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"More than I Expected": Perceived Benefits of Yoga Practice among Older Adults at Risk for Cardiovascular Disease

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Abstract

Objective—This study was conducted with participants from trials examining the effects of an Iyengar yoga program on cardiovascular disease risk. The objective of the current study was to evaluate the perceived benefits of yoga in a population of older, predominantly overweight adults participating in a gentle 8-week yoga program.

Design—This study used a constructivist-interpretive approach to naturalistic inquiry.

Setting—A total of 42 participants completed the intervention and met the inclusion criteria for the current qualitative study.

Intervention—The 8-week Iyengar yoga program included two 90-minute yoga classes and five 30-minute home sessions per week. Participants completed weekly logs and an exit questionnaire at the end of the study.

Main Outcome Measures—Qualitative data from weekly logs and exit questionnaires were compiled and conventional content analysis performed with the use of ATLAS.ti to facilitate the process.

Results—Four broad themes emerged from content analysis: Practicing yoga improved overall physical function and capacity (for 83% of participants); practicing yoga reduced stress/anxiety and enhanced calmness (83% of participants); practicing yoga enriched the quality of sleep (21%

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The authors wish to confirm that there are no known conflicts of interest associated with this publication.

of participants); and practicing yoga supported efforts toward dietary improvements (14% of participants).

Conclusions—These results suggest that yoga may have ancillary benefits in terms of improved physical function, enhanced mental/emotional state, enriched sleep quality, and improved lifestyle choices, and may be useful as a health promotion strategy in the prevention and management of chronic disease.

Background

The practice of yoga has become increasingly common in western industrialized countries.[1–5] Core components of yoga include meditation, physical postures (asanas), and breathing exercises (pranayama) designed to promote mental, physical, and spiritual well-being.[6] Recent research suggests that yoga may enhance health and wellbeing in healthy and clinically ill populations.[7–13] Practicing yoga may aid in the prevention and management of multiple chronic conditions, including depression, stress, anxiety, menopausal symptoms, arthritis, low back pain, cancer, cardiovascular disease, and type 2 diabetes.[7–9, 14–21]

In addition to the health benefits quantified in yoga intervention trials, a limited number of qualitative studies describe health-related outcomes not readily captured by conventional instruments. Individuals have conveyed experiences of life transformation and symptom relief from conditions such as cancer, diabetes, stroke, eating disorders, rheumatoid arthritis, and chronic pain.[22–28]

To date, few qualitative studies have examined how older adults perceive yoga practice, particularly those with limited or no previous yoga experience. The purpose of this study was to evaluate the perceived benefits of yoga practice as described by older, predominantly overweight adults at risk for cardiovascular disease who were learning the practice of gentle yoga over the course of an 8-week time period.

Methods

Study Design

The current qualitative study was conducted with participants from two randomized controlled trials examining the effects of an 8-week Iyengar yoga program on cardiovascular disease (CVD) risk in older adults. The first trial, the Women's Health, Yoga and Education Study (WHYES), included sedentary, overweight, but overall healthy postmenopausal women.[29–31] The second trial, the Diabetes and Yoga Study (DAYS), targeted older adults with type 2 diabetes.[29, 32] DAYS and WHYES participants were enrolled concurrently and shared the same intervention protocol.[29, 32–33]

Each participant completed a weekly yoga practice log and an exit questionnaire regarding perceptions of the study overall (See description below). These data were the basis for the present qualitative study.

Human Subjects Protection

The Institutional Review Board at the affiliated university approved the study. Written informed consent was obtained from participants prior to study enrollment.

Sample

Participants were recruited through advertisements in community newspapers, university buildings, popular local venues, medical offices, e-mail distribution lists, and the University clinical trials website. Inclusion criteria consisted of age (45 years or older), postmenopausal

status (for women), no yoga experience within the past year, and ability to complete a gentle 8-week yoga program. Additional eligibility criteria for DAYS included a medical diagnosis of type 2 diabetes mellitus for at least 6 months; for WHYES, an inactive lifestyle of exercise < 3 times per week; and body mass index [BMI] ≥25, waist circumference ≥88 cm, or a first-degree relative with diabetes or essential hypertension.

Excluded were current smokers, those with a diagnosis of major orthopedic or neurological disorders, active musculoskeletal pain hindering completion of the yoga intervention, or sleep apnea, and/or those who regularly used an assistive device for ambulation. Additional exclusion criteria for DAYS included the use of insulin, any serious chronic comorbid conditions, acute coronary symptoms within the past 6 months, and/or an artificial pacemaker; for WHYES, impaired insulin sensitivity, use of medications affecting carbohydrate metabolism, and/or any serious chronic conditions.

