

Therapeutic Efficacy of Yoga for Common Primary Care Conditions

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ABSTRACT

Introduction: Yoga is a popular form of exercise that uses body postures, meditation, and breathing techniques and has been shown to have many health benefits.

Objective/Methods: Our goal for this review is to orient health professionals to the evidence-based uses of yoga most relevant to primary care. We conducted a PubMed search that included meta-analyses, reviews, systematic reviews, and randomized controlled trials.

Results: Results were limited to English language and publication between 2010 and 2020. Yoga was found to help decrease hypertension, relieve back pain, promote overall well-being, and improve mental health.

Conclusions: Yoga is a relatively safe and effective option for patients interested in therapeutic lifestyle change to promote well-being and to help manage hypertension, back pain, and overall mental health.

INTRODUCTION

Yoga is a system of health-promoting attitudes and practices arising out of Hindu philosophy. In the West, the elements of yoga most emphasized and widely practiced are breath control practices, bodily postures, and meditation.^{1,2} Increasingly, Americans are practicing yoga for overall wellness and to treat specific health conditions. A 2017 survey of US adults ages 18+ found that 1 in 7 Americans had practiced yoga in the past 12 months.³ As such, primary care clinicians may encounter questions about yoga, including the health benefits and safety of this practice. To orient health care professionals to the evidence-based uses of yoga,

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we review current literature on the efficacy of yoga to address commonly encountered health-related concerns. A 2018 systematic review of the top reasons for primary care visits found that—in descending order—hypertension, upper respiratory tract infection, depression/anxiety, back pain, and routine health maintenance are the 5 top reasons for visits to primary care clinicians in developed countries.⁴ Our review focuses on these conditions, excluding upper respiratory tract infection.

SEARCH METHODS

We completed a PubMed search using the key terms “yoga” and each reported condition, and “yoga and safety.” The search parameters included meta-analyses, reviews, systematic reviews, and randomized controlled trials (RCT). We limited our inquiry to English language and publication between 2010 and 2020 for search dates February 1, 2020 through May 29, 2020. Two reviewers evaluated articles for inclusion. From this initial search, we prioritized meta-analyses and reviews with adult study populations, though 1 included study includes incarcerated youth. High quality RCTs were included where meta-analyses and reviews were not available.

PATIENT CASE: Linda

Linda is a 61-year-old woman who comes to see you for a routine health maintenance visit. She has a history of hypertension that she prefers to manage without pharmaceuticals. Additionally, she notes her mother suffered a series of devastating falls, and she'd like a health maintenance activity to support healthy mobility into advanced age. Based on what she's heard of the health benefits of yoga, she asks if yoga might be a good activity to try.

Table 1. Atherosclerotic Cardiovascular Disease Risk

Author/Year	Study Design	Study Populations	Outcomes	No. of Studies/ Subgroups	Sample Size	Results (95% CI) P value	Controls
Chu, et al, 2016 ⁶	Meta-analysis	Healthy adults and ASCVD risk, metabolic syndrome, diabetes, CAD	BMI, kg/m ²	8	654	MD -0.77 (-1.09 to -0.44) P<0.00001	Nonexercise
			SBP, mmHg	22	1470	MD -5.21 (-8.01 to -2.42) P=0.0003	
			LDL, mg/dl	12	751	MD -12.14 (-21.80 to -2.48) P=0.01	
			HDL, mg/dl	12	751	MD 3.20 (1.86 to 4.54) P<0.00001	
Hartley, et al, 2014 ⁷	Meta-analysis	Adults with ASCVD risk factors, HIV, menstrual irregularities, and healthy adults	HDL, mg/dl	5	207	MD 3.09 (0.77 to 5.41) P=0.01	Nonexercise
			Triglycerides, mg/dl	5	207	MD -23.91 (-38.97 to -9.74) P=0	
			DBP, mmHg	8	444	MD -2.90 (-4.52 to -1.28) P=0	

Abbreviations: ASCVD, atherosclerotic cardiovascular disease; BMI, body mass index; MD, mean difference; CAD, coronary artery disease; SBP, systolic blood pressure; LDL, low density lipoprotein; HDL, high density lipoprotein; DPB, diastolic blood pressure.

