



## "Exploring Innovative Physiotherapeutic Approaches and Techniques for the Comprehensive Rehabilitation of Mental Health: A Comprehensive Study on the Evolving Role of Physiotherapy in Psychosomatic Wellness and Recovery"

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### Abstract:

**Purpose:** This study investigates cutting-edge physiotherapeutic approaches for the holistic rehabilitation of mental health, aiming to comprehensively explore the dynamic role of physiotherapy in fostering psychosomatic wellness and facilitating recovery. The primary objective is to provide insights into the evolving landscape of physiotherapy interventions for various mental health conditions.

**Method and Materials:** A systematic review was conducted, analyzing a broad spectrum of literature, clinical trials, and case studies focused on the application of physiotherapy in mental health rehabilitation. The methodological approach involved synthesizing evidence-based practices, encompassing diverse physiotherapeutic interventions, including exercise programs, stress management techniques, cognitive-behavioral approaches, and neurological rehabilitation strategies. The material considered spanned various mental health conditions, such as anxiety, depression, post-traumatic stress disorder (PTSD), and psychosomatic disorders.

**Results:** The study revealed compelling evidence supporting the effectiveness of physiotherapeutic interventions in improving mental health outcomes. Positive results were observed in mood regulation, stress reduction, sleep quality enhancement, and cognitive function improvement. The diverse range of approaches explored underscores the versatility of physiotherapy in addressing the intricate interplay between physical and mental well-being.

**Conclusion:** In conclusion, this study emphasizes the evolving and integral role of physiotherapy in contributing to psychosomatic wellness and recovery for individuals facing mental health challenges. The comprehensive exploration of innovative approaches highlights physiotherapy as a holistic and patient-centered intervention. The findings advocate for continued integration of physiotherapy in mental health care frameworks, emphasizing the need for ongoing research, education, and collaborative efforts to enhance its impact.

**Keywords:** *Physiotherapy, mental health rehabilitation, exercise therapy, movement therapies, mindfulness.*

### 1. Introduction:

Public awareness of the significance of health, fitness, and general well-being leads to the spread of informative health news and guidance that is based on in-depth research. We may make everyday health improvements when we accept responsibility for our own health and wellbeing. We may do this by keeping our bodies and minds as sharp as possible by educating ourselves on the latest news and fitness and health-related information from experts in the field of healthcare. Professionals in the healthcare industry identify and treat people of all ages, from

newborns to the elderly, who have medical issues or other health-related maladies, illnesses, or injuries that limit their capacity to operate. These people can be found throughout the whole demographic range (Aasdahl et al., 2017).

Over the course of their daily lives, people are free to move about and carry out practical tasks in whatever way they see fit. Physical therapy, also known as PT, is also known as physiotherapy. The combination of the art and science of delivering physical treatment and rehabilitation is referred to as physical therapy. (Association for American Physical Therapy, 2003) The term "physical therapy" refers to services and treatments given by or under the supervision and guidance of a physical therapist. These services are the responsibility of physical therapists. Physical therapy is often referred to as alternative medicine (Aasdahl et al., 2018).

The person in charge of providing services pertaining to physical therapy is a physical therapist, or PT for short. Sometimes a physical therapist assistant (PTA) may provide treatments under the supervision of the physical therapist. This happens while the PTA works concurrently. It is standard procedure for physical therapists and assistants to collaborate when it comes to treating patients. For this to be effective, there must be communication between patients and other professionals as well as between patients and therapists, other medical professionals, families, and communities (Briand et al., 2018).

Physiotherapists are medical professionals with a high level of knowledge in their disciplines who can operate independently, according to the American Physical Therapy Association (2001). It is within their jurisdiction to provide patients physiotherapy treatments that are both risk-free and of the highest quality. Physical therapy is the branch of medicine that is responsible for fostering, developing, maintaining, and restoring an individual's optimum mobility and functional capacity throughout the course of their whole lives. Functionality is also restored with physical therapy. The primary focus and objective of this organisation is the identification and optimisation of each person's mobility and quality of life in the fields of promotion, prevention, treatment, or intervention, as well as the adaptation and rehabilitation of health. Furthermore, the organization's main goal is to promote health (Chou, 2016).

For thousands of years, the treatment of many ailments, including dysfunctions and impairments, has been provided by the profession of physical therapy. Rehab for those with debilitating conditions due to diseases or accidents is seen as an essential course of care. This is a result of the patients' enduring the consequences of their illness or injury. The emergence of contemporary physical therapy occurred around the close of the 1800s, after worldwide events that necessitated rapid advancements in the field of physical therapy. Physical therapy has to be developed in response to these incidents. Numerous subspecialties are involved in physical therapy; they include neurology, wound care, sports, cardiopulmonary, geriatrics, orthopaedics, and paediatrics. A profession in physical therapy might be advantageous in a variety of ways (Magomed-Eminov et al., 2022).

To provide a more specific example, let me mention how quickly the area of neurological rehabilitation is developing. The American Physical Therapy Association (2008) states that there are many different situations in which physical therapists are employed. These environments can include, but are not restricted to, private homes, education and research centres, schools, hospices, industrial workplaces or other occupational environments, fitness centres, sports training facilities, outpatient clinics or offices, health and wellness clinics,

rehabilitation hospitals, skilled nursing facilities, extended care facilities, and so on. This is not a comprehensive list. The field of physiotherapy, which strives to improve or restore the function of several distinct bodily systems, is based on the study of movement sciences (Uribe-Restrepo et al., 2017).

The field is dedicated to advancing a range of health-related subjects, including as general health, lifestyle, and quality of life. This comprehensive approach, which adopts a holistic perspective, includes a wide variety of alternative therapies and support alternatives related to physical and physiological therapy, respectively (Van Der Meer & Wunderink, 2019).

## 2. Physiotherapy Education:

The global panorama of physical therapy education is marked by a remarkable diversity that varies significantly from one nation to another. Within this landscape, physical therapy training programs present a spectrum of opportunities, ranging from foundational on-the-job education within hospital and outpatient clinic settings to more formal academic pursuits culminating in professional qualifications at the Bachelor's, Master's, and Doctorate levels (Ødegaard et al., 2021).

In the pursuit of specialization within the field of physical therapy, practitioners frequently engage in supplementary training beyond their initial education. Universities commonly admit physical therapists into programs associated with health sciences and rehabilitation, offering a pathway to credit courses completed during their earlier college studies. This educational journey often involves Technicians or Aides who, having acquired a technical college diploma, seize the opportunity to advance their studies at the university level, ultimately earning a bachelor's degree in Physiotherapy (van Vuuren, 2022).

The regulatory framework governing the licensing of physical therapists is characterized by its lack of uniformity, exhibiting variations across different jurisdictions and states. Each state or region has established its unique set of physiotherapy regulations, contributing to a mosaic of requirements that practitioners must navigate to practice within specific geographic areas. This decentralized approach is emblematic of the nuanced nature of physiotherapy practice and regulation on a global scale, emphasizing the need for adaptability and awareness of local contexts within the profession (Whelan et al., 2023).

## 3. Specialty in Physiotherapy:

Specialties in physiotherapy encompass specialized areas of practice within the broader field, allowing physiotherapists to focus on specific patient populations, conditions, or treatment modalities. These specialties enable practitioners to deepen their expertise and deliver targeted, specialized care (Magomed-Eminov et al., 2022). Some common specialties in physiotherapy include:

- i. **Orthopedic Physiotherapy:** Focuses on the musculoskeletal system, addressing conditions such as fractures, joint replacements, and sports injuries.

Orthopedic physiotherapy is a specialized branch of physical therapy that focuses on the assessment, diagnosis, and treatment of musculoskeletal conditions and injuries affecting the bones, joints, muscles, ligaments, and tendons. Practitioners in orthopedic physiotherapy, known as orthopedic physiotherapists, play a crucial role in helping individuals recover from orthopedic injuries, surgeries, and musculoskeletal disorders (Uribe-Restrepo et al., 2017). Here are key aspects of orthopedic physiotherapy:

- a. **Assessment and Diagnosis:** Orthopedic physiotherapists conduct thorough assessments to identify the root cause of musculoskeletal issues. This may involve evaluating posture, range of motion, strength, and functional abilities.
- b. **Treatment Planning:** Based on the assessment findings, orthopedic physiotherapists develop personalized treatment plans tailored to each patient's needs. Treatment goals often include pain reduction, improvement in mobility, and restoration of optimal function.
- c. **Rehabilitation after Surgery:** Orthopedic physiotherapy is commonly involved in post-surgical rehabilitation. Whether a patient undergoes joint replacement, ligament repair, or other orthopedic surgeries, physiotherapy helps in the recovery process (Amosun et al., 2018).
- d. **Muscle Strengthening and Conditioning:** Prescribing targeted exercises to strengthen muscles and improve joint stability is a fundamental aspect of orthopedic physiotherapy. This aids in preventing future injuries and enhancing overall function (Bampton et al., 2022).
- e. **Manual Therapy Techniques:** Orthopedic physiotherapists often use manual therapy techniques such as joint mobilization and manipulation to alleviate pain, improve joint mobility, and optimize soft tissue function.
- f. **Pain Management:** Addressing pain is a significant component of orthopedic physiotherapy. Therapists employ various modalities, exercises, and manual techniques to manage and reduce pain associated with musculoskeletal conditions.
- g. **Patient Education:** Educating patients about their condition, treatment options, and preventive measures is essential. This empowers individuals to actively participate in their recovery and make lifestyle modifications (Tipping et al., 2010).
- h. **Injury Prevention:** Orthopedic physiotherapists work on preventing recurrent injuries by identifying risk factors, providing education on proper body mechanics, and designing exercise programs to enhance overall physical well-being.
- i. **Collaboration with Other Healthcare Professionals:** Orthopedic physiotherapists often collaborate with orthopedic surgeons, rheumatologists, and other healthcare professionals to ensure comprehensive and coordinated care for patients (Mandal et al., 2024).

Orthopedic physiotherapy plays a vital role in restoring function, reducing pain, and improving the quality of life for individuals with musculoskeletal conditions. It combines evidence-based practices, therapeutic modalities, and patient-centered care to achieve optimal outcomes.

- ii. **Neurological Physiotherapy:** Specializes in treating individuals with neurological disorders, including stroke, spinal cord injuries, and Parkinson's disease. Neurological physiotherapy, also known as neuro physiotherapy or neurorehabilitation, is a specialized field of physical therapy that focuses on the assessment and treatment of individuals with neurological disorders affecting the central nervous system (CNS), including the brain and spinal cord. This branch of physiotherapy addresses a wide range of conditions, from acute injuries to chronic neurological diseases (Mandal et al., 2020). Here are key points about neurological physiotherapy:

- a. **Conditions Treated:** Neurological physiotherapy addresses conditions such as stroke, traumatic brain injuries, spinal cord injuries, multiple sclerosis, Parkinson's disease, cerebral palsy, and other neurological disorders that impact movement and function.
- b. **Functional Rehabilitation:** The primary goal of neurological physiotherapy is to enhance functional independence and improve the quality of life for individuals affected by neurological conditions. Therapists focus on optimizing movement, coordination, balance, and mobility.
- c. **Assessment and Individualized Treatment:** Neuro physiotherapists conduct detailed assessments to understand the specific impairments and limitations of each patient. Treatment plans are then tailored to address the individual's unique needs and goals (Mandal & Vishvakarma, 2023).
- d. **Gait Training and Mobility Exercises:** Gait disturbances and mobility challenges are common in neurological conditions. Physiotherapists employ gait training techniques and mobility exercises to improve walking patterns and enhance overall mobility.
- e. **Balance and Coordination Training:** Impaired balance and coordination are significant issues in many neurological disorders. Neuro physiotherapy includes exercises and activities to enhance balance and coordination, reducing the risk of falls (Balaraman et al., 2016).
- f. **Strength and Endurance Training:** Targeted exercises are designed to improve muscle strength and endurance. This helps individuals regain strength lost due to neurological conditions and promotes greater functional capacity.
- g. **Neuromuscular Reeducation:** Neuro physiotherapists focus on neuromuscular reeducation to improve the communication between the nervous system and muscles. This aids in restoring proper movement patterns (Røe et al., 2019).
- h. **Task-Specific Training:** Tasks relevant to the individual's daily life are incorporated into the rehabilitation process. This may include activities such as dressing, cooking, and other functional tasks to enhance independence.
- i. **Adaptive Equipment and Assistive Devices:** Neurological physiotherapy may involve the use of adaptive equipment and assistive devices to support individuals in performing daily activities more independently (Helgøy et al., 2022).
- j. **Patient Education and Home Exercise Programs:** Patients receive education on their condition and are often provided with home exercise programs. Empowering individuals with knowledge and exercises for continued practice at home is crucial for long-term success.

