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Benefits of Yoga for Physical Health and Quality of Life for Older Adults - Report Series # 18

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Benefits of Yoga for Physical Health and Quality of Life for Older Adults

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About SERC (Sheridan Elder Research Centre)

Through applied research the Sheridan Elder Research Centre (SERC) will identify, develop, test and support implementation of innovative strategies that improve the quality of life for older adults and their families.

1. Wherever possible, older adults participate in the identification of research questions and contribute to the development of research projects at SERC.
2. We conduct applied research from a psychosocial perspective which builds on the strengths of older adults.
3. Our research is intended to directly benefit older adults and their families in their everyday lives. The process of knowledge translation takes our research findings from lab to life.
4. SERC affiliated researchers disseminate research findings to a range of stakeholders through the SERC Research Report Series, research forums, educational events and other means.
5. A multigenerational approach is implicit, and frequently explicit, in our research.
6. To the extent possible our research is linked to and complements academic programs at the Sheridan College Institute of Technology and Advanced Learning.

EXAMPLES OF SERC RESEARCH

Creative and Performing Arts	Lifelong Learning	Civic Engagement	Human Communication	The Built Environment	Accessible Technology
Promotion of healthy aging Strategies to increase participation	Addressing barriers to learning Learning in retirement homes and long-term care	Volunteer work as non-traditional source of personal development	Solutions for older adults with hearing, vision, and cognitive impairments	What is the role of design in health, quality of life, and ability to age at home?	Supporting adult learners of new technology Development of technology to benefit elders

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* Appendices available upon request

What are the benefits of yoga for community-dwelling older adults? In this pilot study, we included six older women in a once-weekly Iyengar yoga class for 12 weeks. Our findings indicate that yoga has beneficial effects for physical fitness and psychological health. Further, reports from interviews and journals indicate that this type of fitness program changes perceptions of ways to engage in physical exercise, and would be likely to encourage adherence among participants.

1. Introduction

1.1 Rationale

One of SERC's recent research initiatives is exploring alternate ways to promote physical fitness and wellness among older adults. While older adults understand that engaging in physical exercise is important (Ory, et al., 2003), less than 25% of older adults regularly get the recommended amount of exercise, according to Statistics Canada (2003), adults ages 65 and over have the lowest exercise rate among all Canadians. This disconnection between insight and action signals a need to promote physical activity among this portion of the population.

There are several potential reasons that older adults do not participant in exercise at the recommended levels. For example, gym-based exercise, while the most supported by research as having positive effects, may not appeal to all older adults. Based on research conducted by SERC, older adults want choice in the activities they undertake (Spadafora, et al., 2008), and gym-based exercise programs represent only a relatively small slice of effective ways to become physically fit. Also, this type of exercise excludes older adults who believe that physical activity of this nature represents high-risk behaviour, as those who are frail or have been injured in the past may feel too vulnerable to participate in these types of exercise programs (O'Brien Cousins, 2003). These two sets of concerns may be addressed by promoting alternative forms of physical activity for older adults.

Given the need for creating opportunities for alternative programs of physical activity, SERC has begun a program of research that seeks to develop such effective exercise programs. In parallel with a current study on the benefits of dance for older adults, this yoga study was undertaken to evaluate how yoga could have an impact on the physical health and psychological wellbeing of community-dwelling older adults. Could yoga be an effective alternative to gym-based programs for both improving physical strength and wellbeing? Further, would participation in a yoga program change the participants' attitudes toward exercise in general?

1.2 Background research

There is already a great deal of evidence supporting the value of yoga for improving physical fitness and aspects of quality of life (QoL). To date, the most complete investigation (Oken, et al., 2006) of the effects of yoga on physical fitness and quality of life (QoL) found that a six month program of Hatha yoga once a week improved balance in a one-legged standing task, as well as forward flexibility. Additional work (Brown, et

al., 2007) showed that involvement in a 12-week, once-weekly yoga course resulted in an improvement in balance as measured by the Berg Balance Scale and the same one-legged standing test. These improvements in balance may be connected to the documented benefits in hip extension and stride length found in older adults who participated in an eight-week, two-times-per-week Iyengar yoga program (DiBenedetto, et al., 2008), as better balance may logically lead to surer steps.

