

A REVIEW OF YOGA PROGRAMS FOR FOUR LEADING RISK FACTORS OF CHRONIC DISEASES

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ABSTRACT

Heart disease, stroke, and diabetes are the major causes of mortality in the United States. Obesity, high blood pressure (BP), excessive hyperglycemia, and high cholesterol are all common causes of chronic illnesses. These disorders are often linked to one another. There were favorable associations between body mass index (BMI) and hypertension occurrence in a prospective cohort research focused on males. Yoga is a kind of physical exercise that is quickly gaining popularity and offers many health advantages. However, healthcare professionals have been reluctant to acknowledge yoga's potential to enhance health, and few treatments that fully exploit its advantages have been created. The goal of this article is to examine existing yoga research and assess the impact of yoga treatments on key chronic disease risk variables (overweight, hypertension, high glucose level and high cholesterol). A thorough search turned up 32 articles that were published between 1980 and April 2007. Yoga treatments are usually successful in decreasing body weight, blood pressure, glucose levels, and high cholesterol, according to the research, but just a handful looked at long-term adherence. Furthermore, there were few studies that covered different groups at high risk for diabetes and its associated health issues.

KEYWORDS: *Yoga, Chronic Disease, Risk Factors, Overweight, Hypertension, Glucose, Cholesterol.*

1. INTRODUCTION

Diabetes and high cholesterol are more likely in men who have a higher BMI. Another research of men and women found a connection between obesity and type 2 diabetes. The Hypertension in Diabetes Study discovered that 40% of patients newly diagnosed with type 2 diabetes had hypertension, and that hypertension significantly increased mortality in individuals with type 2 diabetes. Another recent research found a 79 percent incidence of hypertension in type 2 diabetes patients who had received outpatient treatment for at least two years. Individuals with impaired

glucose tolerance are also more likely to have cardiovascular disease risk factors such as high triglyceride and low-density lipoprotein (LDL) levels, as well as low levels of high-density lipoprotein (HDL) (HDL)[1], [2].

Appropriate physical exercise is promising in this respect since it may lower body weight, blood pressure, glucose levels, and cholesterol. Yoga, a kind of physical exercise that consists of a variety of postures (Asana) as well as breathing and meditation methods (Pranayama), has been proven to offer therapeutic advantages for those suffering from a variety of ailments, including hypertension and diabetes. Because it is linked to cardiovascular reactivity, yoga seems to be helpful in decreasing stress and increasing exercise tolerance. Between 1997 and 2002, the number of individuals practicing yoga in the United States grew substantially. According to the National Health Interview Survey from 2002, 5% of American people had done yoga in the month before the survey. Yoga is also well-received as a therapeutic intervention; participants in a yoga intervention for insomnia, for example, considered it to be simple to learn and execute. Yoga has not been generally acknowledged in attempts to prevent and cure major chronic health problems, despite its popularity and beneficial physiologic benefits. The goal of this article is to look at published research that have used yoga to see how it affects common health issues including obesity, hypertension, high blood sugar, and high cholesterol[3]–[5].

According to the World Health Organization, 64 million individuals have acquired chronic obstructive pulmonary disease (COPD) (COPD). COPD claimed the lives of three million people in 2004, and it is expected to become the third largest cause of death globally by 2030. COPD is a lung disease marked by chronic airflow obstruction and symptoms such as dyspnea, abnormal sputum, and chronic cough. In a study of 29 older COPD patients, participation in a 12-week Iyengar yoga training program decreased dyspnea-related suffering (Baseline; 2.6 2.8, 12-week; 1.6 1.7, effect size (ES)=0.67, p=0.08) and increased functional performance (Baseline; 2.0 0.5, 12-week; 2.2 0.4, ES=0.79, p=0.04). In a separate study of 25 COPD patients, the Hospital Anxiety and Depression Scale anxiety score (pre-Iyengar yoga: 3.91 1.03, post-Iyengar yoga: 4.50 0.76) and the Chronic Respiratory Questionnaire fatigue score (pre-Iyengar yoga: 6.63 4.63, post-Iyengar yoga: 3.25 1.98) both improved significantly. Furthermore, after completing the 12-week Iyengar yoga program, these individuals' clinically significant ratings altered [6], [7].

