ORIGINAL ARTICLE

Yoga Adherence in Older Women Six Months Post–Osteoarthritis Intervention

中老年妇女骨关节炎干预后坚持做瑜伽六个月

Incorporación del yoga en mujeres de edad avanzada que se han sometido a una intervención de artrosis en los últimos seis meses

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ABSTRACT

Background/Objective: Osteoarthritis (OA) is a highly prevalent condition worldwide. Yoga is potentially a safe and feasible option for managing OA; however, the extent of long-term yoga adherence is unknown. The purpose of this study was to examine yoga adherence 6 months after participants completed an OA intervention program.

Methods: This follow-up study employed a cross-sectional descriptive design using survey, interview, and video recordings to collect both quantitative and qualitative data. A total of 31 participants completed and returned the survey, and 10 videotaped their yoga practice for 1 week and participated in a face-to-face interview.

Results: A majority of participants (n=19, 61%) reported that they were still practicing yoga 6 months after the intervention program. On average, participants reported practicing 21 to 30 minutes of yoga per day (32%) 3 to 4 days per week (47%). "Feeling good or feeling better after yoga practice" (50%) and "set aside a time" (31%) were the most common motivating factors for yoga adherence. Dealing with health problems (42%), having pain (25%), and being too busy (25%) were the major barriers. Qualitative data revealed that participants: (1) used mindful yoga movement, (2) incorporated other forms of exercise and resources during yoga practice, and (3) created personalized yoga programs. Additionally, the participants reported less OA pain, increased physical endurance, and more relaxation.

Conclusion: Many participants adhered to yoga practice 6 months post-intervention although not at the frequency and sequence as prescribed. Feeling better after practice motivated participants, but other factors remained key barriers.

摘要

背景/目的： 骨关节炎（OA）是一种全球非常常见的疾病。 瑜伽是管理 OA 的一种潜在安全可行方案；但尚不明确长期坚持做瑜伽的效果如何。 本研究旨在检验一项完成 OA 干预计划后坚持做 6 个月瑜伽的情况。

方法： 本随访研究采用横向描述性设计，旨在使用调查、访谈和录像来收集定量和定性数据。 共 31 名参加者完成了研究，并返回参加调查。 31 名参加者完成了一项调查，10 个录像带记录了他们 1 周的瑜伽锻炼，他们还参加了面对面访谈。

结果： 大多数参加者（n=19. 61%）报告，完成干预计划后他们继续做了 6 个月的瑜伽。 平均来说，32% 的参加者报告每天做 21–30 分钟的瑜伽，47% 的参加者报告每周有 3–4 天做瑜伽。 他们坚持做瑜伽的最常见动机是“做完瑜伽后感觉好或更好”（50%）和“做瑜伽时得到放松”（31%）。 健康问题（42%）、疼痛（25%）和太忙（25%）是坚持做瑜伽的最主要障碍。 定性数据揭示，参加者： （1）使用正念瑜伽运动，（2）做瑜伽期间还结合了其他形式的锻炼和资源，以及（3）创建了个性化瑜伽课程。 此外，参加者报告做瑜伽减轻了 OA 的疼痛感，增强身体耐力，令其感觉更放松。

结论： 许多参加者在干预后坚持参加瑜伽锻炼 6 个月，虽然运动的频率和顺序不同于描述。 参加者做瑜伽后感觉更好，但其他健康问题仍是一个主要障碍。

SINOPSIS

Antecedentes/Objetivo: La artrosis es una enfermedad muy frecuente a nivel mundial. El yoga es potencialmente una opción segura y factible para el tratamiento de la artrosis; a pesar de ello, se desconoce el alcance de la incorporación de la práctica del yoga a largo plazo. El propósito de este estudio era examinar la incorporación de la práctica del yoga después de haber pasado 6 meses tras realizar un programa de intervención para la artrosis.

Métodos: Este estudio de seguimiento utilizó un diseño transversal descriptivo mediante encuestas, entrevistas y grabaciones en vídeo para recopilar datos tanto cualitativos como cuantitativos. Un total de 31 participantes cumplimentaron y entregaron la encuesta. Treinta y un participantes cumplimentaron una encuesta y 10 grabaron en vídeo sus prácticas de yoga durante 1 semana y participaron en una entrevista personal.