In addition to improvements in balance, an outcome that could be predicted by examining the types of movements involved in a yoga course, the benefits of yoga have been shown to extend to the body as a whole. A four-week, three-times-per-week yoga program (Chen & Tseng, 2008) resulted in decreased percentages of body fat, decreased systolic blood pressure, and improved range of motion in both shoulder flexion and abduction for participants. Further, in patient populations, yoga practice has had a positive impact on grip strength in both carpal tunnel patients (Garfinkel, et al, 1998) and patients with arthritis (Haslock, et al., 1994).

Recent research with older persons suggests that interventions encouraging physical activity can also produce significant changes in mood, wellbeing (e.g. Arent, et al., 2000). The comprehensive study of the impact of yoga on physical fitness and QoL mentioned above (Oken, et al., 2006) also demonstrated that participants showed improvements in their sense of wellbeing, energy, and fatigue as compared to no-exercise control participants. Yoga programs have also been shown to improve sleep quality (Brown, et al., 2007; Carlson, et al., 2004) and symptoms of stress (Carlson, et al., 2004), as well as general improvements in mood (e.g. Wood, et al., 1993).

Despite this preponderance of evidence that yoga has a positive impact on physical fitness and psychological wellbeing, previous work investigating these effects has its limitations. Much research on the impact of yoga on older adults has used very stringent exclusion criteria. These exclusions are generally based on the types of measurements that the experimenters need to take (e.g. excluding seniors with vision impairments because of the use of a computer-based task).

Further, no research study has evaluated the impact of a yoga program on attitudes toward exercise, or the perception of barriers that interfere with participation in exercise. Yoga, based on fact that yoga is both an alternative form of exercise, as well as something that older adults may not perceive themselves as able to do, may provide a setting in which to improve feelings of self-efficacy in exercise. Self-limiting beliefs – such as “I’m too old for this,” or “People my age shouldn’t do that” – can interfere with a person’s ability to successfully participate in physical activity (Ory, et al., 2003). A sense of self-efficacy is a significant predictor of engagement in physical activity (Lees, et al., 2003). Yoga provides a place to do something outside of “normal” physical activity, and also creates opportunities to demonstrate to older adults that they can do things they thought they could not. Therefore, participation in yoga may improve general attitudes toward exercise, including improved feelings of self-efficacy, and enthusiasm for continued participation in similar activities.

1.3 The current project
Therefore, based on previous work, we anticipated that a yoga intervention would have significant benefits for participants in their physical health and QoL. Further, we measured each participant's perceived barriers to participation in exercise, and inquired about their attitudes toward exercise and yoga after the class was completed. We also included participants regardless of physical or sensory limitation, in order to obtain a more representative sample of older adults.

2. Methodology

2.1 Physical measures
Physical measurements performed before and after the yoga course were chosen to represent the physical characteristics that were most likely to change as the result of participating in a once-weekly yoga class. We anticipated improvements in balance, flexibility, and strength, as well as potential improvements in aerobic endurance and weight loss.

In order to measure balance, each participant was asked to complete the Berg Balance Scale (see Appendix A). This scale is intended to measure difficulties with balance through a series of tasks similar to those completed on a regular basis. To measure flexibility, an Athletic Therapy student measured the flexibility of the shoulder, hip, and hamstrings for each participant using a goniometer. Upper body and lower body strength was measured using a subjective rating scale out of 5 for each participant by the Athletic Therapy student. Information was gathered about biceps, triceps, shoulder, hamstring, buttocks, and hip strength. Aerobic endurance was measured using the 2-Minute Step Test. This is a commonly used test where the participant is asked to march in place for two minutes; the number of steps completed is counted. Each participant was also weighed prior to and after the yoga course.