Table 2. Well-being in Older Adults

Author/Year	Study Design	Study Populations	Outcomes	No. of Studies/ Subgroups	Sample Size	Results (95% CI) P value	Controls
Sivaramakrishnan, et al, 2019 ⁸	Meta-analysis	Healthy adults mean age 60+	Balance	7	265	ES 0.70 (0.19 to 1.22) P=0.01	Nonexercise
			Lower limb strength	7	485	ES 0.45 (0.22 to 0.68) P<0.001	
			Lower body flexibility	7	431	ES 0.50 (0.30 to 0.69) P<0.001	
			Depression	8	450	ES 0.64 (0.30 to 0.95) P<0.001	
			Perceived mental health	9	554	ES 0.60 (0.33 to 0.87) P<0.001	
			Perceived physical health	5	400	ES 0.61 (0.29 to 0.94) P<0.001	
			Sleep quality	4	353	ES 0.65 (0.41 to 0.88) P<0.001	
			Vitality	3	196	ES 0.31 (0.03 to 0.59) P=0.03	
			Lower body flexibility	3	225	ES 0.28 (0.01 to 0.54) P=0.04	
Lower limb strength	3	225	ES 0.49 (0.1 to 0.88) P=0.01				
Tulloch, et al, 2018 ⁹	Meta-analysis	Adults, mean ages 60+, 74% female, community- and facility-dwelling, healthy with OA, cancer history, Parkinsons disease, COPD, chronic back pain	HRQOL	12	752	SMD 0.51 (0.25 to 0.76) P<0.001	Nonexercise
			Mental well-being	12	752	SMD 0.38 (0.15 to 0.62) P=0.001	

Abbreviations: ES, effect size; SMD, standardized mean difference; HRQOL, health-related quality of life; OA, osteoarthritis; COPD, chronic obstructive pulmonary disease.

HEALTH MAINTENANCE AND WELL-BEING

According to national survey data from 2012, 78% of people practicing yoga in the US are practicing for general health and disease prevention.⁵ Yoga has shown benefit for several indicators of well-being in otherwise healthy individuals.

Yoga may be an effective intervention for atherosclerotic car-

diovascular disease risk reduction. In a 2016 meta-analysis of 32 RCTs with healthy adults and adults with cardiovascular disease risk factors, diabetes, metabolic syndrome, and coronary artery disease (CAD), asana-based yoga practice was shown to improve cardiovascular risk factors including body mass index (BMI), systolic blood pressure (SBP), low density lipoprotein (LDL) and

Table 3. Hypertension

Author/Year	Study Design	Study Populations	Outcomes	No. of Studies/ Subgroups	Sample Size	Results (95% CI) P value	Controls
Hagins, et al, 2013 ¹⁸	Systematic review, meta-analysis nonexercise	Prehypertensive or hypertensive adults	Blood pressure	17	1013	SBP -4.17 mmHg (-6.35 to -1.99) P=0.0002 DBP -3.62 mmHg (-4.92 to -1.60) P=0.0001	Exercise and nonexercise
Cramer, et al, 2014 ¹⁹	Systematic review, meta-analysis	Prehypertensive or hypertensive adults	Blood pressure	7	452	SBP -9.65 mmHg (-17.23 to -2.06) P=0.01 DBP -7.22 mmHg (-12.83, -1.62) P=0.01	Nonexercise
Cramer, et al, 2014 ²⁰	Systematic review, meta-analysis	Healthy, nondiabetic adults with risk of CVD or adults with diabetes mellitus type 2	Blood pressure	17	SBP 952 DBP 991	SBP -5.85 mmHg (-8.81 to -2.89) P<0.01 DBP -4.12 mmHg (-6.55, -1.69) P<0.01	Nonexercise
Wu, et al, 2019 ²¹	Systematic review, meta-analysis	Adults	Blood Pressure	49	3517	SBP weighted mean effect size -0.47 (-0.62 to -0.32, -5.0 mmHg) P<0.001 DBP weighted mean effect size -0.47 (-0.61 to -0.32, -3.9 mmHg) P<0.001	Nonexercise

Abbreviations: SBP, systolic blood pressure; DBP, diastolic blood pressure; CVD, cardiovascular disease.

high density lipoprotein (HDL) cholesterol compared to nonexercise controls. Notably, no difference was observed between yoga and other exercise interventions⁶ (Table 1). A 2014 Cochrane review evaluating yoga for the prevention of cardiovascular disease reported improvements in diastolic blood pressure, HDL cholesterol, and triglycerides with yoga interventions⁷ (Table 1).