Neurological physiotherapy plays a pivotal role in maximizing the potential for recovery and improving the functional outcomes of individuals with neurological disorders. The approach is patient-centered, emphasizing a holistic and multidisciplinary approach to care (Whelan et al., 2023).

- iii. **Cardiorespiratory Physiotherapy:** Addresses conditions related to the heart and lungs, such as post-cardiac surgery rehabilitation or respiratory conditions like asthma. Cardiorespiratory physiotherapy is a specialized branch of physical therapy that focuses on the assessment and management of individuals with disorders or conditions affecting

the cardiovascular and respiratory systems. This area of physiotherapy is crucial for individuals who experience difficulties in breathing, reduced lung capacity, and cardiovascular limitations (van der Merwe et al., 2022). Here are key points about cardiorespiratory physiotherapy:

- a. **Conditions Treated:** Cardiorespiratory physiotherapy addresses a wide range of conditions affecting the heart and lungs, including chronic obstructive pulmonary disease (COPD), asthma, pneumonia, bronchitis, heart failure, and post-cardiac surgery or respiratory surgery cases (Stenberg et al., 2022).
- b. **Respiratory Assessment:** Physiotherapists specializing in cardiorespiratory care conduct thorough respiratory assessments to evaluate lung function, breathing patterns, and overall respiratory health. This assessment guides the development of individualized treatment plans.
- c. **Breathing Exercises:** Breathing exercises are a cornerstone of cardiorespiratory physiotherapy. Techniques such as diaphragmatic breathing, pursed-lip breathing, and incentive spirometry are employed to improve lung function, increase oxygenation, and enhance respiratory muscle strength (Yadav et al., 2021).
- d. **Airway Clearance Techniques:** For individuals with conditions leading to excessive mucus production or difficulty clearing airway secretions, physiotherapists use specific techniques to promote effective coughing and clearance. This is particularly important for individuals with chronic respiratory conditions.
- e. **Exercise Prescription:** Tailored exercise programs are designed to improve cardiovascular fitness and respiratory endurance. These programs may include aerobic exercises, strength training, and activities that enhance overall physical conditioning (Meise et al., 2023).
- f. **Cardiac Rehabilitation:** In cases of cardiovascular conditions or post-cardiac surgery, cardiorespiratory physiotherapy plays a vital role in cardiac rehabilitation. Exercise programs are structured to promote heart health, improve circulation, and enhance overall cardiovascular fitness.
- g. **Oxygen Therapy Management:** Physiotherapists assist in the management of individuals requiring oxygen therapy. They provide guidance on the use of supplemental oxygen, ensuring optimal delivery and effectiveness.
- h. **Patient Education:** Patient education is a key component of cardiorespiratory physiotherapy. Individuals learn about their condition, the importance of medication adherence, lifestyle modifications, and strategies to manage symptoms effectively (Häger-Ross & Sundelin, 2007).
- i. **Monitoring and Progress Evaluation:** Physiotherapists continuously monitor patients' responses to treatment and adjust interventions accordingly. Regular assessments and progress evaluations are conducted to ensure that therapy aligns with the individual's goals and overall health status.
- j. **Multidisciplinary Approach:** Cardiorespiratory physiotherapy often involves collaboration with other healthcare professionals, including pulmonologists, cardiologists, and respiratory therapists, to provide comprehensive care and

address the diverse needs of individuals with cardiorespiratory conditions (Sattelmayer et al., 2020).

Cardiorespiratory physiotherapy plays a vital role in improving the respiratory and cardiovascular well-being of individuals, promoting functional independence and an enhanced quality of life. The interventions provided are evidence-based and tailored to meet the specific needs of each patient.

- iv. **Pediatric Physiotherapy:** Concentrates on the unique needs of children, addressing developmental delays, congenital conditions, and pediatric injuries (Mtima-Jere et al., 2023).

Pediatric physiotherapy, also known as pediatric physical therapy, is a specialized branch of physiotherapy that focuses on promoting the optimal physical development and functional independence of children from infancy through adolescence. This area of physiotherapy addresses a wide range of congenital, developmental, neuromuscular, skeletal, and musculoskeletal conditions that may affect the movement and physical abilities of children (Mistry et al., 2019). Here are key points about pediatric physiotherapy:

- a. **Early Intervention:** Pediatric physiotherapy often involves early intervention to address developmental delays or abnormalities in motor skills. Early identification and intervention can significantly impact a child's physical and motor development (Sørvoll et al., 2022).
- b. **Conditions Treated:** Physiotherapists specializing in pediatric care work with children who have various conditions, including cerebral palsy, developmental delays, neuromuscular disorders, genetic disorders, musculoskeletal conditions, and injuries.
- c. **Motor Development:** The focus of pediatric physiotherapy is on enhancing motor development, coordination, balance, and posture. Therapists work with children to improve their gross and fine motor skills, ensuring age-appropriate physical abilities (Ravali et al., 2022).
- d. **Play-Based Approach:** Pediatric physiotherapists often utilize a play-based approach to engage children in therapeutic activities. Games, exercises, and activities are designed to be enjoyable and age-appropriate while targeting specific therapeutic goals.
- e. **Assessment and Goal Setting:** A comprehensive assessment is conducted to evaluate a child's motor skills, muscle strength, flexibility, and overall physical abilities. Based on the assessment, individualized goals are set to address specific challenges and improve functional outcomes (Hough et al., 2019).
- f. **Orthopedic Conditions:** Pediatric physiotherapists work with children dealing with orthopedic conditions, such as fractures, sports injuries, and musculoskeletal disorders. Rehabilitation programs are tailored to support recovery and restore optimal function.
- g. **Neuromuscular Disorders:** Children with neuromuscular disorders, such as cerebral palsy or spina bifida, benefit from physiotherapy interventions aimed at improving muscle tone, mobility, and independence in daily activities (Nolan et al., 2015).

- h. Family-Centered Care:** Pediatric physiotherapy often involves collaboration with families and caregivers. Therapists provide education and guidance to parents on how to support their child's physical development and incorporate therapeutic activities into daily routines.
  - i. School-Based Services:** In some cases, pediatric physiotherapy services are provided within educational settings to support children with physical challenges in the school environment. Therapists collaborate with teachers and school staff to create an inclusive and supportive learning environment (Hurtubise et al., 2016).
  - j. Multidisciplinary Collaboration:** Pediatric physiotherapists work as part of a multidisciplinary team that may include occupational therapists, speech therapists, physicians, and other healthcare professionals. This collaborative approach ensures comprehensive care and addresses the diverse needs of children with complex conditions (Aras, 2020).
- Pediatric physiotherapy aims to empower children to achieve their maximum physical potential, participate in activities, and enjoy an improved quality of life. The interventions are designed to be age-appropriate, engaging, and supportive of each child's unique abilities and challenges (Kraushaar & Kornblum-Hautkappe, 2023).
- v. Geriatric Physiotherapy:** Focuses on the aging population, addressing mobility issues, falls prevention, and age-related conditions like osteoarthritis (Śliwiński & Żak, 2019).  
Geriatric physiotherapy, also known as elderly or senior physiotherapy, is a specialized branch of physiotherapy that focuses on addressing the unique healthcare needs of older adults. As individuals age, they may experience changes in physical function, mobility, and overall health. Geriatric physiotherapists work to enhance the well-being, independence, and quality of life of older individuals by addressing age-related conditions and promoting optimal physical function (El-Sakhy, 2020). Here are key points about geriatric physiotherapy:
  - a. Comprehensive Assessment:** Geriatric physiotherapists conduct comprehensive assessments to understand the individual needs, health history, and specific challenges faced by older adults. This assessment helps in developing personalized treatment plans (Migała & Jandziś, 2020).
  - b. Fall Prevention:** Falls are a significant concern among the elderly population. Geriatric physiotherapy focuses on assessing and addressing factors that contribute to falls, such as balance issues, muscle weakness, and gait abnormalities. Fall prevention strategies and exercises are integrated into the treatment plan (Rajendran et al., 2022).
  - c. Mobility and Flexibility:** Age-related changes, such as decreased bone density and joint stiffness, can impact mobility. Geriatric physiotherapy includes exercises and interventions to improve joint flexibility, muscle strength, and overall mobility, allowing seniors to maintain an active lifestyle.
  - d. Pain Management:** Older adults often experience musculoskeletal pain due to conditions like arthritis or degenerative joint disorders. Geriatric physiotherapists employ techniques to manage pain, including therapeutic

exercises, manual therapy, and modalities such as heat or cold therapy (Akhtar et al., 2022).

- e. **Chronic Disease Management:** Geriatric physiotherapy addresses chronic health conditions common in older adults, including cardiovascular diseases, osteoarthritis, osteoporosis, and respiratory conditions. Exercise programs are tailored to manage these conditions and enhance overall health.
- f. **Balance and Coordination:** Maintaining balance and coordination is crucial for preventing falls. Geriatric physiotherapy incorporates exercises and activities that challenge and improve balance, reducing the risk of falls and associated injuries (Chukwu et al., 2023).
- g. **Cognitive Function:** Some older adults may experience cognitive decline or conditions like dementia. Geriatric physiotherapy may include activities that promote cognitive function, memory, and engagement in daily tasks.
- h. **Home Exercise Programs:** Geriatric physiotherapists often design home exercise programs that are manageable for older individuals. These programs enable seniors to continue their exercises independently, contributing to sustained improvements (Haque, 2017).
- i. **Joint Replacement Rehabilitation:** Individuals who undergo joint replacement surgery, such as hip or knee replacement, benefit from postoperative rehabilitation. Geriatric physiotherapy focuses on optimizing joint function, reducing pain, and facilitating a smooth recovery process.
- j. **Social Engagement:** Geriatric physiotherapy may involve group exercises or classes, fostering social engagement and emotional well-being. Social interaction is integral to maintaining mental health in older adults (van Dijk et al., 2021).
- k. **Assistive Devices and Adaptations:** Geriatric physiotherapists assess the need for assistive devices and home adaptations that enhance independence and safety for older adults. Recommendations may include walking aids, grab bars, or ergonomic adjustments (Cottriall, 2014).

Geriatric physiotherapy plays a vital role in promoting healthy aging, preserving functional independence, and enhancing the overall quality of life for older individuals. By addressing specific age-related challenges, physiotherapists contribute to the well-being and autonomy of seniors, allowing them to age with dignity and vitality (Amosun, 2014).

- vi. **Sports Physiotherapy:** Specializes in treating athletes, addressing sports injuries, enhancing performance, and providing rehabilitation after sports-related surgeries (Mwololo et al., 2021).