Cancer is the most common cause of death in the world. According to the International Agency for Research on Cancer, the total number of cancer deaths in 2012 was 8.2 million, with lung cancer (1.59 million deaths), liver cancer (745 thousand deaths), stomach cancer (723 thousand deaths), colorectal cancer (694 thousand deaths), and breast cancer (521 thousand deaths causing the most deaths). The impact of a 6-week yoga program on 163 breast cancer patients' quality of life (QOL). At 1 and 3 months after radiation, the yoga group's physical component scale scores and physical functioning improved more than the control group's. Stress symptoms and QOL improved more in the MBCR group than in the control group in a trial of mindfulness-based cancer recovery (MBCR), which included mindfulness meditation and gentle yoga [8].

Cardiovascular disease (CVD) is the leading cause of mortality worldwide. According to the World Health Organization (WHO), the number of fatalities from cardiovascular disease (CVD) was about 17.3 million in 2008, accounting for 30% of all worldwide deaths, and is expected to rise to 23.3 million by 2030. Obesity and diabetes mellitus are the two most significant risk factors for CVD. In 51 overweight and obese men, a short-term yoga-based lifestyle intervention

lasting two hours per day for ten days reduced interleukin (IL)-6 and raised adiponectin. CVD risk was linked to high levels of IL-6 and low levels of adiponectin. As a result, a short-term yoga-based lifestyle intervention may be an essential strategy for reducing the risk of CVD in overweight and obese men, as shown by a reduction in IL-6 and an increase in adiponectin. After a 6-month Hatha yoga program, the activity of superoxide dismutase increased and fasting blood glucose, serum total cholesterol, very LDL, and malondialdehyde reduced in 231 individuals with type 2 diabetes mellitus. In 24 young and 18 older individuals, the impact of Bikram yoga on vascular stiffness and insulin resistance was studied. After the yoga program, total and low-density lipoprotein cholesterol levels, plasma insulin concentrations, and scores on the homeostatic model of insulin resistance assessment reduced in older people, whereas carotid artery compliance improved and the -stiffness index dropped in young adults.

The pathology of many chronic illnesses are known to be modulated by proinflammatory cytokines, and treatments for patients with chronic diseases are intended to decrease inflammation. TGF-, nuclear factor (NF)-B, tumor necrosis factor (TNF)-, and interleukin-6 (IL-6) activation has been observed in prior investigations of COPD, chronic renal disease, obesity, and metabolic syndrome. In 86 individuals with chronic inflammatory illnesses who engaged in a 10-day yoga-based lifestyle program, stress and inflammation makers were decreased. By day 10, the mean level of cortisol had reduced and the amount of -endorphins had risen from baseline in these individuals. By day 10, mean decreases in IL-6 and TNF- levels from baseline had also been detected. The plasma levels of soluble TNF receptor type II, a measure of TNF activity, were constant in the yoga group but rose in the control group in a 12-week Iyengar yoga program for breast cancer patients. Another research found that a 12-week Hatha yoga intervention enhanced the vitality of breast cancer survivors while lowering the tiredness score calculated by the Multidimensional Fatigue Symptom Inventory – Short Form and the levels of IL-6, TNF, and IL-1 three months after treatment. Increased yoga practice reduces the production of IL-6 and IL-1, but not TNF-. As a result, frequent yoga practice may lower proinflammatory cytokine levels and therefore be an effective therapy for chronic illnesses.

1.1. Yoga Session Frequency and Duration:

In assessing and comparing yoga research, the overall dosage of yoga training, which is dependent on both the length and frequency of yoga sessions, must be taken into account. In the research, the most common length and frequency of yoga sessions were 30–60 minutes each session, with sessions meeting daily for 4–10 weeks, although several studies utilized sessions meeting 2–3 times per week for 8–12 weeks. Some yoga programs meet more often but for a shorter period of time than others. In one research, those with essential hypertension got 1 hour of yoga training every day for three months, totaling 84 hours of training, compared to healthy young adults who received 1 hour of yoga training three times a week for ten months, totaling 120 hours of training.

Some of the results may be helpful in determining the most efficient yoga session lengths. In one research, for example, 1 hour of daily yoga practice was linked to substantial weight and cholesterol reductions after 4 weeks, with the benefits lasting for 14 weeks. Daily 30-minute yoga sessions reduced blood pressure on the fifth day in a study of 20 individuals with essential hypertension.

