Transcript for Prominence Musculoskeletal Considerations in Adults with Obesity - Lecture

Slide 1:

Welcome to this presentation where we will explore the musculoskeletal considerations relevant to adults living with obesity.

I'm Caitriona Cunningham from University College Dublin in Ireland, and this presentation was developed by myself and Dr Mary Davis.

The aim is to support you to develop clinically effective, evidence-informed, and person-centred approaches when working with this population.

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This session will begin by outlining the relationship between obesity and musculoskeletal pathology, including how obesity contributes to pain, injury risk and long-term functional limitations.

We will then review some of the most common musculoskeletal conditions seen in adults with obesity.

The discussion will explore the role of adiposity, systemic inflammation and their contribution to pain sensitivity and chronic pain states.

From there, we'll consider key clinical assessment considerations and the implications for physiotherapy practice and rehabilitation.

Slide 3:

Obesity is strongly associated with the development and persistence of musculoskeletal pathology and pain. As physiotherapists, this means obesity can influence not only the conditions we see, but also how we assess patients, select interventions, and predict rehabilitation outcomes.

There are well-established clinical guidelines for the management of pain and for many individual musculoskeletal conditions, such as osteoarthritis or low back pain. Separate guidelines exist for obesity management.

However, guidelines rarely address the combined presentation of obesity

and musculoskeletal pain, despite this being a very common clinical presentation.

To understand why obesity has such a significant impact on musculoskeletal health, it's helpful to consider the key interacting mechanisms.

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It's important to emphasise that obesity-related musculoskeletal pain and dysfunction are not simply the result of 'wear and tear' on joints and tissues.

While increased mechanical loading does play a role, the mechanisms linking obesity and pain are complex and multifactorial, with many shared and overlapping associations.

For example, obesity is often associated with increased sedentary behaviour and reduced physical activity levels. Both of these factors are independently associated with the development and persistence of musculoskeletal pain and deconditioning.

At the same time, pain itself can lead to further reductions in activity, reinforcing a cycle of inactivity, weight gain, and worsening pain.

Psychosocial factors also need to be carefully considered. Depression, pain catastrophising, fear avoidance, and reduced confidence in movement are more prevalent in people living with obesity and can significantly influence pain perception, behaviour, and recovery.

As physiotherapists, this highlights the importance of moving beyond purely structural explanations for pain and a need to adopt a biopsychosocial approach.

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Adipose tissue is not just passive fat storage — it is metabolically active and releases a range of pro-inflammatory molecules, including cytokines such as TNF-alpha and interleukin-6, as well as adipokines like leptin.

This creates a state of chronic, low-grade systemic inflammation, which has important implications for musculoskeletal health and pain perception.

One key effect of this inflammation is increased nociceptor sensitivity, contributing to heightened pain experiences.

Leptin, in particular, has been linked with increased pain perception, further linking excess adiposity to the experience of musculoskeletal pain.

Beyond pain sensitivity, chronic inflammation also contributes to cartilage breakdown in joints and can alter pain processing centrally, potentially leading to central sensitisation. This explains why musculoskeletal pain in adults with obesity can sometimes be more persistent, widespread, or difficult to manage than would be expected based on structural pathology alone.

Understanding these inflammatory mechanisms is crucial for physiotherapists, as it emphasises the need for holistic management that addresses tissue load, physical capacity, and systemic factors influencing pain.

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Adults living with obesity and musculoskeletal pain often experience reduced mobility and movement capacity. Simple tasks such as standing, walking, or bending may become more challenging, and over time, this can lead to further deconditioning.

Transfers and activities of daily living, such as getting in and out of a chair, dressing, or reaching overhead, may also be difficult, requiring careful consideration during assessment and rehabilitation.

Kinesiophobia, or fear of movement, is also common in this population. Pain, combined with concerns about injury, damage or discomfort, can lead to avoidance of activity, which reinforces weakness, stiffness, and causes further functional limitation.

Reduced activity tolerance and overall physical capacity are frequently observed. Even routine activities, like climbing stairs or carrying groceries, may cause fatigue or exacerbate pain.

