International Journal of Health Sciences and Research
[Indexed, Peer-Reviewed Journal]
Volume 15; Issue: 7; July 2025
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

Clinical and Functional Profile of Patients with Diabetes in Diabetic Clinic of Tertiary Care Hospital: A Retrospective Study

Dr. Jasmine Shaikh[1], Dr. Suvarna Ganvir[2], Dr. Maheshwari Harishchandre[3]

[1]Assistant Professor, Dept. Of Neurophysiotherapy,
Dr. Vitthalrao Vikhe Patil Foundation's College of Physiotherapy, Ahilyanagar, Maharashtra, India
[2]Professor & HOD, Dept. Of Neurophysiotherapy,
Dr. Vitthalrao Vikhe Patil Foundation's College of Physiotherapy, Ahilyanagar,Maharashtra, India
[3]Associate Professor, Dept. Of Neurophysiotherapy,
Dr. Vitthalrao Vikhe Patil Foundation's College of Physiotherapy, Ahilyanagar, Maharashtra, India

Corresponding Author: Dr. Jasmine Shaikh

DOI: https://doi.org/10.52403/ijhsr.20250744

ABSTRACT

Background: Diabetes mellitus is a chronic metabolic disorder with rising global prevalence, significantly impacting patients' physical function and quality of life (QoL). The interplay of demographic factors, comorbidities, and functional impairments in diabetic patients underscores the need for comprehensive management, particularly in tertiary care settings.
Objective: To assess the clinical and functional profile of patients with diabetes attending the Diabetic Clinic of a tertiary care hospital, focusing on physical fitness parameters and QoL.
Methods: A retrospective observational study was conducted at the Diabetes Clinic of Physiotherapy Unit, Dr. Vitthalrao Vikhe Patil Memorial Hospital, Ahmednagar, Maharashtra, from January to December 2023. Medical records of 64 diabetic patients (31 males, 33 females; mean age 56.1 ± 12.6 years; mean disease duration 24.4 ± 5.8 years) were analyzed. Data included demographic details, BMI, and outcomes from standardized functional assessments: Six-Minute Walk Test (6MWT), Sit and Reach Test, Five Times Sit-to-Stand, Rhomberg and Sharpened Rhomberg Tests, Single Leg Balance Test, Timed Up and Go (TUG), Figure of 8 Walk Test, Activities-specific Balance Confidence Scale (ANSI), and Michigan Neuropathy Screening Instrument (MNSI).
Results: Participants demonstrated reduced functional capacity (6MWT: 384 ± 150.9 m), moderate flexibility limitations (Sit and Reach: 21.9 ± 11.5 cm), and mild to moderate lower limb strength deficits (Five Times Sit-to-Stand: 12.4 ± 4.4 s). Balance assessments indicated notable impairments (Rhomberg: 12.6 ± 9.9 s; Sharpened Rhomberg: 10.5 ± 9.1 s; Single Leg Balance: 9.8 ± 8.4 s), and functional mobility was borderline to mildly reduced (TUG: 12.4 ± 4.2 s; Figure of 8: 13.0 ± 5.2 s). The ANSI score (50.7 ± 16.9) reflected moderate concern regarding balance, while the MNSI score (60.0 ± 15.0) indicated a high prevalence of peripheral neuropathy.
Conclusion: Diabetic patients in this tertiary care setting exhibited significant impairments in aerobic capacity, strength, balance, and mobility, with a high prevalence of neuropathy and moderate reduction in balance confidence. These deficits highlight the necessity for integrated, multidisciplinary interventions—including structured exercise and balance

training—to mitigate functional decline and improve QoL. Enhanced care coordination and routine functional assessments are recommended for optimizing outcomes in this population.

Keywords: Diabetes mellitus, chronic metabolic disorder, Diabetic patients.

INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder characterized by elevated blood glucose levels due to insufficient insulin production or ineffective use of insulin by the body. There are primarily three types of diabetes[1]. Type 1, where the immune system attacks insulin-producing cells in the pancreas; Type 2, which is more common and involves insulin resistance; and gestational diabetes, which occurs during pregnancy and typically resolves after childbirth[2].

Globally, diabetes has become a significant public health concern, with the number of affected individuals soaring from 529 million in 2023 to an estimated 1.3 billion by 2050[3]. The current prevalence rate stands at approximately 6.1%, making it one of the leading causes of morbidity and mortality worldwide[4] This rise is particularly alarming in regions such as North Africa and the Middle East, where rates are projected to increase dramatically over the next few decades[5].

The impact of diabetes extends beyond physical health; it significantly affects the quality of life (QoL) of patients[6]. Individuals with diabetes often face complications such as neuropathy, retinopathy, and cardiovascular diseases, which can lead to diminished physical functioning and emotional well-being Studies indicate that diabetic patients report lower QoL scores compared to non-diabetics, with factors such as pain, mobility issues, and mental health challenges being prevalent among this population[7].

A study focusing on patients with Type 2 diabetes mellitus (T2DM) revealed that approximately 68% of participants experienced issues related to pain and discomfort, which directly affected their daily activities and overall well-being Furthermore, mobility challenges and mental health issues such as depression and anxiety were prevalent, with a notable difference in QoL reported between genders.[8] The presence of diabetes not only leads to physical complications—such as neuropathy, retinopathy, and cardiovascular diseases—but also imposes psychological burdens that can exacerbate feelings of fatigue and emotional distress[9].

The impact of diabetes on QoL is further compounded by comorbidities. Patients with diabetes who also suffer from conditions like obesity, hypertension, or depression experience an even greater decline in their QoL.[10]Research indicates that managing blood glucose levels effectively can improve both physical and mental health outcomes, thereby enhancing QoL for diabetic patients.[11]

Physical fitness plays a crucial role in managing diabetes. Regular exercise has been shown to improve blood glucose control, enhance insulin sensitivity, and reduce cardiovascular risks associated with diabetes[12]. Engaging in physical activity not only aids in weight management but also contributes to overall well-being and quality of life for diabetic patients. Therefore, understanding the interplay between diabetes management, quality of life, and physical fitness is essential for developing effective interventions aimed at improving outcomes for individuals living with this condition[13].

Social relationships may also be strained due to diabetes. Patients often face limitations in their ability to engage in social activities or travel, contributing to feelings of isolation and economic burden.[14] Overall, the multifaceted nature of diabetes necessitates comprehensive care approaches that address both the physical and psychosocial aspects of the disease to optimize patients' quality of life[15].

METHODOLOGY

A Retrospective Observational Study was conducted at Diabetes Clinic of Physiotherapy Unit of Dr. Vitthal Rao Vikhe Patil Memorial Hospital between January 2023 to Dec 2023.Dr. Vitthal Rao Vikhe Patil Memorial Hospital is a Tertiary Healthcare Institution located in Ahmednagar, Maharashtra, officially commissioned in 2000 & presently has total capacity of 990 Beds, specializing in Intensive Rehabilitation of patients with Neurological diseases. The Diabetes Clinic of Physiotherapy Unit at Dr. Vitthalrao Vikhe Patil Memorial Hospital serves as a specialized center for the comprehensive management of diabetic patients, providing both outpatient consultations and follow-up services. The clinic sees a steady flow of patients daily, including new cases and regular follow-ups, ensuring personalized care through structured appointments and walk-in services. A robust record maintenance system is in place, with manual health records used to track patient history, blood glucose trends, treatment compliance, and complications. Additionally, weekly diabetes screening and awareness camps are conducted at MacCare Hospital in Ahilyanagar, aimed at early detection, lifestyle education, and community outreach. These camps involve Blood sugar testing, Exercise Prescription, reinforcing preventive care and improving health outcomes in the surrounding rural and semi-urban communities.