Resultados: La mayoría de participantes (n = 19, 61 %) indicaron que continuaban practicando yoga 6 meses después del programa de intervención. Los participantes notificaron que practicaban de media entre 21 y 30 minutos de yoga al día (32 %) entre 3 y 4 días a la semana (47 %). Los factores de motivación más frecuentes para practicar yoga fueron "sentirse bien o sentirse mejor tras practicar yoga" (50 %) y "tener un momento de calma" (31 %). Los mayores obstáculos fueron: abordar problemas de salud (42 %), tener dolores (25 %) o estar demasiado ocupado (25 %). Los datos cualitativos revelaron que los partici-

pantes: (1) emplearon movimientos de yoga de forma consciente, (2) incorporaron otros tipos de ejercicio y recursos durante la práctica del yoga y (3) crearon programas personalizados de yoga. Además, los participantes notificaron menos dolores debidos a la artrosis, mayor resistencia física y más relajación.

Conclusión: Muchos participantes incorporaron la práctica de yoga 6 meses después de la intervención aunque no con la frecuencia y secuencia prescritas. El hecho de sentirse mejor tras practicarlo motivó a los participantes, pero otros problemas de salud continuaron siendo una barrera fundamental.

INTRODUCTION

Global statistics reveal that more than 100 million people worldwide suffer from osteoarthritis (OA) and more than 50% of the population around the world (>65 y) show x-ray evidence of OA in one of the joints, demonstrating the high incidence of this disease.[1] It is the most frequent cause of disability among adults in the United States and the fourth most common cause of hospitalization.[2] Incidence rates of OA increase with age, and the condition affects more women than men.[3] The need for new and ever more effective OA interventions will continue to expand as populations age.

Because there are currently no effective cures for OA, exercise is recommended in a number of clinical guidelines,[4-6] and exercise programs that involve aerobic and muscle strengthening and balance are particularly beneficial to OA treatment.[7] Yoga is a mind-body intervention that typically combines physical postures, breathing techniques, and meditation or relaxation. The physical postures are done sequentially with the purpose of promoting flexibility, strength, and balance. The breathing and meditation exercises are intended to calm and focus the mind and to develop a deeper level of mind-body connection and greater self-awareness.[8]

A number of studies in older adults with OA report that yoga is effective in relieving insomnia, managing symptoms, and improving function.[9-13] Yoga is a potentially promising exercise and therapeutic intervention for older adults with OA. However, an intervention will work only if people use it. Although good levels of adherence to home practice were reported in recent yoga clinical trials that involve musculoskeletal conditions[14] and adherence to yoga interventions in trials that lasted for 6 months or more is found to be moderate to good,[15,16] the degree of yoga adherence after an intervention program is completely unknown. Given that many exercise interventions have demonstrated declining levels of adherence in later stages of follow-up compared with immediately after exercise had begun,[17,18] post-intervention adherence deserves special attention because desired therapeutic outcomes can be achieved only if consistent participation in intervention is maintained.

The purpose of this follow-up study was to determine yoga adherence in community-dwelling older women with knee OA 6 months after the completion of a yoga intervention program in a randomized controlled trial (RCT).[13] Specifically, the study examined the yoga adherence rate, identified barriers and motivations to yoga practice, and qualitatively described the experiences of home-based yoga practice.

METHODS

Design

This follow-up study employed a cross-sectional descriptive design using a survey, interview, and video cameras to collect both quantitative and qualitative data. All study participants had a medical diagnosis of knee OA according to the Clinical Criteria for the Classification of Idiopathic OA of the Knee developed by the American College of Rheumatology[19] and had completed the yoga intervention program 6 months prior to data collection. The research protocol was approved by the St Catherine University, Minneapolis, and University of Minnesota, Minneapolis, Institutional Review Boards.

Sample/Intervention

A letter was sent to 34 community-dwelling older women with knee OA who completed an 8-week yoga intervention program inviting them to participate in a 6-month post-intervention survey. They were also invited to videotape their current yoga practices and participate in a brief follow-up face-to-face interview. A total of 31 participants completed the survey, and 10 of them agreed to videotape their yoga practice and participate in the brief face-to-face interview.