Altered biomechanics are another key factor. Increased body mass changes movement patterns and increases mechanical load across joints, which can accelerate tissue stress and contribute to pain.

Finally, the psychosocial impact of this combination of pain, reduced mobility, and obesity can be significant. Participation in physical activity, social roles, and everyday life can all be affected, further influencing mood, confidence, and overall quality of life.

Understanding these functional implications is crucial for physiotherapists. Physiotherapy interventions should aim not just to reduce pain, but to improve movement, independence, and participation.

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Therapists also need to be aware of the impact of new pharmacological therapies on the musculoskeletal system. Glucagon-like peptide-1 receptor agonists, or GLP-1 RAs, are increasingly used to support weight management by regulating appetite and glucose metabolism. While they can be very effective for weight reduction, there are potential musculoskeletal implications that physiotherapists should consider.

Evidence suggests that GLP-1 agonists may contribute to reductions in muscle mass and function in certain individuals. This is an important consideration, because muscle strength and mass are key determinants of mobility, joint stability, and functional capacity.

At the same time, emerging research indicates there may also be potential positive effects on the musculoskeletal system, such as reduction in inflammation, reduced joint stress, though these findings are still preliminary and not fully understood.

As physiotherapists, this highlights the need for a holistic, multidisciplinary approach: monitoring functional capacity, incorporating targeted strength and mobility interventions, and collaborating with medical colleagues to optimise outcomes for patients using these new therapies.

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Let’s now look at some of the common musculoskeletal conditions seen in adults living with obesity, starting with osteoarthritis and tendinopathies.

Osteoarthritis, particularly affecting the knee and hip, is highly prevalent in this population. Mechanically, excess body weight increases joint load and can alter gait patterns, which accelerates cartilage wear and contributes to pain.

Biologically, obesity is associated with systemic inflammation. Adipose tissue releases inflammatory cytokines that can degrade cartilage and other joint tissues.

Clinically, this combination often leads to earlier onset of osteoarthritis and faster disease progression compared with adults of a healthy weight, making early recognition and targeted management especially important.

Tendinopathies are also commonly seen in people living with obesity, affecting the Achilles, patellar, or rotator cuff tendons. Increased mechanical load on tendons is a major factor, but biological mechanisms are also relevant. Inflammation and altered collagen metabolism can

impair tendon healing, making recovery slower and sometimes more complicated.

Understanding both the mechanical and biological contributions to these conditions helps physiotherapists plan interventions that address tissue load, inflammation, and functional limitations in a holistic manner.

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Continuing with common musculoskeletal conditions in adults with obesity, low back pain and foot and ankle pain are particularly important to consider.

Overweight and obesity increase the risk of low back pain, including chronic low back pain and cases that require healthcare intervention. Mechanically, higher body mass increases compressive forces on the lumbar spine, while reduced trunk muscle endurance and deconditioning further compromise spinal function. Over time, this can contribute to degenerative disc disease and facet joint pain.

Biologically, systemic inflammation associated with obesity can heighten pain sensitivity, making symptoms more persistent and severe.

Clinically, these factors may predict poorer outcomes from conservative treatment, highlighting the need for individualised, multimodal management strategies that address load, strength, and movement quality.

Foot and ankle pain are also common, including conditions such as plantar fasciitis. Excess body weight can contribute to mid-foot collapse and high plantar pressures, thus altering foot biomechanics.

These changes can impair balance, reduce gait efficiency, and increase the risk of further musculoskeletal injury.

Recognising the interplay of mechanical stress, tissue health, and functional impact is essential for designing effective physiotherapy interventions across the kinetic chain, from the spine to the feet.

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When assessing adults living with obesity and musculoskeletal pain, a comprehensive and patient-centred approach is essential.

Start with a thorough pain history. Ask about the location, duration, and nature of the pain, as well as factors that aggravate or relieve it. Explore how pain impacts function, sleep, and participation in daily life, and review any previous treatments and their outcomes.