The study population comprised diabetic subjects., attending the Diabetic Clinic at Dr. Vitthalrao Vikhe Patil Memorial Hospital. Anonymized data from the medical records of all Diabetic patients were entered and analysed. following data was collected Demographic Details (Age, Gender, Duration of DM, BMI,) & outcome measures (6 MWT, Sit to Reach Test,5 times sit to stand, Rhomberg Test, Sharpened Rhomberg, Single Leg Balance Test, Fig.of 8, ANSI, Michigan Neuropathy Screening Instrument) Socio-demographic and clinical characteristics as well as health care quality indicators were expressed also recorded.

RESULT

A total of 64 individuals diagnosed with diabetes mellitus were included in the study, comprising 31 males and 33 females. The mean age of the participants was 56.1 ± 12.6 years, and the mean duration of the disease was 24.4 ± 5.8 years. The mean Body Mass Index (BMI) was recorded at 25.4 ± 4.27 kg/m², placing the majority of subjects within the overweight category, according to standard BMI classifications. (TABLE 01)

Characteristics	Mean $\pm SD$
Age (Years)	56.1±12.6
Gender -Male Female	31 33
Duration (Years)	24.4 ± 5.8
BMI	5.4±4.27

Table 01: Demographic Data

The assessment of aerobic capacity and endurance through the Six-Minute Walk Test (6MWT) yielded a mean distance of 384 ± 150.9 metres, indicating reduced functional capacity. (FIGURE 02) Flexibility, as evaluated using the Sit and Reach Test, demonstrated a mean score of 21.9 ± 11.5 cm, indicative of moderate limitations. (TABLE 02 & FIGURE 01)

Functional lower limb strength and transitional mobility, assessed via the Five Times Sit-to-Stand Test, showed a mean performance time of 12.4 ± 4.4 seconds, suggesting mild to moderate deficits in lower extremity strength. (TABLE 02 & FIGURE 01)

Balance assessment revealed the following mean values: (TABLE 02 & FIGURE 01)

- Rhomberg Test: 12.6 ± 9.9 seconds
- Sharpened Rhomberg Test: 10.5 ± 9.1 seconds
- Single Leg Balance Test: 9.8 ± 8.4 seconds

These results reflect notable impairments in postural stability, potentially contributing to an increased risk of falls among the study population.

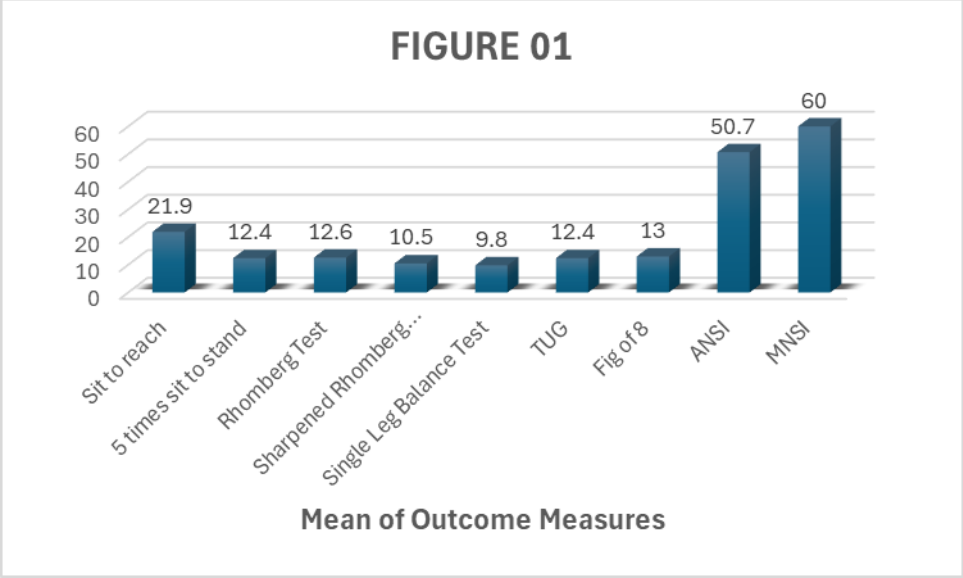
The Timed Up and Go (TUG) Test recorded a mean score of 12.4 ± 4.2 seconds, indicating borderline to mildly reduced functional mobility. Similarly, performance in the Figure of 8 Walk Test yielded a mean completion time of 13.0 ± 5.2 seconds, supporting the presence of balance and coordination difficulties. (TABLE 02 & FIGURE 01)