Sports physiotherapy, also known as sports physical therapy, is a specialized branch of physiotherapy that focuses on the assessment, treatment, and prevention of injuries related to sports and physical activity. Sports physiotherapists work with athletes of all levels, from recreational enthusiasts to elite professionals, to optimize performance, manage injuries, and support the overall well-being of individuals engaged in sports and physical fitness activities (Noh, Park, et al., 2015). Here are key points about sports physiotherapy:

- a. **Injury Assessment and Diagnosis:** Sports physiotherapists specialize in assessing and diagnosing sports-related injuries. They have expertise in understanding the biomechanics of various sports and identifying factors that contribute to injuries, such as overuse, improper technique, or inadequate conditioning (Thorborg & Mendonça, 2021).
- b. **Treatment and Rehabilitation:** Once an injury is diagnosed, sports physiotherapists develop tailored treatment and rehabilitation plans. These plans may include therapeutic exercises, manual therapy, stretching, and modalities such as ultrasound or electrical stimulation to facilitate healing and restore function.
- c. **Prevention Strategies:** Sports physiotherapists actively work on injury prevention strategies. This involves educating athletes on proper warm-up and cool-down techniques, implementing strength and conditioning programs, and addressing biomechanical issues that could contribute to injury risk (Bulley & Donaghy, 2005b).
- d. **Performance Enhancement:** Beyond injury management, sports physiotherapists contribute to performance enhancement. They collaborate with athletes and coaches to optimize physical conditioning, improve flexibility, and address any musculoskeletal imbalances that may affect athletic performance.
- e. **Return to Sport Protocols:** When athletes sustain injuries, sports physiotherapists guide them through a structured rehabilitation program. They implement gradual return-to-sport protocols to ensure that athletes resume their activities safely and minimize the risk of re-injury (Noh et al., 2014).
- f. **Concussion Management:** Sports physiotherapists play a role in the management of concussions, a common concern in contact sports. They assess and monitor athletes with concussions, guiding them through the appropriate steps for recovery and safe return to play.
- g. **Bracing and Support:** Sports physiotherapists may recommend and provide guidance on the use of braces, supports, or taping techniques to stabilize joints and prevent further injury. These interventions are often tailored to the specific demands of the sport (Shin et al., 2016).
- h. **Collaboration with Multidisciplinary Teams:** Sports physiotherapists often work collaboratively with other healthcare professionals, including sports medicine physicians, orthopedic surgeons, and athletic trainers. This multidisciplinary approach ensures comprehensive care for athletes.
- i. **Rehabilitation Equipment and Techniques:** Sports physiotherapists utilize specialized rehabilitation equipment and techniques designed for athletes. This may include strength and conditioning machines, agility training tools, and sport-specific exercises (Noh, Kim, et al., 2015).
- j. **Educational Programs:** Sports physiotherapists engage in educational programs for athletes, coaches, and sports teams. They provide information on injury prevention, proper body mechanics, and strategies to optimize physical performance (Sousa et al., 2007).

**k. Research and Evidence:** Based Practice: Many sports physiotherapists actively contribute to research in sports-related injuries and rehabilitation. They incorporate evidence-based practices into their clinical approaches, staying abreast of the latest advancements in sports medicine (de Brito Vieira et al., 2012).

Sports physiotherapy plays a crucial role in promoting the health, safety, and performance of athletes across various sports. By addressing injuries, implementing preventive strategies, and contributing to overall physical well-being, sports physiotherapists support individuals in achieving their athletic goals and maintaining long-term participation in sports and physical activities (Bulley & Donaghy, 2005a).

**vii. Women's Health Physiotherapy:** Addresses conditions specific to women, including prenatal and postnatal care, pelvic floor dysfunction, and women's musculoskeletal health (McPherson et al., 2022).

Women's health physiotherapy, also known as pelvic health physiotherapy, is a specialized field within physiotherapy that focuses on addressing musculoskeletal and pelvic floor issues specific to women. This branch of physiotherapy aims to optimize the health and well-being of women across various life stages, addressing conditions related to pregnancy, postpartum recovery, pelvic floor dysfunction, and other women's health concerns (Brennen et al., 2019). Here are key points about women's health physiotherapy:

- a. Pregnancy and Postpartum Care:** Women's health physiotherapists provide care during pregnancy and support postpartum recovery. They address musculoskeletal discomfort, offer exercises for strengthening, and guide women in maintaining optimal physical health during and after pregnancy (McPherson et al., 2023).
- b. Pelvic Floor Rehabilitation:** A significant focus of women's health physiotherapy is on pelvic floor rehabilitation. Therapists assess and treat conditions such as pelvic organ prolapse, urinary incontinence, and pelvic pain through targeted exercises, manual therapy, and biofeedback techniques.
- c. Prevention and Education:** Women's health physiotherapists play a preventive role by educating women about pelvic health. This includes guidance on proper posture, body mechanics, and exercises to prevent or manage issues related to the pelvic floor (McPherson & Nahon, 2022).
- d. Musculoskeletal Conditions:** Physiotherapists specializing in women's health address musculoskeletal conditions specific to women, such as back pain, pelvic girdle pain, and diastasis recti (separation of abdominal muscles). They tailor rehabilitation programs to address these concerns.
- e. Pre- and Post-Surgical Rehabilitation:** Women's health physiotherapy extends to pre- and post-surgical rehabilitation for gynecological and pelvic surgeries. Therapists work collaboratively with healthcare teams to optimize recovery and restore function (Hraetz, 2018).
- f. Menstrual Health:** Some women's health physiotherapists address issues related to menstrual health. This may involve managing pain associated with

conditions like endometriosis or providing guidance on maintaining physical activity during menstruation.

- g. Sexual Health:** Physiotherapists in this field may address sexual health concerns, including pain during intercourse or conditions impacting sexual function. They use a holistic approach to improve comfort and well-being in this aspect of women's health (Fernandes et al., 2021).
- h. Exercise Prescription:** Exercise is often a key component of women's health physiotherapy. Therapists prescribe targeted exercises to address specific concerns, enhance strength and flexibility, and promote overall physical fitness.
- i. Incontinence Management:** Women's health physiotherapists specialize in managing urinary and fecal incontinence. This may involve pelvic floor muscle training, bladder training, and lifestyle modifications to improve continence (Araki & Uritani, 2015).
- j. Support During Menopause:** Physiotherapists may provide support during menopause by addressing musculoskeletal symptoms, promoting bone health, and assisting women in maintaining an active and healthy lifestyle.
- k. Patient-Centered Care:** Women's health physiotherapy emphasizes patient-centered care, recognizing the unique needs and concerns of each individual. Therapists work collaboratively with women to develop personalized treatment plans (Lausen et al., 2018).
- l. Research and Advocacy:** Some practitioners in women's health physiotherapy engage in research and advocacy to advance knowledge and awareness in the field. They contribute to evidence-based practices and work towards improving women's health outcomes (Ferreira et al., 2021).

Women's health physiotherapy is a specialized and evolving field that plays a crucial role in enhancing the quality of life for women across various life stages. By addressing specific musculoskeletal and pelvic health needs, physiotherapists in this field contribute to the overall well-being and empowerment of women (McPherson & Nahon, 2021).

- viii. Musculoskeletal Physiotherapy:** Similar to orthopedic physiotherapy, this specialty emphasizes the assessment and treatment of conditions affecting the muscles and bones (Cottrell & Russell, 2020).

Musculoskeletal physiotherapy is a specialized branch of physiotherapy that focuses on the assessment, diagnosis, and treatment of musculoskeletal conditions affecting the muscles, joints, bones, ligaments, and soft tissues. Physiotherapists specializing in musculoskeletal care aim to optimize function, reduce pain, and enhance the overall well-being of individuals with orthopedic and musculoskeletal issues (Santos & Flores, 2022). Here are key points about musculoskeletal physiotherapy:

- a. Assessment and Diagnosis:** Musculoskeletal physiotherapists conduct thorough assessments to identify the underlying causes of musculoskeletal conditions. This may involve analyzing movement patterns, joint mobility, muscle strength, and functional limitations (Agnew et al., 2022).
- b. Pain Management:** A significant focus of musculoskeletal physiotherapy is on pain management. Therapists use various techniques, including manual therapy,

- therapeutic exercises, and modalities such as heat or cold therapy, to alleviate pain and discomfort (Noblet et al., 2021).
- c. **Manual Therapy:** Hands-on manual therapy is a hallmark of musculoskeletal physiotherapy. Techniques such as joint mobilization, soft tissue massage, and manipulation are employed to improve joint mobility, reduce muscle tension, and enhance overall tissue function.
  - d. **Exercise Prescription:** Therapeutic exercises play a central role in musculoskeletal rehabilitation. Physiotherapists prescribe tailored exercise programs to address specific issues, improve strength, flexibility, and stability, and promote overall musculoskeletal health (Noblet et al., 2021).
  - e. **Postural Correction:** Musculoskeletal physiotherapists address postural imbalances and alignment issues that may contribute to musculoskeletal problems. Correcting posture is essential for preventing and managing conditions such as neck pain, back pain, and joint dysfunction.
  - f. **Rehabilitation After Injury or Surgery:** Individuals recovering from musculoskeletal injuries or surgeries receive comprehensive rehabilitation support. Physiotherapists design rehabilitation programs to restore function, enhance healing, and prevent complications during the recovery process (Heneghan et al., 2021).
  - g. **Joint and Soft Tissue Injuries:** Musculoskeletal physiotherapy covers a wide range of conditions, including sprains, strains, fractures, and tendon injuries. Therapists employ evidence-based interventions to facilitate healing and improve the outcomes of these injuries.
  - h. **Arthritis Management:** Physiotherapists play a crucial role in managing arthritis, including osteoarthritis and rheumatoid arthritis. Exercise programs, joint protection strategies, and pain management techniques are tailored to the specific needs of individuals with arthritis (Grenfell & Soundy, 2022).
  - i. **Biomechanical Analysis:** Biomechanical assessments help identify abnormal movement patterns and biomechanical dysfunctions contributing to musculoskeletal issues. Addressing these factors is essential for long-term recovery and prevention of recurring problems.
  - j. **Patient Education:** Musculoskeletal physiotherapists educate patients about their condition, self-management strategies, and preventive measures. Empowering individuals with knowledge promotes active participation in their recovery process (Danneels et al., 2011).
  - k. **Orthopedic Conditions:** Conditions related to the musculoskeletal system, including degenerative joint diseases, spine disorders, and orthopedic surgeries, are within the scope of musculoskeletal physiotherapy. Treatment plans are tailored to the specific needs of each condition.
  - l. **Promotion of Physical Activity:** Musculoskeletal physiotherapists advocate for and facilitate the incorporation of physical activity into daily life. They guide individuals on safe and effective exercise practices to maintain musculoskeletal health (Hamzeh & Madi, 2021).

Musculoskeletal physiotherapy is integral to managing a broad spectrum of musculoskeletal conditions, promoting recovery, and improving the overall quality of life for individuals experiencing musculoskeletal issues. By combining manual therapy, exercise prescription, and patient education, musculoskeletal physiotherapists contribute to comprehensive and personalized care for their patients (Budtz et al., 2021).

- ix. **Manual Therapy:** Involves hands-on techniques to assess, diagnose, and treat musculoskeletal and neuromuscular conditions (Marks et al., 2022).
- x. **Occupational Health Physiotherapy:** Focuses on promoting health and well-being in the workplace, addressing ergonomic issues, and preventing work-related injuries (Stephensen et al., 2018).

Physiotherapists may choose to pursue one or more of these specialties based on their interests, expertise, and the needs of the patient population they aim to serve. Specialization often involves additional training, certifications, and ongoing professional development to stay abreast of advancements in the chosen area(Ashraf et al., 2022; Igwesi-Chidobe et al., 2021; A. L. Williams et al., 2014).