In the RCT, participants were given home practice handouts with pictures and written instructions on the yoga poses, resources on yoga, arthritis literature, and yoga videotapes. Study participants were instructed to continue practicing yoga 30 minutes a day, 5 days a week at home for OA management.[13]

Data Collection

Researchers developed a follow-up survey using multiple-choice questions to examine the frequency and duration of yoga practice, yoga poses that were found to be helpful for OA, strategies used to help motivate yoga practice, barriers that prevented yoga practice, adverse events during yoga practice, and activities that were used to help manage knee OA. The questionnaire was reviewed by content experts (n=2) and pilot-tested with older adults for clarity (face-validity) and readability (n=3). Questions were revised based on the feedback from the pilot test before it was mailed to the study participants.

Videotaping has been used widely over the past several decades to provide visual observational data in educational and clinical settings.[20,21] Videotaped data can be used to avoid report fatigue/bias and capture objective "raw" data that accurately expose the context of the participants' behaviors and events that occur

during the recording.[22] Additionally, videotaped data are more versatile than other forms of data and can be viewed by researchers from diverse backgrounds and disciplines who might bring fresh perspectives to the data analyses.[23] Participants were instructed on the use of the camera and asked to videotape their usual home yoga practice with a video camera, note the number of minutes practiced each time on a log sheet, and include comments associated with their home practice for 1 week. The average frequency and duration of yoga practice and qualitative data on the characteristics of yoga practice including poses and sequences practiced, types of tools used, and settings in which yoga practice took place, were analyzed.

Additional qualitative data was collected through a face-to-face interview at each participant's home when the video camera and log sheet were collected. Two key questions were asked: (1) What was your overall experience with practicing yoga over the last 6 months like? and (2) How has yoga affected your knee OA? The researcher took field notes and clarified responses during the interview. A summary of the critical points was created to enrich the survey and videotaped data.

Analysis

SPSS version 17 (IBM Corp, Armonk, New York) was used to analyze the quantitative data. Descriptive statistics including mean, frequency, and percentage scores were used to analyze adherence data and data on factors that influenced yoga practice. Adherence was defined in several ways for the analysis: (1) practicing yoga (yes/no), (2) average minutes of yoga practice per day, and (3) average number of days of yoga practice per week.

The conventional content analysis method was used to analyze the qualitative interviews and the videotapes.[24] Two researchers reviewed, described, and interpreted the video recordings, and a third researcher was added to analyze the notes from the videotapes and interview data. All yoga poses, other forms of exercise, practice environments, and props/tools used during practice were included in the analysis. The entire text was read, all videotapes were reviewed to get a sense of the whole, and notes were taken for initial analysis. Codes of significant data were labeled and became the initial coding scheme. Codes were then grouped into common categories that were related and linked. Finally, the common categories were clustered into meaningful units, and definitions were written for the categories in the videotapes and the interview data. Where there were differences in how the data were analyzed and categorized, the researchers discussed contextual factors and personal interpretations and reached consensus on how common categories were derived.

Data and method triangulation were used to inform the findings. The interview data informed the survey data by providing more context to the answers that were given on the survey. The videotape data provided another resource to observe the frequency, duration, and characteristics of the yoga practice. The interview data collected at the end of the videotaping also informed the experience of yoga practice.

QUALITATIVE RIGOR

Five criteria (credibility, dependability, confirmability, authenticity, and transferability) were used to evaluate the trustworthiness of the study findings.[25,26] Credibility was maintained by the use of video recordings that allowed the researchers to gain insight into naturalistic reality and enabled the observations to be made that correspond to the real world. The researchers were also able to review and analyze the videotaped recording repeatedly. Dependability was maintained by using the same questions asked of the participants during the interview and the use of videotaping that ensured stability of the data. Triangulating different sources of data and different methods for analysis enhanced the findings. Confirmability was achieved by using a 3-member research team from multiple disciplines (nursing, physical therapy, and yoga) with expertise in qualitative analysis to research consensus on the research findings. Authenticity was accomplished by the 3 researchers coming to consensus of the findings and persistent observation of the videotapes. Recording rich, descriptive data was maintained to enhance transferability to other like contexts.

