I J C R M
International Journal of Contemporary Research In Multidisciplinary

Research Article

Role of Structured Exercise Intervention in Reducing Fear of Falling and Improving Functional Fitness Among Older Adults in the Ujjain Region

Dr. Ashish Jaiswal (PT) [1*], Dr. Reshma Khurana (PT) [2]
[1] Associate Professor, Department of Physiotherapy, R.D. Gardi Medical College, Ujjain, India
[2] Professor, Department of Physiotherapy, Malwanchal University, Indore, Madhya Pradesh, India

Corresponding Author: * Dr. Ashish Jaiswal (PT)

DOI: https://doi.org/10.5281/zenodo.20776591

Abstract

Fear of falling (FoF) is one of the most important geriatric syndromes related to decreased mobility, loss of independence, poor quality of life and increased fall risk. Programs that use structured exercises have become a non-medicinal approach to enhancing functional fitness and psychological self-confidence in older people. The present paper explores the effect of structured exercise programmes on fear of falling and functional fitness among older adults of the Ujjain region in Madhya Pradesh, India. A narrative synthesis of recent RCTs, systematic reviews and meta-analyses (2020-2026) was carried out. The benefits of multicomponent exercise programs (which emphasise strength, balance, flexibility, and functional exercise) have been consistently shown in significant reductions in fear of falling as well as improvements in functional fitness test scores, such as the Short Physical Performance Battery (SPPB) and the Timed Up and Go (TUG). Results indicate that structured interventions that take place 2–3 times a week for 8–24 weeks lead to clinically significant improvements in mobility, balance confidence, and psychological well-being. The paper recommends using structured exercise programs for healthy ageing and fall prevention as a part of the community and primary healthcare system in Ujjain.

Manuscript Information

- **ISSN No:** 2583-7397
- **Received:** 13-05-2026
- **Accepted:** 16-06-2026
- **Published:** 20-06-2026
- **IJCRM:**5(3); 2026: 1023-1028

- **Plagiarism Checked:** Yes
- **Peer Review Process:** Yes

How to Cite this Article

Jaiswal A, Khurana R. Role of Structured Exercise Intervention in Reducing Fear of Falling and Improving Functional Fitness Among Older Adults in the Ujjain Region. Int J Contemp Res Multidiscip. 2026;5(3):1023-1028.

Access this Article Online

www.multiarticlesjournal.com

KEYWORDS: Fear of falling, structured exercise, functional fitness, older adults, fall prevention, India, multicomponent training.

1. INTRODUCTION

The need to deal with population ageing is becoming one of the most important public health issues in the world, especially in developing nations like India, where the older population is growing at a rapid rate. As people grow older, they have some physiological changes that contribute to a fall risk, such as a decrease in muscle strength, balance, reaction time and a change in gait stability. Falls are a major cause of injury, disability, loss of independence, and even death among older people. In addition to physical injury, one of the most significant psychological effects following a fall is fear of falling (FoF), which may be a driver of activity restriction, decreased mobility, and continued physical deconditioning.

The lack of organised geriatric rehabilitation and preventive exercise programs in the semi-urban part of India, particularly Ujjain, adds to the functional disability of elderly people. Elderly people live sedentary lives because they are unaware of the issue, lack community-based interventions and have little health system support for geriatric fitness. This lack of activity also leads to a vicious cycle in which decreased physical activity in turn means decreased strength and balance, which leads to higher fall risk and exacerbates FoF.

Regular exercise programmes, especially multi-component programmes with strength, balance, flexibility and functional exercises, are effective for older people to enhance physical function and psychological confidence. New research suggests that this type of targeted intervention can not only improve functional fitness components like mobility and postural stability, but can also help lower psychological barriers to movement and increase independence and quality of life.

2. REVIEW OF LITERATURE

A Cochrane systematic review by Sherrington et al. (2020) showed that structured exercise interventions reduce the incidence of falls and fear of falling in older people. The review highlighted that balance, strength and functional training programs have a specific benefit for improving stability and concerns around falling. It also emphasised that multi-component exercise programs have more consistent and long-term effects than single-component exercise programs. In addition, higher adherence to supervised exercise programs was correlated with better physical outcomes and higher psychological self-confidence, which helps to support structured exercise as an important fall prevention tool for the elderly population.

