



# EFFECT OF YOGA IMPLEMENTATION ON DEGENERATIVE DISEASE RISK: SYSTEMATIC LITERATURE REVIEW

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**Abstract:** Degenerative diseases are chronic diseases that significantly impact a person's future life. Degenerative diseases are one of the most problematic diseases in 21st-century society. Degenerative diseases cause higher morbidity and mortality than other diseases. Yoga has become a form of medicine believed to improve body function, balance, and quality of life. The method used in this study is a systematic literature review. The aim is to collect all scientific knowledge about the benefits and effects of yoga. Processing uses a prism model, which involves identification, screening, eligibility, and inclusion processes by objectively applying inclusion and exclusion criteria. The final results conclude that implementing yoga can reduce the risk of degenerative diseases. However, this is deepened through direct testing on respondents divided by disease and age groups.

**Keywords:** Degenerative Diseases, Risk, Systematic Literature Review, Yoga

## 1 Introduction

The human body will not forever regenerate and renew its cells. There is a process called aging. The process of reduced or degenerative body function must be considered by everyone as a natural process of the human body (Hardisman., 2010). In this old age, when all human organs and cells experience weakness and reduce their functions, diseases will come and attack quickly. Diseases that usually appear in older adults or the elderly are called degenerative diseases. Degenerative disease is a chronic disease that will significantly affect a person's life in the future, which is included in the group of non-communicable diseases. Non-communicable diseases are chronic diseases with a long duration, and the process of controlling or curing them generally takes a long time (Kemenkes RI, 2017). At the global level, PTM is the cause of death in the world by 70%, where the most significant increase of 80% will occur in poor and poor countries (Sariwati, 2022). Degenerative diseases are one of the most problematic diseases for society in the 21st century. This is because the morbidity and mortality rates caused by degenerative diseases are higher than other diseases. Globally, 7 out of 10 leading causes of death in 2019 are non-communicable diseases (WHO, 2019). The World Health Organization (WHO) deaths from this non-communicable disease have

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reached around 36 million people worldwide each year (Sudayasa et al., 2020). With patients who died aged less than 70 years. 86% of deaths from non-communicable diseases occur in developing countries, which have low and moderate GDPs. Heart disease and stroke are among the highest on the survey list (WHO, 2022). In Indonesia, the report on the results of Basic Health Research (Riskesdas) of the Indonesian Ministry of Health in 2018 revealed that there had been an increase in the morbidity rate in Indonesian society for degenerative diseases compared to the previous year. The results of Riskesdas data in 2018 show that the rate of degenerative diseases in Indonesia has reached 65.7%. A comparison of Riskesdas data for 2013 and 2018 gives the proportion of degenerative diseases in Indonesia, including hypertension (25.8% to 34.1%); Obesity (14.8% to 21.8%); stroke (7% to 10.9%); diabetes (3% to 5.37%); chronic renal failure (2% to 3.8%); cancer (1.4% to 1.8%); and cardiovascular disease 1.5%. In addition to cardiovascular disease, the elderly are also susceptible to musculoskeletal disease. Based on data from the 2018 Riskesdas, the prevalence of musculoskeletal problems in Indonesia is 7.3%. Yoga practice has been reported to be effective in reducing the risk of degenerative diseases that often occur in many elderly populations. Yoga is used as a diversification of medicine. Yoga is usually done with breathing exercises, exercise, and health, which have been known and practiced for more than 5000 years. Yoga can be done by all people, from children to the elderly. Yoga is straightforward to do and is not an exercise associated with any particular religion. Yoga has a physiological effect on muscle strength and strengthens various asanas (body positions) that affect the autonomic nervous system and endocrine glands, which regulate internal functions such as heart rate and hormone production. Lumbar flexibility can increase mobility between the vertebrae and strengthen the back and skeletal muscles so as to prevent degenerative diseases associated with compression of the intervertebral discs. In addition, yoga can also strengthen the abdominal muscles, which play a role in supporting the spine. Yoga can improve balance and quality of life (QoL). Several studies show that yoga can help someone with long-term conditions such as stroke sufferers. Stroke survivors can be physically and cognitively involved and benefit from yoga. Another study said qualitative findings support the perceived effectiveness of post-stroke yoga in strength, range of motion, and walking (Lawrence, 2017). The increase in endorphins during yoga is a physiological reaction that plays a role in relaxation and well-being, thus reducing osteoarthritis pain. Furthermore, this study aims to determine the effect of giving yoga exercises on reducing the risk of degenerative diseases in the elderly.