RESULTS

Survey

Among the 34 participants invited, 31 completed and returned the survey. The response rate was 91%. Participants were predominantly white (86%), with a mean age of 72 years (SD 5.6 y, range 65-86 y). The average duration of education was 15.5 years (SD 2.7 y, range 12-24 y). A majority of participants (n=19, 61%) reported still practicing yoga 6 months after the intervention program. Only 1 participant joined a yoga class; the remaining 18 practiced yoga at home independently. On average, survey participants reported practicing 21 to 30 minutes of yoga per day (32%) 3 to 4 days per week (47%) (Figures 1a and 1b).

Exercises (walking, swimming, weight-lifting, biking, Pilates, tai chi, skiing, aerobics, strengthening, stretching, and ballet) were reported by the study participants to be commonly used for managing OA (94%), followed by medication (71%), yoga (61%) and "other," including cortisone injections, healthy eating, heat/ice, massage, acupuncture, and physical therapy.

The benefit of yoga practice, "feeling good or feeling better after yoga practice," (50%) was the most common motivating factor for participants to adhere to the yoga program. Having a practice partner or using reward did not motivate yoga adherence (Figure 2). The primary barriers among the 10 survey participants who reported no longer practicing yoga were having health problems including surgeries (42%); pain (25%); and being too busy (25%). A small percentage of partici-

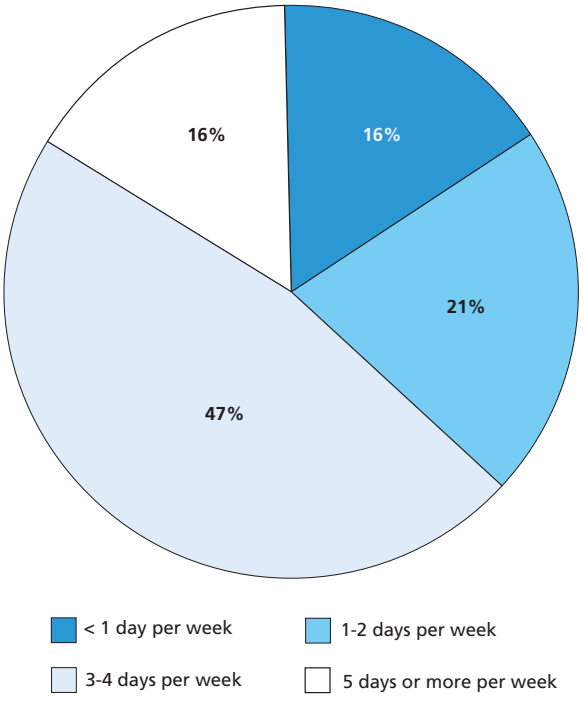

Figure 1a Frequency of yoga practice: number of days per week.

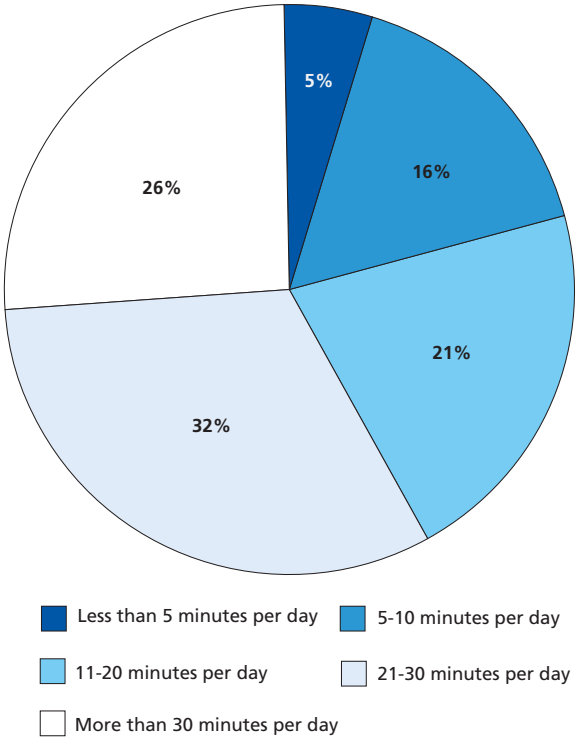

Figure 1b Duration of yoga practice: number of minutes per day.

pants said that being too tired (17%) or that yoga was too boring (17%) and not helpful (17%) had prevented them from continue practicing.