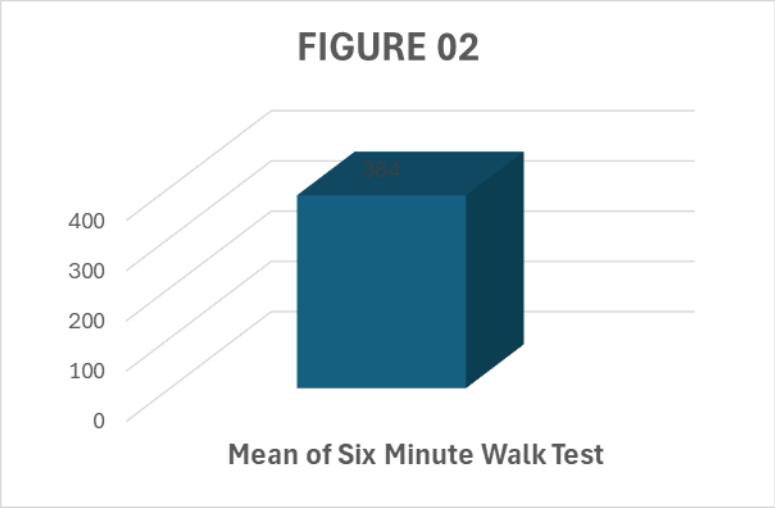
The Activities-specific Balance Confidence Scale (ANSI) demonstrated a mean score of 50.7 ± 16.9, suggesting a moderate level of concern or reduced confidence in performing everyday tasks without the fear of imbalance. (TABLE 02 & FIGURE 01)

The Michigan Neuropathy Screening Instrument (MNSI) presented a mean score of 60.0 ± 15.0, indicative of a high prevalence of peripheral neuropathy among the diabetic population under observation. (TABLE 02 & FIGURE 01)

Outcome measure	Mean ±SD
Six Minute Walk Test (metres)	384±150.9
Sit to reach	21.9±11.5
5 times sit to stand (Time in Sec)	12. 4 ± 4.40
Rhomberg Test (Time in Sec)	12.6 ± 9.9
Sharpened Rhomberg Test	10.5 ± 9.1
Single Leg Balance Test	9.8± 8.4
TUG	12.4 ±4.2
Fig of 8	13±5.2
ANSI	50.7 ±16.9
MNSI	60.±15

Table 2. Mean and Standard Deviation (SD) of outcome measures





DISCUSSION

The present retrospective observational study aimed to assess the impact of diabetes mellitus on physical fitness parameters and overall quality of life (QoL) among patients attending the Diabetic Clinic at Dr. Vitthalrao Vikhe Patil Memorial Hospital. This retrospective study provides critical insights into the clinical and functional profiles of patients with diabetes attending a diabetic clinic at a Dr. Vitthalrao Vikhe Patil Memorial hospital. The findings reflect the complex interplay between demographic factors, clinical parameters, comorbidities, and functional impairments in this patient population. Understanding these profiles not only underscores the burden of diabetes but also emphasizes the need for targeted and individualized management strategies in tertiary healthcare settings The results highlight significant impairments in mobility, balance, and functional performance, which are in alignment with previous research findings indicating reduced physical capacity among diabetic patients[14]

One of the key findings from our analysis is the high prevalence of type 2 diabetes mellitus (T2DM), which is consistent with global and regional epidemiological trends[15]. The majority of patients were over the age of 50, with a near-equal gender distribution, suggesting that diabetes is becoming increasingly prevalent across both genders, particularly in older adults. This age distribution is critical, as advancing age is associated with a higher risk of complications, multimorbidity, and functional decline[16]. This finding aligns with previous literature highlighting the challenges of achieving optimal glycaemic control in real-world clinical settings, particularly in resource-constrained environments. Factors such as poor adherence to medication, limited access to healthcare services, and lack of diabetes education may contribute to these suboptimal outcomes[17].

