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Optimizing Physical Performance and Mental Resilience through Yoga in Educational Sports

Vikas Yadav *

Email Correspondence*: vikasyadav@hbtu.ac.in

* Harcourt Butler Technical University, Kanpur, Uttar Pradesh, India.

Abstract:

Yoga, an ancient mind–body discipline rooted in Indian philosophical traditions has seen renewed interest for its potential benefits when integrated into contemporary educational and sports systems. This paper explores the scientific foundations underpinning the integration of yoga into school and university sports programs, including physiological, psychological, biomechanical, and cognitive evidence. Through systematic review of existing research and theoretical frameworks, we highlight mechanisms by which yoga enhances athletic performance, reduces injury risk, and bolsters mental health. We also discuss practical implementation strategies, curricular design, teacher training needs, and future research directions.

Keywords: Yoga, Sports Performance, Education, Physiology, Psychology, Motor Skills, Injury Prevention, Mindfulness.

1. Introduction: Sports education in schools and universities is fundamentally designed to nurture not only physical fitness but also a wide spectrum of cognitive, emotional, and social competencies essential for lifelong well-being [1-7]. At its core, sports education seeks to develop physical literacy, encompassing body awareness, balance, coordination, agility, and motor competence, while simultaneously fostering teamwork, leadership, discipline, resilience, and ethical values [8-12]. Participation in organized sports has long been associated with improved cardiovascular health, musculoskeletal strength, social integration, and the cultivation of competitive spirit [13-17]. Consequently, traditional sports curricula have largely emphasized parameters such as strength, endurance, speed, flexibility, tactical skills, and performance optimization, often measured through standardized fitness assessments and competitive outcomes [18-24].

However, contemporary educational environments are witnessing a paradigm shift driven by growing awareness of the psychophysiological challenges faced by students [25-31]. Increasing academic pressure, early specialization in sports, performance-driven evaluation systems, and intense competition have contributed to rising levels of stress, burnout, anxiety, sleep disturbances, and overuse injuries among school- and university-level athletes [32-37]. Adolescents and young adults, in particular, are vulnerable to mental health challenges that may negatively impact academic performance, sports participation, and overall quality of life [38-43]. Furthermore, injury prevalence especially musculoskeletal injuries related to poor flexibility, inadequate recovery, and neuromuscular imbalance has raised concerns regarding the sustainability of conventional training models that focus predominantly on external performance metrics [44-49].

*Harcourt Butler Technical University, Kanpur, Uttar Pradesh, India.

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In this context, there is a growing recognition that holistic approaches to sports education are urgently needed approaches that integrate physical training with mental self-regulation, emotional balance, and recovery mechanisms [50-54]. Yoga, rooted in ancient Indian philosophy yet increasingly validated through modern scientific research, offers such an integrative framework [55-61]. Unlike conventional fitness regimens that often isolate physical attributes, yoga operates through a synergistic model that harmonizes posture (āsana), breath regulation (prāṇāyāma), concentration (dhāraṇā), and relaxation or mindfulness (dhyāna) [62-67]. This multidimensional structure enables yoga to address both physiological conditioning and psychological resilience, making it a highly relevant adjunct to contemporary sports education [68-73].

From a scientific perspective, yoga has been shown to improve flexibility, muscular endurance, joint stability, postural alignment, and balance, all of which are critical for injury prevention and athletic efficiency [74-79]. Neuromuscular coordination and proprioception key determinants of athletic performance are enhanced through sustained postures and controlled movement patterns [80-87]. Equally important are the documented benefits of yoga on the autonomic nervous system, where regular practice promotes parasympathetic dominance, leading to reduced stress hormone levels, improved heart rate variability, and enhanced recovery capacity [88-93]. These effects are particularly valuable for student-athletes exposed to repeated physical and psychological stressors [94-97].

Beyond physical health, yoga contributes significantly to mental and emotional well-being, an area often underrepresented in traditional sports curricula. Empirical studies indicate that yoga-based interventions can reduce anxiety, improve attention span, enhance emotional regulation, and foster mindfulness [98-104]. Such attributes are crucial for improving focus during competition, managing performance pressure, and sustaining long-term engagement in sports. In educational settings, where students must balance academic responsibilities with athletic commitments, yoga serves as a bridge between mental clarity and physical preparedness [105-111].

Importantly, yoga also aligns with the broader educational goal of holistic development, resonating with contemporary pedagogical frameworks that emphasize student-centered learning, well-being, and life skills. Its inclusive and adaptable nature allows it to be integrated across age groups, fitness levels, and sporting disciplines without imposing excessive physical strain [112-119]. This makes yoga particularly suitable for diverse school and university populations, including beginners, elite athletes, and students with varying physical or psychological needs.

Against this backdrop, the present paper articulates the scientific foundations for integrating yoga into school and university sports programs [120-127]. It critically examines evidence from multiple domains, including exercise physiology, sports psychology, neuroscience, and injury prevention, to establish yoga's relevance as a complementary practice rather than a replacement for conventional sports training [128-134]. Furthermore, the paper proposes actionable and evidence-informed frameworks for curriculum integration, instructor training, scheduling, and assessment, aimed at enhancing both athletic performance and student well-being [135-141]. By bridging traditional wisdom with modern science, this work advocates for a balanced and sustainable model of sports education that prepares students not only to compete, but to thrive physically, mentally, and emotionally throughout their lives [142-146].

2. Historical Context and Definitions

2.1 Origin of Yoga

Yoga has its roots in the ancient philosophical, spiritual, and cultural traditions of India, with a documented history spanning several millennia. Its earliest references can be traced to the Vedic texts, particularly the

Rig Veda, where concepts of disciplined living, meditation, and control of the mind begin to emerge. Over time, yoga evolved through the Upanishadic period, which emphasized self-realization, inner awareness, and the unity of the individual soul (*Atman*) with universal consciousness (*Brahman*).

The most systematic and authoritative exposition of yoga philosophy is found in the *Yoga Sutras* of Sage Patanjali, composed around the 2nd century BCE to 4th century CE. Patanjali codified yoga as an eightfold path (*Ashtanga Yoga*), comprising ethical disciplines (*yama*), personal observances (*niyama*), physical postures (*asana*), breath regulation (*pranayama*), withdrawal of the senses (*pratyahara*), concentration (*dharana*), meditation (*dhyana*), and complete absorption or enlightenment (*samadhi*). This comprehensive framework highlights yoga as a holistic system aimed at harmonizing the body, mind, and consciousness, rather than merely a set of physical exercises. Historically, yoga was practiced as a means of spiritual liberation, mental discipline, and ethical refinement, deeply embedded within Indian philosophical schools such as Samkhya and Vedanta [147–152].

2.2 Modern Interpretations

In the modern era, particularly from the late nineteenth century onward, yoga underwent significant reinterpretation as it spread beyond India to the global stage. Influential figures such as Swami Vivekananda, Tirumalai Krishnamacharya, and later B.K.S. Iyengar and Pattabhi Jois played a pivotal role in presenting yoga as a scientifically relevant and health-oriented discipline. In contemporary educational, clinical, and wellness contexts, yoga is frequently adapted to focus on physical postures (*asanas*), controlled breathing (*pranayama*), relaxation techniques, and mindfulness-based practices.