2.2 Questionnaires, Structured Interview, & Journal
To assess cognitive function, the Montreal Cognitive Assessment (MoCA, Nasreddine, et al., 2005) was administered to all participants before the yoga course began. All but two of the participants scored a 26 or higher out of 30, which is the cutoff score for an indication of mild cognitive impairment (MCI). The scores of the participants that were below 26, however, are unlikely to indicate probable MCI. One participant's score is likely to have been lower because of self-reported depression, which is known to have an impact on cognitive function; the other participant was able to repeat back several words from the memory test long after the test, despite an inability to do this during the test. All participants, based on this cognitive test, were able to participate fully in the yoga classes.

To evaluate self-reported quality of life and well being, we administered four questionnaires before and after the 12-week yoga course. Participants were first asked to fill out the World Health Organization Quality of Life – Brief Form (WHOQOL-BREF; see Appendix B), a measure developed by the World Health Organization to measure

quality of life around the world. Second, participants filled out a version of the Positive and Negative Affect Schedule (PANAS; see Appendix C), as well as a single-item Participant Health Questionnaire (PHQ), which asked participants to rate their general health on a scale from 1 (Exceptional) to 9 (Poor). The Philadelphia Geriatric Centre Morale Scale (PGCM; see Appendix D) was also completed as part of a one-on-one interview between the participant and the experimenter.

In addition, to evaluate the impact of the yoga program on patterns of exercise and barriers to exercise, we asked participants to fill in a questionnaire that inquired about their exercise habits, as well as an exercise barriers questionnaire (King, et al, 2000). Both of these questionnaires were completed prior to and after the yoga course.

A structured interview (see Appendices E and F) was also conducted to follow up on responses on the WHOQOL-BREF, and to inquire further into levels of personal activity and general health. This interview was conducted before and after the yoga course. After the yoga course was complete, questions were added to the interview which asked about the participant's likelihood to continue to practice yoga, and whether their experience with yoga changed their perceptions of exercise.

Finally, each participant was given a journal in which to record their experiences with the yoga class and any yoga they might practice between classes. A copy of a page from the diary appears in Appendix G.

2.3 Yoga classes
The yoga classes were scheduled to occur once per week for 12 weeks, for a total of 12 classes. Susan Anderson-Wilcox, a registered yoga teacher, led the classes. The 12-week course was presented in the Iyengar tradition, which follows a four-week cycle:

Week 1 – Standing Poses
Week 2 – Forward Bends and Rotations
Week 3 – Backbends
Week 4 – Pranayama (Breathing exercises) and Inversions

The classes all followed a standard format:

1) Breath awareness, either seated or supine
2) Announcement of the focus for the class (e.g. standing poses or rotations, etc) and description of the benefits of that type of pose
3) Warm-up stretches
4) Various poses (asanas), both standing, sitting, and supine
5) Relaxation (Savasana) to close

The specific poses included in the four-week cycles are included in Appendix H.

3. Results and Statistical Analysis

3.1 Demographics
Six participants, all female, participated in the yoga classes. The mean age of the group was 70 years (SD = 5). All reported that they did not require the use of hearing aids, though one participant did note that she believed her hearing could interfere with some of her social interactions. All rated their vision with glasses to be Very Good or better, and their ease of getting around as Okay or better. All reported that English was their first language.

Three of the participants had tried a yoga course before, but their experience was limited, with their experience ranging from one class to four months of classes several years ago. All reported that they engaged in regular physical activity, which included regular walking, gardening, exercise classes, and working out at the gym.

3.2 Physical measurements
Due to the small sample size of six participants, it was unlikely that we would find significant differences between the measures taken before the yoga course (Before) and the measures taken afterward (After). Based on these limitations, we opted to test the significance of the differences between the Before and After measurements using a t-test. As we predicted a certain direction of difference, we used a one-tailed t-test for all measures.

