented a deviation from most studies on exercise during pregnancy. Two perceived barriers to action, participating in an exercise program, for this sample were sedentary lifestyle history and obesity. The mean prepregnant BMI was in the obese range. The sample represented a deviation from most exercise during pregnancy studies. Table 1 describes sample characteristics. There were neither statistically significant differences among demographic and clinical characteristics between the groups, nor significant mean group differences across all instrument scales.

Posttest Group Comparisons

Comparisons of posttest clinical characteristics revealed that a significantly higher proportion of the exercising group participated in the health-promoting behavior of prenatal education classes as compared to the control group, $\chi^2(1, N = 40) = 6.5$, $p = .01$. No other significant group differences were identified.

Participants in the aquatic exercise program reported significantly less physical discomfort, improved mobility, improved body image, and more health-promoting behaviors.

Mean posttest comparisons of health-related outcomes by group indicated that women who had participated in the aquatic exercise program reported significantly less physical discomfort, increased participation in health-promoting behaviors, improved mobility, and positive body image as compared to control subjects (Table 2). Total HPLP posttest scores indicated that the participants were likely to participate in health-promoting behaviors ($p = .05$). Health responsibility ($p < .04$), physical activity ($p = .006$), and stress management ($p < .001$) scores indicated significantly more participation in health-promoting activities among women who had participated in the exercise group as compared to nonexercisers. Group differences regarding health-promoting practices related to nutrition, self-actualization, and interpersonal relations were not significantly different.

Discussion

At the initiation of the study, participant groups, although not randomly selected, demonstrated homogeneity across demographic, clinical, and health-related outcome characteristics. More than half of the participants were African American, all had completed high school, and several were experiencing a 2nd pregnancy. These sample characteristics represent a departure from earlier studies related to pregnancy and exercise, in which most participants were upper class, well educated, White primigravidas (Clapp & Little, 1995; Lokey, Tran, Wells, & Myers, 1991).

Maternal Discomforts

The aquatic intervention used in this study consisted of exercises designed to strengthen abdominal muscles that provided greater support for the expanding girth during pregnancy. Stretching exercises to reduce leg cramps and increase flexibility were included in each session. Study findings regarding overall physical discomforts were consistent with earlier evidence that aquatic exercise positively influences physical discomforts associated with pregnancy.

More than half of the participants were African American representing a departure from earlier studies related to pregnancy and exercise.

Mobility

Podsiadlo and Richardson (1991) had classified individuals who were capable of completing the Timed Get Up and Go measure in less than 10 seconds as functionally mobile. Reflected by the study pretest scores, which ranged from 12 to 26 seconds, it is evident that pregnancy does impede level of mobility. While the groups did not differ on level of mobility prior to the intervention, the aquatic exercising group experienced significant improvement in mobility. Increased

TABLE 2
Mean Comparisons of Health-Related Outcomes by Group (N = 40)

Variable	Exercise (n = 20) Pretest	Exercise (n = 20) Posttest	Nonexercise (n = 20) Pretest	Nonexercise (n = 20) Posttest	p Value	Mean Difference	Power (%)
Body image	65.6 ± 23.6	56.0 ± 23.7	59.1 ± 27.5	80.1 ± 34.5	.03	24.1	80
Health-promoting behaviors	135.2 ± 21.3	146.4 ± 23.8	139.3 ± 26.6	131.3 ± 26.6	.05	−18.1	78
Timed Get Up and Go (mobility), in seconds	17.7 ± 3.14	18.0 ± 4.6	17.2 ± 3.8	22.9 ± 4.0	<.001	4.9	93
Physical discomfort	3.55 ± 1.9	2.7 ± 1.3	2.8 ± 1.9	4.9 ± 1.4	<.001	2.2	98

mobility among exercisers has provided important evidence, which has not been previously investigated.

Body Image

At pretesting, while 75% of the sample could be categorized as obese, lower levels of negative body image were reported. This finding suggested that body image was not a great concern to these women. The racial diversity of the sample may explain why pregnant body image concerns did not reflect what has been previously reported in the literature (Hofmeyer et al., 1990; Walker, 1998). Recently, Morin, Brogan, and Flavin (2002) conducted a study among pregnant African American women to evaluate feelings about body image changes. When compared to White pregnant women, African American women tended to have a more positive body image irrespective of their body size. In conjunction with the differences in body image perception based on ethnicity, pregnant women who have participated in an aerobic exercise program have reported a more positive self-concept (Koniak-Griffin, 1994). The effect of the intervention did improve body image scores among exercisers (i.e., pretest M = 65, posttest M = 56) and may have been influenced by ethnicity.

Health-Promoting Behaviors

Higher scores on the HPLP are associated with participation in health-promoting activities. Participants in the exercise group had statistically significant higher posttest scores than those in the nonexercise group (p = 05).

Evidence indicates that individuals who exercise take more responsibility for their health and are more likely to engage in proactive healthy behaviors (Bottorff, Johnson, Ratner, & Hayduk, 1996; Lannon, 1997). Study findings also support this evidence: Subscale scores were significantly better for health responsibility, physical activity, and stress management among exercisers. However, it appears that the exercise intervention had little impact on the health-promoting lifestyle dimensions of nutrition, interpersonal relationships, and self-actualization.

There were no significant group differences at pretesting, but postintervention scores reflected that a significant number of exercisers became engaged in prenatal classes as compared to nonexercisers. This is an example of assuming increased health care responsibility and most likely resulted from participation in the exercise intervention. Exercisers may have encouraged each other to participate in prenatal education classes, or the exercise intervention itself may have stirred a desire among the participants to learn more about how to take care of themselves and their developing babies.

Limitations

Participant self-selection of group assignment may be a confounding variable contributing to bias among the groups. Randomization of group assignment would have limited this validity threat. While there were no group differences identified among demographics, clinical characteristics, and health-related outcome variables, the small sample size does not assure that group differences indeed do not exist. A post hoc power analysis was performed to determine the effects of using a small sample. The power analysis revealed the study had a .9 power. This pilot study has provided effect size and feasibility components for future research. A larger experimental design study with a larger sample size will be needed to further evaluate the exercise intervention and application of the Pender's model.

Clinical Implications and Future Research

There has been a paucity of research on relieving the clinical manifestations of maternal discomfort. Women report that health care providers provide little to no guidance or encouragement for pregnant women to exercise (Clarke & Gross, 2004). Nurses and childbirth educators need to provide pregnant women information on benefits of participation in exercise and should assume a health promotion leadership role in encouraging women to participate in physical activity at least five times/week × 30 minutes/time (Centers for Disease Control and Prevention, 2006).

Aquatic exercise appears to be a promising alternative to bed rest, medications, or a sedentary lifestyle but remains to be established as a superior form of exercise for pregnant women. It is unclear whether the relief in physical discomforts and mobility might be further enhanced by other types of exercises. Future large experimental design studies should address the benefits of other types of exercises as compared to aquatic exercise in relation to physical discomforts, mobility, edema, health-promoting behaviors, labor and delivery and birth outcomes.

Conclusions

This study has contributed to our understanding regarding benefits of aquatic exercise during pregnancy by providing further evidence that maternal physical discomforts, body image, and mobility can be positively influenced by aquatic exercise during the 2nd and 3rd trimesters of pregnancy. It is important to examine the long-term health outcomes of exercise during pregnancy, how long women stay committed to exercising after the postpartum period, and what type of exercise regime is preferable.

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