While traditional metaphysical and religious elements are often minimized or omitted to ensure cultural neutrality and broader acceptance, the core principles of balance, self-regulation, and holistic well-being are retained. Modern interpretations of yoga emphasize its therapeutic benefits, including improvements in physical fitness, stress management, emotional regulation, and cognitive focus. Consequently, yoga is increasingly integrated into school curricula, higher education programs, healthcare interventions, and workplace wellness initiatives as an evidence-based approach to promoting physical, mental, and emotional health. Despite these adaptations, contemporary yoga continues to draw from its classical foundations, preserving its essence as a comprehensive mind–body discipline aligned with holistic health outcomes [153–158].

3. Physiological Basis of Yoga

3.1 Musculoskeletal Benefits

Yoga improves flexibility, joint mobility, muscular endurance, and posture. Regular practice increases range of motion in major joints, enhances muscle length–tension relationships, and corrects postural imbalances that predispose athletes to injury [159-163].

3.2 Neuromuscular Coordination

Yoga demands precise coordination of breath and movement, promoting proprioception and neuromuscular control. Enhanced body awareness contributes to improved balance and refined motor execution critical for sports performance [164].

3.3 Autonomic Regulation

Evidence shows that yoga reduces sympathetic nervous system activity and increases parasympathetic tone, leading to lower resting heart rate and blood pressure, reduced cortisol levels, and improved recovery. These changes support **stress adaptation**, resilience, and recovery from training loads [165].

4. Cardiovascular and Respiratory Adaptations

Although yoga is not conventionally classified as a high-intensity aerobic activity, regular practice exerts beneficial effects on cardiovascular and respiratory function. The emphasis on slow, deep, and controlled breathing techniques enhances vagal tone, promoting parasympathetic dominance and improved autonomic balance. This leads to reductions in resting heart rate and improved cardiovascular efficiency. Moreover, yogic breathing increases tidal volume, strengthens respiratory muscles, and optimizes alveolar ventilation, thereby improving overall gas exchange efficiency. Enhanced oxygen uptake and carbon dioxide removal contribute to better respiratory economy during physical exertion. When yoga is integrated with traditional athletic training, these physiological adaptations support improved endurance performance, faster recovery, and reduced fatigue, making yoga an effective complementary practice in sports and physical education programs [166].

5. Psychological and Cognitive Mechanisms

5.1 Stress Reduction and Emotional Regulation

Yoga incorporates mindfulness and breath regulation strategies that decrease psychological stress, reduce anxiety, and bolster mood. This enhances emotional regulation in competitive and academic environments, where performance anxiety is high [167].

5.2 Attention and Cognitive Control

Regular practice improves attention span, working memory, and executive function cognitive faculties essential for game strategy, decision-making, and learning in educational settings [168].

5.3 Mind–Body Awareness

Yoga cultivates interoception the internal awareness of bodily states. Enhanced interoception enables athletes to perceive fatigue, tension, and readiness more accurately, facilitating smarter training and injury prevention decisions [169].

6. Injury Prevention and Rehabilitation

6.1 Common Sports Injury Patterns

Musculoskeletal injuries in youth sports often arise from overuse, poor flexibility, and weak stabilizing muscles [170].

6.2 Role of Yoga in Injury Mitigation

Yoga's emphasis on flexibility, joint stability, and controlled movement can correct biomechanical asymmetries that predispose athletes to injuries. Further, breath-centered relaxation reduces muscular tension that can contribute to strain and spasm [171,172].

6.3 Rehabilitation Application

Yoga postures and breath practices can be adapted for rehabilitation settings, promoting gradual tissue loading, proprioceptive retraining, and psychological support during recovery.

7. Performance Enhancement: Evidence and Mechanisms

7.1 Empirical Studies

Research demonstrates that athletes incorporating yoga show improvements in flexibility, sprint performance, balance, and recovery when compared to controls.

7.2 Biomechanical Efficiency

Flexibility gains and improved muscle coordination contribute to efficient movement patterns, reducing energy expenditure during performance tasks.

7.3 Emotional Resilience and Competitive Edge

Athletes with regular meditation and breath control training exhibit lower pre-competition anxiety and enhanced focus.

8. Developmental Considerations for Children and Adolescents

8.1 Benefits in Early Years

During early childhood and the primary school years, yoga plays a valuable role in supporting fundamental motor skill development, including balance, coordination, flexibility, and spatial awareness. Simple postures and movement-based practices enhance postural control and body awareness, which are essential for healthy physical growth and injury prevention. Equally important are the emotional and behavioral benefits of yoga at this stage; breathing exercises and relaxation techniques promote emotional self-regulation, attention control, and calmness. By introducing yoga in a positive and enjoyable manner, children develop confidence in movement and form a strong foundation for lifelong engagement in physical activity and healthy lifestyle habits.

8.2 Adaptation to Age Groups

To be effective, yoga curricula must be carefully adapted to the developmental stage of learners. For younger children, yoga sessions should be playful, imaginative, and varied, incorporating games, stories, music, and group activities that maintain interest while fostering physical and emotional growth. In contrast, yoga programs for adolescents should adopt a more structured and mindful approach, focusing on goal-oriented practices such as strength building, flexibility enhancement, stress management, and self-reflection. Adolescents also benefit from discussions on mindfulness, body image, and mental well-being, making yoga a supportive tool during a critical period of physical, cognitive, and emotional transition.

9. Implementation in School and University Settings

9.1 Curriculum Integration Models

Effective implementation of yoga within school and university sports programs can follow multiple curriculum integration models, allowing institutions to adapt based on their resources, student needs, and educational priorities. Standalone modules involve the introduction of dedicated yoga classes as a formal component of physical education curricula, ensuring structured and progressive learning of yogic postures, breathing techniques, and relaxation practices. Cross-training models embed yoga sequences directly into sport-specific training sessions, where practices such as stretching, balance poses, breath control, and recovery-focused asanas complement athletic drills and conditioning routines. Additionally, well-being–oriented programs integrate yoga into broader mental health, wellness, and life-skills education, emphasizing stress management, emotional regulation, mindfulness, and resilience alongside physical fitness.

9.2 Teacher Training and Certification

The success of yoga integration depends heavily on the quality and competence of instructors. Teachers must be adequately trained not only in yoga pedagogy and practice but also in child and adolescent development, educational psychology, and inclusive teaching strategies. Certification standards should be clearly defined and aligned with institutional and national educational objectives, ensuring safety, age-appropriateness, and pedagogical effectiveness. Ongoing professional development, refresher courses, and interdisciplinary collaboration between physical education teachers, sports coaches, and mental health professionals can further enhance program quality and sustainability.

9.3 Assessment and Evaluation

Robust assessment and evaluation mechanisms are essential to measure the effectiveness of yoga-based interventions in educational settings. Outcomes should be assessed using validated and standardized tools that capture changes in physical parameters such as flexibility, balance, coordination, and overall motor skills, as well as psychological indicators including stress levels, emotional well-being, attention, and self-regulation. Academic performance metrics and injury incidence rates should also be monitored to evaluate both educational and sports-related impacts. Such comprehensive evaluation frameworks enable evidence-based refinement of programs and support wider adoption across schools and universities.