A total of 14 main yoga poses were taught in the intervention program. All but the 2 Warrior poses

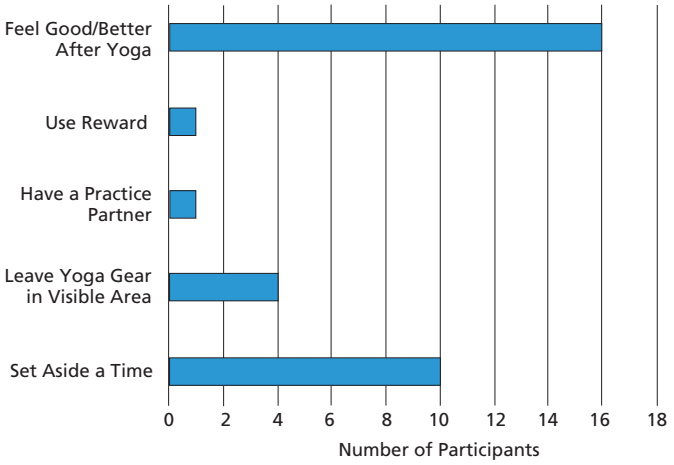

Figure 2 Strategies used to help motivate yoga practice.

(Warrior I and II) were consistently perceived to be helpful for managing knee OA by the majority of participants who continued to practice yoga (53% to 95%). Both seated and floor poses were most frequently preferred (Figure 3a).

Video Recordings

Among the 34 participants invited, 10 agreed to videotape their usual home yoga practices and keep an exercise diary for 1 week. Participants were predominantly white (80%) with a mean age of 71.6 years (SD 4.0 y, range 68-78 y). The average duration of education was 16.4 years (SD 3.4 y, range 12-24 y). A total of 21.5 hours of video-recordings of home yoga practice were reviewed by two researchers, and content analysis was performed on the notes taken from observation of the videotapes.

Of the 10 participants who videotaped their yoga practice for 1 week, the frequency and duration of the practice varied considerably, ranging from 1 to 7 times per week. Four themes emerged in the ways in which the women engaged with their home yoga practice: the mindful movement in which they practiced the postures; the utilization of resources distributed during the study; the commonalities of yoga postures practiced; and the personalization of the yoga practice.

Mindful Movement

The videos showed most of the participants practicing their yoga mindfully—meaning in a slow, conscious, and focused manner. This was demonstrated by the visible incorporation of the diaphragmatic breath work and the slow, purposeful pace of practice introduced in the 8 weeks of yoga classes. During the 8-week yoga intervention, each class began with a seated "easy" pose, diaphragmatic breathing, and a guided meditation with the purpose of tuning into the sensations of the body and fostering a deeper body-mind connection. Interestingly, as seen in the videos, 6 months later ,many of the participants chose to start their home practices with that same ritual. Most of the observed home

practice sessions across participants began with the women taking a minute or 2 in seated easy pose, eyes closed, breath centered in the diaphragm. This mindful awareness to their body's movements visibly continued throughout the home practice sessions, as most of the women demonstrated safe and appropriate form both within the yoga postures as well in the transitions in and out of them. This was particularly notable in the care and attention they placed on transitional movements (eg, sitting to standing, moving to and from the floor), moving slowly, safely, and with intention.