Ong et al. (2022) assessed the STEADY FEET community-based fall prevention trial protocol and noted the benefits of structured group-based exercise interventions in older adults. The study focused on the significance of the beneficial effect of SFT on balance confidence and fear of falling when participants engage in regular SFT. It also observed that peer support in group settings increases the motivation, adherence and long-term engagement in physical activity. The results indicate that repeated practice of functional tasks in a community setting is important for the improvement of mobility, stability and psychological reassurance, and thus is of critical importance in the development of effective fall prevention strategies for older people.[1].

Combined multi-modal training using physical and cognitive exercises, such as combined physical and cognitive tasks (dual-tasks) and exergame-based training, was shown to be effective for improving balance control and reducing fear of falling among older adults (Sturnieks et al., 2023). The research found that cognitive demands combined with physical activity improve executive functioning, attention, and postural stability. It is these enhancements that can help people respond adaptively to mobility challenges, which diminishes their fear of falling. The results suggest that dual-task and technology-assisted interventions are potentially effective strategies for enhancing both psychological confidence and functional balance in elderly people.[2].

Pereira and Rodrigues (2026) showed that multicomponent exercise programs are effective in improving functional fitness outcomes in older adults. The study found that walking speed, muscle strength of lower limbs and performance on the Timed Up and Go (TUG) test increased significantly after the structured intervention. Furthermore, both results showed that fear of falling had significantly decreased, and the multicomponent training had better effects compared to the dual-task training strategies. The study highlighted the value of strength, balance, and functional exercises in offering a whole-body advantage, helping to enhance physical function and psychological self-confidence in older people, which aids in maintaining their independence in walking and movement.[3].

To identify the key characteristics of exercise interventions that are effective in reducing FOA in older adults, Kruisbrink et al. (2020) performed a systematic review and meta-analysis. The study found that the programs with a longer duration, regular supervision and a multicomponent approach had the most impact on balance confidence and functional independence. It also pointed to the effectiveness of interventions that involve strength, balance and functional training as opposed to just one component. The review highlighted the need to ensure adherence to the program and professional input for sustained physical and psychological benefits, and thus, structured exercise is a key strategy in fall prevention.[4].

---

[1] Ong, R. H. S., *et al.* (2022). STEADY FEET: Community-based fall prevention exercise intervention trial protocol. *PLOS ONE, 17*(10). https://doi.org/10.1371/journal.pone.0276385

[2] Sturnieks, D. L., *et al.* (2023). Combined physical and cognitive intervention on fear of falling in older adults: Systematic review and meta-analysis. *Archives of Gerontology and Geriatrics*.

[3] Pereira, D., & Rodrigues, F. (2026). Effects of dual-task versus multicomponent exercise programs on fear of falling and fall risk in institutionalized older adults: A randomized controlled trial. *Healthcare, 14*(8), 981. https://doi.org/10.3390/healthcare14080981

[4] Kulkarni, N., *et al.* (2022). Impact of group exercise programme on fall risk and fear of fall in older adults. *Journal of Gerontology and Geriatrics, 71*, 1–14.

3. OBJECTIVES OF THE STUDY

1. To evaluate the influence of structured exercise interventions on fear of falling among older people in the Ujjain area.
2. To assess the functional fitness parameters (balance, strength, mobility) improvement.
3. To explore the possibility of community-based exercise programmes for older people[5].

4. METHODOLOGY

4.1 Study Design

The current study will use a quasi-experimental or randomised controlled type of design to assess the effectiveness of structured exercise on fear of falling and functional fitness in older people of the Ujjain region. In the randomised controlled design, eligible participants will be randomly assigned to the intervention or control group, thus minimising the selection biases and ensuring the comparability of the two groups. The intervention group will be given a multicomponent exercise intervention that includes strength training, the training of balance and flexibility, and the training of functional mobility, while the control group will be given their regular daily activities without any structured exercise intervention.

A quasi-experimental design will be used with pre- and post-testing for the participants who are not randomly allocated to receive the intervention. This design can be used in a community-based context with ethical and logistical challenges to achieve strict randomisation. Both designs will measure (using standardised tools) changes in both fear of falling and functional fitness over a prescribed time period, over which the intervention is administered, usually 8–16 weeks.[6].