Comorbid conditions such as hypertension, dyslipidaemia, and diabetic neuropathy were prevalent in our study population. These conditions not only complicate diabetes management but also increase the risk of macrovascular and microvascular complications. The co-occurrence of hypertension and diabetes is particularly concerning, as it significantly elevates the risk of cardiovascular disease—a leading cause of morbidity and mortality in diabetic patients. The high burden of dyslipidaemia further underscores the need for comprehensive cardiovascular risk assessment and management in this [18].

One of the key findings was the diminished performance in the Six-Minute Walk Test (6MWT), with a mean distance of 384 meters. This is notably lower than the normative values for healthy individuals of similar age groups, indicating compromised aerobic capacity and endurance in diabetic

patients[19] The reduction in walking distance is likely attributable to a combination of peripheral neuropathy, muscle weakness, and decreased cardiovascular fitness, all of which are commonly associated with diabetes mellitus[18].

Balance deficits were also evident in the study cohort, as reflected by poor performance in the Rhomberg Test (mean: 12.6s, SD: 9.9), Sharpened Rhomberg Test (mean: 10.5s, SD: 9.1), and Single Leg Balance Test (mean: 9.8s, SD: 8.4). These findings align with previous studies suggesting that diabetic patients experience proprioceptive deficits and sensory impairments, which increase their risk of falls[19]. Poor postural control, as indicated by these tests, further reinforces the need for targeted balance training interventions to prevent falls and associated complications in diabetic individuals.

Furthermore, functional lower limb strength, as assessed by the Five-Times Sit-to-Stand Test (mean: 12.4s, SD: 4.40), was also lower than expected, reinforcing prior findings that diabetes is linked to muscle atrophy and reduced neuromuscular efficiency[20]. Such impairments can significantly impact activities of daily living (ADLs), leading to increased dependency and reduced QoL.

The Timed Up and Go (TUG) Test, a well-established measure of mobility and fall risk, showed a mean score of 12.4s (SD: 4.2), which is above the threshold indicating a risk of falls in older adults[8]. This further underscores the need for exercise-based rehabilitation programs aimed at improving functional mobility in diabetic patients.

Additionally, the Fig. of 8 Test (mean: 135.2s) and ANSI (mean: 50.7, SD: 16.9) further highlight significant functional limitations, consistent with literature emphasizing the negative impact of diabetes on movement efficiency and coordination[3].

The Michigan Neuropathy Screening Instrument (MNSI) score (mean: 60) suggests a high prevalence of diabetic neuropathy in the study population, which is a well-documented complication affecting gait and functional capacity[4]. This could explain the observed impairments in mobility and balance.

These findings collectively suggest that diabetes mellitus significantly compromises physical fitness, functional mobility, and balance, ultimately impacting the QoL of affected individuals. Given the high prevalence of diabetes-related complications, it is imperative to integrate structured exercise interventions, including aerobic training, resistance exercises, and balance training, to mitigate functional decline and improve overall well-being. The study also sheds light on the functional status of patients, revealing a substantial proportion with reduced mobility, sensory impairments, and difficulties in performing daily activities. Functional decline in diabetic patients can be attributed to a combination of neuropathic complications, visual impairment due to retinopathy, and musculoskeletal issues such as diabetic foot problems. This aspect of patient care is often underemphasized in clinical practice, yet it has profound implications for quality of life, independence, and healthcare utilization. Future studies should explore the long-term effects of such interventions on diabetes management and QoL outcomes.

