

# Between Inhale and Exhale: Yoga as an Intervention in Smoking Cessation

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## Abstract

The current study provided a review of evidence-based yoga interventions' impact on smoking cessation. The researchers reviewed articles obtained from MEDLINE (PubMed), EBSCOHST, PROQUEST, MEDINDIA, CINAHL, Alt HealthWatch, and AMED databases. Inclusion criteria were as follows: (a) study published between 2004 and 2013, (b) study published in English language, (c) study used yoga-based interventions, (d) study involved smokers with varying level of smoking, (e) study used any quantitative design, and (f) study had physiological and/or psychological outcomes. A total of 10 studies met the inclusion criteria. Designs were 2 pre-post tests and 8 randomized controlled trials. Majority of the interventions were able to enhance quitting smoking rates in the participants under study. Yoga-based interventions hold promise for smoking cessation. Some of the limitations include short follow-up measurements and short duration of intervention.

## Keywords

yoga, smoking, smoking cessation

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## Introduction

Smoking is a leading cause of preventable illness and mortality. Tobacco use kills 6 million people each year in the world, and 600 000 of these deaths are from exposure to secondhand smoke.<sup>1</sup> Smoking is also a risk factor for numerous disorders, such as diabetes, some types of cancer, and heart and lung diseases. In addition, smoking is responsible for more than 500 000 deaths per year in the United States<sup>2</sup> and costs nearly \$100 billion in health care bills every year.<sup>3</sup>

Approximately 70% people are aware of the advantages of not smoking and try to quit smoking.<sup>4</sup> However, for some people quitting tobacco is not easy due to tobacco dependence is a cluster of behavioral, cognitive, and physiological phenomena. Data from the World Health Organization presented that nearly 90% of all smokers start at or before 18 years old.<sup>1</sup> Smoking is also more prevalent among populations with mental health problems, those with alcohol and drug problems, among criminals, and among the homeless.<sup>5</sup> Many smokers see smoking as a way to release anxiety.<sup>6</sup> One study indicated that smokers felt peer acceptance via smoking together, and another reason for smoking is easy accessibility to tobacco.<sup>7</sup> Unfortunately, once people have learned smoking, there is a very high relapse rate and the quit experience is physically uncomfortable, emotionally distressful, and socially isolated.<sup>6</sup>

Smoking cessation is the process of stopping the use of inhaling a smoked substance.<sup>8</sup> Researchers have advocated various interventions to help people go through smoking cessation processes. Two main approaches are pharmacotherapy and

behavior support resources. Pharmacotherapy includes medications and nicotine replacement therapy; behavior support includes individual and group counseling and Web-based and computer programs.<sup>9</sup> Other behavioral coping strategies are keeping busy, chewing gum or toothpicks, deep breathing, avoiding the smoking situation, and exercise.<sup>10</sup>

Researches recommended that exercise adds benefits to smoking cessation because it reduces weight gain and weight concerns, nicotine withdrawal symptoms, cigarette craving, and improves mood.<sup>11,12</sup> Patient using complementary and alternative treatment including yoga for tobacco cessation perceived efficacy of these treatments, and interest in future use of complementary and alternative treatment were ascertained.<sup>13</sup> It underlines the need to conduct research to understand the impact of complementary and alternative treatment such as yoga and tai-chi on human wellness or illness.

Benefits of yoga have been known for years to be plentiful, such as improved flexibility, better sense of self, and lower anxiety levels. Yoga, as a form of exercise, has been shown to promote the desire to stop smoke<sup>14</sup> and enhance subjective well-being<sup>15</sup> and positive mood.<sup>16</sup> Given that the limbs of yoga

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are so multidimensional and include aspects of exercise (*Asana*), breath work (*Pranayama*), concentration (*Dharana*), and meditation (*Dhyana*),<sup>17</sup> it is not surprising that researchers have found positive results regarding yoga in so many diverse areas.<sup>18</sup> Yoga practice includes body stretching, values of merit, and meditation. Regular yoga practice might reduce heart rate and blood pressure, increase pulmonary function, and relax muscle and mind.<sup>19</sup> Using yoga as a valid tool in learning how to quit smoking is a great way to increase chances of successful quitting.<sup>20</sup>