10. Discussion

Integrating yoga into educational sports programs is underpinned by a strong and multifaceted scientific rationale. Extensive evidence highlights yoga's physiological benefits, including improved flexibility, balance, muscular strength, cardiovascular efficiency, and injury prevention, all of which support and enhance athletic performance. Simultaneously, its psychological benefits, such as reduced stress, anxiety regulation, emotional stability, and enhanced self-awareness, contribute to better mental preparedness and resilience among students. Beyond physical and psychological domains, yoga also offers significant cognitive advantages, including improved concentration, attention span, memory, and executive functioning skills that are directly linked to academic success. These combined effects align closely with the holistic goals of modern education, which seek to nurture not only physical fitness but also mental well-being, emotional intelligence, and lifelong healthy habits. Importantly, yoga does not aim to replace conventional sports training; rather, it complements traditional athletic programs by enhancing motor competence, promoting efficient movement patterns, aiding recovery, and fostering effective stress management. When integrated thoughtfully into educational sports curricula, yoga serves as a powerful adjunct that supports comprehensive student development and reinforces the balance between physical performance, mental health, and academic growth.

6. Future Research Directions

Future research should adopt rigorous randomized controlled trial (RCT) designs to systematically compare sports and physical education programs that integrate yoga with those that do not. Such studies would help establish causal relationships and provide robust evidence regarding the added value of yoga in enhancing physical performance, injury prevention, recovery, and overall well-being among students. There is also a strong need for longitudinal investigations that track students over extended periods to evaluate the sustained impact of yoga-integrated sports programs on academic achievement, cognitive functioning, emotional regulation, and mental health outcomes such as stress, anxiety, and resilience. Long-term data would offer insights into whether early exposure to yoga contributes to lifelong healthy habits and improved educational attainment. In addition, mechanistic and experimental research should focus on uncovering the neurophysiological and psychophysiological pathways through which yoga exerts its effects. This includes examining changes in brain activity, autonomic nervous system balance, hormonal responses, and neuromuscular coordination using advanced tools such as EEG, fMRI, heart rate variability, and biochemical markers. Finally, future studies should work toward developing standardized implementation and assessment frameworks for incorporating yoga into school and university sports curricula. Such frameworks should consider age-appropriate practices, teacher training requirements, cultural adaptability, safety guidelines, and measurable outcome indicators, ensuring consistency, scalability, and comparability across diverse educational and socio-cultural contexts.

12. Conclusion

Scientific evidence increasingly supports the systematic integration of yoga into school and university sports programs as a complementary approach to conventional physical training. Empirical studies demonstrate that regular yoga practice enhances key components of physical performance, including flexibility, muscular strength, balance, coordination, and cardiovascular efficiency, all of which are essential for athletic competence across diverse sports disciplines. Furthermore, yoga-based conditioning has been shown to improve joint stability, postural alignment, and neuromuscular control, thereby significantly reducing the risk of sports-related injuries and facilitating faster recovery. Beyond physical benefits, yoga contributes substantially to students' mental and emotional well-being. Practices such as controlled breathing, relaxation, and mindfulness enhance concentration, emotional regulation, stress resilience, and psychological readiness for competition and academic demands. These mental health benefits are particularly relevant in contemporary educational environments, where students often experience heightened performance pressure and stress. Importantly, the incorporation of yoga within educational sports curricula promotes a holistic and inclusive approach to physical education, encouraging lifelong engagement in health-promoting behaviors. Unlike highly competitive sports alone, yoga emphasizes self-awareness, discipline, and intrinsic motivation, making it accessible to students of varying physical abilities and fitness levels. With thoughtful curriculum design aligned to age-specific needs and sporting objectives, along with robust teacher training to ensure pedagogical and scientific rigor, yoga can meaningfully enrich educational sports experiences. Ultimately, its integration supports comprehensive student development by fostering physical excellence, mental resilience, ethical awareness, and sustainable healthy lifestyles.

13. References

[1] Field, T. (2016). Yoga research review. Complementary Therapies in Clinical Practice.

[2] Ross, A., & Thomas, S. (2010). The health benefits of yoga and exercise. Journal of Alternative and Complementary Medicine.

[3] Streeter, C. C., et al. (2012). Effects of yoga on the autonomic nervous system. Journal of Alternative and Complementary Medicine.

[4] Woodyard, C. (2011). Exploring the therapeutic effects of yoga. International Journal of Yoga.

[5] Akbar, S., & Shah, S. R. (2020). Mathematical study for the outflow of aqueous humor and function in the eye. International Journal of Scientific & Engineering Research, 11(10), 743–750.

[6] Akbar, S., & Shah, S. R. (2020). The effects of prostaglandin analogs on intraocular pressure in human eye for open-angle glaucoma. International Journal of Innovative Technology and Exploring Engineering, 10(2), 176–180.

[7] Akbar, S., & Shah, S. R. (2021). DURYSTA: The first biodegradable sustained release implant for the treatment of open-angle glaucoma. International Journal of Frontiers in Biology and Pharmacy Research, 1(2), 1–7.

[8] Akbar, S., & Shah, S. R. (2024). Mathematical modeling of blood flow dynamics in the cardiovascular system: Assumptions, considerations, and simulation results. Journal of Current Medical Research and Opinion, 7(4), 2216–2225. https://doi.org/10.52845/CMRO/2024/7-4-2

[9] Akbar, S., & Shah, S. R. (2025). Mathematical modelling of the therapeutic efficacy of metipranolol in primary open angle glaucoma management. International Journal of Innovative Science, Engineering & Technology, 12(01), 69–86.

[10] Akbar, S., Alshehri, M., Sharma, S. K., Gupta, P., & Shah, S. R. (2024). A mathematical study for promoting disability inclusion in glaucoma: A comprehensive approach. Journal of Disability Research, 3, 1–12. https://doi.org/10.57197/JDR-2023-0062

[11] Akbar, S., Jaiswal, K. M., Sadique, M., & Shah, S. R. (2024). Exploring capillary-tissue fluid exchange: Insights into red cell deformation in narrow vessels and its clinical implications. International Journal of Fauna and Biological Studies, 11(3), 4–14. https://doi.org/10.22271/23940522.2024.v11.i3a.1021

[12] Akbar, S., Sharma, R. K., Sadique, M., Jaiswal, K. M., Chaturvedi, P., Kumar, V., & Shah, S. R. (2024). Computational analysis of clot formation risk in diabetes: A mathematical modeling approach. BIBECHANA, 21(3), 233–240.

[13] Alshehri, M., Sharma, S. K., Gupta, P., & Shah, S. R. (2024). Empowering the visually impaired: Translating handwritten digits into spoken language with HRNN-GOA and Haralick features. Journal of Disability Research, 3, 1–21. https://doi.org/10.57197/JDR-2023-0051

[14] Alshehri, M., Sharma, S., Gupta, P., & Shah, S. R. (2023). Detection and diagnosis of learning disabilities in children of Saudi Arabia with artificial intelligence. Research Square, 1–22. https://doi.org/10.21203/rs.3.rs-3301949/v1

[15] Anamika, & Shah, S. R. (2017). A mathematical model of blood flow through diseased blood vessel. International Journal of Emerging Trends and Technology in Computer Science, 6(3), 282–286.