1.2. Completion of the Yoga Program:

Long-term adherence to yoga would be required for any long-term advantages, which was only looked at in a handful of the research analyzed. In other studies, after completing yoga instruction, participants were invited to continue their routines at home on a regular basis. One of them examined white and black American adults' commitment to yoga practice following a 10-week yoga intervention (mean age: 69 years for whites and 70 years for blacks). Although there was no significant difference in dropout rates (16 percent for whites, 22 percent for blacks), black participants did not practice yoga at home as much as whites. In a separate research, participants in a three-times-per-week yoga session had higher compliance with subsequent home practice than those in a weekly yoga class (86 percent vs 65 percent, P 0.05). However, there was no difference in compliance with home practice between the yoga and aerobic exercise groups.

1.3. Loss of weight:

Regular yoga practice for four years or more was substantially linked with weight reduction in overweight individuals, according to a retrospective observational research of 15,550 people aged 53–57 years. Yoga practice was also shown to be helpful in decreasing body weight in many intervention trials. One research showed a substantial reduction in mean body weight from 72.26 to 70.48 kg among individuals with risk factors for coronary artery disease after a 4-day residential yoga practice followed by 14 weeks of 1 h daily home practice (CAD). Yoga has been linked to substantial weight reduction in both those with and without coronary artery disease, according to other research. After one year of yoga practice, adult males with CAD lost 7% of their body weight, while healthy individuals dropped an average of 5.7 kg after three months of yoga practice, according to Schmidt and colleagues. Within a year of starting yoga-based lifestyle changes, all overweight individuals were back to their normal weight. However, the impact magnitude of this modification was not shown in this article.

1.4. Reduced Blood Glucose Levels:

Yoga was shown to be helpful in lowering blood glucose levels in all six research that looked at it. Fasting glucose levels in a sample of individuals with type 2 diabetes decreased substantially (from 144 to 119 mg dl1, P 0.005) following four months of yoga practice. After 40 days of yoga practice, a group of 24 individuals with type 2 diabetes had substantially lower fasting glucose (from 190.1 to 141.5 mg dl1, P 0.001). After 8 days of 3–4 h of yoga practice, adults with normal blood glucose levels had substantially reduced glucose levels (P 0.001).

1.5. BP Decreased:

Yoga was shown to be helpful in lowering blood pressure in this study. The benefits of a yoga class and an aerobic exercise class, both conducted three times a week for ten weeks, on systolic blood pressure were similar in a sample of low-income older individuals. However, regardless of the kind of yoga used, eight additional research showed that it was helpful in reducing blood pressure in healthy volunteers. People with hypertension, cardiovascular disease, or type 2 diabetes who practiced yoga had a substantial reduction in their blood pressure. For example, after the third week of a 4-week yoga program (1 hour per day, 6 days per week) in 13 patients with essential hypertension, BP decreased substantially, and it dropped even more following the

program. By the third week, systolic blood pressure had decreased from 141.7 to 127.9 mmHg, and by the fourth week, it had dropped to 120.7 mmHg.

1.6. Cholesterol Level Improved:

Yoga has been linked to substantial reductions in cholesterol in those with cardiovascular disease, hypertension, or type 2 diabetes. One research looked at a program that included four days of yoga at a residential course followed by a year of yoga practice at home. All lipid indicators except HDL declined starting the fourth week of yoga practice in both men with angina and asymptomatic individuals with CAD risk factors (for example, total cholesterol went from 206.6 to 193.6 mg dl), and total cholesterol continued to reduce to 176.06 mg dl after 14 weeks. Short-term intense yoga practice (3–4 h per day for 8 days) resulted in substantial improvements (P 0.01) in total cholesterol, triglycerides, LDL, HDL, and very-LDL (VLDL, defined as total cholesterol minus LDL minus HDL) in individuals at risk for cardiovascular disease and diabetes. The reduction in triglycerides (from 151.5 48.9 to 132.7 50.5 mg dl, P 0.001) and VLDL (from 36.7 13.8 to 30.2 14.6 mg dl, P 0.001) was significantly greater in subjects with higher baseline total cholesterol (triglycerides falling from 113.6 46.5 to 110.5 38.1 mg dl, P > 0.05; VLDL from 23.7 12.8 to 23.2 12.8) than in subjects with lower baseline total cholesterol (Finally, a study of healthy individuals over the age of 40 discovered that 5 years of yoga practice prevented age-related decline in cardiovascular function. The results revealed a long-term shift suggesting the efficacy of yoga on cardiovascular functioning, despite the fact that the paper reporting this observational research did not specify the kind of yoga done, nor the frequency or intensity of the yoga sessions.