Smoking and yoga both focus on breathing and creating relaxation, yet yoga is health beneficial. Yoga may not only reduce perceived stress and improve mood but also benefit physical health. Bock and colleagues<sup>21</sup> have conducted a yoga plus cognitive behavior therapy intervention to test its effectiveness on smoking cessation among women. However, there have been limited researches examining the effectiveness of yoga-based interventions on smoking behavior. The purpose of the study was to investigate to what extent yoga-based interventions affect smoking cessation.

## Methodology

The inclusion criteria for selecting articles in this review were (a) interventions targeting the health promotion or control of smoking cessation; (b) using any quantitative design; (c) published in English language; (d) published between 2004 and 2013; (e) using any forms of yoga based interventions, including yoga video intervention, written or other materials, and face-to-face yoga intervention; and (f) using psychological outcomes. The researcher conducted a literature search of the MEDLINE (PUBMED), EBSCOHOST, PROQUEST, MEDINDIA, CINAHL, Alt HealthWatch, and AMED databases using search terms “yoga,” “smoking,” “tobacco,” “smoker,” “smoking cessation,” and “smoking intervention.”

## Results

A total of 10 studies met the inclusion criteria and were reviewed. Table 1 summarizes the components of the interventions, including research design, sample size, intervention dosage, and major findings. The reported interventions are arranged in ascending order by year of publication. Among the 10 interventions, 8 studies used randomized trial design and 2 studies used follow-up measures design.

## Discussion

The purpose of this study was to systematically analyze the yoga-based interventions designed to improve quitting during smoking cessation. Since few number of interventions ( $n = 10$ ) were conducted between 2004 and 2013 (eg, 2 studies are ongoing and 1 study did not publish results), it is evident that more interventions that test the impact of yoga-based activities on smoking cessation are needed. Most studies indicated that yoga-based interventions were effective in reducing craving and number of cigarette smoked during smoking cessation.

Among the 10 studies, 8 were conducted in the United States and 2 were conducted in India. Yoga originated from India; however, a national tobacco survey conducted in 2009-2010 at India indicated that there were 34.6% (ie, 48% males and 20% females) tobacco users, yet 47% current smokers planned to quit or thought of quitting.<sup>22</sup> Hence, there should be more studies conducted in India to investigate the impact of yoga-based interventions on smoking.

Of the interventions, 8 recruited and included male participants and 2 targeted only females. In a national survey, yoga users were predominantly Caucasian (85%) and female (76%), with an average age of 40 years.<sup>23</sup> Results of the review indicated that men have been involved in most of the interventions to treat their smoking behaviors. Although another survey found that only 50% respondents perceived yoga as a way to manage or treat health conditions, 73% reported that one of the main reasons for taking yoga is stress management.<sup>24</sup> Yoga combining a practice of movement, breathing, or relaxation has been linked to improved positive mood.<sup>25</sup> It seems yoga could be promoted as a way to manage anxiety among smokers since most smokers have used smoking as a strategy to reduce their anxiety.

Most of the interventions focused on rhythmic breathing besides physically gentle movement and had showed improvement on quitting smoking. Breathing practice is easy, cost-effective, and nontoxic and should be encouraged to help reduce tobacco consumption.<sup>26</sup> Unlike competitive professional sports, such as basketball or football, which may increase excessive tension and lead to exhaustion, one of the advantages of yoga is integration of physical activity and relaxation.<sup>27</sup> Yogic breathing and mindfulness practice allowed individuals to learn skills, insights, and self-awareness that can target psychological, neural, physiological, and behavioral processes implicated in addiction and relapse.<sup>28</sup> People who use complementary and alternative therapies to pursue wellness indicated that they might be open to additional recommendations to optimize their health.<sup>29</sup> Hence, health professionals and intervention leaders could provide smokers with methods to cope with stress that should in turn improve their ability to quit or remain quit.<sup>30</sup> However, more research is also needed to better understand what types of yoga-based interventions work best for what kinds of population.