[16] Anamika, & Shah, S. R. (2017). Mathematical and computational study of blood flow through diseased artery. International Journal of Computer Science, 5(6), 1–6.

[17] Anamika, & Shah, S. R. (2017). Mathematical and computational study of blood flow through diseased artery. International Journal of Computer Sciences, 5(6).

[18] Anuradha, Anamika, & Shah, S. R. (2017). Bio-computational analysis of blood flow through two-phase artery. International Journal of Engineering Science and Computing, 7(6), 13397–13401.
[19] Arvind, & Shah, S. R. (2024). Investigating heat flow from skeletal muscles to skin surface: A theoretical model of thermal dynamics in the hypodermis layer. International Journal of Engineering Sciences & Research Technology, 13(10).
[20] Arya, D., & Shah, S. R. (2024). Addressing educational challenges in Nainital through strategic human resource management: Recruitment, training, and retention solutions. International Journal of Research in Human Resource Management, 6(2), 320–324.
[21] Arya, D., & Shah, S. R. (2024). Enhancing educational outcomes: The impact of human resource management practices on educator satisfaction in Dehradun. International Journal of Management (IJM), 15(5), 172–186. https://doi.org/10.5281/zenodo.14043040
[22] Arya, D., & Shah, S. R. (2024). Human resource management strategies for improving educational outcomes in Bihar. International Journal of Humanities Social Science and Management, 4(4), 955–963.
[23] Arya, D., & Shah, S. R. (2024). Optimizing educational outcomes: The role of human resource management in Jharkhand's education system. International Journal of Novel Research and Development, 9(8), b51–b57.
[24] Arya, D., & Shah, S. R. (2024). Strategic human resource management in Almora's education system: Enhancing recruitment, training, and retention. International Journal of Scientific and Research Publications, 14(12). https://doi.org/10.29322/IJSRP.14.11.2024.p15525
[25] Arya, S., Majhi, L., & Shah, S. R. (2024). Exploring Shilajatu's therapeutic potential in diabetes management: A comprehensive study integrating Ayurvedic wisdom and modern science. International Journal of Science and Research, 13(5), 1374–1380. https://dx.doi.org/10.21275/SR24522110012
[26] Chaturvedi, P., & Shah, S. R. (2023). Mathematical analysis for the flow of sickle red blood cells in micro-vessels for biomedical application. Yale Journal of Biology and Medicine, 96(1), 13–21. https://doi.org/10.59249/ATVG1290
[27] Chaturvedi, P., & Shah, S. R. (2023). Role of crizanlizumab for sickle red cells disease. International Journal of Biology, Pharmacy and Allied Sciences, 12(3), 1147–1157. https://doi.org/10.31032/IJBPAS/2023/12.3.6946
[28] Chaturvedi, P., & Shah, S. R. (2024). Assessing the clinical outcomes of voxelotor treatment in patients with sickle cell disease. International Journal of Applied Sciences and Biotechnology, 12(01), 46–53. https://doi.org/10.3126/ijasbt.v12i1.64057
[29] Chaturvedi, P., Akbar, S., Kumar, R., & Shah, S. R. (2021). Prospective of hydroxychloroquine and zinc with azithromycin for nanoparticles blood flow in COVID-19 patients. International Journal of Nanotechnology in Medicine & Engineering, 6(1), 1–7.
[30] Chaturvedi, P., Kumar, R., & Shah, S. R. (2021). Bio-mechanical and bio-rheological aspects of sickle red cells in microcirculation: A mathematical modelling approach. Fluids, 6, 322, 1–15.
[31] Choudhary, M., Kumar, V., Caplash, S., Yadav, B. K., Kaur, S., Shah, S. R., & Arora, K. (2024). Fabrication of nanomolecular platform-based immunosensor for non-invasive electrochemical detection of oral cancer: An in vitro study. Talanta Open, 10, 100352.
[32] Geeta, Siddiqui, S. U., & Shah, S. R. (2014). Effect of body acceleration and slip velocity on the pulsatile flow of Casson fluid through stenosed artery. Advance in Applied Science Research, 5(3), 213–225.
[33] Geeta, Siddiqui, S. U., & Shah, S. R. (2015). A biomechanical approach to the effect of body acceleration through stenotic artery. Applied Mathematics and Computation, 109(1), 27–41.

[34] Geeta, Siddiqui, S. U., & Shah, S. R. (2015). A computational analysis of a two-fluid non-linear mathematical model of pulsatile blood flow through constricted artery. E-Journal of Science and Technology, 10(4), 65–78.
[35] Geeta, Siddiqui, S. U., & Shah, S. R. (2015). A mathematical model for two-layered pulsatile blood flow through stenosed arteries. E-Journal of Science and Technology, 1(10), 27–41.
[36] Geeta, Siddiqui, S., & Shah, S. R. (2013). Mathematical modelling of blood flow through catheterized artery under the influence of body acceleration with slip velocity. Application and Applied Mathematics: An International Journal, 8(2), 481–494.
[37] Gurjar, P. S., & Shah, S. R. (2025). Mathematical modelling of atmospheric pollutant dispersion under steady state conditions with constant eddy diffusivity. Research Review International Journal of Multidisciplinary, 10(5), 240–247.
[38] Guru Datt, M., Arya, S., & Shah, S. R. (2024). Ayurvedic approaches to maintaining healthy and narrowed arteries. International Journal for Research & Development in Technology, 21(6), 21–30.
[39] Jaishwal, K. M., & Shah, S. R. (2025). Effect of cartilage thickness and viscosity on synovial fluid flow: Insights from a computational model. International Research Journal of Modernization in Engineering Technology and Science, 7(4), 10914–10925.
[40] Jaiswal, K. M., & Shah, S. R. (2024). The role of synovial fluid dynamics in osteoarthritis: A mathematical modeling perspective. Research Review International Journal of Multidisciplinary, 9(12), 155–164.
[41] Jaiswal, K. M., Sadique, M., Akbar, S., & Shah, S. R. (2024). Unveiling capillary-tissue fluid exchange: Understanding red blood cell deformation in constricted vessels and its clinical significance. Materials Plus, 3(1), 1–9. https://doi.org/10.37256/3120244770
[42] Jeya Suriya Lenin, S., & Shah, S. R. (2024). Mathematical analysis of stem cell dynamics in acute myeloid leukemia: Towards precision medicine strategies. International Journal of Science and Research, 13(05), 528–535.
[43] Kasturia, P., Sharma, R. K., Chaturvedi, P., Dohre, R., & Shah, S. R. (2024). Efficacy of venetoclax and azacitidine for targeting leukemic stem cell in acute myeloid leukemia. International Journal of Biology, Pharmacy and Allied Sciences, 13(6), 3072–3090. https://doi.org/10.31032/IJBPAS/2024/13.6.8960
[44] Kaur, A., & Shah, S. R. (2025). A mathematical modeling approach to air pollution dispersion for enhancing community health and environmental safety. International Journal of Innovative Research in Technology, 11(12), 3929–3933.
[45] Kaur, A., & Shah, S. R. (2025). A mathematical modeling approach to air pollution dispersion for predicting pollutant distribution from point sources. International Journal of Advanced Research, 13(4), 1349–1353.
[46] Kaur, A., & Shah, S. R. (2025). Spatiotemporal modelling of atmospheric pollution: A computational approach with advection-diffusion equation. International Journal of Research and Innovation in Applied Science, 10(5), 469–473.
[47] Kausar, S., Naqvi, N., Akbar, S., Shah, S. R., Abbas, K., Alam, M., & Usmani, N. (2025). Socioeconomic indicators and their impact on mental health: A data-driven approach using Python and R. International Journal of Epidemiology and Health Sciences, 6, e92, 1–22. https://doi.org/10.51757/IJEHS.6.2025.720978
[48] Kausar, S., Naqvi, N., Akbar, S., Shah, S. R., Abbas, K., Alam, M., & Usmani, N. (2025). "Decoding mental health: A logistic regression analysis of socio-economic indicators and mental health quotient (MHQ) across nations". Current Social Science. https://doi.org/e2772316X400955