Only one physical measure improved significantly between the beginning and ending of the yoga course. Endurance improved by an average of eight steps within two minutes ($t(1,5) = 2.61$; $p < 0.05$).

Two of the other physical measures showed improvements that could be considered to be marginally significant: Left Shoulder Flexibility ($t(1,5) = 1.58$; $p < 0.09$) and Left Hip Abductor Flexibility ($t(1,5) = 1.58$; $p < 0.09$). Shoulder flexibility improved by an average of eight degrees; hip abductor flexibility by two degrees. None of the other physical measurements approached significance.

3.3 Questionnaire results
The same analysis approach was taken with the Before and After responses to the questionnaires. Where appropriate, the questionnaires were separated into their indicated subdivisions (e.g. the WHOQOL-BREF indicated that there were four subscales within the larger scale).

Participants scored significantly better on Domain 1: Physical Health on the WHOQOL-BREF, with an average improvement of three total points on that scale ($t(1,5) = 2.59$; $p < 0.03$). Three of the other measures also approached significance. Participant ratings on Domain 4: Environment on the WHOQOL-BREF improved by an average of two points ($t(1,5) = 1.39$; $p < 0.12$). Participants also indicated a decrease in Factor 1 (Agitation) on the Philadelphia Geriatric Centre Morale Scale ($t(1,5) = 1.57$; $p < 0.09$).

Interestingly, participants also reported more barriers to exercise ($t(1,5) = 1.53$; $p < 0.09$). No other differences approached significance.

3.4 Interviews & Journal entries

The information gathered in the interviews communicated two main points: first, that the participants enjoyed the classes, and that many of the participants felt differently about ways to obtain physical exercise after their experience in the class.

In support of the first point, participants indicated that they felt good during and after each class. Even if their ratings of their overall health had not changed, they acknowledged the benefit that they felt they received from the classes, even if that benefit was not measurable:

"I felt good after every class."
"I definitely felt more energy after every class – now I will have to do it every day!"
"I haven't breathed like that in years."

The experience also changed how some of the participants felt about physical exercise. One participant reported that she had signed up for a yoga class starting a month after this one ended because of her experience. One participant mentioned that it had changed her mind a little, and that she would try to become more active in the future. Most expressed that they would be likely to continue yoga in the future, given the right opportunity, as classes geared toward their age and ability group are not as available as other types.

While the level of response in the journals varied widely between participants, all of the participants reported that they enjoyed the class:

"I look forward to the sessions of yoga."
"I'll be sorry to see these sessions end."

In the journals, most reported feeling some qualitative benefit of participating in the classes for how they felt both physically and mentally, even if they noted that they didn't think there was a measurable difference:

"I always felt <u>great</u> after the class!"
"I always felt more limber and alert when leaving the class."
"Before yoga class [I] can't remember when I last took a deep deep breath and stretched the old body to its limits – great feeling of satisfaction."
"Feel that I am doing myself some good instead of running around."
"Good to feel simple exercises improve mental health."
"Realize that yoga can help mentally even when one can't manage much."
"Starting day with yoga helps me cope with various activities."

While the experience was universally positive, there were moments of frustration:

"I really enjoy the session, but I do find it discouraging when I can't do something."
"I was surprised to find it difficult to sit cross-legged on the mat, not limber enough."

Ultimately, however, one comment captured what previous work concerning the benefits of yoga has implied:

"Old age derailed for another wee while."

3.5 Limitations

The greatest limitation of this study was the number of participants. Only including six participants severely limited our statistical power when analyzing the differences between the physical and questionnaire measures before and after the yoga course.

While non-parametric statistical analysis was considered, with this number of participants, all would have needed to show a difference in the same direction to demonstrate what would be considered a significant difference. Older adults tend to be a very heterogeneous group and this group of participants was no exception: all were community-dwelling women over the age of 65, but that is where the similarities ended. Some of the women were regular gym-goers, while others had recently experienced difficulties with their health. Each had her own set of health concerns. Some practiced yoga between classes regularly; others did not. Therefore, it is unreasonable to expect that from such a diverse group that every participant would change in the same way across the course of a 12-week, once-per-week yoga class.