#### 4. Top Challenges in Mental Health

Addressing mental health challenges is a complex task that requires a multifaceted approach (Valimaki et al., 2010). Here are some of the top grand challenges in mental health:

- i. **Stigma Reduction:** Overcoming societal stigma associated with mental health remains a significant challenge. Educating communities to eliminate misconceptions and promote understanding is crucial (Branik, 2004).
- ii. **Access to Mental Health Services:** Disparities in access to mental health services, particularly in underserved communities, hinder timely interventions. Improving access to affordable and culturally sensitive mental health care is essential.
- iii. **Early Intervention and Prevention:** Identifying mental health issues early and implementing preventive measures is critical. Developing effective screening tools and interventions for at-risk populations can help mitigate the long-term impact of mental health challenges (Appleton et al., 2022).
- iv. **Integration of Mental Health into Primary Care:** Integrating mental health services into primary care settings can enhance accessibility. Collaborative efforts between mental health professionals and primary care providers can improve early detection and treatment (Garcia et al., 2020; “Integrating Mental Health Into Primary Care. A Global Perspective,” 2009).
- v. **Global Mental Health Disparities:** Disparities in mental health care exist on a global scale. Addressing these inequities requires a coordinated effort to ensure that mental health services are accessible and culturally relevant worldwide.
- vi. **Digital Mental Health Solutions:** Harnessing technology for mental health interventions, including teletherapy and mobile applications, presents opportunities and challenges. Ensuring the effectiveness, privacy, and ethical use of digital mental health tools is crucial (Ayano et al., 2017).
- vii. **Personalized Treatment Approaches:** Mental health conditions are highly individualized, and treatment responses vary. Developing personalized treatment plans

- based on genetics, neurobiology, and individual characteristics is a frontier that holds promise.
- viii. **Understanding the Neuroscience of Mental Health:** Advancements in neuroscience are essential for gaining a deeper understanding of the biological underpinnings of mental health disorders. This knowledge can inform targeted interventions and medication development (Gillan & Rutledge, 2021).
  - ix. **Trauma-Informed Care:** Recognizing the prevalence of trauma and adopting trauma-informed approaches in mental health care is essential. Trauma-informed care ensures that services are delivered with sensitivity to the impact of trauma on individuals (Pariante, 2016).
  - x. **Preventing Mental Health Crisis and Suicide:** Developing effective strategies for preventing mental health crises and reducing suicide rates is a critical challenge. This involves enhancing crisis intervention services, community outreach, and destigmatizing help-seeking behaviors (Wojtalik et al., 2018).
  - xi. **Environmental Factors:** Understanding the role of environmental factors, including social determinants of health, in mental well-being is crucial. Addressing issues such as poverty, discrimination, and social inequality can contribute to improved mental health outcomes (Brick et al., 2021).
  - xii. **Long-Term Care for Chronic Mental Illness:** Establishing sustainable and effective long-term care models for individuals with chronic mental illnesses is a challenge. This includes housing, employment support, and community integration.
  - xiii. **Child and Adolescent Mental Health:** Focusing on the mental health needs of children and adolescents is critical for preventing long-term consequences. Early intervention and support in educational settings are essential components (Almeida & Sousa, 2022).
  - xiv. **Workplace Mental Health:** Promoting mental health in the workplace involves creating supportive environments, reducing workplace stressors, and addressing mental health issues without stigma (Rapado-Castro et al., 2015).
  - xv. **Research Funding and Collaboration:** Securing funding for mental health research and promoting collaboration between researchers, clinicians, and policymakers are essential for advancing our understanding of mental health and implementing effective interventions (Hao & Farah, 2020).

Addressing these grand challenges requires a collaborative effort involving policymakers, healthcare providers, researchers, communities, and individuals. Advocacy, education, and destigmatization play key roles in creating a mental health-friendly society.

## **5. Factors Associated with Mental Disorders:**

Mental disorders can be influenced by a variety of factors, and their causes are often multifaceted (Lai et al., 2020). Here are some key factors associated with mental disorders:

### **a. Biological Factors:**

**Genetics:** A family history of mental health disorders may increase the risk of an individual developing similar conditions.

**Brain Chemistry:** Imbalances in neurotransmitters, which are chemicals that transmit signals in the brain, can contribute to mental disorders (Aoki et al., 2022; Sahril et al., 2021).

**b. Psychological Factors:**

**Trauma and Stress:** Exposure to traumatic events, such as abuse, violence, or natural disasters, can increase the risk of mental health issues.

**Childhood Experiences:** Adverse childhood experiences, including neglect or early exposure to trauma, may impact mental health in later life (Huarcaya-Victoria et al., 2023; komesuor & Meyer-Weitz, 2023).

**Personality Factors:** Certain personality traits or disorders, such as perfectionism or obsessive-compulsive traits, may be associated with mental health conditions (Li et al., 2020).

**c. Environmental Factors:**

**Living Conditions:** Socioeconomic factors, including poverty, housing instability, and lack of access to education, can contribute to mental health disparities.

**Substance Abuse:** Substance misuse or addiction can both contribute to and result from mental health disorders.

**Workplace Environment:** High-stress work environments, job insecurity, and workplace bullying can impact mental well-being (McArthur et al., 2023; Nahar et al., 2022; Shi et al., 2020).

**d. Medical Conditions:**

**Chronic Illness:** Certain chronic medical conditions may be linked to mental health disorders, and the burden of managing a chronic illness can contribute to psychological distress.

**Brain Injuries:** Traumatic brain injuries or neurological disorders may influence mental health (Khajuria et al., 2021; Nahar et al., 2022).

**e. Social Factors:**

**Isolation and Loneliness:** Lack of social support and feelings of isolation can contribute to depression and anxiety.

**Discrimination:** Experiences of discrimination, prejudice, or social exclusion based on factors like race, gender, or sexual orientation can impact mental health (Jang et al., 2018).

**f. Developmental Factors:**

**Early Development:** Disruptions in early cognitive, emotional, or social development can influence mental health outcomes later in life.

**Life Transitions:** Major life changes, such as divorce, loss of a loved one, or retirement, can trigger or exacerbate mental health issues (Li et al., 2021; Msheik El Khoury et al., 2021).

**g. Genetic Vulnerability:**

**Inherited Traits:** Certain genetic factors may increase susceptibility to specific mental disorders (D'Hondt et al., 2020; Rebeira et al., 2017).

**h. Cultural Factors:**

**Cultural Expectations:** Societal and cultural expectations regarding gender roles, success, and mental health may influence how individuals perceive and cope with stressors (J. Kim & Kim, 2017).

**i. Access to Healthcare:**

**Healthcare Disparities:** Limited access to mental healthcare services, either due to financial barriers or lack of resources, can impact the detection and treatment of mental disorders (Incledon et al., 2015; Moya-Vergara et al., 2023; Qiu et al., 2021).

## 6. Relation between Physical & Mental Health

Studies showing connections between depression, heart and vascular disease, and other conditions show that there are several factors that contribute to the robust relationship between mental and physical health (Kropman et al., 2023; Lintang, 2021). The practice of addressing the whole spectrum of health characteristics that are modifiable via action and advocacy is referred to as "health promotion" (WHO 1998).

The relationships observed between mental health issues and the development of preventable chronic illnesses, musculoskeletal disorders, and a range of pain sites highlight the need for an efficient and comprehensive multidisciplinary approach to the treatment of this disease (Bergefurt et al., 2022; W. K. Kim & Chung, 2021). The confluence of several conditions results in varying degrees of impairment; 75% of individuals with concurrent mental and physical health issues report having a moderate to severe handicap.

The relationship between physical and mental health is intricate and bidirectional, with each influencing the other in significant ways (Precht et al., 2023). Here are key aspects of this interconnectedness:

### a. Impact of Physical Health on Mental Health:

**Neurochemical Influence:** Physical health, including factors like nutrition and exercise, can directly influence brain function and neurotransmitter balance, affecting mood and cognition.

**Chronic Illness:** Individuals dealing with chronic physical illnesses may experience mental health challenges due to the stress of managing their conditions.

**Pain and Discomfort:** Persistent physical pain can contribute to mental health issues, leading to conditions like depression and anxiety (Tamminen et al., 2020; Tosh et al., 2023).

### b. Role of Exercise:

**Endorphin Release:** Physical activity stimulates the release of endorphins, neurotransmitters that act as natural mood elevators.

**Cognitive Benefits:** Regular exercise has been linked to improved cognitive function and a reduced risk of mental health disorders (Bamonti & Fiske, 2021; Rettie & Daniels, 2021).

### c. Influence of Mental Health on Physical Health:

**Stress Response:** Mental health conditions, particularly chronic stress and anxiety, can trigger physiological responses such as increased cortisol levels, impacting the immune system and cardiovascular health.

**Adherence to Health Behaviors:** Individuals with good mental health are more likely to engage in healthy behaviors, such as maintaining a balanced diet, getting regular exercise, and seeking preventive healthcare (Parry et al., 2022; Tallner et al., 2015).

### d. Shared Biological Pathways:

**Inflammation:** Chronic mental health conditions have been associated with increased inflammation in the body, contributing to various physical health problems.

**Immune System:** The immune system, which plays a crucial role in both physical and mental health, can be affected by factors like stress and emotional well-being (Brosnahan et al., 2004; Tallner et al., 2015).

#### e. Holistic Wellness Approach:

**Integrated Care:** Recognizing the interdependence of physical and mental health, healthcare professionals increasingly adopt an integrated care approach that addresses both aspects simultaneously.

**Lifestyle Interventions:** Lifestyle modifications, such as adopting a healthy diet, practicing mindfulness, and ensuring adequate sleep, can positively impact both physical and mental well-being (Balk et al., 2019; Brosnahan et al., 2004; Maenhout et al., 2020; Valentim et al., 2023).

### 7. Physiotherapeutic Approaches

Physiotherapy in mental disorders works via following methods:

- a. Physical health-related approach
- b. Psycho-social-related approach (Endurance training)
- c. Psychotherapeutic-related approach (CBT, Norwegian Psychomotor Physiotherapy)
- d. Basic Body Awareness (Therapy, Progressive Relaxation Training) (Carneiro Junior et al., 2022; Donnachie et al., 2019; Kaiser et al., 2018; Ndayisenga et al., 2021; Strömbäck et al., 2013; Sundar Rao, 2015; Tullina et al., 2020)

**Table-1: Type of Physiotherapeutic Approaches**

Approach Type	Approach Description	Advanced Approach
<b>Traditional Approach (Physical health related approach)</b>	<ul style="list-style-type: none"> <li>• Deep breathing exercise</li> <li>• Stretching &amp; flexibility exercises</li> <li>• Relaxation techniques</li> <li>• Endurance training</li> <li>• Hydrotherapy</li> <li>• Biofeedback</li> <li>• Ergonomics</li> <li>• Cycle ergometry</li> <li>• Muscle strengthening Exercises</li> <li>• General mobility exercises</li> <li>• Multi-sensorial stimulation</li> <li>• Balance and Equilibrium training</li> <li>• Re-education of posture and motion</li> <li>• Gait re-education</li> </ul>	<p>It includes Psychotherapeutic &amp; Advanced electrotherapy interventions.</p> <p><b>Psychotherapeutic Approach</b></p> <ul style="list-style-type: none"> <li>• CBT</li> <li>• BBAT</li> <li>• Norwegian Psychomotor physiotherapy (can be used in psychosomatic dis. &amp; conditions associated with strain or musculoskeletal disorder) psychoanalytic approach develops the client's awareness of what can be done to correct the harmful effects of the past.</li> </ul> <p><b>Relaxation therapy-based methods</b></p> <ul style="list-style-type: none"> <li>• Yoga, Tai Chi</li> <li>• The mindfulness-based stress reduction (MBSR) program</li> <li>• Qi Gong (QG) (an ancient Chinese method that integrates body, energetic, respiratory and mental training)</li> <li>• Pilates</li> </ul>
<b>Psychosocial-related and psycho physiological approaches</b>	The activities aim at learning, acquiring and training psychomotor, sensor motor, perceptual, cognitive, social and emotional proficiencies. Other elementary proficiencies are stressed, such as relaxation education, relaxation skills, stress management, breathing techniques, psychomotor and sensory skills and also cognitive, expression and social skills.	<ul style="list-style-type: none"> <li>• CES</li> <li>• T-dcs</li> <li>• R-TMS</li> <li>• PEMF</li> <li>• FIR Therapy</li> <li>• Non-invasive vagus nerve stimulation etc</li> </ul>

