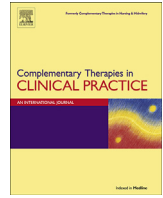




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## Barriers and facilitators to yoga use in a population of individuals with self-reported chronic low back pain: A qualitative approach

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### A B S T R A C T

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Yoga has been found to be efficacious in treating chronic low back pain, yet biomedical treatments are most commonly used for pain. Promoting yoga as part of integrative care would reduce exclusive reliance on high-cost, higher-risk biomedical treatments. Attitudes toward yoga play a role in consideration of it as a treatment. The current study examined attitudes toward yoga in adults with chronic low back pain and compared these results to those found in a 2009 general population study. Participants completed a semi-structured interview where they responded to items about perceptions of potential barriers and facilitators to trying yoga. Participant responses were analyzed qualitatively and several common themes emerged. Themes identified by participants indicated there is mixed information about yoga in the public domain and that clarification of what yoga is, how it can be beneficial, and what it requires one to do physically may help promote its use.

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### 1. Introduction

The practice of yoga originated in India thousands of years ago with traditional goals of uniting mind, body, and spirit for physical and mental well-being [9]. Yoga has been traditionally defined as a combination of physical movements, coordinated, intentional breathing techniques, and mindful awareness [9]. The National Center for Complementary and Alternative Medicine (NCCAM) defines yoga as a mind-body practice that combines breathing, physical movements, and meditation or relaxation techniques to benefit health and well-being [21] and yoga is becoming increasingly recognized in the United States (U.S.) as an activity with both psychological and physiological benefits [8,22]. In fact, yoga is beginning to be considered a viable integrative treatment for a variety of physiological conditions [2]. Positive effects (i.e., decreases in physical symptoms) for yoga have been found for such conditions as diabetes, multiple sclerosis, kidney disease, breast cancer, heart disease, and chronic pain (see review in Ref. [22]). The current study is focused on yoga's potential to be considered a possible integrative treatment in a population of individuals with self-reported chronic low back pain.

Chronic low back pain has been established as a significant public health problem in the US, one that costs significant amounts of money in both treatment costs and lost productivity [16]. More than 80% of the American population will experience low back pain at some point in their life [23] and chronic low back pain is the second most common cause of disability status in American adults [4] and one of the most common reasons that individuals seek consultation from their primary care providers [19]. Traditional biomedical treatments (e.g., medication and surgery) for chronic low back pain are expensive (with estimated annual costs of \$62.5 billion and \$4.7 billion, respectively [13]), often do not result in long-term improvement of pain, and pose high risks for significant side effects [6,11,13,29]. Therefore, it is important to provide treatments for chronic low back pain that are not only effective, safe, and cost-effective, but also to provide individuals with multiple treatment options, rather than requiring them to rely solely on expensive, invasive procedures with potentially serious side effects.

Yet, the use of complementary and/or alternative medicine (CAM) as part of integrative care for chronic low back pain is not yet considered to be widely acceptable in the US. In recent years, however, the treatment of chronic pain conditions with CAM techniques has increased in acceptance and popularity [10,17,28]. It is estimated that approximately 6% of Americans with chronic low back pain have utilized at least one CAM technique in an effort to treat their pain [17]. Early empirical evidence suggests that yoga is a CAM treatment that is feasible and efficacious for treating chronic

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low back pain in adults, when compared to control groups and medical treatment as usual [12,15,18,27].

Even with research demonstrating its benefits, individuals may have attitudes toward yoga that play a significant role in determining whether or not they will be open to trying it, in general, or as a treatment for chronic low back pain. These attitudes may be influenced by such variables as age, gender, ethnicity, culture, geography, and previous experience. A simple lack of knowledge about yoga or other CAM treatments often contributes to misperceptions about and lack of participation in such treatments. This may be especially true for yoga, as its origins and background are often misunderstood. For example, yoga is frequently considered by non-practitioners to be a form of religion and this has been noted by non-practitioners as a barrier to participation [1]. Individuals with chronic pain, in particular, may be afraid that a movement-based therapy would exacerbate their pain, and therefore be less willing to try it.