The duration of interventions ranged from 1 day to 8 weeks. Quitting smoking is challenging because it combines behavioral, cognitive, and physiological domains. Hence, more interventions that evaluate the effect of long-term exposure to yoga practice on smoking cessation are needed.

Smoking is among the most prevalent public health issues and continues to be the top contributor of mortality and chronic diseases. Yoga-based interventions have the potential to become an accessible, cost-effective, and innovative treatment in smoking cessation.

## Author Contributions

C-LD conceptualized the study, developed the inclusion criteria, collected the data, developed the table, reviewed the article, and wrote the

**Table 1.** Summary of Yoga Interventions for Smoking Cessation (n = 10).

Year	Authors	Design and Participant	Intervention	Intervention Dosage	Major Findings
2004	McIver, O'Halloran, McGartland <sup>14</sup>	Pretest–posttest design; n = 20 (18 males, mean ages of 27, and 2 females, mean ages of 24)	Yoga (stretch and breath practice)	60 minutes, once weekly × 5 weeks	Posttest scores (mean = 1.65) for the Transtheoretical Model questionnaire were significantly higher than the pretest scores (mean = 1.35). Five participants moved from precontemplation to contemplation, and posttest scores showed the majority of participants (65%) in the contemplation stage. One participant moved from the preparation to the action stage and quit smoking.
2005	Kochupillai, Kumar, Singh, Aggarwal, Bhardwaj, Bhutani, Das <sup>26</sup>	Pretest–posttest design; n = 82; subject were advised to practice Sudarshan Kriya (SK) and Pranayama (P) daily at home and to come for weekly follow-up	Yoga (Sudarshan Kriya and Pranayama)	22–24 hour structured workshop spread over 6 days	Participants attended the workshop to the last day (day 6), 53 of 82 (65%) remained without tobacco (complete cessation); those remaining reported reduction in tobacco use by 50% to 90%. The majority (95%), however, felt that regular practice of SK and P would help them to quit tobacco, as they thought that the urge to smoke was less when they practiced SK and P. SK and P helped control the tobacco habit in 21% of individuals who were followed-up to 6 months of practice.
2006	Sharma and Corbin <sup>30</sup>	Randomized design; n = 21; mean age 35 with the will to quit smoking	1. Yoga-based intervention (asana + pranayama) 2. Self-help (reading material)	6 yoga sessions were offered and continue home-based practice (participants were given a yoga mat and a video to help them adhere to regular self-practice) of yoga-related practices for 6 weeks	Yoga group showed a significant increase in mean total self-control for quitting from baseline to 6-month follow-up (6.33 to 11.67), while it decreased in the control group (11.25 to 8.75) from baseline to 6-month follow-up.
2008	Albrecht <sup>31</sup>	Randomized design; n = 30; female ages 18–45	1. Yoga 2. Yoga + cognitive behavioral therapy		Research is completed, but no publications provided. The information was retrieved from ClinicalTrials.gov: <a href="http://clinicaltrials.gov/show/NCT00360581">http://clinicaltrials.gov/show/NCT00360581</a>
2011	Elibero, Van Rensburg, Drobjes <sup>32</sup>	Randomized design; n = 76; mean age 29, not currently engaged in an attempt to quit smoking	1. Cardiovascular exercise (CE): walking on the treadmill 2. Hatha yoga (HY): viewing a yoga instruction DVD including breath and stretch 3. No exercise: viewing an educational DVD about exercise	One 30-minute session for each group (ie, CE, HY, and no exercise)	Results showed significant time effects for CE and HY groups for both positive, $F(2, 23) = 5.15$ and $8.09, P = .014$ and $.002$ , and negative mood, $F(2, 23) = 8.43$ and $11.73, P = .002$ , respectively. Participants in each of the groups reported a decrease in craving to smoke, an increase in positive mood, and a decrease in negative mood. Craving in response to smoking cues was much reduced among those who engaged in CE than in HY. Both types of exercise were rated as equally enjoyable, difficult, and likely to be repeated; the present findings suggest that both forms of exercise may serve as a potential treatment options for smokers attempting to quit.