## **2 Methods**

The method used in this study is the Systematic Literature Review (SLR) method using Preferred Reporting Items for Systematic Reviews and Meta-analyses called PRISMA. The Systematic Literature Review (SLR) method aims to review, recognize and

evaluate previous studies that have relevance so that they can answer questions in predetermined research (Triandini et al., 2019). Several stages in this study consisted of formulating research questions, searching for relevant literature, selecting literature, presenting data, processing data, and drawing conclusions. The procedure with the SLR method consists of several steps, namely 1) compiling the background and objectives, 2) looking for trigger questions (research questions), 3) searching for literature, 4) selecting criteria, 5) practical screen, 6) Quality Checklist and Procedures 7) Data Extraction Strategy, 8) Data Synthesis Strategy.

#### 1. Develop background and goals

The first stage in carrying out the Systematic Literature Review (SLR) method, namely compiling the background and research objectives. In this journal, the introduction explains the background by setting goals, namely, knowing the effect of yoga on reducing the risk of degenerative diseases.

#### 2. Problem identification

Researchers examine problems through research journals derived from the results of previous research. The formulation of the problem in this study is to identify the effect of yoga on reducing the risk of degenerative diseases.

#### 3. Search Literature

Searched relevant literature using the Publish or Perish application on several databases, namely Google Scholar, Scopus, Crossref, and PubMed. Based on the title of this study about the effect of implementing yoga on reducing the risk of degenerative diseases, the researchers searched literature using the keywords "yoga, degenerative disease." The total number of journals or literature obtained at this stage was 3832.

#### 4. Selecting criteria or screening

Examined in this study is the effect of yoga implementation on reducing the risk of degenerative diseases. Based on this theme, the literature or journals accessed in the process of making this journal undergo a screening process based on the inclusion and exclusion criteria as follows: Inclusion criteria • Journal published in the year 2015-2023 • Degenerative diseases covering stroke, Low Back Pain (LBP), heart disease and osteoarthritis. • Using yoga as an intervention technique • Type of journal (research articles, experimental studies, case-control studies, and pilot studies) Exclusion criteria • Journals published within the year range < 2015 • Discuss other degenerative diseases besides stroke, Low Back Pain (LBP), heart disease, and osteoarthritis. • Not using yoga as an intervention technique • Type of journal other than (research articles, experimental studies, case-control studies, and pilot studies)

#### 5. Quality assessment

Quality assessment in this journal uses exclusion and inclusion criteria for research that will be included in a systematic literature review based on quality. This criterion can be used to approve journals made available for further analysis. Journals are

evaluated based on the year the journal was published in a certain period (2015-2023) and whether the topic of the problem in the journal is the effect of implementing yoga on reducing the risk of degenerative diseases. Journals or literature that have been screened are 599 journals in the last eight-year publication period with the keywords physiotherapy, yoga, and degenerative disease. Then, journals that are fully accessible are 95 journals. Furthermore, with exclusion and inclusion, 45 journals were obtained.

#### 6. Data extraction or data extraction strategy

Data extraction can be done when all data that meet the requirements have been classified for all existing data. After the screening process is carried out, the data extraction results can be used to determine with certainty how many journals still meet the requirements for further analysis. In the Systematic Literature Review method, data extraction is carried out by reviewing 45 selected articles that have been published and then making a statement in the form of essential findings from these articles so that the results of this extraction can proceed to the next stage, namely data synthesis.

#### 7. Data Synthesis

Strategy Synthesis of the results using meta-analysis or narrative techniques (meta-synthesis). The researcher processed the data synthesis using the narrative method in this study. This method classifies the extracted data. At this stage, important data is grouped and then studied in depth based on data, facts, and information obtained from research journals so that conclusions can be drawn according to the objectives of this study.

