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Beyond the Surface: Insights into Low Back Pain's Impact on Women's Health

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Abstract:

Low back pain (LBP) is a prevalent and multifaceted health issue affecting women, with significant implications for their overall well-being. This review examines the complex interplay of biopsychosocial factors contributing to LBP in women, including biological differences such as spine structure variations and hormonal influences, as well as psychosocial elements like stress and anxiety. Women experience a wide range of symptoms, from localized pain to radiating discomfort and functional impairments, which complicate diagnosis and management. The review highlights that managing LBP requires a combination of non-pharmacological interventions, such as exercise and physical therapy, and careful consideration of pharmacological treatments, including NSAIDs and muscle relaxants, with attention to gender-specific considerations. In severe cases, surgical options may be explored, although their effectiveness varies. The impact of LBP on women's quality of life is profound, leading to functional limitations, psychological distress, and significant economic burdens due to healthcare costs and lost productivity. Preventive strategies are crucial, encompassing lifestyle modifications, ergonomic practices, and public health initiatives aimed at raising awareness and promoting healthy behaviors. The review also identifies future research needs, emphasizing the importance of gender-specific studies and innovative approaches like personalized medicine, telemedicine, and wearable technology. Addressing these areas will be essential for advancing LBP management and improving outcomes for women. Ultimately, this review underscores the necessity for a comprehensive, gender-sensitive approach to tackling LBP to enhance the quality of life and reduce the burden on women's health.

Keywords: Hormonal Changes, Functional Impairment, Psychological Distress, Ergonomic Practices, Pharmacological Treatments, Preventive Measures

1. Introduction

Low back pain (LBP) is a significant health issue that impacts women's lives in numerous ways. Understanding the etiology and risk factors specific to women is crucial for effective prevention and treatment strategies. The causes of LBP in women are multifaceted, including mechanical, biological, and psychosocial elements. Women-specific factors, such as pregnancy and hormonal changes, add to the complexity of LBP etiology and require special consideration compared to their male counterparts.

The biopsychosocial model is essential in comprehending LBP among women, as it integrates the intricate interplay of biological differences, psychological factors, and social influences. This holistic approach is necessary to address the unique challenges women face, including

the impact of hormonal fluctuations and psychosocial stressors, which can exacerbate LBP symptoms.

Clinically, women with LBP present with a wide range of symptoms, often complicating diagnosis and treatment. The overlap with other conditions, such as gynecological issues, necessitates a thorough differential diagnosis to ensure appropriate and effective management. Recognizing the unique clinical presentations and challenges in diagnosing LBP in women is fundamental for healthcare providers.

Management approaches for LBP in women are diverse, involving both non-pharmacological and pharmacological treatments. Non-pharmacological interventions, including exercise, physical therapy, and ergonomic modifications, are often prioritized. Pharmacological treatments must be tailored to consider potential side effects and contraindications specific to women. In severe cases, surgical options may be explored, though their effectiveness can vary. [1]

The impact of LBP on women's quality of life is profound, affecting physical, psychological, and social well-being. Chronic LBP can lead to significant functional limitations, disability, and psychological issues such as depression and anxiety. Additionally, the economic burden of LBP encompasses both direct healthcare costs and indirect costs related to productivity losses and absenteeism.

Preventive strategies for LBP emphasize lifestyle modifications, public health initiatives, and education. Promoting ergonomic practices and healthy behaviors can significantly reduce the risk of developing LBP. Public health campaigns and education by healthcare professionals, particularly nurses, are vital in raising awareness and implementing effective preventive measures. Addressing LBP from a preventive standpoint can enhance women's overall health and well-being.

This review aims to investigate these critical aspects of LBP in women, providing a comprehensive understanding of its etiology, clinical presentation, management approaches, and the broader impact on quality of life. By focusing on these key areas, the review highlights the importance of gender-specific research and interventions in improving health outcomes for women suffering from LBP. [2]

2. Etiology and Risk Factors

The etiology of low back pain (LBP) in women is complex and involves an interplay of various mechanical, biological, and psychosocial factors. Understanding these factors is crucial for developing targeted prevention and treatment strategies.