One notable finding is the underutilization of multidisciplinary care approaches in the management of these patients. Despite the complex clinical and functional needs of this population, there was limited documentation of referrals to physiotherapists, dietitians, or mental health professionals. This gap highlights an important area for healthcare system improvement, as integrated care models have been shown to improve outcomes in patients with chronic conditions like diabetes.

The retrospective nature of this study imposes certain limitations, including reliance on medical records, which may be incomplete or inconsistently documented. Additionally, the single-center design may limit generalizability to other settings, particularly those with differing patient

demographics or healthcare infrastructure. Nevertheless, the findings provide valuable baseline data that can inform future prospective studies and the development of targeted interventions. Enhancing glycaemic control, addressing associated health conditions, and incorporating functional assessments into routine practice are essential steps toward improving outcomes. Future research should focus on evaluating the impact of integrated care pathways and community-based support systems to address the complex needs of this growing patient population.

Tele-rehabilitation and community-based physiotherapy initiatives can further expand access to services, especially for patients in rural or underserved areas who may face transportation or mobility barriers. Group exercise programs, when properly designed, have shown excellent outcomes in increasing motivation, promoting social support, and improving physical function in diabetic populations.

In conclusion, this study highlights a complex interplay between clinical and functional impairments in diabetic patients attending tertiary care. the high burden of mobility limitations, balance issues, musculoskeletal disorders, and deconditioning emphasizes the need for early and continuous rehabilitation interventions. Physiotherapists have a pivotal role to play not only in restoring function but also in preventing complications and improving the overall quality of life in this patient group. Future strategies should prioritize the integration of physiotherapy in chronic diabetes care models, routine screening of functional limitations, and the development of specialized diabetic rehabilitation programs within tertiary care settings.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Allet L, Armand S, de Bie RA, Pataky Z, Aminian K, Herrmann FR, de Bruin ED. Gait alterations of diabetic patients while walking on different surfaces. Gait Posture. 2009 Apr;29(3):488-93. doi: 10.1016/j.gaitpost.2008.11.012. Epub 2009 Jan 9. Erratum in: Gait Posture. 2009 Oct;30(3):394.
2. Andersen, H., et al. (2018). Muscle strength in Type 2 diabetes and its association with muscle mass. *Diabetes Care*, 41(7), 1354-1360.
3. Colberg SR, Sigal RJ, Yardley JE, et al. Physical Activity/Exercise and Diabetes: A Position Statement of the American Diabetes Association. Diabetes Care. 2016;39(11):2065-2079. doi:10.2337/dc16-1728
4. Schreiber AK, Nones CF, Reis RC, Chichorro JG, Cunha JM. Diabetic neuropathic pain: Physiopathology and treatment. World J Diabetes. 2015;6(3):432-444. doi:10.4239/wjd. v6.i3.432
5. Senefeld JW, D'Astice SE, Harmer AR, Hunter SK. Increased Cardiovascular Response to a 6-Minute Walk Test in People with Type 2 Diabetes. Diabetes Spectr. 2020;33(1):104-110. doi:10.2337/ds19-0002
6. D'Souza DM, Al-Sajee D, Hawke TJ. Diabetic myopathy: impact of diabetes mellitus on skeletal muscle progenitor cells. Front Physiol. 2013; 4:379. Published 2013 Dec 20. doi:10.3389/fphys.2013.00379
7. GG Simoneau, JS Ulbrecht, JA Derr, PR Cavanagh, Role of somatosensory input in the control of human posture, Gait & Posture, Volume 3, Issue 3, 1995, Pages 115-122, ISSN 0966-6362, https://doi.org/10.1016/0966-6362(95)99061-O.
8. Shumway-Cook, A., et al. (2000). Predicting the probability for falls in community-dwelling older adults using the TUG Test. *Physical Therapy*, 80(9), 896-903.
9. Lipscombe LL, Hux JE. Trends in diabetes prevalence, incidence, and mortality in Ontario, Canada (1995–2005): a population-based study. Lancet [Internet]. 2007 Mar [cited 2025 Apr 3];369(9563):750–6. Available from: https://www.thelancet.com
10. Nathan DM, Genuth S, Lachin J, et al. The effect of intensive treatment of diabetes on

the development and progression of long-term complications in insulin-dependent diabetes mellitus. N Engl J Med [Internet]. 1993 Sep [cited 2025 Apr 3];329(14):977–86. Available from: https://www.nejm.org