## 3 Result

Results of the document provide a comprehensive picture as a form of response to yoga interventions in degenerative diseases. Large groupings are found in degenerative diseases, including stroke, low back pain, heart attack, and osteoporosis. The matrix of search results for implementing yoga is presented as shown in Table.

Table of Research Groups related to the Effect of Yoga Implementation on Degenerative Diseases

Descrption	Cases	Expert
Yoga Implementatio n	Stroke	Portz <i>etal</i> (2018), Harris <i>etal</i> (2019), Kashyap <i>etal</i> (2023), Lai <i>etal</i> (2023), Garcia <i>etal</i> (2023), Desveaux <i>etal</i> (2015), Thayabaranathan <i>etal</i> (2022), Paldhikar <i>etal</i> (2016), Mooventhan <i>etal</i> (2017), Ji <i>etal</i> (2018), Andrews <i>etal</i> (2021), Wang (2018)
	Low Back Pain	Jalandhara <i>etal</i> (2015), Bandita <i>etal</i> (2022), Shirley <i>etal</i> (2016)

	Serangan Jantung	2018), Chhajer <i>etal</i> (2018), Kiran <i>etal</i> (2017), Tripathi <i>etal</i> (2017), Satayanand <i>etal</i> (2017), Murray <i>etal</i> (2018), Tewani <i>etal</i> (2023), Tyagi <i>etal</i> (2016), Sawane <i>etal</i> (2015), Prasad <i>etal</i> (2018), Jain <i>etal</i> (2022), Permana <i>etal</i> (2020), Anupama <i>etal</i> (2016), Saboo <i>etal</i> (2021), Devi <i>etal</i> (2022), Gupta <i>etal</i> (2020)
	Osteoporosis	Field (2016), Park <i>etal</i> (2016), Nugroho <i>etal</i> (2019), Singh <i>etal</i> (2022), Kumar (2023), Srivastava <i>etal</i> (2015), Corjena <i>etal</i> (2016), Buchanan <i>etal</i> (2017), Alexander <i>etal</i> (2017), Singh <i>etal</i> (2018)

**Yoga Implementation in Stroke.** Portz et al. (2018) explained that patients with chronic stroke participate in 8 weeks of yoga-infused self-management intervention (MY-OT) to increase fall prevention. They have demonstrated positive changes related to physical fitness and physical activity. Not only that, participants also reported an increase in walking, both ability and duration. However, in this study, some participants reported no changes in physical fitness or physical activity—yoga on Low Back Pain Yoga on Heart Attack. Hariss et al. (2019) explain that stroke sufferers feel that yoga benefits stroke-specific deficits in 'connectedness' that other forms of activity do not have. Yoga participation can benefit psychological and physical health, regardless of cognitive and physical challenges. Kashyap et al. (2023) explained that patients trained in yoga showed greater brain activity than those who underwent conventional rehabilitation therapy. This study shows that yoga increases the oxygen content in the blood and may increase brain activity and improve cognitive abilities, so it can be said that early yoga intervention in stroke sufferers will improve cognitive abilities.

Lai et al. (2023), combining yoga with rehabilitation in chronic stroke patients, has the potential to increase hand grip strength and lower blood pressure. Gender and age can also affect the outcome of rehabilitation. Garcia et al. (2023) proved that yoga improves balance in stroke sufferers. Yoga postures (asanas) are challenging to maintain optimal balance, which requires proper muscle activation. In patients with stroke, especially those in the chronic stage, a yoga training program must last at least 12 weeks to be successful. Desveaux et al. (2015) explained that a yoga program with the same composition and duration increases exercise capacity and HRQL (health-related quality of life) among patients with chronic conditions such as heart disease, COPD, and stroke compared to ordinary care.