Mechanical Factors: Mechanical factors are often primary contributors to LBP in women. Common mechanical causes include muscle strain and ligament sprains resulting from improper lifting techniques, sudden movements, or overuse during physical activities. Herniated discs, where the cushioning material between the vertebrae protrudes out of its normal space, can also lead to significant pain and discomfort. Degenerative spinal conditions, such as osteoarthritis and spinal stenosis, are more prevalent as women age and contribute to chronic LBP.

Biological Factors: Biological differences between men and women play a significant role in the etiology of LBP. Anatomical differences, such as a wider pelvis in women, can affect

spinal alignment and mechanics, potentially leading to increased stress on the lower back. Hormonal changes throughout a woman's life, particularly during pregnancy and menopause, also influence the occurrence and severity of LBP. During pregnancy, the growing uterus shifts the center of gravity, leading to altered posture and increased lumbar lordosis (curvature of the lower spine), which can strain the lower back muscles and ligaments. Additionally, the release of the hormone relaxin during pregnancy, which loosens the ligaments to accommodate childbirth, can increase joint laxity and instability, further contributing to LBP.

Psychosocial Factors: Psychosocial factors significantly impact the perception and management of LBP in women. Stress, anxiety, and depression are common in individuals with chronic pain and can exacerbate the experience of LBP. The biopsychosocial model of pain highlights the importance of considering psychological and social dimensions in the assessment and treatment of LBP. Women often face unique psychosocial stressors, such as balancing work, family responsibilities, and caregiving roles, which can contribute to the onset or worsening of LBP. Furthermore, societal expectations and gender roles may influence how women perceive and report pain, as well as their willingness to seek treatment. [3]

Occupational and Lifestyle Factors: Women are often engaged in occupations and lifestyle activities that predispose them to LBP. Jobs that require prolonged standing, repetitive movements, or heavy lifting, such as nursing, teaching, or factory work, can increase the risk of developing LBP. Additionally, lifestyle factors such as wearing high-heeled footwear can lead to altered posture and spinal alignment, placing extra stress on the lower back. Sedentary lifestyles, including prolonged sitting at desks or in front of computers, can weaken core muscles and contribute to poor posture, further increasing the risk of LBP.

Specific Female-Related Conditions: Several conditions unique to women can contribute to LBP. Endometriosis, a condition where tissue similar to the lining of the uterus grows outside the uterus, can cause significant pelvic and lower back pain. Similarly, menstrual cycle-related changes can lead to fluctuating pain levels, with some women experiencing increased LBP during menstruation due to hormonal fluctuations. Postpartum women may also experience LBP due to the physical demands of childbirth and the stress of caring for a newborn, which often involves lifting and carrying the baby.

The etiology of LBP in women is multifactorial, involving a combination of mechanical, biological, psychosocial, occupational, and lifestyle factors. These factors interact in complex ways, making it essential to adopt a holistic approach when assessing and treating LBP in women. By understanding the unique contributions of each factor, healthcare providers can develop more effective, personalized interventions to manage and prevent LBP in women. [4]

3. Biopsychosocial Factors

Low back pain in women is influenced by a complex interaction of biological, psychological, and social factors, often referred to as the biopsychosocial model. Understanding these factors is crucial for a comprehensive approach to managing and treating LBP.

Biological Factors

Anatomical and Structural Differences:

Biological differences between men and women can influence the likelihood and severity of LBP. Women typically have a wider pelvis, which can alter spinal alignment and biomechanics. This anatomical variation may contribute to increased stress on the lumbar spine and surrounding structures. Additionally, differences in muscle composition and strength can affect spinal support and stability. For instance, women often have a higher proportion of body fat and less muscle mass compared to men, which may impact the support provided to the spine.

Hormonal Influences:

Hormonal fluctuations play a significant role in LBP among women. During pregnancy, the body produces relaxin, a hormone that increases ligament laxity to accommodate childbirth. While this is beneficial for delivery, it can also lead to increased joint instability and back pain. Menstruation and menopause are other critical periods where hormonal changes can exacerbate LBP. For example, progesterone levels fluctuate during the menstrual cycle, which can influence pain perception and increase sensitivity to pain. Postmenopausal women experience a decline in estrogen, which affects bone density and can contribute to conditions such as osteoporosis, increasing the risk of spinal degeneration and LBP.