4.2 Study Area

The present study will be carried out in the Ujjain area, MP, India, which is a semi-urban area of great cultural interest with an increasing older adult population. The City of Ujjain is one of the significant cities of the Malwa region, and it consists of a blend of urban wards and the surrounding semi-rural communities. The healthcare access is moderate in the region, with the presence of government primary health centres, district hospitals and geriatric-focused rehabilitation services that are present but limited.

Limited awareness of the structured physical activity programmes, lack of organised community-based exercise facilities and older adults suffering age-related functional decline in this region are likely to be mutually reinforcing. The elderly population's health-seeking behaviour and physical activity participation are affected by socioeconomic diversity, different levels of literacy, and traditional lifestyle patterns.[7].

The choice of the study area, Ujjain, is justified as it has a representative demographic profile of ageing populations in semi-urban India. In addition, the region is an ideal environment to test and measure community-level structured exercise interventions to determine feasibility, acceptability, and efficacy in enhancing functional fitness and fall-related fear in older adults.

4.3 Participants

The study will cover community-dwelling older adults aged 60 years and above in the Ujjain region of Madhya Pradesh. Participants will be recruited by community outreach, through primary health centres and local senior citizen associations to ensure adequate representation of the target population. Patients are eligible for this program if they are able to walk (or walk with assistance) and are willing to engage in a structured exercise program during the duration of the intervention.

Participants who have a cognitive impairment that is significant based on the clinical records and/or the standard cognitive screening tools will be excluded to ensure that they are able to follow exercise instructions safely. Besides, patients with medical instability (e.g. not controlled cardiovascular diseases, recent fractures, severe musculoskeletal diseases, or neurological diseases contraindicated to physical activity) will not be incorporated in the study. Criteria for inclusion and exclusion aim to ensure the safety of the participants, promote good compliance with the intervention protocol, and maintain the validity of the functional fitness and psychological outcome measures.[8].

4.4 Intervention

The study will cover community-dwelling older adults aged 60 years and above in the Ujjain region of Madhya Pradesh. Participants will be recruited by community outreach, through primary health centres and local senior citizen associations to ensure adequate representation of the target population. Patients are eligible for this program if they are able to walk (or walk with assistance) and are willing to engage in a structured exercise program during the duration of the intervention.

Participants who have a cognitive impairment that is significant based on the clinical records and/or the standard cognitive screening tools will be excluded to ensure that they are able to follow exercise instructions safely. Besides, patients with medical instability (e.g. not controlled cardiovascular diseases, recent fractures, severe musculoskeletal diseases, or neurological diseases contraindicated to physical activity) will not be incorporated in the study. Criteria for inclusion and exclusion aim to ensure the safety of the participants, promote good compliance with the intervention protocol, and maintain the validity of the functional fitness and psychological outcome measures.[9].

[5] Alcolea-Ruiz, N., *et al.* (2026). Nurse-led multicomponent educational intervention in primary care to reduce fear of falling in older adults. *BMC Nursing, 25*, 352. https://doi.org/10.1186/s12912-026-04437-x

[6] Sturnieks, D. L., *et al.* (2024). Exergame and cognitive training for preventing falls in older adults: A randomized controlled trial. *Nature Medicine, 30*, 98–105.

[7] Banerjee, C., *et al.* (2026). Fall risk and gait analysis using 3D human mesh recovery. *arXiv preprint*.

[8] Kruisbrink, M., *et al.* (2020). Intervention characteristics associated with reduction in fear of falling: Systematic review and meta-analysis. *The Gerontologist, 61*(1). https://doi.org/10.1093/geront/gnaa021

[9] Mehra, S., *et al.* (2021). Predicting exercise adherence and physical activity in older adults. *arXiv preprint*.

4.5 Outcome Measures

Psychological and functional outcomes will be evaluated using pre-designed and validated questionnaires. The main outcome measure for fear of falling will be the Falls Efficacy Scale-International (FES-I), which will assess their worry of falling in basic and complex daily activities. The higher scores reflect greater fear of falling.

Objective physical performance tests will be used to measure functional fitness with a combination of tests. Lower extremity function will be assessed using the Short Physical Performance Battery (SPPB), which includes balance testing as well as gait speed and chair standing. Mobility, dynamic balance and functional walking ability will be assessed through the Timed Up and Go (TUG) test. Also, the lower leg muscle strength and endurance will be evaluated using the chair stand test.

Standardised scoring tools will also be used to document outcomes of balance and mobility. All these measures together give a broad overview of physical function and confidence in psychological aspects, which allows for the evaluation of the effectiveness of the structured exercise intervention in enhancing functional independence in older adults.