Thayabaranathan et al. (2022) explain that there is emerging evidence of the potential benefits of movement-based mindfulness interventions (MBI), such as yoga for stroke survivors as adjunctive therapy to reduce the influence of risk factors, such as high blood pressure, cholesterol, and anxiety. MBI is a complex intervention with many components, such as static body postures and dynamic movement complex components. Van Puymbroeck et al. (2012) explained that the results showed that the

yoga intervention for eight weeks for chronic stroke sufferers had positive results in the form of increased activity, participation, and quality of life, while the subjects in the control group did not show any improvement. Paldhikar et al. (2016) explained that yoga gives positive results by increasing or improving mobility disorders and limitations, such as increasing balance for hemisphere sufferers after chronic stroke. Mooventhan et al. (2017) stated that yoga is considered an effective advanced or adjuvant treatment for patients with various neurological disorders, one of which is stroke. Post-stroke yoga improvements include increased balance, fear of falling, range of motion, upper extremity strength, and walking 6 minutes in patients with chronic stroke.

Ji et al. (2018) found (1) that Yoga practice therapy can significantly improve stroke patients' cognitive abilities and promote motor function recovery. (2) increase the blood oxygen content in the patient's brain, thereby increasing the patient's cognitive ability by increasing the patient's response and thinking ability. In a study, Andrews et al. (2021) stated that yoga can overcome many common deficits after a stroke, such as changes in physical, emotional, cognitive, sensory, and physiological abilities. Fang (2018) explained that yoga impacts the rehabilitation of stroke sufferers. The results show that yoga improves the patient's balance and mobility.

**Yoga Implementation on Low Back Pain.** Ayuverdic et al. (2016) showed the impact of yoga had a significant (two times greater) reduction in pain in the yoga group compared to the control group. Jalandhara et al. (2015) explained that the seven-day intensive residential IAYT program reduced disability, depression and increased spinal mobility in CLBP patients. The seven-day intensive residential IAYT program reduced disability, depression and increased spinal mobility in CLBP patients. Adhikari et al. (2022) explained demonstrated the feasibility and ability to accept yoga interventions in increasing physical movement, reducing stress levels, reducing pain severity as a neurophysiological response, and distraction and increasing the effectiveness of self and emotional regulation. Shirley et al. (2016) explained that a 12-week yoga program resulted in a reduction in pain and anxiety but did not change MRI-based changes in the intervertebral discs and spine.

**Yoga Implementation in heart attack.** Dubroff et al. (2015) described 22 patients enrolled in this study, and 19 completed it. The research team observed significant improvements in arterial pulse wave velocity ( $P = 0.015$ ) and beneficial reductions in BMI ( $P < 0.0001$ ), total cholesterol ( $P = 0.028$ ), LDL cholesterol ( $P = 0.024$ ), and triglycerides ( $P = 0.046$ ). HDL cholesterol did not change significantly ( $P = 0.90$ ). Most hypertensive patients could reduce or eliminate their antihypertensive medication ( $P = 0.0058$ ). Schlimpert et al. (2018) explained that the patient's quality of life was

significantly better when they did yoga (increased EQ-5D VAS score: 10.7 vs 9.2;  $p=0.002$ ). Chhajer et al. (2018) explained that patients undergoing yoga-based cardiac rehabilitation showed improvement from baseline in several domains. Although not proven superior, yoga-based cardiac rehabilitation may be a suitable alternative rehabilitation, especially in communities where engagement tends to be better. And where the patient is. Therefore tends to persist beyond the initial program.

Kiram et al. (2017). The ultimate goal of all yoga techniques is to generalize all energy into spiritual empowerment and thereby rejuvenate the body and brain. Raj Yoga meditation practiced by Brahma Kumaris has shown a consistently beneficial role in patients with CAD. Tripathi et al. (2017) explained that the effect of Hand Yoga Mudra on heart patients who measured heart rate and blood pressure showed a statistically significant result (decrease) after doing yoga mudra on heart patients. Blood pressure systolic and diastolic blood pressure also showed similar results. Satayanand et al. (2017); Murray et al. (2018) explained that significant differences were observed in the levels of SBP and DBP between the first and last visits in the yoga and control groups. However, DBP showed total normality in the yoga group compared to the control group. Tewani et al. (2023) explained that tone yoga meditation effectively lowers heart rate-mediated anxiety levels in yoga athletes in just two weeks.