(continued)

**Table 1.** (continued)

Year	Authors	Design and Participant	Intervention	Intervention Dosage	Major Findings
2011	Rawat, Anuradha, Vedomurthachar, Rawat, Rawat <sup>33</sup>	Randomized design; n = 20; > 18-year-old males, smoking > 10 cigarettes/day with the will to quit smoking	1. Yoga 2. Yoga + Sudharshan Kriya (SK) (rhythmic breathing technique)	1. 1 hour yoga for 6 days 2. 1 hour yoga + 1 hour SK for 6 days (both groups were asked to practice the yoga and the SK procedure, respectively, every day for about 60 minutes for 6 weeks)	This study shows Sudharshan Kriya helps reduce the smoking habit and increase motivation to quit smoking as compare to yoga only group. The authors concluded that Sudharshan Kriya is a good alternative for the management of smoking cessation therapy.
2011	Bock, Morrow, Becker, Williams, Tremont, Gaskins, Jennings, Fava, Marcus <sup>20</sup>	Randomized design; n = 60; 55 females, mean age 46; smoking > 10 cigarettes/day for more than 1 year; sedentary (not exercising more than 2 days per week)	1. Yoga (asana + pranayama) + cognitive behavioral therapy (CBT) (smoking cessation therapy) 2. Health and Wellness program (videos, materials and discussion) + CBT (smoking cessation therapy)	Yoga, twice weekly × 8 weeks CBT, once weekly × 8 weeks Wellness program, twice weekly × 12 weeks	Yoga group demonstrated increased odds of 24-hour smoking compared with wellness group. At 3- and 6-month follow-up measures, participants of the yoga group continued to show greater rates of abstinence compared with those in wellness group.
2012	Drobes <sup>34</sup>	Randomized design; n = 79; ages 18-55, smoked 10 or more cigarettes a day for the past 2 years, interest in quitting smoking	1. Hatha Yoga + smoking cessation counseling (SCC) 2. Cardiovascular exercise + SCC 3. SCC	Yoga and exercise × 3 (7 days apart) Counseling × 4 (7 days apart)	Ongoing. The information was retrieved December 15, 2013, from ClinicalTrials.gov (Identifier: NCT01423578): <a href="http://clinicaltrialsfeeds.org/clinical-trials/show/NCT01423578">http://clinicaltrialsfeeds.org/clinical-trials/show/NCT01423578</a>
2013	Shahab, Sarkar, West <sup>35</sup>	Randomized design; n = 96; mean age 34, smoked 5 or more cigarettes a day for 1 year	1. Yogic breathing exercise 2. Yogic breathing video	1. Practicing yogic breathing 10 minutes 2. Watching a video about yogic breathing 10 minutes	Yogic breathing group significantly reduced all craving measures compared with the video control group immediately following the intervention.
2013	Matthews and Burns <sup>36</sup>	Randomized design; age ≥ 19, smoker of 5 or more cigarettes per day, willing and physically able to participate in yoga	1. Cognitive behavioral therapy (CBT) 2. CBT + Hatha yoga 3. Hatha yoga + printed materials	CBT × 8 sessions Hatha yoga × 8 sessions/30 minutes per session	Ongoing. The information was retrieved December 15, 2013, from ClinicalTrials.gov (Identifier: NCT01633632): <a href="http://clinicaltrialsfeeds.org/clinical-trials/show/NCT01633632">http://clinicaltrialsfeeds.org/clinical-trials/show/NCT01633632</a>

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### Declaration of Conflicting Interests

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### Ethical Approval

The study did not warrant institutional review board review because no human subjects were involved.

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