Screen for psychosocial risk factors, often referred to as yellow flags. Many risk factors for chronic pain, such as low mood, fear avoidance, or reduced self-efficacy, overlap with factors commonly seen in people living with obesity. Recognising these early can guide more effective management strategies.

Identify patient-centred goals. Clarify the primary reason the person is seeking care. If the musculoskeletal condition is the main concern, ensure your assessment and management prioritise this, while still considering other health factors.

Finally, be aware of weight-related stigma in healthcare. People living with obesity often experience stigma, which can include feeling that their health concerns have been dismissed or automatically attributed to weight. As physiotherapists, it's important to create a respectful, supportive environment and to focus on the individual's goals and functional priorities rather than assumptions about body size.

A comprehensive, compassionate assessment not only improves clinical accuracy but also builds trust, engagement, and long-term adherence to physiotherapy interventions.

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The Edmonton Obesity Staging System is presented as a reminder of the differing stages of obesity with different impacts on the MSK and other systems.

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When we consider best practice care for musculoskeletal conditions and pain, recent high-quality clinical guidelines and evidence, such as the papers shown here, consistently recommend a person-centred approach that prioritises physical activity, self-management, and multimodal interventions.

This evidence indicates the importance of individualised exercise, education, and addressing psychosocial factors to optimise outcomes in adults with chronic pain.

However, it is crucial to recognise that evidence such as this does not specifically refer to the management of pain in adults living with obesity and thus, does not take into account the additional mechanical, metabolic, and psychosocial challenges present.

Obesity can impact implementation of evidence-based recommendations for a specific MSK condition through factors such as altered biomechanics, reduced physical capacity, fear avoidance, and stigma, all of which may affect patient engagement and outcomes.

Physiotherapists must therefore adopt flexible, empathic strategies that balance evidence-based principles for a particular musculoskeletal condition with individualised care that takes account of the presence of obesity and related complications.

This includes adapting exercises for safety and feasibility, addressing barriers to physical activity, and fostering motivation and confidence. Collaboration with multidisciplinary teams, ongoing patient education, and advocacy for stigma-free care environments are also essential.

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When providing rehabilitation for adults living with obesity and musculoskeletal pain, a person-centred and weight-neutral approach is essential.

While weight management is often recommended as part of overall healthcare, the primary focus of physiotherapy should be on functional improvement rather than weight loss alone.

Adopting a biopsychosocial framework helps us address the full range of contributors to pain.

Fear of movement is common in this population, so it’s important to explore any concerns or misconceptions. For example, reassuring patients that pain does not always equal tissue damage can reduce fear and encourage activity.

Building movement confidence and self-efficacy through graded exposure is a key strategy. Gradually increasing activity levels helps patients regain trust in their bodies and improves function.

Physiotherapy should emphasise active, graded rehabilitation over passive treatments. Movement itself is central not only for reducing pain and improving musculoskeletal function, but also for supporting cardiometabolic health.

Ultimately, rehabilitation that is respectful, individualised, and focused on meaningful functional goals promotes better outcomes and long-term engagement.

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When prescribing exercise for adults living with obesity, it's important to consider the severity of obesity, often classified using the Edmonton Obesity Staging System, or EOSS.

Using this system (EOSS) stages 0 to 2, where obesity-related complications are minimal or moderate, combined aerobic and resistance training is recommended, consistent with cardiovascular and obesity management guidelines.

The aerobic exercise target is 150 to 300 minutes per week, gradually progressed based on individual capacity and tolerance.

Resistance training should be incorporated two to three days per week to support muscle strength and joint stability.

Flexibility and balance exercises may also be beneficial to improve mobility, prevent falls and enhance overall functional ability.

Prescribing a mixed exercise programme that addresses these components supports cardiovascular health, musculoskeletal function and quality of life.

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For adults with more advanced obesity complications, classified as EOSS stage 3, obesity-related health issues may significantly impact the ability to engage in physical activity and exercise.

