

## Research Article

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## A Study to Identify the Benefits, Barriers, and Cues to Participating in a Yoga Program among Community Dwelling Older Adults

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### Abstract

**Objectives:** The purpose of this study was to identify the perceived benefits, barriers and cues to participate in a yoga intervention among community dwelling older adults.

**Design:** A cross sectional study using a previously validated survey developed based on the health belief model was administered to participants.

**Setting:** Community Setting - Beneficiaries of the Bihl Haus Arts community center at two different locations.

**Subjects/Participants:** Two hundred and seventy five (275) older adults attending community activity centers. Both males and females ages 50 and older, willing to participate in the survey. Exclusions were made for any unwillingness to complete the survey or incomplete surveys.

**Results:** The participants in the survey were age 50 and older, with average of 70.7 years, 73% were females, 68% were Hispanic by ethnicity, 18.5% were white, 50% had high school or less education and the remaining had a professional degree. 90.6% identified as Christian or Catholic faith. Statistically significant associations were found between some survey items and participant's willingness to do yoga was measured using chi-square statistics and student's t test. Also, associations were found between yoga willingness and three additive scales which were constructed for perceived physical, mental and social benefits.

**Conclusions:** Perceived benefits to participate in yoga are physical, mental, and social benefits to health. Perceived barriers to participating in yoga were do not have time, class is too long, dislike teacher, hurts, might worsen health problems, and that yoga is not an aerobic exercise. Having a physical or mental ailment, advised by friends and family and awareness through the media were the main cues to action or motivation to participate in yoga.

**Keywords:** Yoga; Barriers; Benefits; Cues; Older adults; Health belief model

### Introduction

#### Public health burden

The development of chronic disease conditions greatly impairs function, disability, and quality of life (QOL) in the elderly [1]. There is an alarming rate of physical inactivity among older adults, particularly those aging with a disability [2]; there is strong evidence for the beneficial effects of physical activity on impairment, function, and health-related aspects of QOL among older adults. By 2030, the number of older Americans is expected to double from 35 million to 70 million. The percentage of the total population that is aged 65 or older is expected to grow from 12 percent in 2000 to 20 percent in 2030 [3]. The growing number of older adults will place increasing demands on the public health system and on medical and social services.

#### Benefits of physical activity

Physical activity plays an important role in the treatment of chronic diseases in older adults. Physical activity has beneficial effects for the treatment of cardiovascular disease, high blood pressure, high cholesterol, chronic lung disease, diabetes, obesity, and osteoarthritis. These beneficial effects occur in people of all ages, including the 65 and over population. Physical activity also helps to relieve symptoms of depression, helps to maintain independent living, and enhances overall quality of life [4].

### Physical inactivity and functional decline among older adults

According to the National Center for Health Statistics, Americans are living longer, with life expectancy for those born in 2002 at 77.3 years, up from 71.2 in 1972 [5]. However, the quality of those additional years may be somewhat compromised, with over 34% of adults age 65 or older reporting limitations with even the most basic activities of daily living (ADLs), such as bathing and dressing [6,7]. Decreased physical capacity (e.g., muscular strength and endurance, flexibility, agility, and balance) leads to impairment in functional tasks (e.g., standing up from a seated position, lifting light weights, etc.), potentially leading to difficulties maintaining personal and social roles (i.e., disability). Indeed, decreased lower body strength has been identified as a powerful predictor of disability onset in later life [4]. Because quality of life in

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later years depends largely on the ability to independently engage in self-selected activities [7] it is important to encourage participation in physical activity among older adults – not only to participate but to remain active.

### Lack of participation in physical activity among older adults despite evidence based strategies

Incorporating physical activity into normal daily routines (for example, walking or bicycling rather than driving) is one of the most effective strategies for becoming more active. However, only 16 percent to 19 percent of adults over age 65 reported making trips of 1 mile or less by walking. In addition, less than 0.3 percent of those over age 65 reported using a bicycle to make trips of 5 miles or less [5]. Few older adults achieve the minimum recommended 30 or more minutes of moderate physical activity on 5 or more days per week. Data from the Centers for Disease Control and Prevention (CDC) indicate that about 28 to 34 percent of adults aged 65 to 74 and 35 to 44 percent of adults, ages 75 or older are inactive [5,7]. Inactivity is more common in older people than in middle-aged men and women. Despite evidence-based programs for physical activity among older adults such as “Active Start” and “Enhance Fitness”, they often do not participate [8-10]. One of the reasons they do not participate is that exercise programs are designed for the more functionally able persons; not all seniors are able to participate. Another barrier is that many exercise programs are based on “one size fits all” approach. Resnick proposes that interventions which focus on establishing appropriate goals (tailored to function and physical level) may be more useful to improve adoption and adherence to regular exercise among older adults [11-14]. Yoga can be varied to suit individual needs, and benefits of yoga may be derived from even brief periods of activity. Therefore, the majority of elders could participate in yoga programs [15,16].