In 2009, Atkinson and Permeth-Levine conducted a qualitative study examining the perceived benefits of and barriers to yoga in a general population. Results of this study demonstrated perceived benefits tended to center around the themes of health promotion and wellness, disease prevention, and social/psychological benefits [1]. Individuals noted barriers to practicing yoga, such as, time (e.g., long duration of class), cost (e.g., buying own equipment), perceived negative health effects (e.g., difficulty for people with certain physical conditions), and other negative pre-existing conceptions (e.g., lack of aerobic challenge, religious conflicts [1]). In spite of suggested barriers, individuals with any previous yoga experience tended to recognize the potential benefits of yoga, whether or not these benefits applied directly to them. Since research examining barriers and motivators to yoga practice has been conducted in general, but never in a specific chronic pain population, it is important to assess what obstacles individuals with chronic low back pain perceive as preventing them from engaging in a potentially beneficial treatment and how these might be different from those perceived by a general population.

## 2. Methods and materials

### 2.1. Participants

Participants were 102 community-residing adults, ages 19 to 84 (mean age = 50.5 years), who self-reported having chronic low back pain (pain resulting from an injury or condition that is significant and has lasted at least six months). Participants were recruited as part of a larger study from a collegiate town in western Alabama via publicly distributed flyers, announcements in local newsletters, and in-person recruitment at a number of community sites. An incentive of \$10 was paid to participants for completion of the entire study. Recruitment was limited to participants who were without significant cognitive deficit, able to communicate in English, and who were not reporting acute pain (defined as temporary pain resulting from a specific injury) as a primary pain source. There were no exclusions based on sex or ethnicity.

### 2.2. Measures

Participants were asked to respond to a semi-structured interview. They provided information on their age, sex, ethnicity, marital status, and level of education as part of the interview. Participants were also asked to provide information about their pain history (including pain duration and intensity), level of exercise, previous yoga experience, and attitudes towards yoga. The majority of information included in the interview was used for descriptive purposes, aiding in describing general participant characteristics as

well as in gathering qualitative information related to participants' attitudes toward yoga. The two main items considered for qualitative analysis in the current study addressed participants' opinions about what might motivate or prevent someone from trying yoga and were worded "What might motivate someone to try yoga?" and "What might prevent someone from trying yoga?" respectively. An additional item assessing participants' perceptions of yoga as harmful or beneficial in the context of having chronic low back pain was also included. This item asked participants to respond to the statement, worded "Given my chronic pain condition, if I practiced yoga, it would be," using a scale of 1 (Harmful) to 7 (Beneficial).

As part of the larger study, participants also completed the Pain Catastrophizing Scale [25], the Tampa Scale for Kinesiophobia [20], and the Beliefs About Yoga Scale [24].

### 2.3. Procedure

Participants were either recruited on-site at one of the participating community locations or saw a flyer and scheduled an appointment via phone or e-mail. All participants completed the study in person with a researcher associated with the University of Alabama Pain Research Lab. After giving informed consent participants completed the semi-structured in-person interview, along with other measures administered for purposes of the larger study. At the completion of the interview session, participants were compensated \$10 for their time and effort in completing measures and responding to interview questions.

## 3. Analytic approach

A qualitative analysis of two open-ended items on the study interview, those directly asking about potential barriers and facilitators to yoga practice was conducted utilizing the thematic approach described by Braun and Clarke [5]. This technique is widely used in psychological research and involves the identification of patterned responses (themes) in the data by designated coders. The goal of these qualitative questions was to explore the opinions of adults with chronic low back pain related to what might motivate or prevent someone from trying yoga.

Qualitative analytic steps included: (1) preparing the data for analysis; (2) initial reading of interview responses; (3) re-reading of the interview responses with annotations of potential coding themes; (4) sorting items of interest into proto-themes; (5) examining the proto-themes and attempting initial definitions; (6) axial coding; and (7) constructing the final form of each theme [5]. First, items of interest were reviewed for each participant by 2 coders (primary author and research assistant). The coding team then independently reviewed the participant responses to the first item (facilitators) and the second item (barriers), coding separate responses according to thematic interpretation. After coding all of the responses, each coder sorted the codes into potential themes the coding team then met to discuss and compare the independently identified themes. This occurred for four rounds of coding, where themes were narrowed further in each round. New themes and refinements to identified ones were discussed initially by the two-person coding team at regularly scheduled meetings. The analysis team kept detailed notes as part of an audit trail, documenting each step of the coding process to help document analytic decisions [3]. A senior member of the research team reviewed final identified codes developed by the coding team as a means of facilitating rigor and trustworthiness in the qualitative data [7].

