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REVIEW ARTICLE

Physical and Functional Diagnosis Used in Physiotherapy Practice — Theoretical Review

Alagappan Thiyagarajan[1,*]

[1] *Associate Professor and Senior Sports Physiotherapist,, Chettinad School of Physiotherapy, Chettinad Academy of Research and Education, Kelambakkam, Chennai, India*

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[*] *Corresponding author.*
Alagappan Thiyagarajan
alagappanphd@gmail.com

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ABSTRACT

The field of physiotherapy employs a diverse set of diagnostic methods to comprehensively assess and treat individuals with musculoskeletal, neurological, and movement-related conditions. This holistic approach begins with a detailed patient history and visual observation, progressing to palpation, range of motion assessments, and specialized tests. Diagnostic imaging and neurological evaluations further contribute to a nuanced understanding of underlying issues. Integration of pain assessments, functional movement screenings, and postural evaluations enriches the diagnostic process, emphasizing holistic movement patterns and functionality. This amalgamation of methods enables physiotherapists to formulate personalized treatment plans addressing both symptoms and underlying dysfunctions. Advanced technologies enhance diagnostic precision, providing quantitative data for evidence-based interventions. Continuous progress monitoring ensures adaptive interventions, reflecting a dynamic, patient-centered approach aiming to optimize physical function, enhance overall well-being, and support individuals in achieving functional goals. This article encapsulates the evolving landscape of physiotherapy, highlighting its commitment to delivering high-quality, effective patient care.

Keywords: Physical diagnosis; Functional diagnosis; Physiotherapy; Testing; Movement assessment

1 INTRODUCTION

Physiotherapy, a specialized healthcare profession, employs a diverse range of physical and functional diagnostic methods to assess and address musculoskeletal, neurological, and other physical impairments. These methods aim to comprehensively evaluate patients' conditions, enabling physiotherapists to design effective treatment plans for promoting, restoring, or maintaining optimal physical function and overall well-being. From patient interviews and observation to specific tests measuring range of motion, muscle strength, and neurological function, physiotherapists employ a multifaceted approach to understanding the unique needs of individuals seeking rehabilitation.[1]

This integrated assessment process facilitates the identification of underlying issues, allowing for personalized interventions and ongoing monitoring of progress. In this introductory context, it becomes evident that physiotherapists utilize a combination of techniques to address a spectrum of conditions, emphasizing the importance of a holistic approach to healthcare.[2]

1.1 Physical testing in physiotherapy practice

In the realm of physiotherapy, a variety of specialized tests are employed to assess the conditions of both normal individuals and athletes engaging in sports activities. These tests are designed to target specific anatomical structures or functions, aiding physiotherapists in diagnosing and formulating precise treatment plans. For instance, shoulder special tests like Neer's and Hawkins-Kennedy are utilized to evaluate impingement, while knee assessments such as the Lachman and McMurray tests focus on ligament and meniscal integrity. In spinal evaluations, the Straight Leg Raise helps identify lumbar disc herniation, and the FABER test assesses hip pathology.[3]

Ankle and foot special tests, like the Anterior Drawer Test for ankle ligaments and the Thompson Test for Achilles tendon integrity, are crucial in identifying lower extremity issues. Neurological tests such as the Babinski Reflex and

Romberg Test are employed for assessing neurological function and balance. Moreover, sports-specific tests like hop tests and dynamic balance assessments play a pivotal role in evaluating athletes' readiness to return to sports following injuries. These specialized assessments contribute to a comprehensive understanding of individuals' physical conditions, allowing for tailored interventions that address specific needs and facilitate optimal rehabilitation.[4]