Eligibility for the current study included attending a minimum of six yoga class sessions and completing weekly yoga logs and an exit questionnaire. The rationale for the attendance criterion is based on the authors' prior experience in yoga research and consultation with the yoga instructor regarding the acquisition of yoga skills and associated benefits. Authors determined that a participant who attended at least six sessions of yoga completed roughly one-third of the intervention and likely attained a basic familiarity with yoga.

A total of 75 participants (38 yoga and 37 control group) were enrolled in the WHYES, and 40 participants in the DAYS (20 yoga and 20 control group). Among the 58 individuals collectively assigned to the yoga intervention group, 42 completed at least six yoga sessions and an exit questionnaire (N=30 from WHYES, 12 from DAYS).

Intervention

Daily yoga practice was the foundation of the intervention protocol. The 8-week intervention consisted of 90-minute Iyengar yoga class sessions held two days a week and 30-minute home practice sessions on the five non-class days. Iyengar yoga is a classical form of Hatha yoga focusing on standardized, precisely aligned poses (*asanas*) that can be tailored for individuals who are elderly, physically unfit, or suffer from chronic illness.[34, 35] The use of props (blocks, belts, blankets, and chairs) offers additional support to prevent strain, overstretching, or other injury.[1]

The study yoga instructor, an Iyengar yoga master and teacher trainer, developed yoga sequences in consultation with B. K. S. Iyengar, the yoga master who originally developed this specific form of Hatha yoga.[31] Each class and homework practice included centering poses, basic standing poses (e.g., Tadasana or mountain pose), seated and forward bending poses (e.g., Janu sirsasana or one leg straight forward spinal stretch), twists (e.g., Maricyasana III or pose named for sage), supported back bends and modified inverted poses (e.g., Setu bandha sarvangasana or supported bridge pose), relaxation poses (e.g., Savasana or corpse pose) and simple breathing exercises (Pranayama). During class, the instructor demonstrated modifications of yoga postures as needed to promote safe, effective practice. To facilitate home practice, participants received a yoga mat, strap, video/DVD, and booklet illustrating the home yoga program.

Data Collection

Each week, participants submitted an unstructured yoga log, recording the minutes spent in home-based yoga practice each day and sharing perceptions of yoga practice at home and in class. At the study's end, a 10-item, open-ended exit questionnaire elicited participant perceptions, including factors affecting home-based yoga practice and overall perceptions of the study.

Data Analysis

The authors used SPSS (version 19) to calculate descriptive statistics.[36] Demographic differences between yoga participants, based on inclusion in the current qualitative study, were assessed using independent *t* tests and X^2 analyses.

In approaching the narrative data in the yoga logs and exit questionnaires, the authors assumed a constructivist-interpretive paradigm of naturalistic inquiry.[37–38] To facilitate analysis, the investigators imported all documents into ATLAS.ti.[39] The authors used methods of conventional content analysis by reading and re-reading the text closely; key words or phrases in each participant's log or exit questionnaire were categorized by content, which generated many units of meaning, or codes.[40–43] After an iterative process of reading, analyzing, and open coding of the textual data, the authors organized the codes into meaningful clusters or coding categories, which led to the emergence of underlying meanings, known as latent content, or themes.[43] In addition to describing themes that emerged from the text, the authors tabulated the frequency of subcategories among the sample. These data were used to calculate a percentage, clarifying the portion of the sample whose comments were represented by each theme.

To enhance the validity and trustworthiness of the qualitative analysis, the authors implemented two key strategies for peer review: (1) active discourse regarding the strategies for coding and organization of coding categories, and (2) consultation with an experienced qualitative researcher to review the audit trail and explore decisions regarding data interpretation.[41] Threats to trustworthiness, including researcher bias, were minimized by this approach to peer review, with emphasis on researcher reflexivity and authenticity.[38] Another strategy to increase trustworthiness and credibility is increasing reader access to primary data.[42] Toward that end, participant quotes are presented together with interpretative findings and also displayed in Table 3.

Results

Sample Characteristics

Demographic characteristics of the participants are displayed in Table 1. Overall, the average age of participants was 59 (±7) years. Most participants were female (90.5%), non-Hispanic white (76.2%), married (59.5%), and had completed four or more years of college (73.8%). DAYS and WHYES participants shared similar demographic characteristics, with no significant differences except for gender; per protocol, there were no men in the WHYES group. In addition, DAYS and WHYES participants shared similar baseline clinical measures (BMI, blood pressure, history of anxiety/depression, and former smoking status), except for hemoglobin A1c, fasting blood glucose, and lipid profile values. DAYS participants had significantly higher hemoglobin A1c ($p = 0.017$) and fasting blood glucose values ($p = 0.009$) but lower total cholesterol ($p = 0.005$) and LDL cholesterol ($p = 0.006$) values than WHYES participants.