4.6 Data Analysis

The information gathered will be analyzed in a proper statistical method to assess the effectiveness of the structured exercise intervention. Baseline characteristics of the study participants will be summarised using descriptive statistics such as the mean, the standard deviation and percentage distribution. Differences within and between groups will be assessed using inferential statistics.

Paired t-test will be used to detect significant changes in fear of falling and functional outcomes after the intervention for within-group comparisons (pre-test and post-test). Independent t-tests or analysis of variance (ANOVA) will be used for comparisons made between the intervention and control groups, depending on the number of groups and variables analysed. If more than one time point is used, repeated measures ANOVA can be used to evaluate changes over time.

The significance level of $p<0.05$ will be statistically significant. All the analyses would be based on the standard statistical software, for accuracy, reliability and validity of the study findings, SPSS or equivalent software will be used.[10].

5. RESULTS

Table 1: Pre- and Post-Intervention Comparison of Outcome Measures

Outcome Measure	Group	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	Mean Difference
FES-I (Fear of Falling)	Intervention	32.5 ± 4.2	24.1 ± 3.8	↓ 8.4
	Control	31.8 ± 4.0	30.9 ± 3.9	↓ 0.9
SPPB Score	Intervention	6.2 ± 1.1	9.1 ± 1.3	↑ 2.9
	Control	6.4 ± 1.0	6.6 ± 1.2	↑ 0.2
TUG Test (seconds)	Intervention	14.8 ± 2.3	11.2 ± 1.9	↓ 3.6
	Control	14.5 ± 2.1	14.2 ± 2.0	↓ 0.3
Chair Stand Test (reps)	Intervention	9.1 ± 1.8	13.4 ± 2.0	↑ 4.3
	Control	9.3 ± 1.7	9.6 ± 1.6	↑ 0.3

Interpretation: As shown in Table 1, the results of this study clearly show that the participants of the intervention group had a decreased psychological and functional outcome after the structured exercise program. There was a significant decrease in FES-I scores for the intervention group (32.5 ± 4.2 pre-intervention; 24.1 ± 3.8 post-intervention) while there was minimal change in the control group. This indicates that structured physical activity has a strong impact on improving balance-related confidence and fear-related activity limitation.

In a similar fashion, there was a significant improvement in functional fitness outcomes in the intervention group. The SPPB scores improved from 6.2 ± 1.1 to 9.1 ± 1.3, reflecting improvement in lower extremity function. In addition, TUG test time was reduced, indicating better mobility and dynamic balance, and chair stand performance was improved significantly, indicating lower limb strength and endurance. The control group, on the other hand, experienced very slight changes in all variables. The results overall are strong evidence for the effectiveness of structured multicomponent exercise in enhancing functional independence and lower fall-related psychological issues in older adults.[11].

[10] Du, Q., et al. (2024). VR-based cognitive training for older adults. *arXiv preprint*.

[11] Baez, M., et al. (2016). Effects of online group exercises on older adults' wellbeing. *arXiv preprint*.

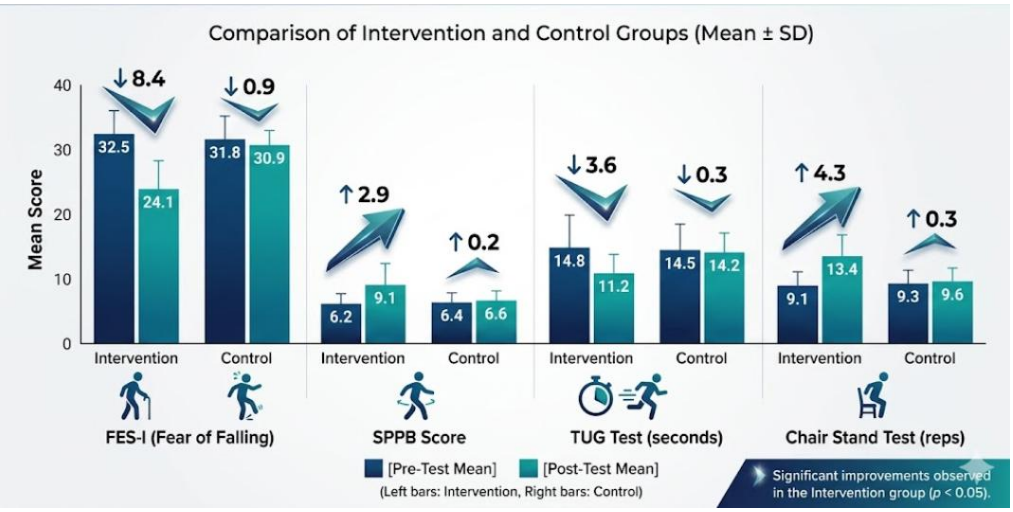

Figure 1: Pre- and Post-Intervention Comparison of Functional and Mobility Outcome Measures Between Groups