Yoga is a practice of gentle stretching, exercise for breath control, and meditation that leads to more patient satisfaction than any other complementary/alternative modality does. It has been reported that yoga has beneficial effects in stabilizing the sympathetic nervous system, increasing psychological well-being, and decreasing stress or reducing cardiovascular risks. The advantages of yoga as option for physical activity in older adults include (a) the comprehensive approach in which physical exercises are linked to a wider a life- style package that also includes diet, relaxation and stress management; (b) low cardiovascular demands relative to other forms of exercise; (c) low impact, hence meets the need of the elderly who have difficulties in mobilization, or contra-indications to strenuous exercise; and (d) it provides an alternative identity option thereby improving self-esteem [17].

Yoga is a potentially promising physical activity among older adults for the following reasons: a) Yoga combines elements of different exercise modalities (aerobic, strength, flexibility, and balance; as recommended by the National Institute on Aging Exercise Guidelines for Older Adults (2008) [18] b) More and more older adults in the United States are practicing yoga [19,20]; and c) Yoga can easily be adapted to an individual's needs and abilities. Surveys have shown that more community dwelling older adults are being offered yoga classes within their residential settings however participation in such classes is limited [20-23]. Research focus on assessing barriers, perceived benefits and cues to action for participation in and adherence to yoga exercise regimes is required to understand how older adults will evaluate whether or not to participate in yoga [6,15,16,21,24-33].

Bihl Haus Arts Community Center at an independent living

community i.e. Monticello apartments and the Lopez Community Center has been offering free yoga classes to the more than 5000 odd residents there, but over the last 3 years participation rates have remained flat at about 10 residents. This study is designed to explore possible reasons for participating or not participating in yoga interventions, applying the health belief model (HBM) of health behavior change [34].

### Research question

What are the perceived benefits, barriers and cues to action to participate in yoga intervention?

### Objectives

To identify the perceived benefits, barriers and cues to participate in a yoga intervention among independently living older adult's beneficiaries of the Bihl Haus Arts Center.

The model posits [34] that beliefs such as perceived benefits of a physical activity, perceived barriers to being active; and perceived threats posed by not engaging in regular physical activity correlate significantly with adopting and maintaining that health behavior. Perceived benefits of exercise might include improvement in physical function and long-term health benefits, while perceived barriers might include committing the time and effort required to maintain an exercise program. Since perceived barriers and benefits vary among individuals, an individual's motivational state at that time greatly influences behavior. HBM however is realistic. It recognizes that sometimes wanting to change a health behavior isn't enough to motivate change, and incorporates one more element into its estimations about what it actually takes to get an individual to make the leap. That is the actual cues to action to initiate physical activity. Cues to action are external events that prompt a desire to make a health change. An example would be a physician's advice to exercise. Demographics and cues to action determine the likelihood of action. The likelihood emerges from the balance of perceived benefits vs. perceived barriers to preventive action (Table 1).

### Methods

#### Design

This was a cross-sectional study; surveys were conducted between February and May 2013. Study period was from August 2012 to July 2013.

#### Setting

Community dwelling older adults more than 50 years of age, who are beneficiaries of the Bihl Haus Arts Community Center in two different locations, in San Antonio Texas. The participants in both the locations were of the same ethnic and socio economic background.

#### Sampling

A power and sample size analysis was conducted with alpha acceptance criteria of  $p < 0.05$ . It calculated that a sample size of 272 would be sufficient to detect an effect size of 0.185 (between small and

HBM Construct	Questions in validated survey
Cues to action*	Reasons people started yoga such as physical ailment, friend advised, physician suggested, TV, Radio etc.
Perceived Benefits*	Help back pain, lower blood pressure, improve balance , reduces stress etc.
Perceived Barriers*	Time, class is long, cost too much, did not like the teacher etc.

**Table 1:** Health Belief Model Constructs and sample questions asked in the validated survey.

medium) at a level of statistical power of 0.8 for an X<sup>2</sup> test having 2 degrees of freedom.