Yoga shows promise as a health maintenance activity for older adults. A large 2019 meta-analysis of the effects of yoga on physical functioning (17 trials) and health-related quality of life (20 trials) in older adults demonstrated that yoga practice is associated with improved balance, flexibility, and strength compared to inactive controls. Compared to active controls, results for strength and flexibility favored yoga interventions. Results for health-related quality of life also favored the yoga interventions in the domains of depression, perceived mental health, perceived physical health, sleep quality, and vitality as compared to nonactive controls⁸ (Table 2). In 2018, Tulloch et al published a meta-analysis of 12 RCTs in people 60+ years of age (n = 752) examining the effects of yoga on health-related quality of life and mental well-being. They found a significant medium-sized effect on health-related quality of life and a small, statistically significant effect on mental well-being⁹ (Table 2). In a 2016 meta-analysis (n = 307), results for yoga trended toward improved balance and mobility in persons 60 years or older, though results did not reach statistical significance.¹⁰ A 2019 pilot RCT with 81 participants 55+ years of age with a diagnosis of mild cognitive impairment showed improvements in memory for both the yoga and a memory training intervention, where only the yoga participants showed statistically significant improvements in executive functioning compared to participants in the memory training group.¹¹ In a 2014 RCT of peri- and postmenopausal women, yoga showed a modest positive effect on menopause-

related quality of life.¹² These results demonstrate that yoga can help older adults improve their physical functioning and quality of life.

In a systematic review of 5 RCTs examining the effects of yoga on workplace well-being, 4 studies evaluating yoga interventions showed statistically significant reductions in workplace stress, and no adverse events were recorded. One study did not report results.¹³

In a 2015 meta-analysis examining the effects of yoga on incarcerated women and youth, participants in yoga programs showed improved behavioral functioning (10 trials) and psychological well-being (9 trials), with longer programs tending to show more robust results.¹⁴

HYPERTENSION

According to America's Health Rankings in 2019, 30.8% of Wisconsin adults have been told they have high blood pressure by a health professional.¹⁵ The Wisconsin Chronic Disease Quality Improvement Project found that patients with hypertension and with Wisconsin health plans and national commercial health plans had controlled blood pressure an average of 68.6% and 62.2%, respectively.¹⁶ As of 2017, high blood pressure was estimated to account for \$68 billion in medical care expenses per year in the US.¹⁷ Yoga has been considered as a treatment to improve blood pressure control.

There have been 4 systematic reviews and meta-analyses in the last several years looking at patients with high blood pressure and yoga¹⁸⁻²¹ (Table 3). All of the reviews have shown some improvement in both SBP and diastolic blood pressure (DPB), though they have not always been consistent in the amount of change seen. This is likely due to the low number of studies in this area, high or unclear risk of bias in most of the studies

included, and high degree of heterogeneity. The 3 reviews that looked at yoga vs exercise as a control showed that there was no statistical difference between these interventions.¹⁸⁻²⁰

In the 2013 systematic review and meta-analysis by Hagins et al, yoga was found to decrease SBP by -4.17 mmHg ($P=0.0002$; 95% CI, -6.35 to -1.99) and DBP by -3.62 mmHg ($P=0.0001$; 95% CI, -4.92 to -1.60).¹⁸ Subgroup analysis showed further reduction of SBP (-8.17 mmHg) and DBP (-6.14 mmHg) when yoga contained all 3 elements (postures, breathing, and meditation) compared to yoga that contained <3 of these elements.¹⁸ The systematic review and meta-analysis in 2014 studying yoga and hypertension by Cramer et al showed a reduction in SBP of -9.65 mmHg ($P=0.01$; 95% CI, -17.23 to -2.06) and DBP of -7.22 mmHg ($P=0.01$; 95% CI, -12.83 to -1.62).¹⁹ Another meta-analysis by Cramer et al looked at patients with cardiovascular risk factors and found that yoga vs usual care or no intervention was associated with a decrease in SBP of -5.85 mmHg ($P<0.01$; 95% CI, -8.81 to -2.89) and DBP of -4.12 mmHg ($P<0.01$; 95% CI, -6.55 to -1.69). Furthermore, in nondiabetic patients with high cardiovascular risk factors, they found that SBP was decreased by -10.00 mmHg ($P<0.01$; 95% CI, -16.42 to -3.59) in the yoga group vs usual care/no treatment.²⁰ Between groups assigned to yoga and to exercise, no significant differences in blood pressure outcomes were observed.¹⁸⁻²⁰