Psychological Factors:

Stress and Anxiety: Psychological factors, such as stress and anxiety, are significant contributors to LBP in women. Chronic stress can lead to muscle tension and poor posture, which may exacerbate or contribute to LBP. Stress also influences the perception of pain, making individuals more sensitive to discomfort. Women experiencing high levels of anxiety or chronic stress may report more severe pain and have a higher likelihood of developing chronic LBP.

Depression: Depression is commonly associated with chronic pain conditions, including LBP. Women with depression may experience heightened pain perception due to altered pain processing in the brain. Additionally, depression can affect a person's motivation to engage in physical activity or adhere to treatment plans, potentially worsening LBP. The relationship between depression and LBP is bidirectional, with chronic pain potentially leading to or exacerbating depressive symptoms.

Social Factors

Social Support: Social factors, including the availability of social support, can impact the experience and management of LBP. Women who have strong social support networks may cope better with pain and have better outcomes compared to those with limited support. Support from family, friends, and healthcare providers can influence pain management strategies and treatment adherence.

Work and Family Responsibilities: Women often juggle multiple roles, including professional responsibilities and family caregiving, which can contribute to or exacerbate LBP. Occupational stressors, such as prolonged sitting, repetitive tasks, or physically

demanding work, can impact spinal health. Balancing work and family duties may also lead to increased stress and strain, potentially worsening LBP.

Socioeconomic Status: Socioeconomic factors can influence the prevalence and management of LBP. Women with lower socioeconomic status may have limited access to healthcare resources, including preventive measures and treatments for LBP. Financial constraints and lack of access to quality healthcare can result in delayed diagnosis and treatment, leading to poorer outcomes. [3]

Hormonal Changes

Pregnancy: During pregnancy, the growing uterus alters the center of gravity, which can increase lumbar lordosis (exaggeration of the lower back curve) and strain the lower back muscles. Additionally, the hormonal changes associated with pregnancy, such as increased relaxin levels, contribute to joint laxity and increased risk of LBP.

Menstruation: Hormonal fluctuations during the menstrual cycle can affect pain sensitivity and exacerbate LBP symptoms. Women may experience increased back pain just before or during menstruation due to hormonal changes affecting muscle tension and pain perception.

Menopause: Menopause leads to a decrease in estrogen levels, which affects bone density and increases the risk of osteoporosis. Osteoporosis can contribute to vertebral fractures and degenerative changes in the spine, resulting in LBP. The decline in estrogen also impacts connective tissues and joints, potentially leading to increased discomfort and pain.

LBP in women results from a complex interplay of biological, psychological, and social factors. Addressing these factors comprehensively is essential for the effective management and treatment of LBP. Tailoring interventions to account for hormonal influences, psychological well-being, and social support can improve outcomes and enhance the overall quality of life for women experiencing LBP. [5]

4. Clinical Presentation

Women with low back pain (LBP) present with a diverse range of symptoms that can vary significantly in intensity and impact. The most common manifestation is localized pain in the lower back, which may be described as dull, aching, or sharp. In some cases, the pain may radiate to the legs, a condition often referred to as sciatica. This radiating pain typically follows the path of the sciatic nerve, extending from the lower back through the buttocks and down the legs, and may be accompanied by sensations of numbness, tingling, or weakness.

Functional impairment is another significant aspect of LBP presentation. Women with this condition may experience difficulties with activities of daily living, such as bending, lifting, or walking, which can impact their overall quality of life and limit their ability to perform work or household tasks. The severity of functional impairment can vary, with some women experiencing mild limitations while others may face significant disruptions to their daily routines. [6]

Diagnosing LBP in women presents several challenges due to the potential overlap with other medical conditions, particularly gynecological disorders. Conditions such as endometriosis, ovarian cysts, or pelvic inflammatory disease can present with symptoms similar to LBP, making it essential to differentiate between these conditions to ensure accurate diagnosis and

effective treatment. The presence of other symptoms, such as abnormal menstrual cycles or pelvic pain, may further complicate the diagnostic process.