Comparisons between those included and excluded from qualitative analysis are depicted in Table 2. Relative to those excluded, individuals included in the current study were more likely to be married ($p = 0.054$) and to have higher diastolic blood pressure ($p = 0.052$) and HDL cholesterol ($p = 0.004$) and lower hemoglobin A1c ($p = 0.042$) values but did not differ in other characteristics.

Primary Themes

Four principal themes emerged through data analysis. DAYS and WHYES participants reported similar patterns of benefit, with slight differences noted when examining

subcategories separately by group. A detailed description of each theme follows, including a percentage of the sample whose commentary supports the identified theme. Representative participant quotes, categorized by theme and subcategory, are summarized in Table 3.

Theme 1: Practicing yoga improved overall physical function and capacity

Most participants (83% total, 100% of DAYs, 77% of WHYES) reported improvements in physical function and capacity for physical activity.

Increasing self/body awareness—Participant phrases ranging from “think of posture alignment several times a day” to “felt the pull in shoulders and knees” were common. As one participant aptly phrased, “I am especially pleased [with] the way I am able to incorporate yoga poses in the way I walk, sit, stand and go about daily activities. It has made me so much more aware.”

Overall fitness—Participants used phrases ranging from “great workout for abs and quads” to “strenuous session, worked up a sweat.” One participant stated, “I already know I’ve improved tone and lost weight.” Inspired by novel experiences with yoga, another participant wrote, “I am becoming more aware of my surroundings & beginning to develop better healthy choices. For the first time in over 25 years, I am taking action to lose weight.”

Stretching—Participants noted an improved capacity for stretching and renewed flexibility. As one participant described, practicing yoga was instrumental in “learning how to stretch properly.” For others, yoga practice restored function or enhanced baseline physical fitness. One participant wrote, “I enjoyed the flexibility that had returned to my body. I have noticed the difference.”

Strengthening body and maintaining poses—Many participants reflected on incremental increases in strength and ability to maintain poses over time. One participant wrote, “tough poses but I was determined, good class, sticking with it, gaining strength--I feel it, can go a little longer.” Other individuals shared the belief that continuing yoga would “benefit in the long run,” in spite of initial soreness.

Deep breathing—Several participants observed improved quality and depth of breathing with yoga practice. Individual phrases ranged from “refreshing workout, I felt easier, smoother breathing afterwards….able to breathe deeper” to “breathing is coming easily.” In sharing comments such as “deep breathing throughout the day,” some participants revealed an integration of deep breathing into daily life.

Enhanced energy—Participants commonly noted a sense of energy infusion through yoga. For some, yoga mitigated fatigue: “I was tired prior to class but after class I felt relaxed and [had] more energy.” Other participants observed the revitalizing effects of yoga throughout the day: “Tired today, yoga warmed me up and was able to keep going, building stamina, feel good.”

Symptom relief—Another reported physical benefit was symptom relief, particularly the ability to manage joint stiffness and pain. One participant wrote pointedly, ““Yoga = relief from stiffness.” Participants expressed having relief from aches and pains in the back, knee, hip, and groin. Capturing the satisfaction of pain relief, one person wrote, “My body doesn't have joint pain when I do Yoga! I feel stronger and better in control of my body day by day.”

Theme 2: Practicing yoga reduced stress/anxiety and enhanced calmness

Most participants (83% total, 83% of DAYS, 83% of WHYES) described an enhanced mental and emotional state.

Relaxation and stress/anxiety reduction—Some participants seemed to view yoga as a safe haven after a busy, tense day. One participant wrote, “I was pretty anxious, jittery all day until my yoga.” Expressions such as “I'm not anxious; I feel good about myself” and “felt better, tense, needed to relieve stress” emphasized the anxiolytic effects of yoga, reinforced by statements regarding the “stress relief/calming influence of yoga,” and “yoga as a stress reliever.”

Pleasure—Some participants expressed a deep pleasure and sense of joy resulting from yoga. Subtle expressions of pleasure were common: “pleasantly surprised, enjoying the class” and “last relaxing pose is wonderful, good.” For others, the pleasure was effusive: “I love this!” and “starting to feel day is incomplete without yoga… enjoy every moment!”

Increased tranquility and decreased reactivity—Some participants described a calm response to stressful stimuli, attributing this ability to yoga practice. One wrote, “car had to be towed after class but deep breathing helped me to maintain 'my cool'.” Comments ranging from “noticed calming reactions to situations” to “deep breathing to keep my temper” suggest that yoga practice helped to reduce reactivity and enhance capacity to manage stress.

Theme 3: Practicing yoga enriched the quality of sleep

Several participants (21% total, 17% of DAYS, 23% of WHYES) attributed a better quality of sleep to yoga. Some simply wrote “slept well at night” or “better sleep.” One wrote about “doing some breathing exercises before going to sleep,” while another claimed that “exercises are less strenuous, [the] more I do the better I sleep.” Relaxation-inducing effects of yoga led to enhanced sleep quality for another, who wrote of “the deep relaxation felt in class…feel more centered and am sleeping like a baby.”