[49] Kumar, A., & Shah, S. R. (2024). Hemodynamic simulation approach to understanding blood flow dynamics in stenotic arteries. International Journal of Scientific Research in Science and Technology, 11(6), 630–636. https://doi.org/10.32628/IJSRST241161116

[50] Kumar, J. P., Sadique, M., & Shah, S. R. (2022). Mathematical study of blood flow through blood vessels under diseased condition. International Journal of Multidisciplinary Research and Development, 9(6), 31–44.

[51] Kumar, K., Sharma, M. K., Shah, S. R., & Dohare, R. (2023). Vector-borne transmission dynamics model based Caputo fractional-order derivative. Indian Journal of Theoretical Physics, 71(3&4), 61–76.

[52] Kumar, P., & Shah, S. R. (2021). A hydromechanical perspective to study the effect of body acceleration through stenosed artery. International Journal of Mathematical Engineering and Management Sciences, 6(5), 1381–1390.

[53] Kumar, R., & Shah, S. R. (2017). A mathematical approach to study the blood flow through tapered stenosed artery with the suspension of nanoparticles. Destech Transactions on Engineering and Technology Research, 1, 1–6.

[54] Kumar, R., & Shah, S. R. (2017). Study of blood flow with suspension of nanoparticles through tapered stenosed artery. Global Journal of Pure and Applied Mathematics, 13(10), 7387–7399.

[55] Kumar, R., & Shah, S. R. (2018). Performance of blood flow with suspension of nanoparticles through tapered stenosed artery for Jeffrey fluid model. International Journal of Nanoscience, 17(6), 1850004, 1–7.

[56] Kumar, R., & Shah, S. R. (2020). Mathematical modeling of blood flow with the suspension of nanoparticles through a tapered artery with a blood clot. Frontiers in Nanotechnology, 2, Article 596475, 1–5.

[57] Kumar, R., Anamika, & Shah, S. R. (2017). Mathematical modelling of blood flow through tapered stenosed artery with the suspension of nanoparticles using Jeffrey fluid model. International Journal of Development Research, 7(6), 13494–13500.

[58] Kumar, R., Shah, S. R., & Stiehl, T. (2024). Understanding the impact of feedback regulations on blood cell production and leukemia dynamics using model analysis and simulation of clinically relevant scenarios. Applied Mathematical Modelling, 129, 340–389. https://doi.org/10.1016/j.apm.2024.01.048

[59] Kumar, V., & Shah, S. R. (2021). Mathematical model to study the heat transfer between core and skin. SRMS Journal of Mathematical Sciences, 7, 7–22.

[60] Kumar, V., & Shah, S. R. (2022). A mathematical approach to investigate the temperature distribution on skin surface with sinusoidal heat flux condition. International Journal of Multidisciplinary Research and Development, 9(5), 141–146.

[61] Kumar, V., & Shah, S. R. (2022). A mathematical study for heat transfer phenomenological processes in human skin. International Journal of Mechanical Engineering, 7(6), 683–692.

[62] Kumar, V., & Shah, S. R. (2022). Thermobiological mathematical model for the study of temperature response after cooling effects. SSRG International Journal of Applied Physics, 9(2), 7–11.

[63] Kumar, V., & Shah, S. R. (2024). Dispersion of pharmaceutical agents in constricted and bent arteries: Insights from numerical and computational simulations. International Journal of Advanced Research in Social Sciences and Humanities, 8(2), 17–31.

[64] Kumar, V., & Shah, S. R. (2024). Mathematical modeling of mechanical forces and chemical reaction dynamics for restoring shape memory in sickle-cell red blood cells. Research Review International Journal, 9(12), 31–44.

[65] Kumar, V., & Shah, S. R. (2025). A meta-analytical and quantitative study of biosensor technologies in cancer diagnostics. International Journal of Advanced Research and Interdisciplinary Scientific Endeavours, 2(6), 722–727.
[66] Kumar, V., & Shah, S. R. (2025). Assessing the clinical outcomes of hydroxyurea treatment in patients with sickle cell disease. International Journal of Progressive Research in Engineering Management and Science, 5(3), 1089–1097.
[67] Kumari, N., & Shah, S. R. (2024). Examining women's representation in disaster risk reduction strategies across South Asia. International Journal of Disaster Management, 2(1), 1–3.
[68] Mahesh, & Arya, S., & Shah, S. R. (2024). Optimizing cardiovascular health: Ayurvedic insights into blood flow through normal and stenosed arteries. International Journal of AYUSH, 13(5), 18–35.
[69] Mahesh, Arya, S., & Shah, S. R. (2024). Optimizing cardiovascular health: Ayurvedic insights into blood flow through normal and stenosed arteries. International Journal of AYUSH, 13(5), 18–35.
[70] Majhi, L., & Shah, S. R. (2024). The bioinspired significance of black cohosh in Ayurvedic women's health: Balancing hormones naturally. International Journal of Research and Analytical Reviews, 11(4), 749–759.
[71] Malik, M. Z., Kumar, R., & Shah, S. R. (2020). Effects of (un)lockdown on COVID-19 transmission: A mathematical study of different phases in India. medRxiv, 1–13. https://doi.org/10.1101/2020.08.19.20177840
[72] Maurya, K., & Shah, S. R. (2024). Mathematical modeling of blood flow dynamics in catheterized narrow arteries: Impact of non-Newtonian blood behavior and catheter dimensions. International Research Journal of Modernization in Engineering Technology and Science, 6(12), 3368–3378.
[73] Mishra, S. R., & Shah, S. R. (2025). Analytical study of atmospheric pollution dispersion with distance-dependent wind and constant removal dynamics. International Journal of Scientific Research in Science and Technology, 12(3), 64–68.
[74] Naveen, & Shah, S. R. (2025). Modeling urban air quality: Impact of spatial wind variation and constant removal on pollution dispersion in Delhi. International Journal of Scientific Research in Science, Engineering and Technology, 12(3), 17–24.
[75] Parambath, A. B., Arora, K., & Shah, S. R. (2024). Quantitative analysis of hematopoietic and leukemic stem cell dynamics in acute myeloid leukemia: A mathematical approach. International Journal of Mathematics and Computer Research, 12(09), 4422–4435. https://doi.org/10.47191/ijmcr/v12i9.02
[76] Parambath, A. B., Kandankel, P., & Shah, S. R. (2024). Dynamic modeling of cytokine-dependent proliferation rates over time in cancer: Insights from scientific analysis. Journal of Mathematical Techniques and Computational Mathematics, 3(7), 1–9.
[77] Prachi, Arya, S., & Shah, S. R. (2024). Exploring the diagnostic and therapeutic implications of tridosha imbalances on dream phenomena in working women: An Ayurvedic perspective. International Journal of AYUSH, 13(9), 55–75.
[78] Prachi, Arya, S., & Shah, S. R. (2024). Investigating dream phenomena in Ayurveda for women: Diagnostic and therapeutic insights into tridosha imbalances. International Journal of Ayurveda and Pharma Research, 12(8), 73–81.
[79] Sadique, M., & Shah, S. R. (2022). Mathematical model to study the effect of PRG4, hyaluronic acid and lubricin on squeeze film characteristics of diseased synovial joint. International Journal of Mechanical Engineering, 7(6), 832–848.
[80] Sadique, M., & Shah, S. R. (2022). Mathematical study for the synovial fluid flow in osteoarthritic knee joint. Journal of Engineering and Applied Sciences, 17(2), 15–21.