A thorough differential diagnosis is crucial to identify the underlying cause of LBP and to develop a tailored treatment plan. This process typically involves a detailed patient history, physical examination, and, if necessary, imaging studies such as X-rays, MRIs, or CT scans to rule out structural abnormalities or other underlying conditions.

Healthcare providers must approach the diagnosis and management of LBP in women with a comprehensive perspective, taking into account the unique presentations and challenges specific to this population. This includes considering the potential impact of hormonal changes, psychosocial factors, and the interplay of other health conditions. By doing so, providers can better address the multifaceted nature of LBP and offer more effective and personalized treatment strategies.

5. Management Approaches

Management of low back pain (LBP) in women requires a comprehensive approach that integrates both non-pharmacological and pharmacological interventions. The choice of treatment often depends on the severity of the pain, the underlying cause, and the individual patient's health status and preferences.

Non-Pharmacological Treatments

1. Exercise:

Exercise therapy is a cornerstone of LBP management. It helps improve flexibility, strengthen core muscles, and enhance overall physical conditioning. Regular exercise, including activities such as walking, swimming, and specific stretching and strengthening exercises, can reduce pain and improve function. Tailored exercise programs often focus on strengthening the abdominal and lower back muscles to provide better support for the spine.

2. Physical Therapy:

Physical therapy involves a range of techniques designed to alleviate pain and improve function. Therapists may use manual therapy, including spinal manipulation and mobilization, to address musculoskeletal issues. They also guide proper body mechanics and ergonomic practices to prevent further injury. Educational components of physical therapy help patients learn how to manage their condition and avoid activities that exacerbate their symptoms.

3. Ergonomic Adjustments:

Ergonomic interventions involve modifying the physical environment to support better posture and reduce strain on the back. This can include adjustments to workstations, using chairs with proper lumbar support, and adopting correct lifting techniques. Ergonomic education helps women make these adjustments both at work and at home, aiming to minimize the risk of developing or worsening LBP. [7]

Pharmacological Treatments

1. Nonsteroidal Anti-Inflammatory Drugs (NSAIDs):

NSAIDs, such as ibuprofen and naproxen, are commonly used to manage LBP. They work by reducing inflammation and alleviating pain. While effective, NSAIDs can have side effects, including gastrointestinal irritation, renal impairment, and cardiovascular risks. Women may be particularly susceptible to these side effects, especially when used long-term, so careful consideration and monitoring are necessary. [8]

2. Muscle Relaxants:

Muscle relaxants, such as cyclobenzaprine and methocarbamol, are prescribed to relieve muscle spasms associated with LBP. These medications can help reduce pain and improve mobility. However, they can cause drowsiness, dizziness, and other side effects, which must be weighed against their benefits. Their use is typically short-term due to the potential for dependence and adverse effects. [9]

3. Other Pharmacological Options:

In some cases, other medications may be considered, including acetaminophen for pain relief or antidepressants such as tricyclic antidepressants, which can help with chronic pain and improve sleep. Opioids are generally reserved for severe, refractory pain due to their risk of addiction and other significant side effects.

Surgical Interventions

In severe cases of LBP that do not respond to conservative treatments, surgical options may be considered. Surgical interventions can range from minimally invasive procedures, such as endoscopic discectomy, to more extensive surgeries, such as spinal fusion. The choice of surgery depends on the specific diagnosis, the extent of spinal damage, and the overall health of the patient. While surgery can be effective in relieving pain and restoring function, its success varies and involves risks such as infection, bleeding, and complications related to anesthesia.

Overall, managing LBP in women requires a multidisciplinary approach that combines various treatment modalities. It is essential to tailor the management plan to the individual needs of each patient, considering factors such as the cause of pain, overall health, and personal preferences. Regular follow-up and reassessment are crucial to ensure that the treatment remains effective and to make any necessary adjustments.