Theme 4: Practicing yoga supported efforts toward dietary improvements

A subset of the participants (14% total, 8% of DAYS, and 17% of WHYES) expressed the belief that yoga practice led to improved dietary patterns and habits. One individual claimed, “I seem to have suddenly lost my taste for salty and heavy food and crave vegetables.” Another individual stated that practicing yoga “affected my appetite. I am able to eat less and crave carbs less.” For others, practicing yoga appeared to foster a new “focus on diet,” change in orientation to food, and awareness of body sensations: “[I] ate healthy meals & did not stuff when I felt full.”

Discussion

The four themes that emerged from data analysis are likely interconnected and synergistic, with reciprocal relationships. The first theme, yoga improved physical function and capacity, has been noted in other studies. Individuals with chronic illness have reported relief from joint pain, improved range of motion and flexibility, and strengthening of previously unused muscle groups as a result of yoga practice.[26, 28, 44]

The clinical implications of this finding are numerous; enhanced physical fitness leads to improved cardiopulmonary function, as well as increased muscle strength and endurance.[8, 44–50] Furthermore, practicing yoga may increase the capacity for physical activity or restore the desire to improve physical fitness.[51]

Consistent with the current study's findings, individuals with chronic pain report responding to painful stimuli with intentional relaxation strategies through yoga.[28] Other studies indicate the potential of self/body awareness to transcend physical and psychosocial limitations.[25, 52] These findings support the central therapeutic mechanism of mind-body intervention: a growing awareness of the body and self leads toward integration of body-self-environment.[53]

The second theme, yoga reduced stress/anxiety and enhanced calmness, has been reported previously by individuals living with cancer or CVD.[24, 54–56] Findings from the current study reinforce the efficacy of yoga for enhanced stress reduction, anxiety management, and calmness/tranquility, as well as decreased reactivity. These reported benefits are clinically important, given the documented negative effects of psychosocial distress on health and well-being.[57–61]

The third theme, yoga enriched sleep quality, was reported by healthy individuals and those with cancer or osteoarthritis.[23, 62–63] However, only 21% of participants in the current study reported sleep improvements. While evidence may suggest that yoga practice improves sleep quality, efficiency, and duration[63–64], the majority of participants in the current study did not report such benefits. Further research examining the efficacy of yoga practice to improve sleep quality is warranted, given the high prevalence of disturbed sleep among individuals with diabetes and CVD[65–66] and the relationship between impaired sleep and adverse health outcomes.[67–69]

The fourth theme, yoga improved dietary patterns, has been less commonly reported. Yoga practice is associated with improved dietary intake and healthy attitudes toward eating, according to studies among women of varying ages, some with a history of binge eating.[25, 27, 70] However, only a small fraction (14%) of participants in the current study reported dietary benefits from yoga practice. The efficacy of yoga to influence eating behaviors and patterns, or other lifestyle factors, merits further investigation.

Limitations

This qualitative study relied on a descriptive study design with no control group; although the completion of yoga logs was encouraged, submission was inconsistent. The log format was open-ended, allowing participants the freedom to write as much or as little as they preferred. Some participants only recorded home practice times without comments. Others provided minimal commentary on exit questionnaires, in contrast to the broad range of benefits expressed spontaneously by participants during class. Future studies may benefit from a protocol that includes systematic recording of participant comments in class and a face-to-face exit interview for those who prefer verbal communication.

Another limitation of the current study is potential response bias, given the percentage of participants excluded from analysis. However, those excluded from analysis were similar overall to those included in demographics, lifestyle factors, and psychophysiological indicators (Table 2), rendering bias less likely. Among the 16 participants excluded from analysis, three did not provide narrative data in yoga logs or exit questionnaires, and 13 dropped out of the study, citing health problems (n=7), scheduling conflicts (n=2), and unknown reasons (n=4). None of the participants reported dropping out because of difficulty with the yoga program.

Another limitation of the current study is the lack of diversity in the sample; 90% of the participants were female, and over 75% were non-Hispanic white. The sample homogeneity limits generalizability of the findings; for example, men or individuals of racial/ethnic minority status may hold different values or beliefs regarding yoga.

Data were collected over an 8-week time period, reflecting short-term benefits of yoga. Several participants did not express confidence with yoga until weeks 5 and 6 of the intervention period; a longer intervention may have yielded greater benefit. To advance understanding of the short- and long-term benefits of yoga, a longitudinal study design including a longer intervention period, comprehensive evaluation, and a longterm follow-up is needed.