Participant answers to one additional Likert item assessing beliefs about yoga's potential to be harmful or helpful in the context of chronic pain were also analyzed to provide a greater understanding of their expressed perceived barriers and facilitators.

**Table 1**  
General sample descriptives.

Variable	Descriptive/M (SD)
Sex	60.8% female
Age	50.5 (18.01) years
Education	47.1% with college degree
Pain intensity	5.85 (2.51)
Pain duration	143.58 (165.12) months
Never tried yoga	57.8% of sample
Yoga benefit rating	5.12 (1.66)

Note. Pain intensity ratings were on a scale of 0 (no pain) to 10 (extreme pain). Yoga benefit rating refers to participant responses to the item "Given my chronic pain, if I practiced yoga, it would be:" where participants answered on a scale of 1 (harmful) to 7 (beneficial).

## 4. Results

Participants were 60.8% female with an average age of 50.5 years. Approximately 47% of participants had a college degree, suggesting that the sample was highly educated in comparison to the general population. Approximately 58% of the sample had never practiced yoga before at the time of study completion. Of those who had tried yoga in the past, 86% had not done yoga in the past month. See Table 1 for sample descriptives for the entire sample.

Coding procedures identified five main response themes for barriers and six for facilitators to the practice of yoga in this population. Many participants listed more than one barrier and/or more than one facilitator.

### 4.1. Perceived facilitators

Facilitators identified for the practice of yoga in this study population were varied and included a range of topics outside of those related to chronic pain. These topics were grouped into six overall themes (See Table 2).

#### 4.1.1. Physical issues

A large number, 44.3% ( $n = 43$ ), of participants listed physical issues as primary reasons for which one would be motivated to try yoga and 18% ( $n = 8$ ) of this subset of respondents noted having chronic pain as a specific physical issue that might draw someone to yoga. Participants noted that a desire for improvement of health

and physical well-being would be an important reason one might try yoga. Noted desirable physical improvements that may come from yoga included: increased flexibility and range of motion, improved sleep quality, improved bodily strength, decreased blood pressure, weight loss, and pain relief. One participant stated, "For people in pain, the strengthening exercises [in yoga] are supposed to help," while others noted that yoga had the potential to reduce stiffness and ease pain in the low back and other areas of the body. Four participants reported that motivation to try yoga would be increased if it were recommended by a medical professional. Lastly, viewing yoga as an exercise option (and specifically a low-impact exercise) was noted as a potential facilitator. Participants noted that there are many benefits one may get from yoga that also occur in other exercise regimens (e.g., strengthening) and that yoga may be a "holistic way to exercise" or "something you could do for a fun exercise."

#### 4.1.2. Cognitive/affective issues

Cognitive/affective issues were identified as facilitators by 15.5% ( $n = 15$ ) of participants. Participants reported that an individual who has high stress levels or needs to relax may look to yoga for stress-relief and mind-body relaxation. It was noted that yoga has a calming effect that may be appealing to individuals during times of stress. It was also indicated that individuals might seek a yoga practice for mood improvement (i.e., individuals with depression or anxiety.) One participant stated that "someone living in a stressful environment and seeking peace" may be motivated to try yoga. Participants also noted that certain cognitive characteristics of a person may make him or her more likely to try yoga, for example, having an open-mind or a generally positive outlook on new experiences.

#### 4.1.3. Motivational issues

Overall, motivational issues were reported by 13.4% ( $n = 13$ ) of participants. Curiosity was noted as the most common motivational issue that may encourage someone to try yoga. Participants suggested that individuals who are curious about yoga or who want to try something new may be more likely to engage in yoga practice. One participant stated that an individual who wanted to "try a different method of being healthy" may be motivated to try yoga, while others noted that "wanting the body to feel better" or "committing to being in better condition" would be motivational