1.2 Functional testing in physiotherapy practice

Functional testing in physiotherapy involves the assessment of an individual's ability to perform various movements and activities that are essential for daily living or specific to their functional needs. These tests go beyond isolated joint or muscle assessments, providing physiotherapists with a comprehensive understanding of a person's overall movement patterns and capabilities. Functional testing often includes activities such as squatting, lunging, reaching, lifting, and dynamic balance tasks. The Y-Balance Test is one such example, evaluating dynamic stability and proprioception by assessing an individual's reach in multiple directions. The Functional Movement Screen (FMS) is another widely used tool that assesses fundamental movement patterns to identify any asymmetries, weaknesses, or limitations that may contribute to injury or dysfunction. These tests play a crucial role in designing tailored rehabilitation programs, as they help pinpoint specific areas of weakness or dysfunction that may be contributing to a patient's pain or impairment. Additionally, functional testing is valuable in monitoring progress throughout the rehabilitation process and determining an individual's readiness to return to daily activities or sports. Overall, functional testing is a key component of physiotherapeutic assessment and intervention, facilitating a holistic approach to improving individuals' functional capacity and quality of life.[5]

1.3 Functional and selective functional movement screening

Functional Movement Screening (FMS) and Selective Functional Movement Assessment (SFMA) are integral components of physiotherapeutic evaluation, each offering unique insights into movement patterns and dysfunctions. FMS employs a standardized set of tests to assess fundamental movements, such as squatting and reaching, aiming to identify asymmetries or limitations that may indicate an increased risk of injury or decreased performance. It serves as a valuable pre-participation screening tool for athletes and aids in designing targeted interventions to enhance overall movement quality. In contrast, SFMA takes a more comprehensive approach, delving into specific causes of movement dysfunctions by assessing joint mobility, stability, and motor control through a series of tests and provocative maneuvers. SFMA is clinically driven, helping physiotherapists differentiate between various sources of dysfunction, such as joint restrictions or neuromuscular control deficits. Together, FMS and SFMA contribute to a holistic understanding of an individual's movement capabilities, guiding tailored intervention strategies to improve function, prevent injuries, and enhance overall well-being.[6]

1.4 Kinetic Control and Shirley Sahrmann's Movement System Impairment (MSI)

Kinetic Control and Shirley Sahrmann's Movement System Impairment (MSI) are two influential approaches in the field of physiotherapy, each emphasizing the importance of assessing and addressing movement dysfunctions to optimize function and reduce the risk of musculoskeletal injuries. Kinetic Control is a movement rehabilitation system that focuses on identifying and correcting faulty movement patterns through the understanding of muscle synergies and control. It employs a thorough assessment to pinpoint specific muscles or muscle groups that may be contributing to dysfunctional movements, guiding interventions to restore optimal control and coordination. On the other hand, Shirley Sahrmann's MSI approach is based on the premise that movement impairments arise from deviations in alignment, muscle imbalances, and altered motor control. Her model involves classifying movement dysfunctions into specific syndromes and prescribing targeted exercises to address the underlying issues.[7] Both Kinetic Control and Sahrmann's Movement System Impairment offer systematic frameworks for physiotherapists to comprehensively evaluate and treat movement disorders, contributing to the development of personalized rehabilitation programs that address the root causes of dysfunction and promote lasting improvements in movement quality.

1.5 Movement analysis test used in physiotherapy

Advanced technologies have revolutionized movement analysis in physiotherapy, providing detailed insights into biomechanics and facilitating precise assessments of individuals' movement patterns. Motion capture systems, employing high-speed cameras and reflective markers, allow for three-dimensional tracking of joint movements, providing quantitative data on range of motion, gait, and functional activities. Electromyography (EMG) measures muscle activity by recording electrical signals, helping physiotherapists assess muscle recruitment patterns and identify imbalances. Force plates provide information on ground reaction forces during activities like walking or jumping, aiding in the evaluation of weight distribution and impact forces. Inertial measurement units (IMUs) enable real-time monitoring of joint angles and accelerations, offering portable and wearable solutions for assessing movement in various environments. Video analysis, utilizing high-speed cameras and computer software, allows for detailed scrutiny of movement patterns,

identifying subtle abnormalities or asymmetries. These advanced technologies not only enhance the precision of movement analysis but also contribute to personalized and data-driven treatment plans in physiotherapy. By combining objective measurements with clinical expertise, physiotherapists can tailor interventions to address specific movement dysfunctions and optimize rehabilitation outcomes.[8]