Conclusions

The results of this study suggest that the practice of gentle yoga provides a number of benefits that promote health and well-being among older, predominantly overweight adults at risk for cardiovascular disease. Participants reported a wide range of benefits, including enhanced self/body awareness, physical fitness, energy, symptom relief, anxiety reduction, tranquility, pleasure, and improved sleep quality and dietary patterns. These findings support the use of yoga as a health promotion strategy in the prevention and management of chronic disease, and warrant confirmation in larger controlled trials.

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Table 1

Sample Characteristics

	All	Women's Health and Yoga Study (WHYES)	Diabetes and Yoga Study (DAYS)	P Value*
N	42	30	12	
Age				0.291
M (SD)	59.1 (7.1)	58.2 (6.1)	61.3 (9.0)	
Range	50 –76	50 –76	52 – 73	
Gender				0.001
Female	38 (90.5%)	30	8 (66.7%)	
Male	4 (9.5%)	0	4 (33.3%)	
Currently Married	25 (59.5%)	17 (56.7%)	8 (66.7%)	0.551
Race/Ethnicity				0.909
Non-Hispanic White	32 (76.2%)	23 (76.7%)	9 (75%)	
Racial/Ethnic Minority	10 (23.8%)	7 (23.3%)	3 (25%)	
Education				0.505
<4 years of college	11(26.2%)	7 (23.3%)	4 (33.3%)	
>=4 years of college	31 (73.8%)	23 (76.7%)	8 (66.7%)	
Currently Employed	26 (61.9%)	21(70%)	5 (41.7%)	0.088
Body Mass Index (kg/m^2)				0.555
Mean (SD)	32.8 (8.4)	33.3 (8.7)	31.6 (7.9)	
Median	30.1	31.0	30.0	
Systolic Blood Pressure (mm Hg)				0.989
M (SD)	131 (21)	131 (21)	131 (21)	
Diastolic Blood Pressure (mm Hg)				0.608
M (SD)	75 (10)	75 (11)	73 (9)	
Hemoglobin A1c (%)				0.017
M (SD)	6.0 (0.7)	5.8 (0.4)	6.6 (1.0)	
Fasting glucose (mg/dL)				0.009
M (SD)	108.6 (28.7)	98.5 (15.1)	134.0 (38.4)	
Total cholesterol (mg/dL)				0.005
M (SD)	202.3 (48.5)	215.2 (45.2)	170.1 (42.5)	
HDL cholesterol (mg/dL)				0.571
M (SD)	55.0 (13.0)	55.7 (13.5)	53.2 (12.0)	
LDL cholesterol (mg/dL)				0.006
M (SD)	126.9 (41.5)	137.8 (39.5)	99.7 (34.0)	
Triglycerides (mg/dL)				0.384
M (SD)	121 (75.9)	127.5 (84.7)	104.7 (45.9)	
History of Depression	9 (21.4%)	6 (20%)	3 (25%)	0.618
History of Anxiety	4 (9.5%)	3 (10%)	1 (8.3%)	0.931

	All	Women's Health and Yoga Study (WHYES)	Diabetes and Yoga Study (DAYS)	P Value*
Former Smoker	10 (23.8%)	8 (26.7%)	2 (16.7%)	0.706

* To assess differences in continuous variables, independent t-tests were used. For categorical variables, X^2 analyses were used.

Table 2

Comparison of Yoga Participants, Based on Qualitative Study Inclusion

	Included	Excluded	P Value*
N	42	16	
Age			0.694
M (SD)	59.1 (7.1)	58.3 (6.5)	
Range	50 –76	48 –73	
Gender			0.335
Female	38 (90.5%)	13 (81.3%)	
Male	4 (9.5%)	3 (18.8%)	
Currently Married	25 (59.5%)	5 (31.3%)	0.054
Race/Ethnicity			0.127
Non-Hispanic White	32 (76.2%)	15 (93.8%)	
Racial/Ethnic minority	10 (23.8%)	1 (6.3%)	
Education			0.196
< 4 years of college	11 (26.2%)	7 (43.8%)	
>=4 years of college	31(73.8%)	9 (56.3%)	
Currently Employed	26 (61.9%)	10 (62.5%)	0.967
Type 2 diabetes mellitus	12 (28.6%)	8 (50%)	0.125
Body Mass Index (kg/m^2)			0.946
M (SD) Median	32.8 (8.4) 30.1	33.0 (5.5) 30.8	
Systolic Blood Pressure (mm Hg)			0.199
M (SD)	131 (21)	123 (19)	
Diastolic Blood Pressure (mm Hg)			0.052
M (SD)	75 (10)	69 (9)	
Hemoglobin A1c (%)			0.042
M (SD)	6.0 (0.7)	6.5 (0.9)	
Fasting glucose (mg/dL)			0.064
M (SD)	108.6 (28.7)	125.4 (34.5)	
Total cholesterol (mg/dL)			0.553
M (SD)	202.3 (48.5)	193.6 (52.5)	
HDL cholesterol (mg/dL)			0.004
M (SD)	55.0 (13.0)	46.1 (8.5)	
LDL cholesterol (mg/dL)			0.658
M (SD)	126.9 (41.5)	121.3 (45.2)	
Triglycerides (mg/dL)			0.075
M (SD)	121.0 (75.9)	157.2 (38.9)	
History of Depression	9 (21.4%)	3 (18.8%)	0.875
History of Anxiety	4 (9.5%)	2 (12.5%)	0.702