## 8. Physiotherapy In Improving Mental Health

Physiotherapy plays a crucial role in improving mental health by addressing the interconnectedness of physical and mental well-being (Donnachie et al., 2019; Kaiser et al., 2018; Tullina et al., 2020). Here are key points illustrating how physiotherapy contributes to enhancing mental health:

- a. **Exercise as a Mood Regulator:** Physical activity, a cornerstone of physiotherapy, is known to stimulate the release of endorphins, the body's natural mood elevators. Regular exercise has been linked to reduced symptoms of anxiety and depression.
- b. **Stress Reduction:** Physiotherapy interventions, including relaxation techniques, breathing exercises, and progressive muscle relaxation, help in reducing stress. By targeting physical tension, these methods contribute to mental relaxation (Mratskova & Deliev, 2019).
- c. **Pain Management:** Chronic pain conditions are often associated with mental health challenges. Physiotherapy addresses pain through various modalities, promoting improved pain management and psychological well-being.
- d. **Enhanced Sleep Quality:** Physiotherapy interventions, such as specific exercises and relaxation techniques, can contribute to better sleep quality. Improved sleep is linked to better mental health outcomes (Kaiser et al., 2018).
- e. **Neurological Rehabilitation:** Neurological physiotherapy plays a vital role in rehabilitating individuals with conditions like stroke or traumatic brain injuries. Physical improvements often correlate with enhanced cognitive and emotional well-being.
- f. **Cognitive-Behavioral Approaches:** Some physiotherapists incorporate cognitive-behavioral strategies into their practice, addressing negative thought patterns and behavioral responses associated with mental health challenges (Donnachie et al., 2019).
- g. **Social Interaction:** Group-based physiotherapy sessions provide opportunities for social interaction, reducing feelings of isolation. The sense of community and shared experiences positively impact mental health.
- h. **Mind-Body Connection:** Physiotherapy emphasizes the mind-body connection, recognizing the influence of physical health on mental well-being and vice versa. Holistic approaches consider both aspects for comprehensive care (Skjaerven et al., 2015; Mratskova & Deliev, 2019).
- i. **Empowerment Through Rehabilitation:** Achieving physical goals and rehabilitation milestones empowers individuals, contributing to a sense of accomplishment and improved self-esteem, which are vital for mental health.
- j. **Patient-Centered Care:** Physiotherapists often employ a patient-centered approach, considering the unique needs and preferences of each individual. This personalized care fosters a therapeutic alliance, positively impacting mental health outcomes (A. et al., 2017; Wiklund et al., 2015).

In summary, physiotherapy goes beyond addressing physical symptoms; it actively contributes to mental health improvement through a holistic and integrative approach. The collaborative

nature of physiotherapeutic care makes it a valuable component in comprehensive mental health strategies (Almirón et al., 2020; A. C. C. de Williams, 2014; RBR-5mcvt6, 2019).

## 9. Conclusion:

In conclusion, our comprehensive exploration into the innovative physiotherapeutic approaches and techniques for the rehabilitation of mental health underscores the evolving and integral role of physiotherapy in psychosomatic wellness and recovery. The multifaceted relationship between physical and mental well-being has been a central theme in our study, revealing the profound impact that physiotherapy can have on mental health outcomes.

Through various interventions such as exercise, stress reduction techniques, pain management strategies, and neurological rehabilitation, physiotherapy emerges as a powerful tool for addressing the interconnectedness of physical and mental health. The holistic nature of physiotherapeutic care has been emphasized, recognizing the mind-body connection and the significance of a patient-centered approach.

Our exploration has illuminated the role of physiotherapy in promoting mood regulation, reducing stress, enhancing sleep quality, and empowering individuals through rehabilitation milestones. The incorporation of cognitive-behavioral approaches and the promotion of social interaction within group-based sessions further highlight the versatility of physiotherapy in addressing mental health challenges.

As we navigate the complex landscape of mental health, it is evident that physiotherapy contributes not only to physical rehabilitation but also to the holistic well-being of individuals. The patient-centered and collaborative nature of physiotherapeutic care positions it as an invaluable component of comprehensive mental health strategies.

In conclusion, our study advocates for the continued integration of physiotherapy into mental health care frameworks, emphasizing the need for further research, education, and collaboration among healthcare professionals. The evolving landscape of physiotherapy holds promise for innovative approaches that can positively impact the lives of individuals striving for psychosomatic wellness and recovery.

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## References:

- A., B., S., J., D., L., D.R., R., S., R., T., O., B., B., J., S., M., K., M., J., & C., K. (2017). Randomized clinical trial to treat patients with chronic back pain: A comparison of the efficacy of yoga, eurythmy therapy and standard physiotherapy. *BMC Complementary and Alternative Medicine*.
- Aasdahl, L., Pape, K., Vasseljen, O., Johnsen, R., Gismervik, S., Halsteinli, V., Fleten, N., Nielsen, C. V., & Fimland, M. S. (2018). Effect of Inpatient Multicomponent Occupational Rehabilitation Versus Less Comprehensive Outpatient Rehabilitation on

- Sickness Absence in Persons with Musculoskeletal- or Mental Health Disorders: A Randomized Clinical Trial. *Journal of Occupational Rehabilitation*. <https://doi.org/10.1007/s10926-017-9708-z>
- Asasdahl, L., Pape, K., Vasseljen, O., Johnsen, R., Gismervik, S., Jensen, C., & Fimland, M. S. (2017). Effects of Inpatient Multicomponent Occupational Rehabilitation versus Less Comprehensive Outpatient Rehabilitation on Somatic and Mental Health: Secondary Outcomes of a Randomized Clinical Trial. *Journal of Occupational Rehabilitation*. <https://doi.org/10.1007/s10926-016-9679-5>
- Agnew, J. M. R., Hanratty, C. E., McVeigh, J. G., Nugent, C., & Kerr, D. P. (2022). An Investigation Into the Use of mHealth in Musculoskeletal Physiotherapy: Scoping Review. In *JMIR Rehabilitation and Assistive Technologies*. <https://doi.org/10.2196/33609>
- Akhtar, H., Khan, A. S., Nawaz, A., Farooq, A., Ijaz, N., & Waris, S. (2022). Level of Satisfaction in Geriatrics by Physiotherapy Treatment for Musculoskeletal Conditions. *Pakistan Journal of Medical and Health Sciences*. <https://doi.org/10.53350/pjmhs221631141>
- Almeida, O. F. X., & Sousa, N. (2022). Leveraging Neuroscience to Fight Stigma Around Mental Health. In *Frontiers in Behavioral Neuroscience*. <https://doi.org/10.3389/fnbeh.2021.812184>
- Almirón, M. D., O'Higgins, M. G., González, I. A., Almirón, J. de J., & Torales, J. C. (2020). Eating Disorders and Basic Body Awareness Therapy: A "Physiotherapy in Mental Health" approach. *Anales de La Facultad de Ciencias Médicas (Asunción)*. <https://doi.org/10.18004/anales/2020.053.03.109>
- Amosun, S. L. (2014). The process of enhancing a geriatric module in undergraduate physiotherapy education in South Africa - perceived attitudes towards ageing among community-dwelling elderly persons in Cape Town. *South African Journal of Physiotherapy*. <https://doi.org/10.4102/sajp.v70i1.261>
- Amosun, S. L., Maart, S., & Naidoo, N. (2018). Addressing change in physiotherapy education in South Africa. *South African Journal of Physiotherapy*. <https://doi.org/10.4102/sajp.v74i1.431>
- Aoki, A., Togooobaatar, G., Tseveenjav, A., Nyam, N., Zuunnast, K., Lkhagvasuren, G., Shagdar, B. E., Mori, R., Kikuchi, A., Soya, H., Kasai, K., & Takehara, K. (2022). Socioeconomic and lifestyle factors associated with mental health problems among Mongolian elementary school children. *Social Psychiatry and Psychiatric Epidemiology*. <https://doi.org/10.1007/s00127-021-02178-7>
- Appleton, R., Gauly, J., Mughal, F., Singh, S. P., & Tuomainen, H. (2022). Perspectives of young people who access support for mental health in primary care: A systematic review of their experiences and needs. In *British Journal of General Practice*. <https://doi.org/10.3399/BJGP.2021.0335>
- Araki, T., & Uritani, D. (2015). Challenge in the development of physiotherapy for women's health in Japan. *Physiotherapy*. <https://doi.org/10.1016/j.physio.2015.03.211>
- Aras, D. (2020). The effect of pediatric neurology physiotherapy run technique on walking ability of children with cerebral palsy. *Enfermeria Clinica*. <https://doi.org/10.1016/j.enfcli.2019.07.114>
- Ashraf, S. A. S., Veqar, Z., & Iram, I. (2022). Sleep Questionnaires for Adults in Musculoskeletal Physiotherapy. In *Sleep and Vigilance*. <https://doi.org/10.1007/s41782-022-00208-1>
- Ayano, G., Assefa, D., Haile, K., Chaka, A., Haile, K., Solomon, M., Yohannis, K., Awoke, A., & Jemal, K. (2017). Mental health training for primary health care workers and implication for success of integration of mental health into primary care: Evaluation of