While we anticipated that participation in a yoga class might reduce the perceived barriers to exercise, the reverse appeared to occur. This increase in barriers to exercise may be explained by two additional pieces of information. First, many of the participants stated that the overlap of the course with the holidays (including Thanksgiving and the beginning of the Christmas season) interfered with their exercise patterns because of a lack of time. Second, two of the six participants experienced significant medical events during the course of the project, resulting in their inability to attend each class and a decrease in their participation in other exercise activities. Both of these factors were also apparent in reports of exercise habits. While not statistically significant, the number of total hours per week dedicated to exercise also decreased across the course of the project.

4. Conclusions

"Old age derailed for another wee while."

While the small sample size restricted our ability to detect significant differences between the measurements taken before and after the yoga course, these results are promising. We believe that our results indicate that the potential for yoga to be a beneficial exercise program for older adults should be explored further.

The impact of the yoga course on physical fitness mirrors results found by other researchers, and supports the idea that yoga can have positive effects on physical tasks that are required in activities of daily living. Increased aerobic endurance and flexibility translate to improved ability to engage in day-to-day activities, such as grocery shopping, laundry, and driving. These changes were supported by significantly higher ratings of Physical Health domain of the WHOQOL-BREF after the yoga course than before. This domain incorporates ratings of activities of daily living, dependence on medication, energy, mobility, pain, sleep, and capacity for work.

Improvements on other measures of quality of life, though not statistically significant, were promising for the beneficial effects of yoga. The improvement on Factor 1 (Agitation) of the Philadelphia Geriatric Center Morale Scale, is promising, because it indicates a reduction in anxiety. This finding is consistent with the reported impact of participation in the classes on the mental benefits of yoga. It was also in line with the stated goal or reducing stress that many of the participants mentioned.

"I haven't breathed like that in years."

Ratings of Environment (Domain 4) on the WHOQOL-BREF were also better after the yoga class. On the surface, this may seem surprising, as the yoga class would have not have an impact on a participant's financial resources, physical safety and freedom, access to health care, transportation, or physical or home environments. However, by introducing the students to a new practice and changing their perceptions of exercise, participation in yoga could improve perceptions of the opportunities that exist for acquiring new skills and information, and opportunities for recreation.

These types of changed perceptions were reported in the subjective experience of the classes themselves. The experience of the participants was very positive. Many participants reported that they would be likely to participate in yoga classes in the future, and that it had changed their perception of the ways in which they could engage in physical activity. This result is in line with our expectations that yoga, as a non-gym-based program, would encourage confidence and interest in physical activity.

This last finding provides a strong indication that yoga courses such as this one have the potential to encourage both participation in and adherence to an exercise class. This result may be the most relevant when considering the benefits of exercise programs for older adults: no matter how "good" a program may be, if a person does not participate regularly in it, they will not experience its benefits. Based on the reports of our participants, there is reason to believe that the promotion of yoga classes for older adults may be an effective health promotion strategy. This premise deserves further investigation.

5. Implications for Policy and Research

Based on these findings, we believe that further research should be conducted to fully understand the benefits of yoga for older adults within a variety of settings. This research should include a focus on the impact of a yoga class on adherence to the course itself, as well as its influence on concurrent changes in healthy behaviours such as eating habits and sleep.

All of the participants in the yoga class expressed interest in continuing with this yoga class beyond the scope of the research project. Unfortunately, this was not possible for us to administrate. However, given the strong interest in yoga classes geared toward the learning needs and physical abilities of older adults, we recommend that these types of classes be made more readily available within the Oakville community. A barrier to participation that many of the older adults cited was that classes were not directed to people of their age group, which meant that they would feel invisible, or left behind. Therefore, to effectively meet this need, classes would need to be designed by an instructor comfortable and experienced with educating older adults, and should be clearly advertised as a course for a more mature group of adults who are yoga beginners.

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