	Included	Excluded	P Value*
Former smoker	10 (23.8%)	5 (31.3%)	0.384

*To assess differences in continuous variables, independent t-tests were used. For categorical variables, X^2 analyses were used.

Table 3

Summary of Participant Quotes by Theme*

Physical Benefits			
All	**DAYS**	**WHYES**	**P Value** **
83% (35/42)	100% (12/12)	77% (23/30)	0.067
Increasing self/body awareness All (N=22, 52%) D (n=9, 75%) W (n=13, 43%)	"moved some unused muscles" (DM5) "good, for the first time I was sore, wrists, ankles, and neck" (DM9) "appreciation for my own body…beginning to feel more comfortable with poses….feel unfamiliar parts of my body" (DM10) ""release of tension, feeling my body respond to the poses, energy and a sense of empowerment--that there is something I can do to keep myself healthy" (DM11) "hard to breathe when at full tension" (DM13) "Legs in pain. But good pain…. Back of legs are sore." (DM26) "Was actually sore in shoulders the next day" (DM27) "feeling and awareness of body increasing" (DM34) "I am standing with my feet apart a lot wider than when I started…. Yoga is good. I've learned how to take deep breaths, lifting my toes and shifting my weight to my heel." (DM35) "muscles aren't as tight" (2) "…feeling more aware of posture during the day" (6) "more aware of posture….posture much improved, feeling of well being" (10) "more conscious about body….have increased awareness of posture" (18) "felt good, muscles were in better shape for dancing" (33) "posture improved, think of posture alignment several times a day" (36) "more aware of body through the days…. I am especially pleased the way I am able to incorporate yoga poses in the way I walk, sit, stand and go about daily activities. It has made me so much more aware." (II 02) "continuing to concentrate on breathing in various activities…. Trying desperately to stand correctly" (II 15) "Learning to 'fine tune' postures to do more correctly…" (II 17) "Exercises felt good, all are more natural….the back 'flex' feels good on more weak back muscles." (II 20) "noticed posture improving, more aware of standing straight, less cramping in feet" (43) "Trying to stand and sit with more attention to my posture and breathing has been an ongoing focus of mine….felt the 'pull' in shoulders & knees; maybe I am aligning body parts better?" (70) "yoga posture awareness all day…. This session, I paid particular attention to my back and did not 'try a little harder.' Instead, I relaxed into each pose and enjoyed its benefits" (78)		
Overall fitness All (N=8, 19%) D (n=3, 25%) W (n=5, 17%)	"strenuous session, worked up a sweat" (DM5) "Pushed us to the max - best class of all [last class]" (DM25) "Hard class, but good work out" (DM26) "I can see the yoga is going to challenge me for a long time to come." (II 14) "Great workout for abs and quads. A natural deep breath occurs intermittently with relaxation. Balance improving in warrior pose, no need [for] chair." (II 17) "I already know I've improved tone and lost weight." (33) "Motivated me to lose weight and continue with regular exercise programs…my body is getting in shape – finally!" (64) "I am becoming more aware of my surroundings & beginning to develop better healthy choices. For the first time in over 25 years, I am taking action to lose weight." (II 28)		
Stretching All (N=11, 26%) D (n=3, 25%) W (n=8, 27%)	"feel very pleased my knee has been able to bend further over course of last few weeks, good class…. Able to stretch some poses further than before, good class" (DM10) "I recognize the added flexibility to my range of motion." (DM34) "learning how to stretch properly" (DM35) "stretching felt wonderful…" (6) "I really looked forward to the class because it helped in relaxing me and stretching muscles that had not been worked for a long time" (8) "I enjoyed the flexibility that had returned to my body. I have noticed the difference." (10) "very good-especially the leg and ankle stretches" (13) "Gaining mobility, flexibility" (II 15) "Can touch hands over shoulder, behind back stretch!…. Really good stretching of legs today, felt results with belt and alternating leg lift poses." (II 20) "I was calmer and more limber after each yoga session….seemingly better fit"(45) "Able to stretch more each time; hold each position for several minutes" (64)		
Strengthening the body and Maintaining poses All (N=11, 26%) D (n=4, 33%) W (n=7, 23%)	"Strengthened legs which had gotten weak because of knee arthritis." (DM1) "able to hold poses a little longer than previously, my bad knee is getting a little stronger….feeling more strength in my upper legs and shoulder, new poses, felt little sore from staying in poses longer in Saturday's class but I feel better about it, I know I will benefit in the long run." (DM10) "I wish I could do more poses- getting easier, and I feel good when finished" (DM25) "L side stiff, upper arms slightly sore, wonderful class - I need to work on upper arm strength" (DM41) "tough poses but I was determined, good class, sticking with it, gaining strength-I feel it, can go a little longer….good class, we're building strength and comfort"(10) "Leg strength is increasing" (18) "Feeling stronger" (29)		