Tyagi et al. (2016) explained that yoga practices, including meditation, relaxation, yoga postures, breathing, and integrated practices, seem to increase autonomic regulation and increase vagal dominance seen from the results of HRV measurements. However, it is difficult to make a statement about yoga and HRV because the existing research has poor quality and use heterogeneous sizes. Changes in HRV with yoga reflect a resonance effect between breathing, muscle contraction, HR, and baroreflexes that increase autonomic efficiency. Sawane et al. (2015) explained that almost all HRV variables experienced a statistically significant increase through these two types of exercise. However, several HRV variables show a more statistically significant increase through yoga than swimming. Prasad et al. (2018) explained that practicing yoga in conventional therapy and carrying out lifestyle interventions in post-heart attack patients caused a significant reduction in the main study results, such as body weight, body mass index (BMI), waist circumference, blood sugar levels, glycosylated hemoglobin, lipid profile (triglycerides, total cholesterol), and smoking cessation. In addition, there was a significant increase in HDL cholesterol levels.

Jain et al. (2022) proved that three months of yoga practice with appropriately directed medical therapy significantly improves the quality of life and LVEF while decreasing NTproBNP and CRP in stable condition heart failure patients. Yoga is a safe and affordable method and can be easily applied to heart failure patients without any side effects Permana et al. (2020) explained that Yoga significantly reduces blood pressure in the elderly. Yoga can be an effective way to improve blood pressure balance in the

elderly. Yoga is safe for older people by combining breathing exercises, relaxation, and structured gentle movements. The basic movements in Yoga can lower blood pressure in the elderly so that they can maintain physical strength and carry out daily activities according to their abilities. Yoga can be used as a non-pharmacological method to improve efforts to manage hypertension in the elderly as an additional therapy besides pharmacotherapy, without side effects. Therefore, Yoga can be recommended as a non-pharmacological therapy that is safe and without side effects to treat hypertension.

Tyagi et al. (2016) explained that further long-term studies are needed to determine whether regular yoga practice improves autonomic flexibility and improves clinical outcomes in metabolic syndrome patients. Saboo et al. (2021) explained, Yoga increases autonomic regulation and vagal dominance as presented by HRV. This confirms that regular Yoga is a valuable strategy for dealing with disturbances of cardiac autonomic activity and changes in arterial structure. Devi et al. (2022) explained that oga helps teenagers maintain their blood pressure. Normalized blood pressure produces a variety of physical benefits and can have a positive effect on the overall well-being of society. Therefore, this study concluded that the differences between the pre-test and post-test were insignificant.

**Yoga Implementation in osteoporosis.** Field (2016) describes massage therapy protocols as effective in reducing pain and increasing the range of motion, mainly when pressure massage is being used and when both quadriceps and hamstrings are massaged. Yoga studies usually measure pain with WOMAC. Most of these studies demonstrated clinically significant reductions in pain, especially those focused on poses (e.g., the Iyengar study) compared to those with integrated protocols (poses, breathing exercises, and meditation). Nugroho et al. (2019) explained that community service obtained data that the average pre-test pain intensity in osteoarthritis patients was 4.9 (moderate pain) while the average post-test pain intensity was 3.8 (moderate pain). The results mean that the intensity of pain in patients with osteoarthritis has decreased. Singh et al. (2022) explained that this trial would be the first study to compare yoga with a strengthening exercise program to manage symptomatic knee OA. We will also explore whether the presence of neuropathic pain modifies the results of yoga compared with strengthening exercises. Kumar (2023) explains that data calculations using SPSS version 26 produce a significance value of 0.00 below the significance level. Table T value with 29 degrees of freedom and a significance level of 0.05 is = 2.045. The T value calculated by SPSS version 26 is 6.33. Table DF value (2.045) < Calculated value (6,335). So, based on the results of the data above, yoga therapy has a good effect on reducing the main symptoms of KOA.