**Table 2**  
Common themes expressed by study participants.

	Barriers	Facilitators
Physical issues	<ul style="list-style-type: none"> <li>• Chronic pain</li> <li>• Physical limitations</li> </ul>	<ul style="list-style-type: none"> <li>• Chronic pain</li> <li>• Desire for improved physical health</li> <li>• Exercise</li> </ul>
Cognitive/affective issues	<ul style="list-style-type: none"> <li>• Fear of pain or injury</li> <li>• Fear of trying something new</li> <li>• Fear of being compared to others in class</li> <li>• Disbelief in own ability</li> </ul>	<ul style="list-style-type: none"> <li>• Stress-relief and relaxation</li> <li>• Mood improvement</li> <li>• Having an open-mind or positive outlook</li> </ul>
Motivational issues	<ul style="list-style-type: none"> <li>• Laziness</li> <li>• Lack of motivation</li> <li>• Lack of interest</li> </ul>	<ul style="list-style-type: none"> <li>• Curiosity</li> <li>• Desire to try something new</li> <li>• Fun and enjoyment</li> </ul>
Informational issues	<ul style="list-style-type: none"> <li>• Lack of adequate knowledge or explanation</li> <li>• Preconceived notions</li> <li>• Stereotypes</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of accurate information</li> <li>• Explanation of potential benefits</li> <li>• Clarification of potential misconceptions</li> <li>• Positive testimonials</li> <li>• Observing a class or seeing a demonstration</li> </ul>
Practical issues	<ul style="list-style-type: none"> <li>• Time constraints</li> <li>• Financial limitations</li> <li>• Transportation difficulties</li> <li>• Lack of accessibility</li> </ul>	<ul style="list-style-type: none"> <li>• Free class</li> <li>• Incentive for going</li> <li>• Convenient</li> <li>• Positive class environment</li> </ul>
Social issues	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Recommendation from a friend</li> <li>• Having a friend to go with</li> </ul>

issues that may facilitate engagement in yoga. Yet another motivational issue centered on the perception that yoga “seems fun” or “seems enjoyable” which may motivate individuals to try it.

#### 4.1.4. Informational issues

Informational issues were identified by 15.5% ( $n = 15$ ) of participants as facilitators to yoga practice. Participants noted that individuals may be more motivated to try yoga if they were provided accurate information about what yoga is as well as its potential benefits. They indicated that the provision of more explanation may clarify confusion or misconceptions (i.e., that yoga is “new-age”, only for women, or not an exercise). One participant expressed belief that “If it [yoga] were marketed differently or advertised more as a physical exercise versus a passive meditation” more people would try it. Others indicated that hearing positive testimonials from others would help motivate individuals to try yoga. Participants stated that “hearing a personal testimony from someone who participates and has similar [physical] limitations themselves”, “being around someone who has been through it”, and “seeing how it has helped others improve” would facilitate engagement in yoga. Lastly, seeing a yoga demonstration or observing a class was noted as a potential facilitator for trying yoga.

#### 4.1.5. Practical issues

A small number of participants, only 8.2% ( $n = 8$ ), reported practical issues as potential facilitators to trying yoga. It was noted that if a class were free or if there were an incentive for going, one might be more motivated to attend a yoga class. Participants also reported that convenience (time and location) were important factors to consider in the motivating individuals to try yoga. One participant stated that people would be motivated to try yoga if “someone were offering a free class at work”, demonstrating both financial and convenience issues as important factors. Two participants noted that a positive class environment would be a motivating factor, stating that “having an instructor encourage you”, “doing it in a small group”, and “the non-judgmental atmosphere of class” would be facilitating factors.

#### 4.1.6. Social issues

Social issues were noted by 14.4% ( $n = 14$ ) of participants. Participants noted that individuals may be more inclined to try yoga if it were recommended by a friend or if friends persuaded them to go. “Having a friend go with you” was also a common social issue that arose as a facilitating theme among these respondents.

### 4.2. Perceived barriers

Participants identified a variety of potential barriers to practicing yoga, some of which related to their chronic low back pain, and some of which did not.

These topics were grouped into five of the same overall themes identified under facilitators: physical issues, cognitive/affective issues, motivational issues, informational issues, and practical issues. Social issues were not mentioned as a category related to perceived barriers.

#### 4.2.1. Physical issues

Thirty-one percent ( $n = 31$ ) of respondents cited physical issues as barriers and of that subset of participants, 9.6% ( $n = 3$ ) listed chronic pain as a specific barrier. Participants seemed to identify numerous physical health issues that would possibly prevent someone from trying yoga. Health conditions identified as potential barriers included having poor balance or poor flexibility, being out of shape or overweight, having chronic pain, and more generally having “poor health”, or “medical problems.” One participant noted

that it would seem unlikely that a person would consider trying yoga if he felt he was “limited physically.”