6. Impact on Quality of Life

Functional Limitations and Disability:

Women suffering from low back pain (LBP) frequently encounter significant functional limitations that impair their daily routines. This disability often affects their ability to perform essential tasks such as household chores, childcare, and personal care activities. The pain may also restrict participation in recreational activities and limit mobility, which can affect overall quality of life and lead to decreased independence. Chronic pain conditions can lead to the

development of compensatory movement patterns or postural changes, which may further contribute to discomfort and functional impairment. [10]

Psychological Distress:

The psychological impact of LBP is profound; as persistent pain often leads to heightened levels of emotional distress. Women with chronic LBP are at increased risk of developing mood disorders such as depression and anxiety. The constant discomfort can disrupt daily life and sleep patterns, leading to fatigue, irritability, and decreased cognitive function. The fear of exacerbating the pain or being unable to manage the condition may contribute to feelings of hopelessness and diminished self-esteem. Additionally, chronic pain is associated with a decreased ability to engage in enjoyable activities, further affecting emotional well-being and mental health. [11]

Social and Economic Consequences:

Socially, LBP can significantly affect personal relationships and social interactions. Women may experience reduced engagement in social activities due to pain, leading to social isolation and strained relationships with family and friends. The impact on social life can lead to a diminished support network, which may exacerbate feelings of loneliness and stress. Economically, the cost burden of LBP includes not only direct healthcare expenses but also indirect costs such as lost wages and decreased productivity. Women may face challenges in maintaining employment or may need to reduce working hours, impacting household income and financial stability. Long-term or severe cases of LBP can lead to a cycle of ongoing medical treatments and lost income, further straining financial resources. [12]

Holistic Approach:

To effectively manage LBP and its extensive effects on quality of life, a holistic approach is essential. This approach should incorporate physical therapy to improve function, psychological support to address mental health concerns, and social interventions to enhance social engagement and support. Multidisciplinary care, including collaboration between healthcare providers, mental health professionals, and social workers, can provide comprehensive support for women suffering from LBP. Additionally, patient education on pain management techniques and self-care strategies is crucial for empowering women to actively participate in their care and improve their overall well-being. Implementing these strategies can help alleviate the multifaceted burden of LBP, ultimately enhancing women's quality of life and enabling them to lead more fulfilling and productive lives. [13]

7. Preventive Strategies

Preventing low back pain (LBP) requires a comprehensive approach that incorporates various strategies to address both individual and systemic factors. Effective prevention involves lifestyle modifications, public health initiatives, and educational efforts aimed at reducing the risk of LBP and promoting overall spinal health.

Lifestyle Modifications:

Encouraging individuals to adopt healthy lifestyle practices is crucial for preventing LBP. Regular physical activity, including exercises that strengthen the core and improve flexibility, can support spinal health and reduce the risk of injury. Maintaining a healthy weight is also

important, as excess body weight can place additional strain on the lower back. Incorporating practices such as proper posture, ergonomic adjustments, and safe lifting techniques can prevent the onset of LBP. For example, using correct body mechanics when lifting objects and avoiding prolonged periods of sitting or standing can help minimize the risk of developing back pain.

Public Health Initiatives:

Public health campaigns play a key role in raising awareness about LBP and promoting preventive behaviors. These initiatives can include community-based programs, media campaigns, and outreach efforts that highlight the importance of spinal health and provide information on risk factors and prevention strategies. Health organizations and government agencies can collaborate to disseminate educational materials, conduct workshops, and offer resources to the public. Emphasizing the benefits of early intervention and proactive management can help individuals make informed decisions about their health and reduce the prevalence of LBP.

Educational Efforts:

Education is a critical component of preventing LBP, both for individuals and healthcare professionals. Nurses and other healthcare providers are instrumental in educating patients about risk factors, preventive measures, and appropriate self-care techniques. Guiding ergonomic practices, exercise routines, and proper body mechanics can empower individuals to take proactive steps in managing their spinal health. Additionally, incorporating education on the importance of regular check-ups and early intervention can help identify potential issues before they become severe. By fostering a culture of health awareness and self-care, educational efforts can contribute to the long-term prevention of LBP.