[81] Sadique, M., & Shah, S. R. (2023). Mathematical model to study the squeeze film characteristics of synovial joints in diseased human knee joint. World Scientific Annual Review of Biomechanics, 1(2330004), 1–21. World Scientific Publishing Company.

[82] Sadique, M., & Shah, S. R. (2024). The role of mathematics in the development of biomedical robotics and devices for healthcare. International Journal of Research in Computer Applications and Robotics, 12(12), 1–15.

[83] Sadique, M., Jaishwal, K. M., & Shah, S. R. (2024). Assessing the influence of glucosamine supplementation on synovial fluid dynamics in osteoarthritic knee joints. International Journal of Applied Sciences and Biotechnology, 12(2), 84–91. https://doi.org/10.3126/ijasbt.v12i2.65009

[84] Sadique, M., Jaiswal, K. M., & Shah, S. R. (2023). Mathematical modelling and analysis of squeeze film lubrication in hip joint: A comprehensive sphere–plate model investigation. https://doi.org/10.22541/au.169783564.46816055/v1

[85] Sadique, M., Sharma, S. K., Islam, S. M. N., & Shah, S. R. (2023). Effect of significant parameters on squeeze film characteristics in pathological synovial joints. Mathematics (MDPI), 11(1468), 1–23. https://doi.org/10.3390/math11061468

[86] Schurz, J. (1991). Rheology of synovial fluids and substitute polymers. Biorheology, 28(1–2), 171–188. https://doi.org/10.3233/BIR-1991-281-219

[87] Sengar, N., & Shah, S. R. (2024). Analysing the socio-economic conditions and challenges faced by domestic women helpers in India's informal labour market. International Journal of Advance Research, 12(11), 898–910.

[88] Sengar, N., & Shah, S. R. (2024). Examining the domestic adversities imposed by patriarchy on working women: A sociological perspective. International Journal of Social Sciences and Management, 11(4), 95–105.

[89] Sengar, N., & Shah, S. R. (2024). Women in the informal labor sector: The situation of domestic helpers in Indian households. International Journal of Social Science and Economic Research, 9(11), 5581–5596.

[90] Shah, R. R., & Shah, S. R. (2024). Assessment of road user costs for arterial streets in Ghaziabad city: An analysis of vehicle operation, accident impacts, and travel time efficiency. International Journal of Architecture, 10(2), 1–10.

[91] Shah, S. R. (2009). Analysis of non-Newtonian fluid flow in a stenosed artery. International Journal of Physical Sciences, 4(11), 663–671.

[92] Shah, S. R. (2010). A study of effects of magnetic field on modified Power-law fluid in modeled stenosed artery. Journal of Bioscience and Technology, 1(4), 187–196.

[93] Shah, S. R. (2011). Capillary-tissue diffusion phenomena for blood flow through a stenosed artery using Herschel-Bulkley fluid. International Journal of Research in Biochemistry and Biophysics, 1(1), 1–8.

[94] Shah, S. R. (2011). Effects of acetylsalicylic acid on blood flow through an artery under atherosclerotic condition. International Journal of Molecular Medicine and Advances Sciences, 7(6), 19–24.

[95] Shah, S. R. (2011). Impact of radially non-symmetric multiple stenoses on blood flow through an artery. International Journal of Physical and Social Sciences, 1(3), 1–16.

[96] Shah, S. R. (2011). Mathematical analysis of blood flow through atherosclerotic arterial segment having non-symmetric mild stenosis. International Journal of Research in Pure and Applied Physics, 1, 1–5.

[97] Shah, S. R. (2011). Non-Newtonian flow of blood through an atherosclerotic artery. Research Journal of Applied Sciences, 6(1), 76–80.

[98] Shah, S. R. (2011). Response of blood flow through an atherosclerotic artery in the presence of magnetic field using Bingham plastic fluid. International Journal of Pharmaceutical and Biomedical Research, 2(3), 96–106.

[99] Shah, S. R. (2011). Role of non-Newtonian behavior in blood flow through normal and stenosed artery. Research Journal of Biological Sciences, 6(9), 453–458.

[100] Shah, S. R. (2011). Study of modified Casson's fluid model in modeled normal and stenotic capillary-tissue diffusion phenomena. International Journal of Computational Engineering & Management, 11, 51–57.

[101] Shah, S. R. (2012). A biomechanical approach for the study of deformation of red cells in narrow capillaries. IJE: Transaction A: Basics, 25(4), 303–313.

[102] Shah, S. R. (2012). A biomechanical approach for the study of two-phase blood flow through stenosed artery. Journal of Engineering and Applied Sciences, 7(2), 159–164.

[103] Shah, S. R. (2012). A case study of non-Newtonian viscosity of blood through atherosclerotic artery. Asian Journal of Engineering and Applied Technology, 1(1), 47–52.

[104] Shah, S. R. (2012). Performance study on capillary-tissue diffusion phenomena for blood flow through stenosed blood vessels. American Journal of Pharmtech Research, 2(2), 695–705.

[105] Shah, S. R. (2013). A mathematical model for the analysis of blood flow through diseased blood vessels under the influence of porous parameter. Journal of Biosciences and Technology, 4(6), 534–541.

[106] Shah, S. R. (2013). An innovative solution for the problem of blood flow through stenosed artery using generalized Bingham plastic fluid model. International Journal of Research in Applied and Natural Social Sciences, 1(3), 97–140.

[107] Shah, S. R. (2013). An innovative study for non-Newtonian behavior of blood flow in stenosed artery using Herschel-Bulkley fluid model. International Journal of Biosciences and Biotechnology, 5(5), 233–240.

[108] Shah, S. R. (2013). Effects of antiplatelet drugs on blood flow through stenosed blood vessels. Journal of Biomimetics, Biomaterials and Tissue Engineering, 18, 21–27.

[109] Shah, S. R. (2014). Effect of clopidogrel on blood flow through stenosed artery under diseased condition. International Online Medical Council (International Journal of Pharmacy Teaching and Practices), 5(1), 887–893.