#### 4.2.2. Cognitive/affective issues

Cognitive/affective issues were identified by 31.3% ( $n = 31$ ) of participants as potential barriers to yoga practice, the majority of which centered on fear in two different areas. Fear of pain or injury as a result of doing yoga was noted as a potential barrier by 35% ( $n = 11$ ) of this subset of respondents, with participants suggesting that people may not be willing to participate if they thought they might hurt themselves doing the poses. In addition, fear of trying something new or being inexperienced was indicated as a limiting factor. Participants described fear of being embarrassed, fear of being compared to or judged by others in class, fear of being unable to do the poses correctly, and general intimidation related to doing a new activity as barriers in this area.

#### 4.2.3. Motivational issues

Approximately 11% ( $n = 11$ ) of total participants noted motivational issues as a potential barrier. Lack of motivation, laziness, and general lack of interest were identified by participants as motivational issues that may prevent someone from trying yoga. Some participants also noted that the belief that yoga is “boring” or “not a good enough exercise” may deter some individuals from trying it. Dislike of physical activity, in general, was also noted as a potential reason someone may not be interested in trying yoga. One participant also noted that individuals who “don’t want help” with a physical issue may be unmotivated to try yoga.

#### 4.2.4. Informational issues

Of study participants, 36.4% ( $n = 36$ ) listed informational issues as being primary barriers to participation in yoga. Informational issues identified included: lack of adequate information, lack of accurate information, disbelief in yoga’s potential to be helpful, misunderstandings about what yoga is, and negative preconceptions. Many participants noted that “not having information,” having a “lack of knowledge,” or “being uneducated” about yoga would be a primary barrier. Responses indicated that lack of information about yoga may lead someone to be unsure of what yoga involves, who goes to yoga, what would be required physically, the level of difficulty and the potential benefits yoga may offer. Specifically noted was yoga’s “perceived lack of manliness”, with one participant stating, “A lot of men think it is sissy compared to other exercises.” Also included in informational issues was the identification of stereotypes that may prevent individuals from trying yoga. For example, it was noted that “someone who is very religious and not open-minded” might be hesitant to try yoga. Another participant stated that “People might think that it [yoga] is too new-age or anti-Christian.” Yet another indicated that the fact that yoga “originated in a different culture” might be a deterrent to some. Participants identified “stigma” associated with yoga, noting that it may be considered “a hippy thing”, “cultish”, “way-out”, or “off-beat”. Three participants responded that an individual who is “close-minded” or “narrow-minded” would be unlikely to try yoga.

#### 4.2.5. Practical issues

Practical issues were identified by 12.1% ( $n = 12$ ) of participants as important in determining why someone might not try yoga. Issues in this theme included time constraints, financial limitations, transportation difficulties, and lack of convenience or availability of yoga.

#### 4.3. Relationship of pain intensity and duration to perceived barriers and facilitators

Descriptive analyses indicated that the overall average pain intensity reported by the current sample was 5.85 on a scale of 0 (no pain) to 10 (extreme pain) while the average pain duration was 143.58 months (or approximately 12 years). Individuals mentioning pain as a reason to try yoga had an average intensity rating of 6.75 (SD = 2.31) and a duration of 78.00 (SD = 52.89) months (about 6.5 years). Those who mentioned having pain as a barrier to yoga practice had a slightly higher average intensity rating of 7.67 (SD = 2.08) and higher duration of 216.00 (SD = 157.38) months (18 years).

In an effort to examine how pain intensity and duration affected participants' perceptions of barriers and facilitators, hierarchical regressions were utilized as exploratory analyses. Two simple linear regressions were run, one examining the relationship between pain intensity and participants' responses to the item assessing perception of yoga as harmful or beneficial, and another assessing the relationship between pain duration and the same item. In the first regression, pain intensity emerged as a significant predictor ( $\beta = -.298, p < .05$ ) of participants' ratings of yoga as the potential for yoga to be harmful or beneficial, such that the higher the pain intensity rating the more likely participants were to rate yoga as harmful. However, results of the second regression suggest that there was no significant relationship between pain duration and this rating ( $\beta = .05, p = .59$ ).