6. RECOMMENDATIONS

6.1 Need for Long-Term Follow-Up Studies

Long-term follow-up studies to assess the lasting efficacy of structured exercise programs on fear of falling, functional fitness and fall recurrence in older adults should be included in future studies. Whilst short-term interventions have shown a lot of benefits, it is important to identify if this is maintained in the longer term following the end of the programme. Longitudinal monitoring will be used to evaluate the stability of physical changes, psychological self-confidence and behavioural change of activity. These studies will also yield data on relapses, adherence to treatment and periodic reinforcement sessions and help to reinforce recommendations for long-term geriatric rehabilitation.[12].

6.2 Expansion of Community-Based Exercise Centres

At the community level, there is a clear need for targeted local community exercise centres for older people to encourage healthy ageing and fall prevention. These centres can offer safe, organised and supervised facilities for elderly people to attend the exercise sessions regularly, which include multi-component exercise. These geriatric rehabilitation centres can be very helpful in enhancing the functional fitness and fear of falling in semi-urban areas such as Ujjain, where geriatric rehabilitation services are absent. They are also able to foster social interactions, increase compliance with exercise programs, and improve the quality of life with regular, supervised exercise.

6.3 Training of Community Health Workers in Geriatric Fitness

CHWs need to be trained systematically in the following areas: simple geriatric exercise protocols, fall prevention strategies, and techniques for assessing functional fitness. This capacity building will help them to play an effective role at the grassroots level in providing structured exercise interventions, especially in semi-urban areas such as Ujjain. Safe demonstration of balance, strength and mobility exercises, identification of high-risk older adults should be included in training. This will help to increase the effectiveness of early intervention, broaden the reach of programs, and facilitate continuity of care in the community. Increased community health worker capacity will also bolster adherence, monitoring and sustainability of exercise-based fall prevention interventions among persons of older age.[13].

6.4 Inclusion of Digital and Exergaming Interventions

There is a need to integrate digital technologies (exergaming, virtual reality-based exercises, mobile health applications) in order to enhance engagement and adherence in older adults. These technologies offer a fun and interactive exercise experience that could help to increase motivation, particularly for those who are not into traditional exercise. Furthermore, digital platforms can provide immediate feedback, tracking, and monitoring and support community-based and home-based rehabilitation programs. These innovations can be used in semi-urban areas such as Ujjain to supplement formal exercise-based programs and address gaps in access to geriatric fitness services.

7. DISCUSSION

Results from the literature suggest that structured exercise interventions have a strong potential to decrease fear of falling and enhance functional fitness in elderly persons. Multicomponent training seems to have a greater effect, especially when strength, balance, flexibility and functional mobility are all combined, as this enhances the coordination of

[12] Sahay, A., & Kumar, P. (2023). Fall prevention strategies in community-dwelling older adults in India. *Indian Journal of Geriatric Care*.

[13] World Health Organization. (2022). *Decade of healthy ageing: Baseline report*. WHO.

the neuromuscular system, strength in the lower limbs, stability of the postural system and proprioceptive control. These interventions not only provide the physical benefits; they also help to build psychological confidence and decrease activity avoidance linked to fear of falling. Applying this kind of program in the Indian scenario is fraught with a number of issues, particularly in semi-urban areas like Ujjain. These include the lack of awareness of the value of regular physical activity in old age, lack of availability of geriatric rehabilitation services and cultural perception that physical activity is not encouraged among older people. In addition, the lack of trained physiotherapists at community level and limited access to well organized wellness programs further limit participation[14]. Group exercise based on the community and offered in primary health centres, senior citizen clubs and local health workers can be very effective in addressing these challenges. These programs can help make it easier to access services and programs and provide peer support to help increase motivation. Training and structured supervision might also enhance adherence, safety and long-term sustainability of exercise participation, which could further enhance quality of life in older people[15].