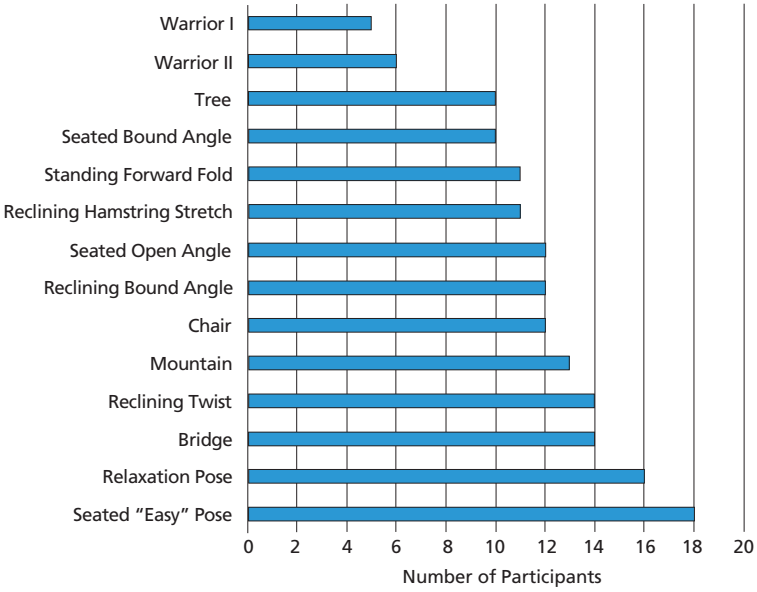

Figure 3a Yoga poses perceived as most helpful for managing knee osteoarthritis according to survey.

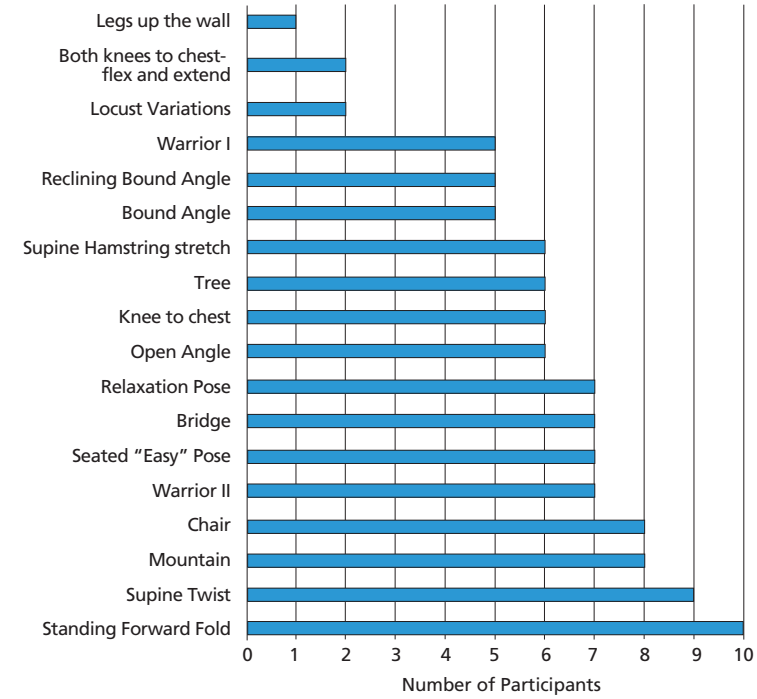

Figure 3b Number of participants who practiced each pose according to video observations. Four of the 6 least popular postures are done in a standing position. Four of the 8 most popular postures are done in a supine position.

Use of Resources

Many of the resources for home practice that were distributed as part of the study were incorporated into the participants' continued home practice. Most women continued to make use of the home practice sheets and the yoga mats that were given out as part of the study. One participant had audio-recorded one of the yoga sessions in the 8-week series, and she continued to use this recording to guide her home practice.

Poses Practiced

There were also similarities within the actual poses chosen by the subjects to be part of their home practices (Figure 3b). Generally, participants were able to create their own personalized flow of yoga postures, often starting with the seated or supine postures that encourage relaxation and joint mobility and working up to the standing postures that promote strength and balance. This mirrored the progression of poses taught from week to week during the intervention, as the first half of the 8 weeks were focused on flexibility and relaxation and the second half on strength and balance. Many of the women chose postures from the final home practice sequence (warrior I, relaxation pose, seated "easy" pose, supine twist, standing forward fold, chair, mountain, warrior II, and tree poses) and a few other postures from earlier in the program (supine hamstring stretch, bridge, bound angle/reclining bound angle, knee to chest, and open angle poses). Several of these postures promote hip and knee flexibility (supine hamstring stretch, knee to chest, open angle, bound angle, bridge, seated "easy" pose, standing forward fold, and supine twist); others focus more on lower-extremity strength, balance, and healthy alignment of the knee joint in weight bearing (warrior I and II, chair, mountain, bridge, tree, and standing forward fold); and others foster deep relaxation and body-mind awareness (relaxation pose, seated "easy" pose).