### 5. Discussion

Although some research has focused on the benefits, barriers, and cues to action of yoga in a general population [1], the examination of factors influencing attitudes toward yoga in a sample of individuals with chronic low back pain is a step that has been neglected thus far in fields of pain and yoga research. Identifying perceived barriers and facilitators to trying yoga in a population of individuals with chronic low back pain is important, as yoga has been shown to have beneficial effects when used as a treatment for low back pain. In addition, it is important to identify differences in the reported barriers and facilitators to yoga reported in this pain population as compared to a more general (i.e., non-pain) population (as assessed by Atkinson and Permeth-Levine in 2009).

Regardless of whether or not participants had tried yoga in the past, they appeared to perceive common barriers and facilitators to yoga practice. Overarching themes noted by participants for both barriers and facilitators included physical, cognitive/affective, motivational, informational and practical issues, while social issues emerged as a theme for facilitators only.

#### 5.1. Physical issues

As yoga involves physical movement, it was expected that physical issues would appear as prominent themes in both perceived barriers and facilitators to trying yoga. Although yoga, unlike some other physical activities, has the potential to be adapted for many physical limitations and health conditions, this is not well-known by the general public. Therefore, the fact that many participants would indicate that physical limitations (e.g., lack of flexibility, injuries, medical problems, pain) may prevent someone from trying yoga is not surprising. However, other participants appeared to be aware of yoga's potential health benefits and indicated that individuals with health issues (e.g., high blood pressure, overweight, restricted range of motion, pain) may be motivated to try yoga in an effort to treat or alleviate those problems. In addition, participants noting yoga's potential benefits also tended to be

aware of yoga as an exercise, where typical exercise-related benefits (i.e., strength, heart health) could be obtained. It seems as if there exists mixed information about yoga, where some view it as an activity to be done only when in good physical condition and others acknowledge its potential to aid in improving physical health. These general physical issues are consistent with ideas reported by participants in the 2009 Atkinson & Permeth-Levine study, which found participants listing numerous physical benefits of doing yoga (e.g., improving blood pressure, balance, strength, and weight), yet also noting physical limitations (e.g., lack of flexibility, presence of injury or pain) as a barrier [1]. This suggests that, regardless of the presence of pain, physical issues are common topics related to individuals' willingness or motivation to try yoga.

It is interesting to note that chronic pain, a physical issue experienced by all of the participants in the current study, was mentioned as a barrier by some, a facilitator by some, and not at all by others. Overall, only 10% of the total number of participants noted having chronic pain as either a barrier or facilitator to trying yoga, a surprisingly small percentage given that the study was conducted in a population of individuals with self-reported chronic low back pain. This would suggest that individuals might see reasons for trying or not trying yoga as somewhat separate from their pain. However, more general physical issues were the most commonly listed facilitator and the second most commonly listed barrier to trying yoga. Therefore, it may be important to introduce yoga as a way to more broadly benefit physical health, particularly specific health issues that may be of interest to individuals with chronic pain (e.g., strength-building, improving flexibility and balance, reducing stiffness), as it seems that chronic pain does not appear to be a main motivator (or barrier) in and of itself.

Regarding why some saw chronic pain as a barrier and some as a facilitator to trying yoga, it is likely that attitudes and perceptions about one's pain experience would be determining factors. It is possible that one's level of pain intensity and/or pain duration may play a role in whether or not an individual sees himself as capable of trying yoga. Overall, this self-reported pain population appeared to have a modest level of pain intensity (average rating of 5.85 out of 10), with an average pain duration of approximately 12 years. There were some differences on these constructs between individuals who mentioned pain as a barrier or a facilitator, with participants who reported pain as a barrier averaging slightly higher pain intensity and duration. However, given that only eight people noted pain as a facilitator and only three as a barrier, any potential differences between this small subsample are likely not meaningful for the majority of participants. Results of the exploratory analyses suggest that pain intensity was significantly related to perception of yoga as either harmful or beneficial such that the lower the reported intensity of the pain, the more likely an individual is to perceive yoga as beneficial in the context of having chronic low back pain. Pain duration, however, does not seem to be related to one's perception of whether or not yoga will be helpful for pain. This suggests that, regardless of how long an individual has had chronic low back, the perceived intensity of the pain may influence perceptions of barriers and facilitators to trying yoga. Further, pain intensity may also influence willingness to consider any treatment program that integrates physical movement, such that individuals with high levels of perceived intensity of pain may be less willing to try yoga or any other movement-based therapy.