	"I never thought I could do yoga poses--now I plan to incorporate yoga into my life." (33) "I'm finally feeling more strength in my legs - more flexible on some positions…"(II 14) "improvement in strength to over all sense of wellbeing, creation of desire to continue personal study of yoga" (II 17) "holding poses for longer periods of time" (64)
Deep breathing All (N=7, 17%) D (n=4, 33%) W (n=3, 10%)	"refreshing workout, I felt easier, smoother breathing afterwards…able to breathe deeper" (DM10) "What I do when I practice is count breaths and try to extend holding each pose. I do each pose sometimes 3–4 times repeated, extending the amounts of breaths with each." (DM27) "breathing is coming easily" (DM34) "Great breathing - set the tone of the class" (DM41) "…deep breathing throughout the day" (43) "emphasis on breathing & relaxation (legs up wall) for extended time; deep breathing exercise" (78) "15 minutes spent on breathing & trying to watch for a pattern" (II 28)
Enhanced energy All (N=9, 21%) D (n=1, 8%) W (n=8, 27%)	"I was tired prior to class but after class I felt relaxed and more energy." (DM10) "feel really committed, doing yoga in the morning makes me feel energized" (2) "Tired today, yoga warmed me up and was able to keep going, good class, building stamina, feel good" (10) "Feeling more energetic" (29) "Felt tired before coming to class, but felt better after" (34) "I feel increased strength/ flexibility relaxed and energized!" (II 14) "the deep relaxation felt in class and the added energy. I have more stamina, feel more centered…" (II 36) "relaxed and energized after practice; another great session!" (64) "following class I felt relaxed & invigorated….poses are becoming easier to get into; they are still hard work but the result is always peace and more energy…. ""so wonderful to do Yoga, I was tired and joints ached, indigestion, sluggish, water retentive before class. I felt relaxed and energized following class!" (78)
Symptom relief All (N=12, 29%) D (n=2, 17%) W (n=10, 33%)	"groin hurt going in, better after class!" (DM25) "I have less joint stiffness and aches with daily Yoga practice….really helps loosen my knees after tennis… like to loosen arms + fingers too….twisting poses leave upper back sore; wall exercises help" (DM34) "Getting to be part of my daily routine, very good, made me feel very relaxed, help my back muscles…" (2) "yoga is helping my knees" (5) "felt sick before class but much better after" (6) "I'm noticing that my bunions do not hurt as much and that my feet are stronger and more flexible." (10) "Stretching out sore muscles from weekend gardening, felt good…. Back out. Good exercises to help stretch…. After painting, climbing ladders all weekend, I did most of the relaxation poses and stretching felt wonderful." (II 14) "After 4 hours of yardwork I needed it." (II 15) "Seems best to start day with yoga to relieve morning stiffness (right hip especially sore)…. Yoga = relief from stiffness. In divided doses doing postures to relieve stiff lower back, stretch hamstrings, open shoulders, stand straight…. Right hip is better, yoga helps." (II 17) "An ahha moment, pressing right heel mire in warrior pose relieves knee strain/ pain in right knee - duh!" (II 36) "making slight adjustments in placement of hands/wrists during poses alleviates pain from arthritis / carpal tunnel syndrome" (64) "My body doesn't have joint pain when I do Yoga! I feel stronger and better in control of my body day by day….absence of joint pain and fatigue, renewed hope!…overall joint stiffness is greatly diminished - even sciatic nerve pain is very low or negligible" (78)