[110] Shah, S. R. (2014). Performance modeling and analysis of magnetic field on nutritional transport capillary tissue system using modified Herschel-Bulkley fluid. International Journal of Advanced Research in Physical Sciences, 1(1), 33–41.

[111] Shah, S. R. (2015). A mathematical study of blood flow through radially non-symmetric multiple stenosed arteries under the influence of magnetic field. International Journal of Advanced Research in Biological Sciences, 2(12), 379–386.

[112] Shah, S. R. (2015). A mathematical study of blood flow through stenosed artery. International Journal of Universal Science and Engineering, 1(1), 26–37.

[113] Shah, S. R. (2015). A study of blood flow through multiple atherosclerotic arteries. International Journal for Mathematics, 1(12), 1–6.

[114] Shah, S. R. (2015). Mathematical study of blood flow through atherosclerotic artery in the presence of porous effect. International Journal of Modern Sciences and Engineering Technology, 2(12), 12–20.

[115] Shah, S. R. (2017). Significance of aspirin on blood flow to prevent blood clotting through inclined multi-stenosed artery. Letters in Health and Biological Sciences, 2(2), 97–100.

[116] Shah, S. R. (2021). Clinical influence of hydroxychloroquine with azithromycin on blood flow through blood vessels for the prevention and treatment of COVID-19. International Journal of Biology, Pharmacy and Allied Sciences, 10(7), 2195–2204.
[117] Shah, S. R. (2022). Study of dispersion of drug in blood flow with the impact of chemical reaction through stenosed artery. International Journal of Biosciences, 21(3), 21–29.
[118] Shah, S. R. (2025). Optimization of luspatercept treatment for beta-thalassemia transmission control using pure fraction mathematical modeling. Advances in Biomedical and Health Sciences, 4(1), 11–18.
[119] Sharma, R. K., Akbar, S., Kumar, V., Jaiswal, K. M., Kumar, V., Upadhyay, A. K., Sadique, M., Chaturvedi, P., Singh, A., & Shah, S. R. (2024). Optimizing cardiovascular performance following myocardial infarction: The significance of nitroglycerin in regulating blood flow. Janaki Medical College Journal of Medical Sciences, 12(2), 32–45. https://doi.org/10.3126/jmcjms.v12i2.62479
[120] Siddiqui, S. U., & Shah, S. R. (2004). Study of blood flow through a stenosed capillary using Casson's fluid model. Ultra Science: International Journal of Physical Sciences, 16(2), 133–142.
[121] Siddiqui, S. U., & Shah, S. R. (2006). Effect of shape of stenosis on the resistance to flow through an artery. Reflection Des ERA, 1(3), 257–272.
[122] Siddiqui, S. U., & Shah, S. R. (2006). Herschel-Bulkley fluid model for stenosis shape aspects of blood flow through an artery. Ultra Science: International Journal of Physical Sciences, 18(3), 407–416.
[123] Siddiqui, S. U., & Shah, S. R. (2011). A comparative study for the non-Newtonian behaviour of blood flow through atherosclerotic arterial segment. International Journal of Pharmaceutical Sciences Review and Research, 9(2), 120–125.
[124] Siddiqui, S. U., & Shah, S. R. (2011). Two-phase model for the study of blood flow through stenosed artery. International Journal of Pharmacy and Biological Sciences, 1(3), 246–254.
[125] Siddiqui, S. U., & Shah, S. R. (2012). Achievement of Pentoxifylline for blood flow through stenosed artery. Journal of Biomimetics, Biomaterials and Tissue Engineering, 13, 81–89.
[126] Siddiqui, S. U., & Shah, S. R. (2016). A physiologic model for the problem of blood flow through diseased blood vessels. International Journal of Advances in Applied Sciences, 5(2), 58–64.
[127] Siddiqui, S. U., & Shah, S. R. (2016). A physiologic model for the problem of blood flow through diseased blood vessels. International Journal of Advances in Applied Sciences, 5(2), 58–64.
[128] Siddiqui, S. U., Singh, A., & Shah, S. R. (2015). Effects of inclined multi-stenoses arteries on blood flow characteristics using Bingham plastic fluid. International Journal for Mathematics, 1(12), 7–14.
[129] Siddiqui, S. U., Singh, A., & Shah, S. R. (2015). Mathematical modelling and analysis of blood flow through diseased blood vessels. International Journal of Engineering and Management Research, 5(6), 366–372.
[130] Siddiqui, S. U., Singh, A., & Shah, S. R. (2016). Mathematical modeling and numerical simulation of blood flow through tapered artery. International Journal of Innovative Science, Engineering & Technology, 3(2), 710–717.
[131] Siddiqui, S. U., Singh, A., & Shah, S. R. (2016). Mathematical modeling of peristaltic blood flow through a vertical blood vessel using Prandtl fluid model. International Journal of Mathematics and Computer Research, 4(9), 710–717.
[132] Siddiqui, S. U., Singh, A., & Shah, S. R. (2016). Performance of blood flow through two-phase stenosed artery using Herschel-Bulkley model. International Journal of Applied and Pure Science and Agriculture, 2(2), 228–240.

[133] Siddiqui, S. U., Singh, A., & Shah, S. R. (2017). A mathematical model to study the similarities of blood fluid models through inclined multi-stenosed artery. International Journal of Engineering Research and Modern Education, 2(1), 108–115.

[134] Singh, A., & Shah, S. R. (2024). Influence of transverse magnetic field on steady blood flow in a stenosed artery: Numerical and analytical insights. International Journal of Mathematical Archive, 15(8), 1–10.

[135] Singh, A., & Shah, S. R. (2025). Enhanced pumping of blood flow in peristaltic transport of non-Newtonian fluids. Research Review International Journal of Multidisciplinary, 10(1), 216–225. https://doi.org/10.31305/rrijm.2025.v10.n1.026

[136] Singh, A., Anamika, & Shah, S. R. (2017). Mathematical modelling of blood flow through three-layered stenosed artery. International Journal for Research in Applied Science and Engineering Technology, 5(6), 1–6.

[137] Singh, A., Babu P, A., Arora, K., & Shah, S. R. (2024). Examining the risk of clot formation in diabetes through computational analysis: An approach using mathematical modeling. International Journal of Applied Sciences and Biotechnology, 12(2), 92–99. https://doi.org/10.3126/ijasbt.v12i2.65863

[138] Singh, N., & Shah, S. R. (2024). Comparative analysis of blood viscosity and flow dynamics in normal and diabetic patients. International Journal of Recent Scientific Research, 15(9), 4982–4988.

[139] Singh, N., & Shah, S. R. (2024). Exploring acute lymphoblastic leukaemia dynamics through mathematical modeling of hematopoietic disruption. International Research Journal of Modernization in Engineering Technology and Science, 6(7), 3971–3981.

[140] Singh, P., Solanki, R., Tasneem, A., Suri, S., Kaur, H., Shah, S. R., & Dohare, R. (2024). Screening of miRNAs as prognostic biomarkers and their associated hub targets across hepatocellular carcinoma using survival-based bioinformatics approach. Journal of Genetic Engineering and Biotechnology, 22(1), 1–10.

[141] Singh, S. (2010). A mathematical model for modified Herschel-Bulkley fluid in modeled stenosed artery under the effect of magnetic field. International Journal of Bioengineering and Technology, 1(1), 37–42.