#### 5.2. Cognitive/affective issues

Cognitive and affective issues were prominent themes for both barriers and facilitators to trying yoga. As a barrier, these issues centered on fear or apprehension, while listed facilitators were more focused on stress-relief and mood improvement. Many



participants seemed to fear that trying yoga would result in pain or injury, regardless of whether or not they had tried yoga before. Even though few participants ( $n = 11$ ; only 10% of the sample) specifically noted chronic pain as either a barrier or facilitator, it is possible that this concern could be more pronounced in the current population, as having pain may increase fear of further pain or pain-related injury. Pain research has suggested that individuals with chronic pain often avoid physical activity in an effort to prevent their pain from worsening [31]. Perhaps such avoidance has the potential to lead to general disinterest in exercise that might prevent individuals with pain from being motivated to try yoga, underscoring that fear-avoidance tendencies are an important area to target in pain treatment. Atkinson and Permeth-Levine's results suggested that some participants associated yoga with increased risk of worsening pre-existing physical issues, but did not identify fear as a theme, specifically [1]. Thus, the perception of yoga as a potentially risky activity may be widespread but fear of injury may be more of an issue for individuals with chronic pain conditions.

Other concerns reported by participants included fear of trying something new and fear of being judged by others, both of which are understandable emotions for an individual engaging in an unfamiliar activity about which they may have little or inaccurate information. Again, the 2009 study by Atkinson and Permeth-Levine found similar results, with participants noting that self-consciousness in classes may be a barrier to trying yoga [1].

Expectations often play a large role in determining behavior. Participants' apprehension, noted above, may encourage negative expectations about engaging in yoga, resulting in hesitance to try it. Yet, some participants seemed to have positive expectations about yoga's potential to relieve stress, facilitate calm and relaxation, and improve mood issues, themes similarly noted in the Atkinson study. Given the strong association between chronic low back pain and mood issues [14], promoting these potential benefits may be an important way of motivating individuals with pain to try yoga. In fact, previous research has demonstrated that yoga improves anxiety and depression in individuals with chronic low back pain [26], supporting this as an important component of yoga to emphasize, specifically in a population with chronic pain.

### 5.3. Motivational issues

Despite the potential benefits of an activity, an individual will only engage in it if motivated to do so. Therefore, it is not surprising that motivational issues emerged as common themes serving as barriers or facilitators to trying yoga in the current population. Participants discussed that being curious or desiring to try something new were motivational states that would serve as facilitators, while lacking interest in yoga or lacking general motivation to try anything new would be barriers. Laziness and general disinterest in physical activity were also noted as barriers. It is interesting to note that such specific motivational issues did not seem to emerge from Atkinson's study in a general population, where only one participant noted that disinterest in beginning a new activity would be a barrier [1].

### 5.4. Informational issues

Informational issues were noted as the most common barrier and the second most common facilitator to trying yoga. Regardless of whether they were listed as a barrier or a facilitator, these issues centered on the fact that individuals may be hesitant to try yoga due to lack of adequate information and might be motivated to try it were more explanation provided. Participants noted that many

individuals may have negative preconceptions about what yoga is and may believe certain stereotypes that might prevent them from feeling comfortable trying yoga. Examples of stereotypes reported included ideas that yoga may conflict with certain religious beliefs, may be a feminine activity, may not be a worthwhile exercise, or may be an alternative activity that would be looked down upon by mainstream culture. It was suggested by participants that provision of accurate information about yoga, including an explanation of its history and potential physical benefits may help to clarify potential misconceptions and motivate people to try it. This type of misinformation (i.e., notions that yoga is female dominated, too earthy, or poses religious conflict) has been identified previously as a common barrier to yoga practice [1] and the findings of the current study underscore the importance of presenting yoga in an accurate and consistent way to the general public and, maybe especially, to individuals with chronic pain, as misinformation may prevent them from engaging in an efficacious complementary treatment. Methods of providing such explanation included listening to positive testimonials, seeing a demonstration of poses, or observing an entire class.