In the most recent systematic review and meta-analysis, a meta-regression analysis was done to determine which elements of yoga elicited the greatest blood pressure effects. Reductions of SBP were statistically significantly greater for studies including breathing techniques and higher initial blood pressures. The additive model created for SBP (samples with hypertension, breathing techniques, and average methodological study quality and controlled for publication bias) showed a decrease in SBP of -11.3 mmHg (95% CI, -14.6 to -8.1).²¹ Reductions of DBP were statistically significantly greater for studies including meditation, practicing $\geq 4x$ per week, and higher initial blood pressure. The additive model created for DBP (samples with hypertension, meditation, average methodological study quality, and yoga practiced $>3x$ per week) showed a reduction of DBP by -5.5 mmHg (95% CI, -7.4 to -3.8).²¹

Despite the high amount of heterogeneity and high risk of bias in the randomized controlled trials noted in most of the meta-analyses, all have found a statistically significant decrease in blood pressure with yoga. This suggests that there is evidence that yoga can decrease both SBP and DBP in meaningful amounts ranging from 4 mmHg to 11 mmHg and 3 mmHg to 7 mmHg, respectively.

However, as with most lifestyle modifications, questions remain about the feasibility and the likelihood that patients will implement these changes in their lives. A matched controlled study by Wolff et al looked at adult patients who were matched by SBP and whether a yoga class vs at-home yoga were more effective in lowering blood pressure.²² The yoga at-home group was given a CD and a manual by a health professional who was not a qualified yoga instructor. Interestingly, the at-home yoga group showed a

decrease in DBP by 4.4 mmHg compared to the control (treatment as usual). This is in contrast to no improvement in blood pressure in the yoga class group compared to the control, suggesting that an at-home practice could be a feasible lifestyle change.²² Another study by Sarah et al looked at male patients who were hospitalized in Germany for noncardiac or pulmonary diagnoses and with SBP >135 and <165 mmHg.²³ These patients underwent inpatient yoga practice during rehab prior to discharge. The study was evaluating whether telerehabilitation (including telephone check-ins) vs no further support increased the likelihood of continued compliance with yoga practice. It was found that adherence was statistically significantly higher in the telerehabilitation group vs the control group (60.5% vs 29.3%, $P<0.0001$ at 6 months and 56.0% vs 23.9%, $P=0.014$).²³ This suggests that phone check-ins can be useful in supporting patient adherence to this lifestyle modification.

Overall, yoga has been shown to decrease SBP by 4 mmHg to 11 mmHg and DBP by 3 mmHg to 7 mmHg and is a feasible option for patients to do at home with some support from primary care providers.

PATIENT CASE: Linda continued

You discuss the benefits of yoga with Linda. At a follow-up 4 months later, she states that she has been practicing yoga about 3 times a week and finding joy in this practice. Her blood pressure is under control and she thanks you for your recommendation.

PATIENT CASE: Mark

Mark is a 50-year-old male with a history of depression who presents to your office to discuss low back pain. He has had low back pain for years. He has tried many different treatment modalities including NSAIDs, acetaminophen, lidocaine patches, Icy Hot, and physical therapy. He is wondering if there is anything else that can be done to help with his pain. He also has a nephew with opioid use disorder and would like to avoid any more medications. His wife has been doing yoga and he's wondering if this would help with his back.