1.6 Performance test used in sports physiotherapy practice

Performance tests play a pivotal role in sports physiotherapy practice, serving as valuable tools to assess an athlete's physical abilities, functional movements, and overall performance. These tests are designed to evaluate specific aspects such as strength, flexibility, agility, balance, and endurance, providing physiotherapists with objective data to identify areas of improvement or potential injury risk. Examples of performance tests commonly used in sports physiotherapy include the Single Leg Hop Test, assessing lower limb function and symmetry after injury; the 40-Yard Dash for measuring sprint speed and acceleration; and the Functional Movement Screen (FMS), which evaluates fundamental movement patterns. These tests aid in establishing baseline measurements, monitoring progress during rehabilitation, and guiding the development of targeted exercise programs to enhance athletic performance and reduce the likelihood of injuries. The integration of performance testing in sports physiotherapy underscores its role in promoting evidence-based interventions and facilitating a safe return to sport for athletes recovering from injuries.[9]

2 DISCUSSION

In the realm of physiotherapy, functional diagnosis emphasizes the evaluation of an individual's capacity to perform daily activities, employing tools like functional movement screenings and outcome measures. These assessments provide a dynamic understanding of movement patterns and limitations, aiding in the development of targeted rehabilitation strategies. However, the challenge lies in replicating the intricacies of real-world movements entirely, and the subjective nature of these assessments introduces variability. Careful consideration of outcome measures is essential, balancing standardized tools with the need for personalized evaluations that align with specific treatment goals. On the other hand, physical diagnosis methods delve into musculoskeletal and neurological aspects, employing palpation, range of motion assessments, and diagnostic imaging. While these techniques offer valuable insights into structural and biomechanical issues, their subjective nature and potential limitations, such as exposure to radiation, underscore the importance of ongoing training and collaboration with other healthcare professionals. Integrating insights from both functional and physical diagnosis allows physiotherapists to craft comprehensive rehabilitation plans, addressing both symptoms and root causes of dysfunction. This balanced and integrated approach optimizes patient care, ensuring tailored interventions that enhance physical function and overall well-being. Continuous advancements in technology and professional development will further refine these diagnostic methods, elevating their effectiveness in the field of physiotherapy.[8,9]

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3 CONCLUSION

The synergy between physical and functional diagnostic methods allows for a nuanced understanding of the factors contributing to a patient's condition. This comprehensive approach guides the formulation of personalized treatment plans, addressing both symptoms and underlying dysfunctions. The incorporation of advanced technologies further refines diagnostic precision, providing quantitative data to inform evidence-based interventions.[11]

Moreover, the continuous monitoring of progress ensures that physiotherapists can adapt interventions based on individual responses to treatment. This dynamic and patient-centered approach to diagnosis and treatment in physiotherapy ultimately aims to optimize physical function, enhance overall well-being, and support individuals in achieving their functional goals. The ongoing evolution of diagnostic methodologies and the integration of innovative technologies underscore the commitment of physiotherapy

to advancing the quality and effectiveness of patient care.

3.1 Recommendations

- Standardization and Training
  - Standardize assessment protocols and provide continuous training to physiotherapists to enhance consistency and reliability.
- Interdisciplinary Collaboration
  - Collaborate with other healthcare professionals, including radiologists and orthopedic specialists, to ensure comprehensive and accurate diagnostic evaluations.
- Utilization of Technology
  - Incorporate advanced technologies like motion capture systems and electromyography for objective and quantitative data, enhancing diagnostic precision.

3.2 Limitations

- Subjectivity in Assessments
- The inherent subjectivity in many assessments may lead to variations in interpretation, emphasizing the need for continuous training and inter-rater reliability checks.
- Resource Constraints
  - Access to advanced diagnostic technologies may be limited, particularly in certain healthcare settings, posing challenges to their widespread utilization.
- Dynamic Nature of Movement
  - The dynamic and multifactorial nature of human movement may present challenges in capturing all relevant aspects through standardized assessments, emphasizing the need for a comprehensive approach.

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