In these cases, it's still important to align exercise prescription with disease-specific clinical guidelines. For example, guidelines for conditions such as stroke, heart disease, or diabetes.

At EOSS stage 4, where obesity complications and mobility limitations are often greatest, the focus should shift toward encouraging 'little and often' or an 'everything counts' approach when it comes to physical activity.

Here, specific exercise duration or intensity targets are less important than prioritising function, managing pain, and supporting any achievable movement.

This flexible approach respects the individual's capacity and promotes gradual improvements without overwhelming the person.

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Regardless of obesity severity, some key principles apply when supporting adults to increase physical activity and exercise.

Low-impact exercises should be prioritised to reduce joint stress while improving capacity. Examples include walking on flat surfaces, cycling, aquatic exercise if appropriate, and seated or supported strengthening exercises.

Using graded exposure and pacing is vital. Start exercise below pain-provoking thresholds, then gradually increase duration and intensity while carefully monitoring symptoms between sessions.

Targeting large muscle groups, such as the hip and knee extensors, trunk stabilisers, and gluteal muscles, helps improve load sharing and joint stability.

Finally, it's important to prioritise exercise that the person enjoys and is likely to adhere to, as consistency is key for long-term benefits.

By tailoring programmes with these principles in mind, physiotherapists can support sustainable improvements in function, pain management, and overall health.

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Education is a vital part of managing musculoskeletal pain in adults living with obesity.

Start by exploring the person's beliefs about pain, weight, and exercise. Address fear-avoidance behaviours and catastrophising, which can increase disability and reduce activity.

It's important to correct common myths about painful movement and reassure patients that movement is generally safe and beneficial.

Discuss pacing strategies to help patients balance activity and rest, reducing the risk of flare-ups.

For behaviour change, collaborate on realistic and meaningful functional goals, like walking to the shop, work or playing with children, to enhance motivation and adherence.

Use goal-setting and motivational strategies to promote self-management and establish sustainable physical activity routines.

Emphasise small, achievable steps, as these build confidence and support long-term success.

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Manual therapy may have a role in managing musculoskeletal conditions in adults with obesity, but as always, its use should be guided by the individual patient presentation and relevant evidence-based clinical guidelines.

As for all patients, consider whether manual therapy is indicated, whether a more active, exercise-based approach is preferable or perhaps a combined approach, perhaps moving from some manual therapy initially, and then to a more active approach.

Clinical reasoning should adopt a biopsychosocial approach, addressing underlying causal factors and selecting interventions or intervention packages most likely to lead to optimal outcomes.

When manual therapy is used, it should complement other treatments rather than stand alone.

People moving and handling principles are important here. Consider patient positioning and therapist biomechanics to optimise comfort, safety and treatment effectiveness when using manual therapy techniques. Ensure appropriate plinths, supports and equipment to reduce injury risk for the physiotherapist and to facilitate effective manual therapy.

These considerations help ensure that manual therapy is safe, comfortable, and effective for adults with obesity.

Bariatric ergonomics is covered in a separate OER section where the need for risk benefit analysis is highlighted when making clinical decisions.

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Modest weight loss - typically five to ten percent of body weight - can reduce joint pain and improve function in people with overweight or obesity and musculoskeletal pain.

Reductions in adiposity are associated with lower levels of inflammatory markers, such as C-reactive protein and interleukin-6, which often parallel improvements in chronic pain and mobility.

However, it’s important to recognise that obesity is a chronic, relapsing disease. The weight loss journey is often non-linear and requires ongoing support and realistic expectations.

Pharmacotherapy is commonly used as part of pain management. Many adults take analgesics such as paracetamol or NSAIDs, adjuvant agents like certain antidepressants, or they may receive joint injections.

Physiotherapists should understand the indications and potential side effects of these medications in order to provide comprehensive care.

Patient education is crucial. Medications can support active rehabilitation but should never be considered as stand-alone solutions.

By integrating weight management, pharmacotherapy, education, and active rehabilitation, physiotherapists can contribute to effective, holistic pain management for adults with obesity and musculoskeletal pain.