BACK PAIN

Back pain is estimated to generate \$100 billion in health care costs annually,²⁴ and back pain consistently ranks among the top 3 diagnoses in claims prevalence and cost for Quartz Health Solutions, a major Wisconsin health insurance company.²⁵

Yoga has been studied extensively for chronic low back pain and function.²⁶⁻²⁸ A 2019 meta-analysis of 13 RCTs evaluating the effectiveness of yoga for low back pain demonstrated that yoga practice significantly decreased pain intensity (standardized mean difference [SMD] -0.33; 95% CI, -0.47 to -0.19, $P<0.001$)²⁶ (Table 4). In a 2013 meta-analysis of yoga for low back pain and pain-related function, yoga was shown to improve pain based on what the reviewers deemed moderate quality evidence from 6 high quality RCTs. Short-term improvements in back-related disabil-

Table 4. Back Pain

Author/Year	Study Design	Study Populations	Outcomes	No. of Studies/ Subgroups	Sample Size	Results (95% CI) P value	Controls
Zou 2019 ²⁶	Meta-analysis	Adults with chronic low back pain	Pain intensity	10	1179 <i>P</i> <0.001	SMD -0.33 (-0.47 to -0.19) nonexercise	Exercise and
Cramer ²⁷ 2013	Meta-analysis	Adults with chronic low back pain (short-term)	Pain intensity + pain bothersomeness	6	584	SMD -0.48 (-0.65 to -0.31) <i>P</i> <0.01	Exercise and non-exercise
			Back-specific disability	8	689 <i>P</i> <0.01	SMD -0.59 (-0.87 to -0.30) nonexercise	Exercise and
Wieland ²⁸ 2017	Meta-analysis	Adults with chronic low back pain	Back-specific function (short-term)	5	256	SMD -0.45 (-0.71 to -0.19) <i>P</i> =0.00070	Nonexercise
			Back-specific function (long-term)	2	365	SMD -0.26 (-0.46, -0.05) <i>P</i> =0.015	Nonexercise

Abbreviations: SMD, standardized mean difference.

ity were also observed²⁷ (Table 4). In a 2017 Cochrane Review, 9 trials compared yoga to nonexercise controls. Yoga was associated with improved function at short- and long-term follow-up, with moderate and small effect sizes, respectively. Yoga was associated with improved pain at short-, intermediate-, and long-term follow-up as well; results were statistically significant but did not meet the authors' threshold for clinical significance²⁸ (Table 4). The same Cochrane review compared yoga to exercise controls (4 trials), and the authors found no difference between yoga and nonyoga exercise for back-related function. For pain, yoga participants demonstrated statistically and clinically significant improvement at intermediate-term follow-up (1 trial) but not short-term follow-up. No long-term follow-up results were reported for this comparison.²⁸

In addition to meta-analyses, yoga for back pain also has been evaluated in 2 large systematic reviews in the past 10 years. In a 2017 review of 14 RCTs, functioning was significantly better in the yoga group compared to education intervention controls at short-term (5 trials) and long-term (4 trials) follow-up. When compared to exercise, yoga tended to be associated with small improvements in pain and functioning, though results were not always statistically significant.²⁹ In a 2020 systematic review published by the US Agency for Healthcare Research and Quality, when compared to attention or wait-list controls, yoga showed improved function at short-term (8 trials) and intermediate-term (3 trials) follow-up. Additionally, when compared with attention or wait-list controls, yoga was associated with improved pain at short-term (7 trials) and intermediate-term (2 trials) follow-up. There were no differences between yoga and other exercise for pain or function at short- or intermediate-term follow-up.³⁰

A 2017 review on the cost-effectiveness of various nonpharmacologic therapies for low back pain suggests that yoga is a cost-effective therapy for chronic low back pain. However, these results must be interpreted with caution in the United States as the studies reviewed were carried out in Europe.³¹

Overall, there is a growing body of literature demonstrating

that yoga is a moderately effective means of treating chronic low back pain.

PATIENT CASE: *Mark continued*

Mark also notes that his mood isn't as good as it used to be, despite continuing to take his selective serotonin reuptake inhibitor (SSRI) regularly. His wife has been saying that yoga has been helping her mood. He's wondering if there is any truth behind this.