### 5.5. Practical issues

Practical issues arising in the identification of barriers and facilitators to yoga practice were expected and understandable. Convenience was noted as a facilitator to yoga practice, with participants noting that they would be more likely to try yoga if it were convenient in regards to time, location, cost, and accessibility. Understandably, lack of convenience in these areas was a commonly reported theme that might prevent someone from trying yoga. As with many extracurricular activities, time constraints play a role in whether or not someone will participate and time has been noted as a potential barrier to yoga in previous research [1]. In both the current study and the Atkinson study, many participants seemed to express the belief that they did not have time to begin or maintain a yoga practice, regardless of the benefits they may experience. Financial difficulties (and related lack of transportation) were also practical issues noted as barriers in the current study, but not in previous research. As part of the semi-structured interview, participants were asked how much they would be willing to pay for one yoga class. Nearly 20% of participants indicated that they would not be willing to pay anything to attend a yoga class, supporting the identified facilitating theme that access to a free class would be a motivator to try yoga. Overall, it seemed that many participants, especially those without any previous yoga experience, did not have a clear idea about the typical cost of yoga classes. The introduction of yoga classes into convenient locations with consideration of time, cost, and accessibility seems to be an important need. Perhaps holding group yoga classes at medical centers, where low back pain patients may be going for appointments anyway, would be an important step into overcoming these practical barriers.

### 5.6. Social issues

Interestingly, social issues emerged as a theme for facilitators, but not for barriers to yoga practice. This trend was also found in Atkinson and Permeth-Levine's study, where participants in a general population noted that attending yoga with friends and having an opportunity to socialize were specific benefits. In the current study, it seems like participants believed that having a friend go with them to yoga or having a friend recommend yoga in the first place would increase motivation to try it. Overall, it seems

that yoga may offer potential social benefits that increase an individual's willingness to try it.

## 6. Limitations and future directions

There were a few limitations to the current study. For example, although most important to the aim of the study, responses used for qualitative analysis were brief and may not have provided as much useful information had participants been asked to provide more comprehensive answers. In addition, it may have been useful to hold focus groups for participants to further discuss potential barriers and facilitators after data was collected in the original study. However, this was not feasible. Lastly, participants included individuals who had and had not tried yoga. Although over half of the study sample had never tried yoga and, of those who had, very few were regular practitioners; interpretation may have been simpler if all participants had no previous yoga experience.

The sample was highly educated relative to the general U.S. population [30], with approximately 50% having at least a college degree. This is likely related to the fact that recruitment took place in a large university town. However, researchers in the original study intentionally chose a broad range of sites in this location (e.g., a university recreation center, a federally qualified health clinic) in an effort to obtain a more generalizable sample. It is estimated that only 28% of individuals in the U.S. have a bachelor's degree or higher [30]. Therefore, educational attainment in the current sample is greater than in the general population and may have affected perceptions of barriers and facilitators to trying yoga. Extant research suggests that yoga practitioners are more likely to have higher educational attainment [8] and individuals with a college degree or higher are more open to CAM treatments in general [28]. Therefore, it is likely that the educational level of many participants in the sample affected attitudes toward yoga.

## 7. Conclusion

In general, the barriers and facilitators identified by participants with chronic low back pain in the current study do not seem to be largely disparate from the barriers and benefits identified by Atkinson and Permut-Levine's general population in 2009. Both populations noted physical issues, cognitive/affective issues, informational issues, practical issues, and social issues as potential barriers or facilitators/benefits. Even some participants in the 2009 general sample noted that having pain may be a barrier to trying yoga, while others noted a benefit may be the prevention or reduction of pain symptoms [1].

Overall, it appears that individuals with chronic low back pain perceive a variety of barriers and facilitators to yoga practice. Although many of the identified themes have the potential to be specifically relevant to the experiences of individuals with chronic pain, overall, the majority of participants did not seem to see the simple fact that they had chronic pain as either a definite barrier or facilitator to trying yoga. Instead, the fear of pain or injury seemed to be more prominently identified as a barrier, a theme that appeared to be more prominent in the current pain population when compared to the general sample. Therefore, the promotion of yoga as an integrative treatment for chronic low back pain may need to emphasize the provision of accurate information about yoga, the promotion of its benefits for specific issues rather than for chronic pain, in general, and intervention for patient's potential fears that participating in yoga will cause or exacerbate their pain.

## Conflict of interest statement

None declared.

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