Four studies utilized yoga as a control and aerobic exercise as an intervention. One of these studies, which looked at healthy active individuals aged 65 and above, showed that aerobic exercise had no meaningful effect on weight or blood pressure, but that 4 weeks of yoga practice did (for example, systolic BP decreased from 146 to 139 mmHg). In the yoga control group, there was no change in glucose and insulin responses. During yoga practice, however, the yoga control group was monitored to ensure that pulse rates did not surpass 90 beats per minute. As a consequence, this limitation should be taken into account while evaluating this outcome.

2. DISCUSSION

Yoga was shown to have positive benefits on body weight, blood pressure, blood glucose, and cholesterol levels in the studies. Nonetheless, in order for clinical programs to capitalize on these health advantages, numerous flaws in research on this subject must be corrected.

Only a handful of the papers discussing treatments included information about yoga programs or the names and sequences of yoga poses. Different kinds of health benefits are provided by asana and pranayama, and therapeutic yoga programs may include diverse mixes of these two components. Knowing the mix of Asana and Pranayama performed is necessary for an appropriate comparison of research findings. The sequence of yoga poses may be deduced from the list of position names, but future research that want to replicate or generalize the findings will need more simple information. How to standardize yoga activities for research purposes is a similar problem that has yet to be addressed.

The ideal length and intensity for maximizing the efficacy of yoga, as well as the requirement for a booster to give long-term benefits, must be established. Because yoga has a low MET,

increasing the frequency may boost the benefits. Many papers did not explicitly specify the dose of the yoga program examined, and they concentrated on the short-term health advantages of yoga, thus these variables cannot be evaluated from reviews research. Only a few research included data beyond the first six months. It's also unclear if more intense training, i.e., a higher dose, increases the chances of long-term adoption and maintenance of active behavior.

Additional issues arise as a result of the samples used in the research examined. It's no surprise that the majority of the research was done in India, the birthplace of yoga's theory and practice. However, the findings' generalizability is limited due to the study's emphasis on a certain geographical area where yoga is especially entrenched in the culture. Few studies have looked at factors relevant to minorities in the United States (Blacks, Hispanics, and Asians), who are thought to be more susceptible to type 2 diabetes and physical inactivity.

Yoga is helpful for a variety of health issues. A significant number of the research looked at the effects of yoga on healthy people. Yoga has been shown to be more helpful in reducing triglycerides in individuals with high cholesterol levels than in people with low cholesterol levels. Since a result, it is important to examine the health conditions of participants, as there may be variations in the benefits of yoga depending on their health severity.

Yoga has recently been shown to enhance a variety of immunological markers. Antimicrobial peptides called defensins kill bacteria by damaging the hydrophobic core of their lipid bilayers. The epithelial cells of the oral cavity and respiratory tract express human-defensin 2 (HBD-2). In a recent research, we found that 90 minutes of yoga stretching enhanced salivary HBD-2 concentrations and the rate of HBD-2 expression in 15 older people. Emotional stress has been shown to affect HBD-2 expression. As a result, we hypothesized that yogic stretching reduces stress, resulting in increased salivary HBD-2 expression.

3. CONCLUSION

We looked at the impact of yoga on chronic illnesses and immunological functioning in this article. These findings indicate that yoga may help chronic illness patients by reducing discomfort and increasing functional performance. Yoga has recently been shown to have beneficial benefits on many immunological markers, suggesting that it may be an effective way for older people to avoid infectious illnesses. Yoga has the potential to be useful as a supplementary and alternative treatment for chronic illnesses, and it may also aid in the health maintenance of older people. Yoga intervention analyses should be developed and performed to find programs that are most suited for a variety of groups, including those with high-risk factors for chronic health problems. Such research may help to create more realistic and effective treatments. Yoga is a low- to moderate-intensity activity that may be done gently and readily by beginners and older people. We examined the benefits of yoga on COPD, cancer, CVD, obesity, diabetes mellitus, and immunological functioning in this article; however, many research have shown that yoga has a variety of favorable impacts on other illnesses and mental stress. As a result, yoga may be beneficial for maintaining health in older people. A further in-depth look of the impact of yoga on immunological function is required.

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