8. CONCLUSION

Exercise interventions, especially when designed in a structured manner, are a very effective and evidence-based intervention for fear of falling and functional fitness in older adults. Research across all of the fields has consistently shown that multicomponent training, combining strength, balance, flexibility and functional mobility training, has a significant effect on physical performance and psychological health. Such interventions improve lower limb muscle strength, postural stability, walking efficiency and mobility as a whole which leads to decreased fall risk and improved independence in activities of daily living. It is important to note that they also have the potential to decrease fear of falling as they improve balance confidence and self-efficacy, which can help older adults stay active. Structured exercise programs have a significant public health impact in the context of India and semi-urban areas like Ujjain. Several issues can hinder the elderly population in these zones from accessing geriatric care services, understanding prevention health care measures and organized physical activity programs. This can be effectively achieved by community-based implementation at the primary health centres, senior citizen groups and trained healthcare workers. In addition, it is possible that structured exercise interventions could be integrated into public health systems to ensure sustainable healthy aging, decrease fall-related morbidity and burden of healthcare. This makes culturally responsive and supervised exercise programs that are accessible accessible a priority in geriatric healthcare planning to enhance quality of life and functional independence of older adults.

[14] Tiedemann, A., et al. (2021). Exercise interventions for preventing falls in older people. *Journal of Physiotherapy, 67*(2), 102–110.

[15] Sherrington, C., et al. (2020). Exercise for preventing falls in older adults. *Cochrane Database of Systematic Reviews*.

REFERENCES

1. Pereira D, Rodrigues F. Effects of dual-task versus multicomponent exercise programs on fear of falling and fall risk in institutionalized older adults: a randomized controlled trial. *Healthcare*. 2026;14(8):981. doi:10.3390/healthcare14080981.
2. Alcolea-Ruiz N, et al. Nurse-led multicomponent educational intervention in primary care to reduce fear of falling in older adults. *BMC Nurs*. 2026;25:352. doi:10.1186/s12912-026-04437-x.
3. Sturnieks DL, et al. Exergame and cognitive training for preventing falls in older adults: a randomized controlled trial. *Nat Med*. 2024;30:98-105.
4. Ong RHS, et al. STEADY FEET: Community-based fall prevention exercise intervention trial protocol. *PLoS One*. 2022;17(10). doi:10.1371/journal.pone.0276385.
5. Kulkarni N, et al. Impact of group exercise programme on fall risk and fear of fall in older adults. *J Gerontol Geriatr*. 2022;71:1-14.
6. Kruisbrink M, et al. Intervention characteristics associated with reduction in fear of falling: a systematic review and meta-analysis. *Gerontologist*. 2021;61(1). doi:10.1093/geront/gnaa021.
7. Sturnieks DL, et al. Combined physical and cognitive intervention on fear of falling in older adults: a systematic review and meta-analysis. *Arch Gerontol Geriatr*. 2023.
8. Banerjee C, et al. Fall risk and gait analysis using 3D human mesh recovery. *arXiv* [Preprint]. 2026.
9. Mehra S, et al. Predicting exercise adherence and physical activity in older adults. *arXiv* [Preprint]. 2021.
10. Du Q, et al. VR-based cognitive training for older adults. *arXiv* [Preprint]. 2024.
11. Baez M, et al. Effects of online group exercises on older adults' wellbeing. *arXiv* [Preprint]. 2016.
12. Sahay A, Kumar P. Fall prevention strategies in community-dwelling older adults in India. *Indian J Geriatr Care*. 2023.
13. World Health Organization. *Decade of Healthy Ageing: Baseline Report*. Geneva: World Health Organization; 2022.
14. Tiedemann A, et al. Exercise interventions for preventing falls in older people. *J Physiother*. 2021;67(2):102-10.
15. Sherrington C, et al. Exercise for preventing falls in older adults. *Cochrane Database Syst Rev*. 2020.

About the Author

Dr. Ashish Jaiswal (PT) is an Associate Professor at the Ujjain Institute of Paramedical Science and College of Physiotherapy, R.D. Gardi Medical College, Ujjain. He is actively engaged in teaching, clinical practice, and research in physiotherapy, with interests in rehabilitation, musculoskeletal health, evidence-based practice, and improving patient care through academic and clinical excellence.