Personalizing The Program

One final commonality that emerged from the content analysis was how the women took advantage of the adaptability of the yoga postures they learned and personalized their practice. Several participants made use of household items to support their body in the yoga postures, including chairs, blankets, belts/straps, and pillows. Many of the participants also adapted the yoga practice from day to day—some days practicing more than 10 postures in 1 session, other days focusing on 3 or 4 postures. In this way, the women were able to practice both long and short forms of the yoga sequences from the classes, adapting their practice to their fluctuating needs and potential time constraints.

Participants also adapted their yoga practice

through the incorporation of other forms of exercise, including Pilates exercises, strength training, and dance movements. In this way, the yoga practice acted as a scaffolding upon which other forms of exercise and movement were built.

Interviews

Among the 10 participants who videotaped their yoga practice for 1 week, most reported that they had a positive experience with yoga and that practicing yoga was beneficial to their knee OA. Three thematic categories emerged from the interviews: improvement of OA symptoms, conditioning of the body, and use of yoga as both therapy and exercise.

Yoga Improves OA-related Symptoms and Relaxation

Most of the women talked about the improvement in their OA symptoms, including the pain they experienced. Yoga also helped their endurance for activity and relaxation through meditation and improving mind-body connection. Those who practiced yoga regularly said that in addition to relieving pain, reducing stiffness, and promoting relaxation, yoga improved their overall physical functioning and social wellbeing.

A 68-year-old volunteer said she joined a yoga class after the initial intervention because it helped relieve her OA symptoms: "I think this stuff [yoga] really works. My pain is less, it helps me keep going. I am going to keep doing it."

A 72-year-old retired school teacher said yoga was a tool for relaxation: "Not just my knees, I feel I am more positive about things when I do yoga. The meditation and breathing help me relax."

A 65-year old full-time academic counselor said: "I just got back from traveling to Europe with my granddaughter and was nervous about all the walking, but I didn't have that much pain in my knees and was able to keep up with her and enjoy the trip."

Yoga Conditions the Body

Regular yoga practice helped participants become more conscious about their bodies and participate in other physical activities.

A 78-year old retiree said, "I think about my posture more whether I am standing or sitting, even when I am doing dishes."

A 67-year old grandmother said, "Yoga prepares my body to do more. I recently joined a curling club, something I have always wanted to do . . . don't think I would be able to do it if I had not done yoga."

Yoga Is Both Therapy and Exercise

Participants reported practicing yoga along with other forms of exercise to stay healthy and active. Although participants were not engaging in any supervised exercise programs, many were active community dwellers and had been doing a variety of exercises on their own. Practicing yoga is not only for managing OA-related symptoms. The participants said yoga is a feasible and safe exercise option for older adults with knee OA.

A 78-year old participant said, "I used to dance and skate when I was younger, so I add some of those moves into my yoga practice."

Another woman who is a part-time psychologist said, "I have always been active. I bike, hike, and do Pilates. I now add yoga."

DISCUSSION

The results of the current study show that many participants adhere to yoga practice 6 months post-intervention (61%). This is comparable to a previously reported 6-month exercise intervention trial that reported that 63% of sedentary women were practicing exercise at home at the end of the intervention period and 57% at 6 months post-intervention.[27] Compared to the adherence pattern during the intervention period, which is 20 to 30 minutes/day, 5 days a week,[13] the level of yoga adherence declined, which is consistent with findings from the literature.[27,28] Additionally, the results of the current study are in line with those of earlier studies among heterogeneous groups of older adults with specific diseases or with specific interests, in which poor health has often been reported as a barrier to exercise in these populations.[29,30]

Being too busy or lack of time is also found to be a barrier to adherence. Individuals who volunteered to be in an exercise study tend to be active and outgoing. There are competing interests and activities that make finding time for yoga practice a challenge. The positive effects of yoga and setting aside a time for practice were reported to help participants to adhere to practicing yoga at home. Perceived benefits of a health behavior have long been associated with behavior change.[31] However, if setting aside a specific time during the day for yoga practice is difficult, building short bouts of yoga into one's daily activities rather than setting aside a block of time for practice may be more appealing and achievable to older exercisers. Older adults with musculoskeletal challenges may find short bouts of yoga less overwhelming and physically demanding than sustained exercise. As a result, they may be more likely to be adherent. Older adults with OA need additional resources that include information and tools to help carry out their home yoga practice routine. The video recordings show that yoga mats and home practice handouts play an important role in facilitating continued home practice.

