PHYSIOTRENDS
Advancing Physiotherapy through Knowledge & Innovation

From Angles to Aches: The Q-Angle's Crucial Link to Pain and Life Quality in Postmenopausal Women

Dr. Ishani A Gopiyani (PT), Dr. Sonalee Chudasama (PT)

[1] MPT Cardio-Respiratory Sciences, [2] MPT Musculoskeletal Conditions,

DOI: **10.5281/zenodo.14253779**

ABSTRACT:

Low back pain (LBP) is a prevalent issue among postmenopausal women, significantly affecting their quality of life (QoL) and overall functionality. This study delves into the intricate relationship between pain disability, QoL, and Q-angle within this age group. Over six months, 150 postmenopausal women were recruited from a community health center for this observational study. Pain disability was meticulously assessed using the Oswestry Disability Index (ODI), QoL was evaluated through the SF-36 questionnaire, and the Q-angle was measured with precision using a goniometer. The analysis, conducted using Pearson correlation coefficients, unveiled significant correlations: a strong negative correlation between pain disability and QoL ($r = -0.65$, $p < 0.01$), a moderate positive correlation between pain disability and Q-angle ($r = 0.34$, $p < 0.05$), and a modest negative correlation between QoL and Q-angle ($r = -0.29$, $p < 0.05$). These findings indicate that greater pain disability is linked to poorer QoL and an increased Q-angle in women experiencing LBP. This study underscores the critical need for comprehensive management strategies that address these factors to enhance patient outcomes in this population.

Keywords: Low Back Pain, Postmenopausal, Quality of Life, Pain Disability, Q-angle.

INTRODUCTION:

Low back pain (LBP) is a global health issue, particularly prevalent among women aged 50-60 years.[1] This age group undergoes significant physiological changes due to aging, such as decreased bone density and altered muscle function, which contribute to the onset and persistence of LBP.[2] Understanding the underlying factors associated with LBP in this demographic is vital for developing targeted and effective interventions. One crucial factor is the Q-angle, the angle formed by the quadriceps muscle and the patellar tendon. An increased Q-angle can disrupt lower limb biomechanics, potentially leading to LBP.[3] Additionally, pain disability and quality of life (QoL) are pivotal outcomes that significantly affect the overall well-being of individuals suffering from LBP.[4]

This study aims to explore the intricate relationships between pain disability, QoL, and Q-angle in adults aged 50-60 years, shedding light on the complex interplay of these factors. By investigating these correlations, we hope to provide valuable insights that can inform the development of comprehensive management strategies for this population, ultimately enhancing patient outcomes and quality of life. The findings of this research could pave the way for more effective treatments and interventions, addressing the multifaceted nature of LBP in postmenopausal women.

METHODOLOGY:

This study focused on a population of postmenopausal women aged 50-60 years who were experiencing low back pain (LBP). The sample size consisted of 150 participants, which was determined through a power analysis aimed at detecting medium effect sizes with 80% power and a significance level of 0.05. Data collection was carried out through face-to-face interviews and physical examinations at a community health center. Participants completed standardized questionnaires, and their physical measurements were conducted by trained healthcare professionals to ensure accuracy and reliability.

Participants were recruited over six months using a convenience sampling method, specifically from the outpatient department of the Health Centers. To ensure the suitability of participants, a rigorous screening process was implemented. This included evaluating their medical history and conducting physical examinations. Individuals with severe comorbidities, such as cancer or severe cardiovascular disease, recent surgeries within the past six months, or cognitive impairments that would affect their ability to complete questionnaires were excluded from the study.

The inclusion criteria required participants to be postmenopausal women aged 50-60 years, experiencing LBP for at least three months, and capable of providing informed consent. This thorough and meticulous approach ensured that the study population was well-defined and relevant to the research objectives, providing a robust foundation for examining the correlations between pain disability, quality of life, and Q-angle in this demographic.

STATISTICAL ANALYSIS:

Data analysis was conducted using SPSS version 26. Descriptive statistics provided a comprehensive summary of the sample characteristics, offering a clear overview of the participant demographics and key variables. To explore the relationships between pain disability (measured by the Oswestry Disability Index), quality of life (assessed via the SF-36 questionnaire), and Q-angle, Pearson correlation coefficients were calculated. The significance of these relationships was determined with a p-value threshold of <0.05, ensuring statistical rigor and reliability. This approach allowed for a nuanced understanding of the interplay between these critical factors in the study population.