Mental Benefits			
All	**DAYS**	**WHYES**	**P Value**
83% (35/42)	83% (10/12)	83% (25/30)	1.00
Relaxation and stress/anxiety reduction All (N=20, 48%) D (n=6, 50%) W (n=14, 47%)	"Last relaxing position is wonderful, good" (DM9) "felt good, relaxing….starting to feel comfortable, definitely feel more relaxed…felt relaxed and happy…. I was pretty anxious, jittery all day until my yoga….after a tension filled day I practiced at the end of the day and felt much more relaxed post session…" (DM10) "I feel more relax[ed]" (DM26) "very relaxing…always relaxing." (DM34) "relaxing by laying on my back" (DM35) "Relaxation" (DM41) "Getting to be part of my daily routine, very good, made me feel very relaxed, help my back muscles, very good, instructor is super, makes me feel very good…. I like the way you are taught how to relax and to unwind" (2) "I really looked forward to the class because it helped in relaxing me…" (8) "focus on relaxing…. Nice and slow, good work out, very good-especially the leg and ankle stretches, felt rushed, relaxing after a tense week" (13) "new skills in relaxation and 'living in the moment…. very relaxing" (18) "concerns about knees, feet, and weight are minimized" (33) "very relaxing" (34) "The class successfully convinced me of the value of yoga as a stress reliever…" (II 02) "Much better - helped me unwind from traveling. I spent more time in relaxation poses…. Great way to unwind after a busy week." (II 14) "Feels best to start day with yoga and do afternoon relaxations…. Great sense of relaxation by end of class." (II 17) "Yoga class very relaxing" (II 20) "felt better, tense, needed to relieve stress….stress relief/calming influence of yoga" (43) "so relaxing" (45) "the breathing exercises are so relaxing" (64)		

	"felt need for relaxation & deep breathing…. I'm not anxious; I feel good about myself" (78)
Pleasure All (N=22, 52%) D (n=7, 58%) W (n=15, 50%)	"Felt great to be doing yoga…. Gave me a good feeling about my body." (DM1) "pleasantly surprised, enjoying the class….enjoyable class, very good workout" (DM5) "more enjoyable….enjoyed the bound angle leg pose and accounts for longer practice today" (DM9) "practice felt good" (DM13) "Enjoyed the relaxation poses most." (DM25) "Enjoyed the class….[Instructor] gave a good work out. I enjoyed it very much" (DM26) "information and yoga all very straightforward and fun" (DM34) "enjoyable" (5) "the "extended legs up the wall pose" is hard to get into, but it feels fantastic." (6) "enjoying the lying down bound angle [pose]….enjoyable" (10) "enjoyed class" (27) "loved first class….enjoyable" (36) "I liked the way I felt after class" (39) "…[liked that] yoga that was mostly not too hard for me, and feeling the benefits almost immediately" (40) "Good, forgiving, renewing class. I need this." (II 02) "I enjoy my classmates as much as the yoga. Lots of fun…Exhilarating. I love [instructor]." (II 14) "Looking forward to yoga time." (II 15) "Starting to feel day is incomplete without yoga and much stronger feeling within when starting day with yoga." (II 17) "Love the feeling after class" (II 36) "enjoyed class, very informative, felt good" (43) "I love this!, easier on my back this time" (45) "enjoy every moment!…. very pleased to 'feel' my progress! Enjoying the quiet time I'm allowing for myself…. Excellent! So glad I'm taking time for myself!" (64)
Increased tranquility and decreased reactivity All (N=8, 19%) D (n=1, 8%) W (n=7, 23%)	"felt calmer after session from a long day" (DM10) "deep breathing to keep my temper" (27) "noticed calming reactions to situations" (43) "…learning calming techniques." (II 15) "Mental detachment from basement water leak…Gives sense of strength and calmness and control over life." (II 17) "Came in rushed - left calm" (II 19) "Car had to be towed after class but deep breathing helped me to maintain 'my cool'." (II 28) "I was calmer and more limber after each yoga session" (45)

Sleep Benefits

All	DAYS	WHYES	P Value
21% (9/42)	17% (2/12)	23% (7/30)	0.634

"after a tension filled day I practiced at the end of the day and felt much more relaxed post session and slept better" (DM10)
"practice felt good, slept well…. Been sleeping great since yoga-I almost always do it just before I sleep." (DM13)
"exercises are less strenuous, more I do the better I sleep" (2)
"slept well at night" (10)
"yoga helped relax me before sleep" (II 20)
"the deep relaxation felt in class and the added energy. I have more stamina, feel more centered and am sleeping like a baby" (II 36)
"better sleep" (45)
"doing some breathing exercises before going to sleep" (64)
"restful sleep" (78)

Dietary Benefits

All	DAYS	WHYES	P Value
14% (6/42)	8% (1/12)	17% (5/30)	0.486

"beneficial in helping me to think about what I was eating and how I was moving. I am still enthused about yoga and taking better care of myself." (DM11)
"I seem to have suddenly lost my taste for salty and heavy food and crave vegetables" (6)
"focus on diet" (13)
"Eating habits improving…. This stuff [yoga and instructor feedback] is good for me…Back on healthy eating!" (II 02)
"Ate healthy meal & did not stuff when I felt full." (II 28)
"Felt a noticeable difference before and after, also affected my appetite. I am able to eat less and crave carbs less." (34)

* D = DAYS (Diabetes and Yoga Study)

W = WHYES (Women's Health, Yoga, and Education Study)

** X^2 analyses