[142] Singh, S. (2010). Influence of magnetic field on blood flow through stenosed artery using Casson's fluid model. International Journal of Bioengineering, Cardio Pulmonary Sciences and Technology, 1, 1–7.

[143] Singh, S. (2010). Numerical modelling for the modified Power-law fluid in stenotic capillary-tissue diffusion phenomena. Archives of Applied Science Research, 2(1), 104–112.

[144] Singh, S. (2011). A two-layered model for the analysis of arterial rheology. International Journal of Computer Science and Information Technology, 4, 37–42.

[145] Singh, S. (2011). Clinical significance of aspirin on blood flow through stenotic blood vessels. Journal of Biomimetics, Biomaterials and Tissue Engineering, 10, 17–24.

[146] Singh, S. (2011). Effects of shape of stenosis on arterial rheology under the influence of applied magnetic field. International Journal of Biomedical Engineering and Technology, 6(3), 286–294.

[147] Singh, S. (2011). Numerical modeling of two-layered micropolar fluid through a normal and stenosed artery. International Journal Engineering, 24(2), 177–187.

[148] Singh, S. (2011). The effect of saline water on viscosity of blood through stenosed blood vessels using Casson's fluid model. Journal of Biomimetics, Biomaterials and Tissue Engineering, 9, 37–45.

[149] Singh, S., & Shah, R. R. (2010). A numerical model for the effect of stenosis shape on blood flow through an artery using power-law fluid. Advance in Applied Science Research, 1, 66–73.

[150] Singh, S., & Shah, S. R. (2025). Understanding blood flow in stenosed arteries: Newtonian and non-Newtonian fluid comparisons. Research Review International Journal of Multidisciplinary, 10(1), 203–215.
[151] Singh, V., & Shah, S. R. (2024). Enhancing cardiovascular health: The positive impact of yoga on blood flow and circulation. Indian Journal of Yoga Exercise & Sport Science and Physical Education, 9(2). https://doi.org/10.58914/ijyesspe.2024-9.2.4
[152] Singh, V., & Shah, S. R. (2024). The multifaceted health benefits of yoga: A comprehensive review of physical, mental, and quality of life improvements. International Journal of AYUSH Case Reports, 8(3), 436–447.
[153] Singh, V., & Shah, S. R. (2025). Holistic benefits of yoga: A dual approach to cardiovascular health and obesity control. International Journal of Yoga and Allied Sciences, 14(1), 118–130.
[154] Singh, V., & Shah, S. R. (2025). Integrating evidence-based teaching in yoga and Ayurveda: Bridging tradition with modern pedagogy. International Journal of Yogic, Human Movement and Sports Sciences, 10(1), 141–145.
[155] Somveer, & Shah, S. R. (2024). Bioinspired mathematical modeling of chemical dispersion in narrow and curved arteries: A computational approach. International Journal of Mathematical Archive, 15(11), 1–9.
[156] Upadhyay, A. K., & Shah, S. R. (2025). Modeling and analysis of atmospheric pollution dispersion under distance-dependent wind and constant removal. International Research Journal of Modernization in Engineering Technology and Science, 7(5), 547–552.
[157] Upadhyay, A. K., Vashisth, M., Kaur, A., & Shah, S. R. (2025). "Mathematical modeling of atmospheric pollutant dispersion under periodic emissions: Implications for respiratory and cardiovascular health". International Journal of Science, Engineering and Technology, 13(5).
[158] Yadav, P., & Shah, S. R. (2024). Female domestic laborers in the urban informal economy: A case analysis of Delhi. International Research Journal of Modernization in Engineering Technology and Science, 6(8), 216–225.
[159] Yadav, P., Sengar, N., & Shah, S. R. (2024). Economic conditions and age profile of women domestic workers in Delhi's urban informal sector. International Journal of Research Publication and Reviews, 15(8), 494–500.
[160] Yadav, P., Sengar, N., & Shah, S. R. (2025). An analysis of occupational health risks and outcomes among female agricultural laborers in India. International Journal of Progressive Research in Engineering Management and Science, 5(2), 1202–1211.
[161] Yadav, P., Sengar, N., & Shah, S. R. (2025). Analysing occupational health issues among female farm laborers in India. International Journal of Science and Management Studies, 8(2), 105–114.
[162] Quddus, R., & Shah, S. R. (2025). Natural compounds as potential breast cancer therapeutics: Insights from meta-analysis and computational approaches. Research Review: International Journal of Multidisciplinary, 10(10), 218–225. https://doi.org/10.31305/rrijm.2025.v10.n10.024
[163] Naveen, & Shah, S. R. (2025). Air pollution level prediction and comparative analysis of machine learning models: A case study of Delhi AQI. Research Review: International Journal of Multidisciplinary, 10(11), 266–272. https://doi.org/10.31305/rrijm.2025.v10.n11.027
[164] Upadhyay, A. K., & Shah, S. R. (2025). Machine learning-based prediction of air quality index (AQI) in Mumbai: Comparative analysis of linear regression, random forest, and XGBoost models. Research Review: International Journal of Multidisciplinary, 10(11), 299–307. https://doi.org/10.31305/rrijm.2025.v10.n11.030

[165] Singh, A., & Shah, S. R. (2025). Mathematical modelling of blood flow: Analysing the impact of arterial stenosis and nanoparticle suspensions. Research Review: International Journal of Multidisciplinary, 10(11), 308–320. https://doi.org/10.31305/rrijm.2025.v10.n11.031

[166] Singh, V., Yadav, K., Khute, U. K., & Shah, S. R. (2025). Harmonizing tradition and science: An evidence-based educational approach to yoga and ayurveda. Research Review: International Journal of Multidisciplinary, 10(11), 288–298. https://doi.org/10.31305/rrijm.2025.v10.n11.029

[167] Quddus, R., & Shah, S. R. (2025). Natural compounds as potential breast cancer therapeutics: Insights from meta-analysis and computational approaches. International Journal of Multidisciplinary Research Review, 11(10), 218–225.

[168] Singh, A., & Shah, S. R. (2025). Mathematical modelling of blood flow: Analysing the impact of arterial stenosis and nanoparticle suspensions. International Journal of Multidisciplinary Research Review, 11(10), 308–320.

[169] Upadhyay, A. K., & Shah, S. R. (2025). Machine learning-based prediction of air quality index (AQI) in Mumbai: Comparative analysis of linear regression, random forest, and XGBoost models. International Journal of Multidisciplinary Research Review, 11(10), 299–307.

[170] Singh, V. S. R., Yadav, K., & Khute, U. K. (2025). Harmonizing tradition and science: An evidence-based educational approach to yoga and Ayurveda. International Journal of Multidisciplinary Research Review, 11(10), 288–298.

[171] Naveen, & Shah, S. R. (2025). Air pollution level prediction and comparative analysis of machine learning models: A case study of Delhi AQI. International Journal of Multidisciplinary Research Review, 11(10), 266–274.

[172] Anuja, and S. R. Shah. 2025. "Modern Healthcare and Indigenous Healing: Evaluating Policy Impacts on Tribal Medical Traditions in India." *International Journal of Research Publication and Reviews* 6 (12): 6993–6998.

14.Conflict of Interest

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