MENTAL HEALTH

Anxiety and depression are, together, the third leading chief complaint for primary care visits in developed countries,⁴ and in 2018, 7.2% of adults had an episode of major depressive disorder in the last year.³² In a national survey on yoga use, 84.7% of people stated that practicing yoga reduced their stress levels, and 67.5% of people stated that practicing yoga made them feel better emotionally.⁵ One proposed mechanism of the feeling of decreased stress levels is that practicing yoga has been found to increase γ -aminobutyric acid levels in the thalamus.³³ While most of the randomized control trials studying yoga and depression/anxiety have high risk of bias and heterogeneity, there is some evidence that yoga can be effective in treating these conditions.³⁴⁻³⁸

A systematic review and meta-analysis looking at yoga and depression found that there was moderate evidence for short-term effects of improving severity of depression with yoga vs usual care (SMD -0.69; 95% CI, -0.99 to -0.39; *P*<0.001)³⁴ (Table 5). There was also limited evidence for improvement of depression for yoga vs relaxation and yoga vs aerobic exercise, though smaller than yoga vs usual care.³⁴ Another systematic review for patients with major depressive disorder found that there was no difference between yoga and exercise or antidepressant medication (imipramine) for treatment of depression.³⁵ This particular systematic review was flawed in that it analyzed very few studies that had few participants. However, given that exercise and antidepressant medications are known to improve depression, it is reasonable to

Table 5. Depression

Author/Year	Study Design	Study Populations	Outcomes	No. of Studies/ Subgroups	Sample Size	Results (95% CI) P value	Controls
Cramer ³⁴ et al, 2013	Systemic review, meta-analysis	Adults with depression	Various depression scales	5	284	SMD -0.69 (-0.99 to -0.39) P < 0.001	Usual care
				3	109	SMD -0.62 (-1.03 to -0.22) P = 0.003	Relaxation
				2	159	SMD -0.59 (-0.99 to -0.18) P = 0.004	Aerobic exercise

Abbreviations: SMD, standardized mean difference.

Table 6. Anxiety

Author/Year	Study Design	Study Populations	Outcomes	No. of Studies/ Subgroups	Sample Size	Results (95% CI) P value	Controls
Cramer ³⁶ et al, 2018	Systematic review, meta-analysis	Adults with diagnosis of an anxiety disorder	Improvement of anxiety based on various scales	3	169	SMD -0.43 (-0.74 to -0.11) P = 0.008	No treatment
				3	79	SMD -0.86 (-1.56 to -0.15) P = 0.02	Active controls

Abbreviations: SMD, standardized mean difference.

suggest that yoga can also improve depression in those with major depressive disorder.

For anxiety, there is even less research available; however, a recent systematic review and meta-analysis found that there was evidence for short-term benefits of yoga on anxiety compared to no treatment (SMD -0.43; 95% CI, -0.74 to -0.11; $P=0.008$)³⁶ (Table 6). Even greater effects were found for yoga compared to active controls like progressive muscle relaxation (SMD -0.86; 95% CI, -1.56 to -0.15; $P=0.02$).³⁶ In a more recent RCT looking at yoga vs no treatment for anxiety in college students, there was a statistically significant improvement of anxiety symptom scores in those in the yoga group.³⁷

While there is at least modest evidence for improvement in the short term for both anxiety and depression with yoga, very few studies have looked at long-term benefits. One such study followed patients with cancer for 6 months after the end of a yoga intervention to see if there were decreases in depression and anxiety scores.³⁸ Overall, both symptoms of anxiety and depression were statistically significantly improved compared to their baseline scores prior to the yoga intervention. In addition, 69% of patients in the study were still practicing yoga at 6-month follow-up, likely due to reported subjective benefits.³⁸

Overall, there is moderate evidence that yoga could be an additional tool to treat anxiety and depression.

PATIENT CASE: Mark continued

Mark's daughter attends classes at a "power yoga" studio, and their website depicts highly flexible young adults in challenging positions, including headstand. Mark asks if you advise this type of yoga for him.