Although the underlying mechanisms associated with greater adherence are not well understood, it has been postulated that those with greater adherence may engage in many other health-promoting behaviors. Participants in this study used a wide variety of exercise modalities to manage their OA. Many complementary therapies and exercise interventions require greater effort than simply taking a pill. Future studies are needed to further examine the therapeutic effects of different self-selected modalities, the desired doses (frequency and consistency), and the relationship between

adherence and health outcomes.

It is often hypothesized in the literature that a lack of adherence to recommended exercises could be one of the main reasons for poor long-term effectiveness of exercise therapy.[32] Understanding yoga adherence, the adherence pattern, and factors that affect adherence are critical for designing intervention programs to help improve the long-term adherence to recommended activities.

While the survey results of all the participants noted that warrior I and II yoga postures were not considered beneficial by a majority of participants (Figure 3a), at least half of the 10 women who were videotaped practiced 1 or both of these postures (Figure 3b). One potential explanation for this discrepancy could be that the warrior postures might have been less popular because they are more challenging for people struggling with knee OA; they engage the muscles around the knee in a loaded, weight-bearing position. However it is precisely because of this challenge that these postures are extremely beneficial for the knee joints as they strengthen the quadriceps, hamstrings, iliopsoas, and gluteal muscle groups, all of which are essential for healthy function of the knee joints. The women who volunteered to be videotaped might have been more dedicated to the yoga practice and thus less deterred by the challenge of the poses in light of their benefits.

The mindful movements observed in the video recordings are a marker for enhanced safety not only within the yoga practice, but also potentially with daily transitional movements. Through the observed personalization of the yoga practice in the video recordings, this study points to the use of yoga practice as a basis for incorporating and encouraging other forms of exercise and movement, leading subjects to a healthier lifestyle and closer to meeting the American College of Sports Medicine guidelines for healthy aging.[33] The video recordings show the overall adaptability of the yoga intervention developed in this study. The subjects built on the yoga postures, breathing techniques, and relaxation/mindfulness training they had learned in the 8 weeks of classes to create a home practice that was safe, mindful, and suited to their individual needs. Yoga as a mindful practice may also reduce the pain associated with OA.[10-13]

There are a few limitations to this study. First, a gold standard in measuring exercise adherence does not exist.[34] In this study, exercise adherence was measured with a self-report questionnaire. Although widely used, the quality of self-report questionnaires to measure exercise adherence is debatable. They are known to overestimate adherence and to be susceptible to bias caused by patients' memories, social desirability, and social approval.[35] However, a self-report questionnaire has the advantage that it is a simple method. Second, using videotaping has two inherent limitations. Many older adults are not experts in using video cameras, and some mechanical limitations occurred during the data collection process. A number of practice sessions were not recorded, and the participants' explanations included "low battery," "the camera was not turned on," and "not sure what happened." Additionally, it is possible that videotaping the yoga had an influence on the participant's behavior. Knowing their behavior was to be reviewed by the researchers, participants may act in a way that they think the investigators expect (practicing yoga more often and completely than they normally would) and/or choosing the poses they perceive as desirable or "correct" to the investigators. However, while it is difficult to define what the actual influence is, video recording provides valuable in-depth visual information on what actually happened during an event that no other data collection method would provide. Supplementing the survey data with video recording and interviews provided the benefits of data and method triangulation that led to rich and fruitful findings.

Findings from this follow-up study add to the current body of knowledge of yoga research. Further research is necessary to provide additional information on the use of yoga as an intervention for OA management and strategies to help improve adherence and follow the yoga-adherence behaviors of the participants for a longer period of time. More studies are needed to compare adherence to different types of yoga in older adults with different health concerns. In addition, using larger samples would allow more powerful analyses of correlations of adherence. The study findings are important for clinicians working with elderly women with OA. Yoga therapy may be beneficial in the following ways: mindfulness, relaxation, relief of OA pain, and increased physical endurance. There is a need for structured sustainable programs to be initiated in community centers and senior care facilities at acceptable times for women to schedule these activities so that they fit into their routines. The practice of yoga is an important low-cost complementary therapy that may benefit the overall health of older adults with OA from a holistic framework of care.

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