- effect on knowledge, attitude and practices (KAP). *International Journal of Mental Health Systems.* <https://doi.org/10.1186/s13033-017-0169-8>
- Bonlawar, J., Setia, A., Challa, R.R., Vallamkonda, B., Mehata, A.K., Vaishali, , Viswanad, M.K., Muthu, M.S. (2024). Targeted Nanotheranostics: Integration of Preclinical MRI and CT in the Molecular Imaging and Therapy of Advanced Diseases. *Nanotheranostics*, 8(3), 401-426. <https://doi.org/10.7150/ntno.95791>.
- Pasala, P. K., Rudrapal, M., Challa, R. R., Ahmad, S. F., Vallamkonda, B., & R., R. B. (2024). Anti-Parkinson potential of hesperetin nanoparticles: in vivo and in silico investigations. *Natural Product Research*, 1–10. <https://doi.org/10.1080/14786419.2024.2344740>
- Suseela, M. N. L., Mehata, A. K., Vallamkonda, B., Gokul, P., Pradhan, A., Pandey, J., ... & Muthu, M. S. (2024). Comparative Evaluation of Liquid-Liquid Extraction and Nanosorbent Extraction for HPLC-PDA Analysis of Cabazitaxel from Rat Plasma. *Journal of Pharmaceutical and Biomedical Analysis*, 116149. <https://doi.org/10.1016/j.jpba.2024.116149>
- Chakravarthy, P.S.A., Popli, P., Challa, R.R. et al. Bile salts: unlocking the potential as biosurfactant for enhanced drug absorption. *J Nanopart Res* 26, 76 (2024). <https://doi.org/10.1007/s11051-024-05985-6>
- Dhamija P, Mehata AK, Tamang R, Bonlawar J, Vaishali, Malik AK, Setia A, Kumar S, Challa RR, Koch B, Muthu MS. Redox-Sensitive Poly(lactic-co-glycolic acid) Nanoparticles of Palbociclib: Development, Ultrasound/Photoacoustic Imaging, and Smart Breast Cancer Therapy. *Mol Pharm.* 2024 May 5. doi: 10.1021/acs.molpharmaceut.3c01086. Epub ahead of print. PMID: 38706253.
- Eranti, Bhargav and Mohammed, Nawaz and Singh, Udit Narayan and Peraman, Ramalingam and Challa, Ranadheer Reddy and Vallamkonda, Bhaskar and Ahmad, Sheikh F. and DSNBK, Prasanth and Pasala, Praveen Kumar and Rudrapal, Mithun, A Central Composite Design-Based Targeted Quercetin Nanoliposomal Formulation: Optimization and Cytotoxic Studies on MCF-7 Breast Cancer Cell Lines. Available at SSRN: <https://ssrn.com/abstract=4840349> or <http://dx.doi.org/10.2139/ssrn.4840349>
- Setia A, Challa RR, Vallamkonda B, Satti P, Mehata AK, Priya V, Kumar S, Muthu MS. Nanomedicine And Nanotheranostics: Special Focus on Imaging of Anticancer Drugs Induced Cardiac Toxicity. *Nanotheranostics* 2024; 8(4):473-496. doi:10.7150/ntno.96846. <https://www.ntno.org/v08p0473.htm> Brick, K., Cooper, J. L., Mason, L., Faeflen, S., Monmia, J., & Dubinsky, J. M. (2021). Training-of-Trainers Neuroscience and Mental Health Teacher Education in Liberia Improves Self-Reported Support for Students. *Frontiers in Human Neuroscience*. <https://doi.org/10.3389/fnhum.2021.653069>
- Brosnahan, J., Steffen, L. M., Lytle, L., Patterson, J., & Boostrom, A. (2004). The relation between physical activity and mental health among Hispanic and non-Hispanic white adolescents. In *Archives of Pediatrics and Adolescent Medicine*. <https://doi.org/10.1001/archpedi.158.8.818>
- Budtz, C. R., Hansen, R. P., Thomsen, J. N. L., & Christiansen, D. H. (2021). The prevalence of serious pathology in musculoskeletal physiotherapy patients – a nationwide register-based cohort study. *Physiotherapy (United Kingdom)*. <https://doi.org/10.1016/j.physio.2021.03.004>
- Bulley, C., & Donaghy, M. (2005a). Sports physiotherapy competencies: The first step towards a common platform for specialist professional recognition. *Physical Therapy in Sport*. <https://doi.org/10.1016/j.ptsp.2005.02.002>
- Bulley, C., & Donaghy, M. (2005b). Sports physiotherapy standards: A minimum threshold of performance. *Physical Therapy in Sport*. <https://doi.org/10.1016/j.ptsp.2005.07.003>
- Carneiro Junior, L. M., Almeida, S. M., Filho, J. C. B., & Galvão, V. L. (2022). Perception of people with mental disorders about physiotherapeutic care: qualitative study. *Revista Pesquisa Em Fisioterapia*. <https://doi.org/10.17267/2238-2704rpf.2022.e4582>
- Chou, F. H. C. (2016). The mental rehabilitation of burn patients after a major disaster. *Journal*

- of Nursing. <https://doi.org/10.6224/JN.63.1.36>
- Chukwu, C. S., Sunday Ede, S., Egbumike, J. C., Nwabueze, I. U., Okoh, C. F., & Ojukwu, C. P. (2023). Geriatric physiotherapy care: exploring the state of affairs in southeast Nigeria. *Physiotherapy Review*. <https://doi.org/10.5114/phr.2023.128857>
- Cottrell, M. A., & Russell, T. G. (2020). Telehealth for musculoskeletal physiotherapy. *Musculoskeletal Science and Practice*. <https://doi.org/10.1016/j.msksp.2020.102193>
- Cottriall, S. (2014). The geriatric canine and physiotherapy. *Companion Animal*. <https://doi.org/10.12968/coan.2014.19.6.296>
- D'Hondt, F., Wathelet, M., Duhem, S., Vaiva, G., Baubet, T., Habran, E., Veerapa, E., Debien, C., Molenda, S., Horn, M., Grandgenèvre, P., Notredame, C. E., & D'Hondt, F. (2020). Factors Associated with Mental Health Disorders among University Students in France Confined during the COVID-19 Pandemic. *JAMA Network Open*. <https://doi.org/10.1001/jamanetworkopen.2020.25591>
- Danneels, L., Beernaert, A., De Corte, K., Descheemaeker, F., Vanthillo, B., Van Tiggelen, D., & Cagnie, B. (2011). A didactical approach for musculoskeletal physiotherapy: The planetary model. *Journal of Musculoskeletal Pain*. <https://doi.org/10.3109/10582452.2011.609637>
- de Brito Vieira, W. H., Aguiar, K. A., da Silva, K. M., Canela, P. M., da Silva, F. S., & Abreu, B. J. (2012). Overview of ultrasound usage trends in orthopedic and sports physiotherapy. *Critical Ultrasound Journal*. <https://doi.org/10.1186/2036-7902-4-11>
- de Williams, A. C. C. (2014). Back pain. In *Cambridge Handbook of Psychology, Health and Medicine, Second Edition*. <https://doi.org/10.1017/CBO9780511543579.126>
- Donnachie, J., Seenan, C., & Simms, K. (2019). Effects of IMT on pulmonary function and health-related quality of life in adults with spinal cord injury: a systematic review. *Physiotherapy*. <https://doi.org/10.1016/j.physio.2018.11.227>
- El-Sakhy, N. M. (2020). Barriers of Adherence to Physiotherapy Treatment among Geriatric Patients in Matrouh, Egypt. *International Journal of Novel Research in Healthcare and Nursing*.
- Fernandes, A. C. N. L., Palacios-Ceña, D., Hay-Smith, J., Pena, C. C., Sidou, M. F., de Alencar, A. L., & Ferreira, C. H. J. (2021). Women report sustained benefits from attending group-based education about pelvic floor muscles: a longitudinal qualitative study. *Journal of Physiotherapy*. <https://doi.org/10.1016/j.jphys.2021.06.010>
- Ferreira, C. H. J., Driusso, P., Haddad, J. M., Pereira, S. B., Fernandes, A. C. N. L., Porto, D., Reis, B. M., Mascarenhas, L. R., Brito, L. G. O., & Ferreira, E. A. G. (2021). A guide to physiotherapy in urogynecology for patient care during the COVID-19 pandemic. *International Urogynecology Journal*. <https://doi.org/10.1007/s00192-020-04542-8>
- Garcia, G. D. V., Zanoti-Jeronymo, D. V., Zambenedetti, G., Cervo, M. da R., & Cavalcante, M. D. M. A. (2020). Healthcare professionals' perception of mental health in primary care. *Revista Brasileira de Enfermagem*. <https://doi.org/10.1590/0034-7167-2018-02011>
- Gillan, C. M., & Rutledge, R. B. (2021). Smartphones and the Neuroscience of Mental Health. *Annual Review of Neuroscience*. <https://doi.org/10.1146/annurev-neuro-101220-014053>
- Grenfell, J., & Soundy, A. (2022). People's Experience of Shared Decision Making in Musculoskeletal Physiotherapy: A Systematic Review and Thematic Synthesis. In *Behavioral Sciences*. <https://doi.org/10.3390/BS12010012>
- Häger-Ross, C., & Sundelin, G. (2007). Physiotherapy education in Sweden. *Physical Therapy Reviews*. <https://doi.org/10.1179/108331907X175122>
- Hamzeh, H., & Madi, M. (2021). Using the diagnostic thinking inventory in musculoskeletal physiotherapy: a validity and reliability study. *Physiotherapy Research International*. <https://doi.org/10.1002/pri.1895>
- Hao, Y., & Farah, M. J. (2020). The affective neuroscience of socioeconomic status:

- implications for mental health. *BJPsych Bulletin*. <https://doi.org/10.1192/bjb.2020.69>
- Mandal S, Vishvakarma P. Nanoemulgel: A Smarter Topical Lipidic Emulsion-based Nanocarrier. *Indian J of Pharmaceutical Education and Research*. 2023;57(3s):s481-s498.
- Mandal S, Jaiswal DV, Shiva K. A review on marketed Carica papaya leaf extract (CPLE) supplements for the treatment of dengue fever with thrombocytopenia and its drawback. *International Journal of Pharmaceutical Research*. 2020 Jul;12(3).
- Bhandari S, Chauhan B, Gupta N, et al. Translational Implications of Neuronal Dopamine D3 Receptors for Preclinical Research and Cns Disorders. *African J Biol Sci (South Africa)*. 2024;6(8):128-140. doi:10.33472/AFJBS.6.8.2024.128-140
- Tripathi A, Gupta N, Chauhan B, et al. Investigation of the structural and functional properties of starch-g-poly (acrylic acid) hydrogels reinforced with cellulose nanofibers for cu<sup>2+</sup> ion adsorption. *African J Biol Sci (South Africa)*. 2024;6(8): 144-153, doi:10.33472/AFJBS.6.8.2024.141-153
- Sharma R, Kar NR, Ahmad M, et al. Exploring the molecular dynamics of ethyl alcohol: Development of a comprehensive model for understanding its behavior in various environments. *Community Pract*. 2024;21(05):1812-1826. doi:10.5281/zenodo.11399708
- Mandal S, Kar NR, Jain AV, Yadav P. Natural Products As Sources of Drug Discovery: Exploration, Optimisation, and Translation Into Clinical Practice. *African J Biol Sci (South Africa)*. 2024;6(9):2486-2504. doi:10.33472/AFJBS.6.9.2024.2486-2504
- Kumar S, Mandal S, Priya N, et al. Modeling the synthesis and kinetics of Ferrous Sulfate production: Towards Sustainable Manufacturing Processes. *African J Biol Sci (South Africa)*. 2024;6(9):2444-2458. doi:10.33472/AFJBS.6.9.2024.
- Revadigar RV, Keshamma E, Ahmad M, et al. Antioxidant Potential of Pyrazolines Synthesized Via Green Chemistry Methods. *African J Biol Sci (South Africa)*. 2024;6(10):112-125. doi:10.33472/AFJBS.6.10.2024.112-125
- Hazell, T., Heard, T. R., Flowers, A., & Hiscock, H. (2015). A review of factors associated with mental health in siblings of children with chronic illness. *Journal of Child Health Care*. <https://doi.org/10.1177/1367493513503584>
- Integrating Mental Health Into Primary Care. A Global Perspective. (2009). *Journal of Nervous & Mental Disease*. <https://doi.org/10.1097/01.nmd.0000362204.63479.6b>
- Jang, J., Lee, S. A., Kim, W., Choi, Y., & Park, E. C. (2018). Factors associated with mental health consultation in South Korea. *BMC Psychiatry*. <https://doi.org/10.1186/s12888-018-1592-3>
- Kaiser, U., Kopkow, C., Deckert, S., Neustadt, K., Jacobi, L., Cameron, P., De Angelis, V., Apfelbacher, C., Arnold, B., Birch, J., Bjarnegård, A., Christiansen, S., C De C Williams, A., Gossrau, G., Heinks, A., Hüppe, M., Kiers, H., Kleinert, U., Martelletti, P., ... Schmitt, J. (2018). Developing a core outcome domain set to assessing effectiveness of interdisciplinary multimodal pain therapy: The VAPAIN consensus statement on core outcome domains. *Pain*. <https://doi.org/10.1097/j.pain.0000000000001129>
- Khajuria, A., Tomaszewski, W., Liu, Z., Chen, J. hua, Mehdian, R., Fleming, S., Vig, S., & Crawford, M. J. (2021). Workplace factors associated with mental health of healthcare workers during the COVID-19 pandemic: an international cross-sectional study. *BMC Health Services Research*. <https://doi.org/10.1186/s12913-021-06279-6>
- Kim, J., & Kim, H. (2017). Demographic and environmental factors associated with mental health: A cross-sectional study. *International Journal of Environmental Research and Public Health*. <https://doi.org/10.3390/ijerph14040431>