### Subjects/Participants

Independently living seniors - 275 beneficiaries of the Bihl Haus Arts Community Center were interviewed using the validated survey. Inclusion criteria were age >50 years, both male and female, should be able to answer the questions that were asked. Exclusion criteria were incomplete surveys and unwillingness to complete the survey. Each participant was given a \$10 HEB gift card (A supermarket chain in Texas and New Mexico) on completion of the survey.

### Data collection tool

A validated survey [24] from a previous pilot study the survey (Patel et al unpublished data) was administered to 170 participants in an independent living community and the response rate was less than 20%. Focus groups were conducted among the participants to understand the low response rate. Reasons identified for low response were physical limitations like tremors that interfered with their writing or visual impairment with reading and responding to questionnaires. Hence the questionnaire was administered as a survey and response rate was 89% and questions were worded based on the feedback given. The revised validated survey was used in this study (Appendix 1).

### Recruitment and data collection

Two open houses were conducted in February and in March at the Bihl Haus Arts Center. We discussed the purpose of the survey and recruited residents who were willing to participate. We also placed flyers in the resident mailboxes and attended the residents' meetings to publicize participation in the survey. We conducted the surveys at a place and time that was convenient for the residents, either in their own homes or at the Arts Center. A written informed consent was taken from each participant.

Data was collected by 4 interns and residents for two half-day sessions each week according to the convenience of the participants until data collection was complete. We completed data collection in 12 weeks. Data was entered using the double entry method by two masked independent data entry interns. The data entry was cross-verified by a data analyst.

### Data analysis

Electronic data was entered into and analyzed using IBM – SPSS v21. Association between survey items and participants willingness to do yoga was measured using chi-square statistics and student's t tests. Three additive scales were constructed for perceived physical, mental and social benefits from items in the survey.

Three scales for yoga benefits were constructed by taking the mean of the rescaled item categories. The survey category coding for the yoga benefit items was rescaled with those who responded 'Don't Know' =0, those with 'Strongly Disagree' or 'Disagree' = 1 and 'Agree' or 'Strongly Agree' = 2. A scale for physical benefit consisted of combined values for the items 'Improving balance', 'Increases strength', 'Improves posture', 'Reduces arthritis' and 'Prevents fatigue'. A scale for social benefits was constructed from items 'Helps socialize' and 'Make friends'. The scale for mental benefit used items 'Self-acceptance' and 'Inspires mindfulness'. A cron bach's alpha co-efficient for internal constancy was derived for each of the three scales; physical (alpha = .922), social (alpha = .942) and mental (alpha = .895). The mean of the rescaled items was calculated for each scale for each participant and statistically analyzed for differences between those who were either willing or not willing to participate in yoga using three t-tests for independent groups.

## Results

### Descriptive

First, study investigators analyzed basic descriptive statistics such as frequencies, proportions, means and standard deviations to assess the demographic information from our sample. We evaluated different measures of central tendency (e.g., mean, median and mode) and dispersion (e.g., range and standard deviation) to acquire an understanding of our sample distributions. More than 75% of the participants were female. Ninety percent of the female participants were willing to participate in yoga whereas only 67% of males were willing to participate in yoga and this was a statistically significant difference between the genders. We did not find any difference in willingness to participate based on ethnicity, education and religion. Majority of the participants were Hispanic 85% and only 15% were white, black or Asian ethnicity. There was a variation in education ranging from high school or less (44%), some college 8%, graduates including professional degrees was 43%. Educational level had no significant association with willingness to participate in yoga. Majority were of catholic or Christian religion 84% (Table 2).

### Perceived benefits

The participants perceived that yoga had physical, mental and social benefits and the findings were statistically significant as shown in Figure 1. The physical health benefits were perceived as lowering blood pressure, improving balance and muscle strength, improving sleep, posture, immune response, arthritic pain, prevents chronic fatigue. The mental health benefits included improves mental ability, reduces stress level, helps accept one better and improves self-esteem, inspires mindfulness. The social health benefits were helps to socialize, make new friends.

Willing to Participate in Yoga						
	No		Yes		Total	
	Count	Row N %	Count	Row N %	Count	P value*
<b>Sex</b>						
Male	22	32.4%	46	67.6%	68	
Female	19	9.8%	175	90.2%	194	<0.001
<b>Ethnicity</b>						
American Indian/Alaskan Native	1	14.3%	6	85.7%	7	
Black - Non Hispanic	5	23.8%	16	76.2%	21	
Hispanic	24	13.6%	153	86.4%	177	
White	8	17.0%	39	83.0%	47	
	3	30.0%	7	70.0%	10	0.627
Other Ethnic	0	.0%	1	100.0%	1	
<b>Education Level</b>						
Less than 8th grade	8	22.2%	28	77.8%	36	
8th grade to High School	19	22.6%	65	77.4%	84	
Some College	6	8.1%	68	91.9%	74	
College Degree	3	10.7%	25	89.3%	28	
Graduate Degree	2	22.2%	7	77.8%	9	
Professional Degree	1	11.1%	8	88.9%	9	0.151