Role of Nurses:

Nurses play a pivotal role in preventing LBP through their direct interactions with patients and their involvement in community health initiatives. They can offer personalized education on risk reduction strategies, guide lifestyle modifications, and support patients in implementing preventive measures. By integrating preventive care into routine clinical practice and advocating for spinal health, nurses can help mitigate the impact of LBP and enhance overall well-being. Their contributions are essential in promoting a proactive approach to back pain prevention and supporting individuals in maintaining a healthy, pain-free lifestyle. [14]

8. Future Directions and Research Needs

Future research on low back pain (LBP) should concentrate on emerging trends and address current gaps to enhance management and prevention. Personalized medicine, which customizes treatment based on individual patient characteristics such as genetic profiles and lifestyle, represents a key area for advancement. This approach could improve intervention efficacy by catering to specific patient needs. Additionally, innovative therapeutic approaches, including advanced pharmacological treatments and novel physical therapy techniques, offer promising avenues for improving LBP management.

Current research has limitations, particularly concerning the effects of hormonal therapies on LBP. Exploring how hormonal fluctuations and treatments like hormone replacement therapy

impact LBP symptoms and progression could provide crucial insights for better management strategies in women. Furthermore, there is a need to delve into gender-specific mechanisms influencing LBP, as the condition often presents differently in women compared to men. Investigating how biological, hormonal, and psychosocial factors uniquely affect LBP in women will aid in developing more effective and targeted interventions.

Technological advancements also hold the potential for transforming LBP management and prevention. Telemedicine can enhance access to care and support remote monitoring, while wearable devices and digital health tools offer real-time data on posture, activity levels, and pain patterns. Research should evaluate the effectiveness of these technologies in reducing LBP and improving patient outcomes. Overall, focusing on these areas will advance our understanding of LBP and improve care quality for those affected by this widespread condition. [15,16]

9. Discussion

The current review highlights several critical aspects of low back pain (LBP) and its management, revealing significant insights and implications for clinical practice. This discussion integrates findings from recent research and clinical observations, providing a comprehensive analysis of LBP's multifaceted nature.

One of the major takeaways from the reviewed literature is the complex interplay between lifestyle factors and LBP. The evidence underscores that sedentary behaviors, poor ergonomics, and inadequate physical activity are closely linked to the onset and exacerbation of LBP. This aligns with the growing recognition that preventive measures must address these modifiable risk factors. The effectiveness of lifestyle interventions, such as regular exercise and ergonomic adjustments, has been well-documented, suggesting that tailored programs could significantly reduce LBP incidence and improve patient outcomes.

Another key discussion point is the evolving understanding of the psychological and emotional dimensions of LBP. Research increasingly supports the role of psychosocial factors, such as stress, anxiety, and depression, in the persistence and severity of LBP. This highlights the need for a biopsychosocial approach to LBP management, integrating mental health support into traditional physical treatments. The evidence suggests that interventions addressing psychological well-being can enhance overall treatment efficacy and contribute to better long-term outcomes.

The review also brings attention to the disparities in LBP research and management across different populations. For instance, variations in LBP prevalence and treatment outcomes between different ethnic and socioeconomic groups indicate that a one-size-fits-all approach may be insufficient. Customized care strategies that consider cultural and socioeconomic factors are essential for improving equity in LBP management. Addressing these disparities through targeted research and community-specific interventions could lead to more effective and inclusive care.

Furthermore, the integration of multidisciplinary approaches in LBP management emerges as a significant theme. Combining physical therapy, pharmacological treatments, and alternative therapies, such as acupuncture and mindfulness-based interventions, appears to offer a holistic approach to managing LBP. Evidence supporting these diverse treatment modalities

suggests that a multidisciplinary team approach can address the various dimensions of LBP more effectively than single-modality treatments alone.

10. Conclusion

In conclusion, low back pain (LBP) poses a significant health challenge for women, driven by a range of complex biological, psychological, and social factors. Effective management of LBP requires a comprehensive, integrative approach that addresses these multifaceted dimensions. This involves not only preventive measures and innovative treatments but also a focus on gender-specific research to understand the unique experiences and needs of women. Enhanced emphasis on personalized care and multidisciplinary strategies is essential to improving treatment outcomes and overall quality of life. By advancing our knowledge in these areas, we can better mitigate the personal and societal impact of LBP on women, ultimately leading to more effective and targeted interventions.

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