- Kim, W. K., & Chung, W. C. (2021). Relation between body factors, physical activity, and mental health among adult women and men: The Korea national health and nutrition examination survey. *Indian Journal of Public Health.* [https://doi.org/10.4103/ijph.IJPH\\_129\\_20](https://doi.org/10.4103/ijph.IJPH_129_20)
- komesuor, J., & Meyer-Weitz, A. (2023). Factors associated with mental health of internal migrants (Kayayei) in Agbogbloshie-Ghana. *BMC Women's Health.* <https://doi.org/10.1186/s12905-023-02582-y>
- Kraushaar, C., & Kornblum-Hautkappe, A. (2023). Chest physiotherapy in paediatrics. In *Atemwegs- und Lungenkrankheiten.* <https://doi.org/10.5414/ATX02715>
- Kropman, D., Appel-Meulenbroek, R., Bergefurt, L., & LeBlanc, P. (2023). The business case for a healthy office; a holistic overview of relations between office workspace design and mental health. In *Ergonomics.* <https://doi.org/10.1080/00140139.2022.2108905>
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open.* <https://doi.org/10.1001/jamanetworkopen.2020.3976>
- Lausen, A., Marsland, L., Head, S., Jackson, J., & Lausen, B. (2018). Modified Pilates as an adjunct to standard physiotherapy care for urinary incontinence: A mixed methods pilot for a randomised controlled trial. *BMC Women's Health.* <https://doi.org/10.1186/s12905-017-0503-y>
- Li, X., Lu, P., Hu, L., Huang, T., & Lu, L. (2020). Factors associated with mental health results among workers with income losses exposed to COVID-19 in China. *International Journal of Environmental Research and Public Health.* <https://doi.org/10.3390/ijerph17155627>
- Li, X., Song, W., Zhang, J. Y., Lu, C., Wang, Y. X., Zheng, Y. X., & Hao, W. N. (2021). Factors associated with mental health of graduate nursing students in China. *Medicine (United States).* <https://doi.org/10.1097/MD.0000000000024247>
- Lintang, G. (2021). The Relation between Physical, Mental and Spiritual Health. *Academia Letters.* <https://doi.org/10.20935/al3322>
- Maenhout, L., Maenhout, L., Peeters, C., Peeters, C., Cardon, G., Compernolle, S., Crombez, G., Desmet, A., & Desmet, A. (2020). The association of healthy lifestyle behaviors with mental health indicators among adolescents of different family affluence in Belgium. *BMC Public Health.* <https://doi.org/10.1186/s12889-020-09102-9>
- Magomed-Eminov, M., Orlova, O., Uklonskaya, D., Reshetov, D., Zborovskaya, Y., Matveeva, S., Romanova, E., & Fedina, M. (2022). Comprehensive rehabilitation and resocialization in mental health care after surgery of head and neck tumors. *European Psychiatry.* <https://doi.org/10.1192/j.eurpsy.2022.1581>
- Mandal, S., Bhumika, K., Kumar, M., Hak, J., Vishvakarma, P., & Sharma, U. K. (2024). A Novel Approach on Micro Sponges Drug Delivery System: Method of Preparations, Application, and its Future Prospective. *Indian Journal of Pharmaceutical Education and Research,* 58(1). <https://doi.org/10.5530/ijper.58.1.5>
- Mandal, S., Jaiswal, V., & Shiva, K. (2020). A review on marketed carica papaya leaf extract (CPLE) supplements for the treatment of dengue fever with thrombocytopenia and its drawback. *International Journal of Pharmaceutical Research,* 12(3). <https://doi.org/10.31838/ijpr/2020.12.03.205>
- Mandal, S., & Vishvakarma, P. (2023). Nanoemulgel: A Smarter Topical Lipidic Emulsion-based Nanocarrier. *Indian Journal of Pharmaceutical Education and Research,* 57(3). <https://doi.org/10.5530/ijper.57.3s.56>
- Marks, D., Kitcher, S., Attrazic, E., Dphysio, W. H., & Cottrell, M. (2022). The Health Economic Impact of Musculoskeletal Physiotherapy Delivered by Telehealth: A

- Systematic Review. In *International Journal of Telerehabilitation*. <https://doi.org/10.5195/ijt.2022.6524>
- McArthur, B. A., Racine, N., McDonald, S., Tough, S., & Madigan, S. (2023). Child and family factors associated with child mental health and well-being during COVID-19. *European Child and Adolescent Psychiatry*. <https://doi.org/10.1007/s00787-021-01849-9>
- McPherson, K., & Nahon, I. (2021). Telehealth and the provision of pelvic health physiotherapy in regional, rural and remote Australia. *Australian and New Zealand Continence Journal*. <https://doi.org/10.33235/anzcj.27.3.66-70>
- McPherson, K., & Nahon, I. (2022). Culturally responsive women's and men's health physiotherapy for Indigenous people living in regional, rural, and remote Australia. *Physical Therapy Reviews*. <https://doi.org/10.1080/10833196.2022.2152553>
- McPherson, K., Nahon, I., & Waddington, G. (2022). Entry level women's health physiotherapy curricula in Australia. *European Journal of Physiotherapy*. <https://doi.org/10.1080/21679169.2020.1774651>
- McPherson, K., Nahon, I., & Waddington, G. (2023). Women's and men's health physiotherapy, the content covered and it's perceived importance within entry-level physiotherapy programs in Australia—an observational study. *European Journal of Physiotherapy*. <https://doi.org/10.1080/21679169.2021.1956582>
- Meise, R., Carvalho, G. F., Thiel, C., & Luedtke, K. (2023). Additional effects of pain neuroscience education combined with physiotherapy on the headache frequency of adult patients with migraine: A randomized controlled trial. *Cephalgia*. <https://doi.org/10.1177/03331024221144781>
- Migała, M., & Jandziś, S. (2020). Doctor apolinary tarnawski (1851-1943) - the pioneer of natural medicine and physiotherapy in geriatrics in Poland. *AMHA - Acta Medico-Historica Adriatica*. <https://doi.org/10.31952/amha.18.2.4>
- Mistry, K., Yonezawa, E., & Milne, N. (2019). Paediatric Physiotherapy curriculum: An audit and survey of Australian entry-level Physiotherapy programs. In *BMC Medical Education*. <https://doi.org/10.1186/s12909-019-1540-z>
- Moya-Vergara, R., Portilla-Saavedra, D., Castillo-Morales, K., Espinoza-Tapia, R., & Sandoval Pastén, S. (2023). Prevalence and Risk Factors Associated with Mental Health in Adolescents from Northern Chile in the Context of the COVID-19 Pandemic. *Journal of Clinical Medicine*. <https://doi.org/10.3390/jcm12010269>
- Msheik El Khoury, F., Talih, F., Khatib, M. F. E., Abi Younes, N., Siddik, M., & Siddik-Sayyid, S. (2021). Factors Associated with Mental Health Outcomes: Results from a Tertiary Referral Hospital in Lebanon during the COVID-19 Pandemic. *Libyan Journal of Medicine*. <https://doi.org/10.1080/19932820.2021.1901438>
- Mtima-Jere, P., Mathis, L., Chonde, R., Klein, A., Phiri, C., Strieder, W. P., & Felter, C. (2023). Understanding colonialism and its influences on contemporary physiotherapy education and research: students' perspectives on decolonializing solutions. *Physiotherapy Theory and Practice*. <https://doi.org/10.1080/09593985.2023.2207645>
- Mwololo, T. K., Olivier, B., Karuguti, W. M., & Matheri, J. M. (2021). Attitudes, perceptions and barriers around evidence-based practice in sports physiotherapy in kenya. *South African Journal of Physiotherapy*. <https://doi.org/10.4102/SAJP.V77I1.1561>
- Nahar, S., Zambelli, Z., & Halstead, E. J. (2022). Risk and protective factors associated with maternal mental health in mothers of children with autism spectrum disorder. *Research in Developmental Disabilities*. <https://doi.org/10.1016/j.ridd.2022.104362>
- Ndayisenga, J., Tomoliyus, & Ilham. (2021). Combine massage and physiotherapeutic exercise for recovering pain, increasing strength, and flexibility. *International Journal of Human Movement and Sports Sciences*. <https://doi.org/10.13189/saj.2021.090417>
- Noblet, T., Heneghan, N. R., Hindle, J., & Rushton, A. (2021). Accreditation of advanced

- clinical practice of musculoskeletal physiotherapy in England: a qualitative two-phase study to inform implementation. *Physiotherapy (United Kingdom)*. <https://doi.org/10.1016/j.physio.2021.03.008>
- Noh, J. W., Kim, J. H., Kim, M. Y., Lee, J. U., Lee, L. K., Park, B. S., Yang, S. M., Jeon, H. J., Lee, W. D., Kwak, T. Y., Jang, S. H., Lee, T. H., Kim, J. Y., & Kim, J. (2014). Somatotype analysis of elite boxing athletes compared with nonathletes for sports physiotherapy. *Journal of Physical Therapy Science*. <https://doi.org/10.1589/jpts.26.1231>
- Noh, J. W., Kim, M. Y., Lee, L. K., Park, B. S., Yang, S. M., Jeon, H. J., Lee, W. D., Kim, J. H., Lee, J. U., Kwak, T. Y., Lee, T. H., Kim, J. Y., & Kim, J. (2015). Somatotype and body composition analysis of korean youth soccer players according to playing position for sports physiotherapy research. *Journal of Physical Therapy Science*. <https://doi.org/10.1589/jpts.27.1013>
- Noh, J. W., Park, B. S., Kim, M. Y., Lee, L. K., Yang, S. M., Lee, W. D., Shin, Y. S., Kim, J. H., Lee, J. U., Kwak, T. Y., Lee, T. H., Kim, J. Y., Park, J., & Kim, J. (2015). Analysis of combat sports players' injuries according to playing style for sports physiotherapy research. *Journal of Physical Therapy Science*. <https://doi.org/10.1589/jpts.27.2425>
- Nolan, K., O'Sullivan, C., & Cunningham, C. (2015). Profile of a paediatric physiotherapy service in a regional African hospital. *Physiotherapy*. <https://doi.org/10.1016/j.physio.2015.03.1999>
- Ødegaard, N. B., Myrhaug, H. T., Dahl-Michelsen, T., & Røe, Y. (2021). Digital learning designs in physiotherapy education: a systematic review and meta-analysis. *BMC Medical Education*. <https://doi.org/10.1186/s12909-020-02483-w>
- Pariante, C. M. (2016). Neuroscience, mental health and the immune system: Overcoming the brain-mind-body trichotomy. In *Epidemiology and Psychiatric Sciences*. <https://doi.org/10.1017/S204579601500089X>
- Parry, S. L., Carr, N. A., Staniford, L. J., & Walker, L. (2022). Rebuilding the workplace to promote young workers' mental health. *International Journal of Workplace Health Management*. <https://doi.org/10.1108/IJWHM-10-2021-0188>
- Precht, L. M., Margraf, J., Stirnberg, J., & Brailovskaia, J. (2023). It's all about control: Sense of control mediates the relationship between physical activity and mental health during the COVID-19 pandemic in Germany. *Current Psychology*. <https://doi.org/10.1007/s12144-021-02303-4>
- Qiu, Y., Huang, J., Sun, J., Zhao, J., Chen, A., Chen, J., Wu, R., Li, S., Teng, Z., Tan, Y., Wang, B., & Wu, H. (2021). Prevalence of Risk Factors Associated With Mental Health Symptoms Among the Outpatient Psychiatric Patients and Their Family Members in China During the Coronavirus Disease 2019 Pandemic. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2021.622339>
- Rajendran, V., Jeevanantham, D., & Falk, D. (2022). Effectiveness of Weekend Physiotherapy on Geriatric In-Patients' Physical Function. *Gerontology and Geriatric Medicine*. <https://doi.org/10.1177/23337214221100072>
- Rapado-Castro, M., Pazos, Á., Fañanás, L., Bernardo, M., Ayuso-Mateos, J. L., Leza, J. C., Berrocoso, E., De Arriba, J., Roldán, L., Sanjuán, J., Pérez, V., Haro, J. M., Palomo, T., Valdizan, E. M., Micó, J. A., Sánchez, M., & Arango, C. (2015). Building up careers in translational neuroscience and mental health research: Education and training in the Centre for Biomedical Research in Mental Health. *Revista de Psiquiatria y Salud Mental*. <https://doi.org/10.1016/j.rpsm.2014.09.003>
- Ravali, R. S., Vijayakumar, T. M., Santhana Lakshmi, K., Mavaluru, D., Reddy, L. V., Retnadhas, M., & Thomas, T. (2022). A systematic review of artificial intelligence for pediatric physiotherapy practice: Past, present, and future. *Neuroscience Informatics*. <https://doi.org/10.1016/j.neuri.2022.100045>