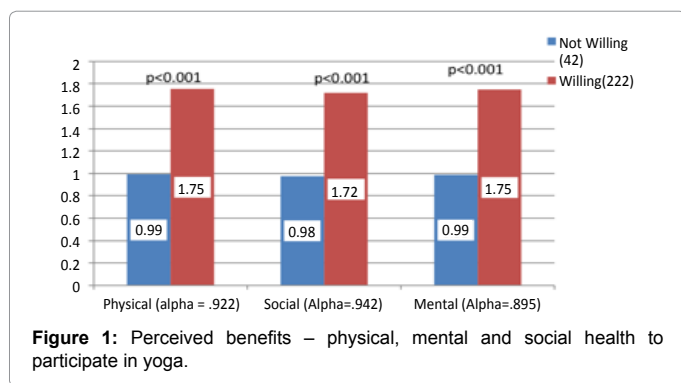
Table 2: Demographic data of the study population and willingness to participate in yoga.

### Perceived barriers

The perceived barriers were lack of time, class too long, quality of the yoga teacher, will hurt, will worsen health problems and lack of aerobic challenge were that significantly reduced the willingness to participate. Table 3 represents the various barriers to participating in yoga and shows the reasons that were statistically significant (Table 3).

### Cues to action

Some of the external events that prompted participants to participate in yoga were presence of physical or mental ailment that they perceived would be benefitted by yoga, if friends or family members motivated them to advise them to participate. Media publicity of yoga



was a cue for them to participate in yoga. In this study, physicians or health care providers advice was not a cue to action, which is contrary to participation in other exercise programs. On the contrary if they had heard about yoga or had attended yoga or are currently participating in a yoga class, they were more likely to be willing to participate in a future yoga program as shown in Table 4.

### Discussion

One of the reasons for the gender difference in willingness to participate in yoga maybe related to the fact that males do not perceive an aerobic challenge with yoga, another reason being more female yoga instructors compared to male personal trainers. Having prior knowledge of this science or any experience with it was a significant motivator to participate, which suggest the importance of educating this age group the health benefits using different sources. Interference with faith was not an obstacle in this study unlike one found in perceptions study [35]. This is a very significant finding, as even though the population was mainly Catholic by faith they did not perceive yoga as a religion based activity. Awareness of yoga and its perceived benefits in physical, mental and social health was similar to the systematic review of randomized control studies in yoga [36] and other limited studies in yoga [15,28,37-39].

Lack of time was a significant barrier in our study, which is in line with some of the other studies done on barriers to initiate physical activities in older adults [24,40,41]. Typically most of the yoga classes being hour and half was a challenge for most of the older adults. Quality

Barriers to Yoga	Willing to Participate in Yoga*	Willing to Participate in Yoga*		Willing to Participate in Yoga*		Total	P value*
		No	Yes	Count	Row N %		
Do not have time	Don't know	10	10	50.0%	50.0%	20	(<0.001)**
	Not a problem	7	133	5.0%	95.0%	140	
	Big problem	14	44	24.1%	75.9%	58	
Class too long	Don't Know	14	39	26.4%	73.6%	53	(0.022)**
	Not a problem	10	121	7.6%	92.4%	131	
	Big problem	7	26	21.2%	78.8%	33	
Female dominated	Don't Know	13	34	27.7%	72.3%	47	(0.16)**
	Not a problem	12	134	8.2%	91.8%	146	
	Big problem	4	17	19.0%	81.0%	21	
Dislike Teacher	Don't Know	14	55	20.3%	79.7%	69	(0.035)**
	Not a problem	12	118	9.2%	90.8%	130	
	Big problem	5	12	29.4%	70.6%	17	
Caregiver	Don't Know	12	24	33.3%	66.7%	36	(0.21)**
	Not a problem	14	143	8.9%	91.1%	157	
	Big problem	4	18	18.2%	81.8%	22	
Interferes with faith	Don't Know	13	26	33.3%	66.7%	39	(0.59)**
	Not a problem	17	154	9.9%	90.1%	171	
	Big problem	1	5	16.7%	83.3%	6	
Hurts	Don't Know	14	28	33.3%	66.7%	42	(0.005)**
	Not a problem	8	126	6.0%	94.0%	134	
	Big problem	9	30	23.1%	76.9%	39	
Worsen Health problems	Don't Know	16	32	33.3%	66.7%	48	(0.014)**
	Not a problem	10	140	6.7%	93.3%	150	
	Big problem	5	13	27.8%	72.2%	18	
Not aerobic	Don't Know	14	37	27.5%	72.5%	51	(0.028)**
	Not a problem	12	135	8.2%	91.8%	147	
	Big problem	5	13	27.8%	72.2%	18	

\*Pearson Chi-Square Tests  
 \*\* Not a problem vs. Big Problem

Table 3: Cross table between willingness to participate and barriers to participating in yoga.