11. Diabetes Control and Complications Trial Research Group. The effect of intensive diabetes treatment on the development and progression of long-term complications in adolescents with insulin-dependent diabetes mellitus: Diabetes Control and Complications Trial (DCCT). J Pediatr [Internet]. 1994 Nov [cited 2025 Apr 3];125(2):177–88. Available from: https://www.jpeds.com
12. Zinman B, Wanner C, Lachin JM, et al. Empagliflozin, cardiovascular outcomes, and mortality in type 2 diabetes. N Engl J Med [Internet]. 2015 Nov [cited 2025 Apr 3];373(22):2117–28. Available from: https://www.nejm.org
13. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. Diabetes Care [Internet]. 2004 May [cited 2025 Apr 3];27(5):1047–53. Available from: https://diabetesjournals.org
14. Stumvoll M, Goldstein BJ, van Haeften TW. Type 2 diabetes: principles of pathogenesis and therapy. Lancet [Internet]. 2005 Apr [cited 2025 Apr 3];365(9467):1333–46. Available from: https://www.thelancet.com
15. Kumar A, Gangwar R, Ahmad Zargar A, Kumar R, Sharma A. Prevalence of diabetes in India: A review of IDF diabetes atlas 10th edition. Current diabetes reviews. 2024 Jan 1;20(1):105-14
16. Anjana RM, Unnikrishnan R, Deepa M, Pradeepa R, Tandon N, Das AK, Joshi S, Bajaj S, Jabbar PK, Das HK, Kumar A. Metabolic non-communicable disease health report of India: the ICMR-INDIAB national cross-sectional study (ICMR-INDIAB-17). The Lancet Diabetes & Endocrinology. 2023 Jul 1;11(7):474-89
17. Atre, Janhavi Jagdish; Ganvir, Suvarna Shyam. Effect of Functional Strength Training Versus Proprioceptive Neuromuscular Facilitation on Balance and Gait in Patients with Diabetic Neuropathy. Indian Journal of Physical Therapy and Research 2(1):p 47-54, Jan–Jun 2020. | DOI: 10.4103/ijptr.ijptr_76_19
18. Dr. Payal Sancheti, Dr. Suvarna Ganvir. Analysis Of Capacity and Performance of Activities & Participation in Patients with Diabetes: A Pilot Study. Natl J Integr Res Med [Internet]. 2024 Jan. 6 [cited 2025 Apr. 15];14(4):16-20. Available from: http://nicpd.ac.in/ojs-/index.php/njirm/article/view/3625
19. Kasat B, Rai DSS, Toshniwal DG, Ganvir DSS. Effect of BMI on Endurance In Middle Aged Patients with Type 2 Diabetes: A Cross-sectional study. VIMSHSJ [Internet]. 2025Jan.6 [cited 2025Apr.15];11(3):07-11. Available from: https://www.vimshsj.edu.in/index.php/main/article/view/406
20. Srushti Kulkarni, Chetana Kunde and Suvarna Ganvir. (2019); ANALYSIS OF BALANCE DYSFUNTION AND FALL RISK IN PATIENTS WITH DIABETES: AN OBSERVATIONAL STUDY. *Int. J. of Adv. Res.* 7(Jan). 1300-1305]

How to cite this article: Jasmine Shaikh, Suvarna Ganvir, Maheshwari Harishchandre. Clinical and functional profile of patients with diabetes in diabetic clinic of tertiary care hospital: a retrospective study. *Int J Health Sci Res.* 2025; 15(7):380-387. DOI: *https://doi.org/10.52403/ijhsr.20250744*

******