RESULTS:

- **Descriptive Statistics**

Table 1 presents the demographic and clinical characteristics of the study participants.

Characteristics	*Mean (SD)*
Age (years)	55.4 (2.8)
Duration of LBP (months)	12.7 (7.3)
ODI Score	45.2 (12.5)
SF-36 Score	58.6 (14.8)
Q-angle (degrees)	18.4 (4.2)

- **Correlation Analysis**

Pearson correlation coefficients revealed significant relationships between the variables of interest (Table 2).

Correlation	*r-value*	*p-value*
Pain Disability and QoL	-0.65	<0.01
Pain Disability and Q-angle	0.34	<0.05
QoL and Q-angle	-0.29	<0.05

DISCUSSION:

The findings indicate a significant negative correlation between pain disability and QoL, suggesting that as pain disability increases, QoL decreases. This aligns with previous studies highlighting the impact of LBP on QoL in adults aged postmenopausal women.[5] Additionally, the positive correlation between pain disability and Q-angle suggests that an increased Q-angle may contribute to greater pain disability, potentially due to altered lower limb biomechanics.[6] The negative correlation between QoL and Q-angle further supports the detrimental impact of increased Q-angle on overall well-being.[7,8,9]

CONCLUSION:

This study demonstrates significant correlations between pain disability, QoL, and Q-angle in postmenopausal women with LBP. These findings underscore the importance of comprehensive management strategies addressing these factors to improve outcomes in this population. Further research is needed to explore the underlying mechanisms and develop targeted interventions.

REFERENCES:

[1] Hoy, D., Brooks, P., Blyth, F., & Buchbinder, R. (2010). The Epidemiology of low back pain. *Best practice & research. Clinical rheumatology*, *24*(6), 769–781. https://doi.org/10.1016/j.berh.2010.10.002

[2] Leveille, S. G., Jones, R. N., Kiely, D. K., Hausdorff, J. M., Shmerling, R. H., Guralnik, J. M., & Bean, J. F. (2009). Chronic Musculoskeletal Pain and the Occurrence of Falls in an Older Population. JAMA, 302(20), 2214-2221.

[3] Powers C. M. (2003). The influence of altered lower-extremity kinematics on patellofemoral joint dysfunction: a theoretical perspective. *The Journal of orthopaedic and sports physical therapy*, *33*(11), 639–646. https://doi.org/10.2519/jospt.2003.33.11.639

[4] Chiarotto, A., Maxwell, L. J., Terwee, C. B., Wells, G. A., Tugwell, P., & Ostelo, R. W. (2016). Roland-Morris Disability Questionnaire and Oswestry Disability Index: Which Has Better Measurement Properties for Measuring Physical Functioning in Nonspecific Low Back Pain? Systematic Review and Meta-Analysis. *Physical therapy*, *96*(10), 1620–1637. https://doi.org/10.2522/ptj.20150420

[5] Chou, R., & Shekelle, P. (2010). Will this patient develop persistent disabling low back pain? *JAMA*, *303*(13), 1295–1302. https://doi.org/10.1001/jama.2010.344

[6] Yeole, U., & Rizvi, T.S. (2023). Association between Q angle and flat foot on knee disability in patients with knee osteoarthritis. *International Journal of Science & Engineering Development Research*, 8(7), 837-841. Retrieved from http://www.ijsdr.org/papers/IJSDR2307122.pdf

[7] Ozcan, A., Donat, H., Gelecek, N. *et al*. The relationship between risk factors for falling and the quality of life in older adults. *BMC Public Health* 5, 90 (2005). https://doi.org/10.1186/1471-2458-5-90

[8] You, S., Shen, Y., Liu, Q., & Cicchella, A. (2023). Patellofemoral pain, Q-angle, and performance in female Chinese collegiate soccer players. *Medicina*, *59*(3), 589. https://doi.org/10.3390/medicina59030589

[9] Arab, A. S., Hamam, H. W., Al-Qerem, W. A., & et al. (2023). Health-related quality of life and its associated factors among outpatients with heart failure: a cross-sectional study. *Health and Quality of Life Outcomes*, *21*, 73. https://doi.org/10.1186/s12955-023-02142-w