Yoga Experience		Willing to Participate in Yoga					
		No		Yes		Total	
		Count	Row N %	Count	Row N %	Count	p value*
Heard about Yoga	Yes	31	13.8%	193	86.2%	224	0.053
	No	11	25.6%	32	74.4%	43	
Ever tried Yoga	Yes	6	7.9%	70	92.1%	76	0.025
	No	36	19.0%	153	81.0%	189	
Currently in Yoga	Yes	0	.0%	18	100.0%	18	0.057
	No	42	17.0%	205	83.0%	247	
	Total	42	15.8%	223	84.2%	265	

**Table 4:** Relationship between prior or current yoga experience and willingness to participate in yoga.

of the yoga teacher is a significant factor in encouraging participating in a yoga class, especially for this age group, since the fitness level of the individuals can vary tremendously and an experienced yoga teacher can tailor the same pose and use props and modifications which will keep all engaged and challenged enough at the same time. The notion that yoga will hurt was a barrier, which was mostly from lack of awareness and not having enough knowledge that the initial discomfort is transient, and is a sign that muscles are getting stronger as yoga related injuries and negative effect of yoga are very rare if practiced under an expert guidance [36]. An assumption that yoga will worsen an existing health problem was a barrier too, which is again a myth which can be removed by educating the older adults with the help of physician, yoga instructors and media. A similar finding was observed in a earlier study on older adults stating the most significant barriers mentioned by non exercisers were fear of falling, inertia, and negative affect [42-47]. Yoga not being an aerobic challenge was another barrier in our study that is mainly because of lack of awareness of yoga benefits. Yoga has been seen as an exercise that involves endurance, stretching, balance and flexibility, all the four aspects of exercise as advocated by the National Institute on Aging [18]. Interference with faith was not perceived as barrier to participation contrary to other studies that have identified catholic religion and interference with faith as a perceived barrier [35].

Presence of physical and mental ailment was a significant cue to initiate yoga. Participants were more willing to try out yoga if were advised by friends and family. Media was a significant triggering factor to prompt participation. Advice from a health care provider was not a cue to participate in a yoga intervention in this study. One of the reasons for this may be because the participants do not perceive yoga as an exercise and also lack of health care providers knowledge of yoga as an exercise. Although participants are looking to their physician for physical activity counseling, physicians are not initiating a regular dialogue on participating in a yoga class. Possible reasons may include lack of physician knowledge or skill.

A limitation to this study is that the study was on predominantly Hispanic population which may not represent the general population as San Antonio is predominantly of Hispanic ethnicity. The group studied was also of a low socioeconomic status, and hence perceived barriers might be different. At the same time it can be also looked at as a study done on America's largest ethnic minority, which constitutes 17% of total population and is expected to grow to 31% by 2060. (U.S. census bureau)

Another limitation was that majority of the people interviewed were the ones that were members of the center and were already active and motivated to get out of the house. This study may have missed those community dwelling older adults who may have other barriers to participation such as transportation, physical disability and mobility problems. This may have also eliminated a population that is

sedentary with undetected challenges that may be important to learn in identifying barriers to participation in yoga.

## Conclusions

The findings from the survey will help offer to rejuvenate the existing yoga intervention based on the perceived benefits; barriers and cues to participating in the program and thereby increase participation. This will also help design the intervention and future yoga interventions based on a valid health behavior change theory to encourage older adults to exercise and remain functionally independent. The findings from this study has helped to understand the key variables, how they differ in older adults and how they can be tailored to the individual needs of the elderly as important first steps in developing long term, far-reaching effective yoga interventions. This study reveals what catalysts promote the initiation of yoga beyond benefits that most already know. This study served as an important step for survey and quantitative research to assess the extent of perceptions in general for participation in exercise and physical activity among older adults. This study also makes comparisons across gender and racial/ethnic backgrounds. This is the first study conducted in an independent living community to study the participation in a community-based yoga intervention tailored to older adults.

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