SAFETY

In clinical trials, yoga has generally been shown to be a safe activity. Only about 2.2% of participants experience yoga-related adverse events, and only 0.6% of participants experience serious adverse events.³⁹ These numbers are comparable to usual care or other exercise interventions.⁴⁰ The most common adverse event reported with respect to yoga practice for back pain is temporarily increased pain.^{30,41} Serious adverse events include stroke and glaucoma, although these complications are rare.⁴²

The wide variety of yoga interventions studied and variations in reporting generally preclude assessment of risk by specific type of yoga.³⁹ However, certain postures have demonstrated increased risk of adverse events. The yoga practices most frequently associated with serious adverse events are headstand, shoulder stand, lotus position (where the practitioner is seated and the legs are crossed such that both feet rest on the opposite thighs), postures requiring the placement of 1 or both feet behind the head, and intense, forceful breathing practices.⁴² These practices are generally not recommended for a medical population and may only be considered on a case-by-case basis for advanced yoga practitioners under the guidance of a certified yoga instructor.

Overall, yoga is regarded as being as safe as other exercise or usual care and can be safely practiced by most people under the direction of a certified instructor.

PATIENT CASE: Mark Continued

Mark returns to your clinic 3 months later and states that he has been practicing yoga with his wife 3 to 4 times per week. He has not gone to the power yoga class with his daughter. He states that his mood has improved overall since starting yoga. While he still has some back pain, he also feels that yoga has improved both his mobility and pain.

CONCLUSIONS

To date, yoga shows promise as a relatively safe and effective option for patients interested in therapeutic lifestyle change to promote well-being and to help manage hypertension, back pain, and overall mental health. However, our review is limited by number of studies, small sample sizes, poor quality data, and risk of bias. Additionally, there are many different types of yoga and different elements of yoga practice, such as meditation, breathing, and postures. Preliminary data suggest that a mix of these elements in the treatment of hypertension could be more beneficial than only practicing 1 or 2 of these elements of yoga. These results indicate that more studies are needed to determine the optimal components of a yoga intervention for a given health condition, dosing of the intervention, and delivery method. Additionally, more studies are needed to discern the safety and efficacy profiles of different styles of yoga, which vary widely in emphasis on the different components of yoga and level of exertion. Still, the current data in aggregate are encouraging, and we hope clinicians will feel more comfortable considering yoga as a therapeutic option for the top conditions seen in primary care.

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Table 7. Level of Evidence

Condition	Evidence	Level of Evidence	Comments
Hyperlipidemia	Yoga practice improves HDL, LDL, triglycerides	Level 2	Compared to nonexercise controls ^{6,7}
Well-being in older adults	Yoga practice improves HRQOL, physical functioning in older adults	Level 1	Compared to nonexercise controls ⁸⁻¹²
Workplace stress	Yoga practice in the workplace reduces workplace stress	Level 1	Consistent results across varied work settings including health care ¹³
Well-being in incarcerated populations	Yoga practice improves behavior, mental well-being in incarcerated women, youth	Level 2	Longer programs show more benefit ¹⁴
Hypertension	Yoga practice improves SBP, DBP	Level 1	Compared to nonexercise controls ¹⁸⁻²¹
Back pain	Yoga practice improves chronic back pain, overall function	Level 1	Effect sizes generally small to moderate vs nonexercise controls ²⁶⁻³⁰
Depression of depression	Yoga practice improves symptoms	Level 1	Compared to nonexercise and non-medication controls and over short time period ^{34,35}
Anxiety of anxiety	Yoga practice improves symptoms	Level 2	When compared to no treatment, muscle relaxation ³⁶

Abbreviations: HDL, high density lipoprotein; LDL, low density lipoprotein; HRQOL, health-related quality of life; SBP, systolic blood pressure; DBP, diastolic blood pressure; SR, systematic review; RCT, randomized control trial.

Level 1 - SR/meta-analysis of RCTs with consistent findings. High-quality individual RCT. All-or-none study.

Level 2 - SR/meta-analysis of lower-quality clinical trials or of studies with inconsistent findings. Lower-quality clinical trial. Cohort study. Case-control study.

Level 3 - Consensus guidelines, extrapolations from bench research, usual practice, opinion, disease-oriented evidence (intermediate or physiologic outcomes only), or case series for studies of diagnosis, treatment, prevention, or screening.

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