Srivastava et al. (2015), representing numbers in SPSS, GpA patients experienced a statistically significant decrease in IL-6 and an increase in IL-10. In addition, there was



a significant decrease in the analgesic medication administered, and the WOMAC scores decreased for stiffness, pain, and emotional functioning. However, there was an increase in social function scores, although not statistically significant. The total WOMAC GpA score decreased significantly. The GpB patient group experienced a decrease in the IL-6 score, and the WOMAC score experienced the same decrease but was not statistically significant. Corjena et al. (2016) explained that there is a high correlation between the frequency and duration of yoga practice on better outcomes related to OA. The high frequency and duration of yoga practice are closely related to the high rate of OA symptom development in a good direction, starting from body function, sleep quality, and quality of life. Buchanan et al. (2017) explained that after conducting research for 12 weeks, it was found that 10 participants said the intervention was successful in reducing the pain they experienced, while the other 9 participants felt that their sleep quality had improved. Regarding having a partner, 8 participants feel it is helpful, but one person feels it is not helping. The IY and SY groups experienced significant improvement in ISI and PROMIS after the whole yoga program, but other than sleep disturbance, there were no significant changes in other outcomes. Further research is needed to conclude that this program improves sleep quality and OA symptoms in a better direction.

## 4 Discussion

**Yoga Intervention Against Stroke Cases.** Stroke cases include neurological disorders, which refer to cerebrovascular circulatory disorders. Post-stroke patients experience decreased quality of life, such as cognitive and motor dysfunction. The literature that the authors have read and reviewed states that yoga interventions in post-stroke patients significantly increase cognitive and motor function. Intervention or yoga practice therapy given to stroke patients can significantly improve cognitive abilities and recovery of motor function. In addition, yoga can also increase blood oxygen content in the patient's brain to improve response and thinking skills which in this case refers to improving the cognitive abilities of stroke patients. This resulted in positive things from yoga interventions for stroke, namely increased activity and participation in the environment or community and increased quality of life so that stroke patients are independent in caring for or taking care of themselves, such as eating, dressing, bathing, going to the toilet, going up and down stairs. , and so on has increased.

**Yoga Intervention Against Low Back Pain.** Cases From the tests that the authors have done, there is a relationship between yoga and various degenerative diseases. Yoga in Low Back Pain has a link in the form of increasing spinal mobility in CLBP patients. There was also a reduction in pain and anxiety, although yoga did not change the MRI-based changes in the intervertebral discs and spine.

**Yoga Intervention Against Heart Attack.** Cases Through the intervention of yoga training, it is possible to reduce cases of heart attacks. This is because, based on several studies that have been discussed, yoga can help reduce the risks of having a heart attack such as blood pressure. Several studies show that both parents and teenagers practicing yoga can reduce hypertension or high blood pressure. Yoga can also improve the autonomic regulation of the heart and cope with changes in the structure of the arteries so that it will maintain the heart's health.

**Yoga Intervention Against Osteoporosis.** Cases Yoga turned out to be much help in reducing patient discomfort in activities and assisting in recovery. Participants who previously experienced movement difficulties and discomfort in daily activities felt better with their complaints. There was increased mobilization, reduced pain, increased muscle strength, and reduced medication with drugs after therapy using yoga. In addition, yoga for people with osteoporosis also affects the quality of sleep for the better. As many as 50% of sufferers experience sleep disturbances, difficulty falling asleep, difficulty maintaining sleep, waking up too early, and not sleeping well (National Sleep Foundation, 2003). Conventional therapy with yoga also affects the psychology of sufferers. Yoga together can help reduce depression and stress, increase motivation to recover, and improve social functioning.

## 5 Conclusions And Recommendations

Yoga influences various body functions. Yoga effectively reduces pain, improves balance, and improves the quality of life (QoL). Therefore, Yoga influences reducing the risk of degenerative diseases. Yoga can be used to prevent the risk of contracting non-communicable diseases and as an alternative treatment for curing degenerative diseases. However, further research is needed to deepen the effectiveness and efficiency of implementing Yoga therapy for degenerative diseases so that it is more beneficial for the elderly. This journal can also be a reference for further research on the influence of Yoga and degenerative diseases. By increasing evidence and samples, more methods will be obtained and sharpening clinical evidence to be applied to society.

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