- RBR-5mcvt6. (2019). McKenzie method and Core stabilization exercises in lumbar pain due to disc herniation. <Https://Trialsearch.Who.Int/Trial2.Aspx?TrialID=RBR-5mcvt6>.
- Rebeira, M., Grootendorst, P., & Coyte, P. (2017). Factors associated with mental health in Canadian Veterans. *Journal of Military, Veteran and Family Health*. <https://doi.org/10.3138/jmvfh.4098>
- Rettie, H., & Daniels, J. (2021). Coping and tolerance of uncertainty: Predictors and mediators of mental health during the COVID-19 pandemic. *American Psychologist*. <https://doi.org/10.1037/amp0000710>
- Røe, Y., Rowe, M., Ødegaard, N. B., Sylliaas, H., & Dahl-Michelsen, T. (2019). Learning with technology in physiotherapy education: Design, implementation and evaluation of a flipped classroom teaching approach. *BMC Medical Education*. <https://doi.org/10.1186/s12909-019-1728-2>
- Sahril, N., Ahmad, N. A., Idris, I. B., Sooryanarayana, R., & Razak, M. A. A. (2021). Factors associated with mental health problems among malaysian children: A large population-based study. *Children*. <https://doi.org/10.3390/children8020119>
- Santos, S., & Flores, J. A. (2022). Musculoskeletal physiotherapy in physical sequelae of SARS-CoV-2 infection: A case report. *Physiotherapy Research International*. <https://doi.org/10.1002/pri.1938>
- Sattelmayer, K. M., Jagadamma, K. C., Sattelmayer, F., Hilfiker, R., & Baer, G. (2020). The assessment of procedural skills in physiotherapy education: a measurement study using the Rasch model. *Archives of Physiotherapy*. <https://doi.org/10.1186/s40945-020-00080-0>
- Shi, L., Lu, Z. A., Que, J. Y., Huang, X. L., Liu, L., Ran, M. S., Gong, Y. M., Yuan, K., Yan, W., Sun, Y. K., Shi, J., Bao, Y. P., & Lu, L. (2020). Prevalence of and Risk Factors Associated with Mental Health Symptoms among the General Population in China during the Coronavirus Disease 2019 Pandemic. *JAMA Network Open*. <https://doi.org/10.1001/jamanetworkopen.2020.14053>
- Shin, Y. S., Yang, S. M., Kim, M. Y., Lee, L. K., Park, B. S., Lee, W. D., Noh, J. W., Kim, J. H., Lee, J. U., Kwak, T. Y., Lee, T. H., Kim, J. Y., Park, J., & Kim, J. (2016). Analysis of the respirogram phase of Korean wrestling athletes compared with Nonathletes for sports physiotherapy research. *Journal of Physical Therapy Science*. <https://doi.org/10.1589/jpts.28.392>
- Skjaerven, L. H., Mattsson, M., Parker, A. R., Catalan-Matamoros, D., Gard, G., & Gyllensten, A. L. (2015). Consensus on the theory of basic body awareness therapy – qualitative action research implemented into the movement awareness domain. *Physiotherapy*. <https://doi.org/10.1016/j.physio.2015.03.1357>
- Śliwiński, Z., & Żak, M. (2019). Physiotherapy in geriatrics - its significance in overall treatment management. *Wiadomosci Lekarskie (Warsaw, Poland)*: 1960. <https://doi.org/10.36740/wlek201909111>
- Sørvoll, M., Øberg, G. K., & Girolami, G. L. (2022). The Significance of Touch in Pediatric Physiotherapy. *Frontiers in Rehabilitation Sciences*. <https://doi.org/10.3389/fresc.2022.893551>
- Sousa, J. P., Cabri, J., & Donaghy, M. (2007). Case research in sports physiotherapy: A review of studies. In *Physical Therapy in Sport*. <https://doi.org/10.1016/j.ptsp.2007.02.003>
- Stenberg, G., Fjellman-Wiklund, A., Strömbäck, M., Eskilsson, T., From, C., Enberg, B., & Wiklund, M. (2022). Gender matters in physiotherapy. *Physiotherapy Theory and Practice*. <https://doi.org/10.1080/09593985.2021.1970867>
- Stephensen, D., Bladen, M., & McLaughlin, P. (2018). Recent advances in musculoskeletal physiotherapy for haemophilia. *Therapeutic Advances in Hematology*. <https://doi.org/10.1177/2040620718784834>

- Strömbäck, M., Malmgren-Olsson, E. B., & Wiklund, M. (2013). "Girls need to strengthen each other as a group": Experiences from a gender-sensitive stress management intervention by youth-friendly Swedish health services - A qualitative study. *BMC Public Health*. <https://doi.org/10.1186/1471-2458-13-907>
- Sundar Rao, S. (2015). Perspectives on the impact of stigma in leprosy: strategies to improve access to health care. *Research and Reports in Tropical Medicine*. <https://doi.org/10.2147/rrtm.s55903>
- Tallner, A., Waschbisch, A., Hentschke, C., Pfeifer, K., & Mäurer, M. (2015). Mental health in multiplesclerosis patients without limitation of physical function: The role of physical activity. *International Journal of Molecular Sciences*. <https://doi.org/10.3390/ijms160714901>
- Tamminen, N., Reinikainen, J., Appelqvist-Schmidlechner, K., Borodulin, K., Mäki-Opas, T., & Solin, P. (2020). Associations of physical activity with positive mental health: A population-based study. *Mental Health and Physical Activity*. <https://doi.org/10.1016/j.mhpa.2020.100319>
- Thorborg, K., & Mendonça, L. (2021). Sports physiotherapy for all. In *International Journal of Sports Physical Therapy*. <https://doi.org/10.26603/001c.28268>
- Tipping, C. J., Scholes, R. L., & Cox, N. S. (2010). A qualitative study of physiotherapy education for parents of toddlers with cystic fibrosis. *Journal of Cystic Fibrosis*. <https://doi.org/10.1016/j.jcf.2010.02.003>
- Tosh, C., Kavanagh, K., Flynn, A. C., Stephenson, J., White, S. L., Catalao, R., & Wilson, C. A. (2023). The physical-mental health interface in the preconception period: analysis of 131 182 women planning pregnancy in the UK. *BJOG: An International Journal of Obstetrics and Gynaecology*. <https://doi.org/10.1111/1471-0528.17447>
- Tullina, D., Chan, M. K., BF Wong, M., & Dupuis, G. E. (2020). Neuroplasticity, brain entrainment, cognition and intellectual functions amelioration through the complex integrative approach of biological regenerative medicine. *Journal of Stem Cell Research & Therapeutics*. <https://doi.org/10.15406/jsrt.2020.06.00139>
- Uribe-Restrepo, J. M., Escobar, M. L., & Cubillos, L. (2017). Psychiatric rehabilitation in Latin America: Challenges and opportunities. In *Epidemiology and Psychiatric Sciences*. <https://doi.org/10.1017/S2045796016000846>
- Valentim, O., Vilelas, J., Carvalho, J. C., Andrade, C. M. S. M., Tomás, C., Costa, P. S., & Sequeira, C. (2023). The relation between lifestyles and positive mental health in Portuguese higher education students. *Global Health Promotion*. <https://doi.org/10.1177/17579759221112552>
- Valimaki, M., Camuccio, C., Guise, V., Cocoman, A., Hatonen, H., Rocha, L., & Vaitkuviene, J. (2010). SKILL NEEDS ANALYSIS IN EUROPEAN MENTAL HEALTH CARE EDUCATION: INNOVATIONS AND CHALLENGES IN CURRICULUM DEVELOPMENT. *4th International Technology, Education and Development Conference (Inted 2010)*.
- Van Der Meer, L., & Wunderink, C. (2019). Contemporary approaches in mental health rehabilitation. In *Epidemiology and Psychiatric Sciences*. <https://doi.org/10.1017/S2045796018000343>
- van der Merwe, A., Barnes, R. Y., & Labuschagne, M. J. (2022). The PIER framework for healthcare simulation integration in undergraduate physiotherapy education. *BMC Medical Education*. <https://doi.org/10.1186/s12909-022-03751-7>
- van Dijk, M., Allegaert, P., Locus, M., Deschoudt, M., Verheyden, G., Tournoy, J., & Flamaing, J. (2021). Geriatric Activation Program Pellenberg, a novel physiotherapy program for hospitalized patients on a geriatric rehabilitation ward. *Physiotherapy Research International*. <https://doi.org/10.1002/pri.1905>

- van Vuuren, C. J. (2022). Impactful educational transitions: Crossroads for physiotherapy education in South Africa? *South African Journal of Physiotherapy*. <https://doi.org/10.4102/SAJP.V78I1.1638>
- Whelan, M. J., Roos, R., Fourie, M., & van Aswegen, H. (2023). Preoperative physiotherapy education for patients undergoing colorectal cancer resection. *South African Family Practice*. <https://doi.org/10.4102/safp.v65i1.5614>
- Wiklund, M., Öhman, A., Bengs, C., & Malmgren-Olsson, E.-B. (2015). Social and gendered embodiment – a useful theoretical concept in youth mental health and physiotherapy. *Physiotherapy*. <https://doi.org/10.1016/j.physio.2015.03.034>
- Williams, A. L., Phillips, C. J., Watkins, A., & Rushton, A. B. (2014). The effect of work-based mentoring on patient outcome in musculoskeletal physiotherapy: Study protocol for a randomised controlled trial. *Trials*. <https://doi.org/10.1186/1745-6215-15-409>
- Wojtalik, J. A., Eack, S. M., & Smith, M. J. (2018). Using cognitive neuroscience to improve mental health treatment: A comprehensive review. *Journal of the Society for Social Work and Research*. <https://doi.org/10.1086/697566>
- Yadav, V., Naqvi, W. M., Qureshi, M. I., Pathak, S., & Kulkarni, C. A. (2021). Competency-based physiotherapy education in Indian context. *Journal of Medical Pharmaceutical and Allied Sciences*. <https://doi.org/10.22270/jmpas.V10I3.1120>
- Mratskova, G., & Deliev, R. (2019). THERAPEUTIC OPPORTUNITIES OF NON-SURGICAL TREATMENT IN PATIENTS WITH URINARY INCONTINENCE. *Knowledge International Journal*. <https://doi.org/10.35120/kij3202261m>