Hospital Authority Convention 2025

The Role of Body Composition in Knee Pain: Gender-Specific Insights for the SAFE Program

Authors:

Leung SH (1), Tsang NC (3), Wan SY (1), Yeung SF (1), Ng CK (1), Mak YK (2), Wong MK (2), Yam SK (2), Kwong S (3), Lam KM (4), Wu MY (4)

(1) Physiotherapy Department, PYNEH; (2) Department of O&T, PYNEH

(3) Physiotherapy Department, HKEC; (4) Department of SOP, PYNEH

醫院管理局
HOSPITAL AUTHORITY

HONG KONG EAST CLUSTER
港島東醫院聯網

Introduction of SAFE Program

Screening **A**ssessment **F**ast-track **E**ducation

SAFE Launched 2008

Enhancement Program 2024

Introduction of SAFE Program

Long Waiting Time of ORT SOPD Routine Case

↓

Doctor-led Collaborative Models of Physiotherapy Triage and Early Intervention for New Orthopedic Patients with Non-Acute MSK Condition

↓

Screening Assessment Fast-track Education

Care Model on New Patients with MSK Disorders Referred to O&T SOPD

Patient Journey with
APPROPRIATE CARE
delivered TIMELY Rx

1. Timely Medical Consultation
2. Early Physiotherapy Intervention
3. Early Access to Prevent Chronicity
4. Reduce First Consultation Waiting Time

Questionnaire / Tele-Consultation / CMS Scrutiny / Face To Face Triage → **Red Flag Screening**

Safe, Effective & Efficient

Red Flag Identification

Fast Track to P1/ P2 ORT

PT Face-to-Face Triage

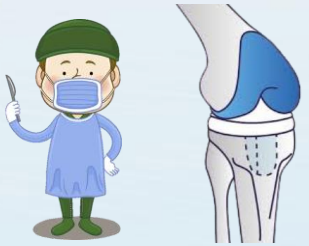
PT Early Intervention

Severe Functional Limitation

Rapid Deterioration within 1 year

Severe Knee Deformity

SAFE Joint Clinic



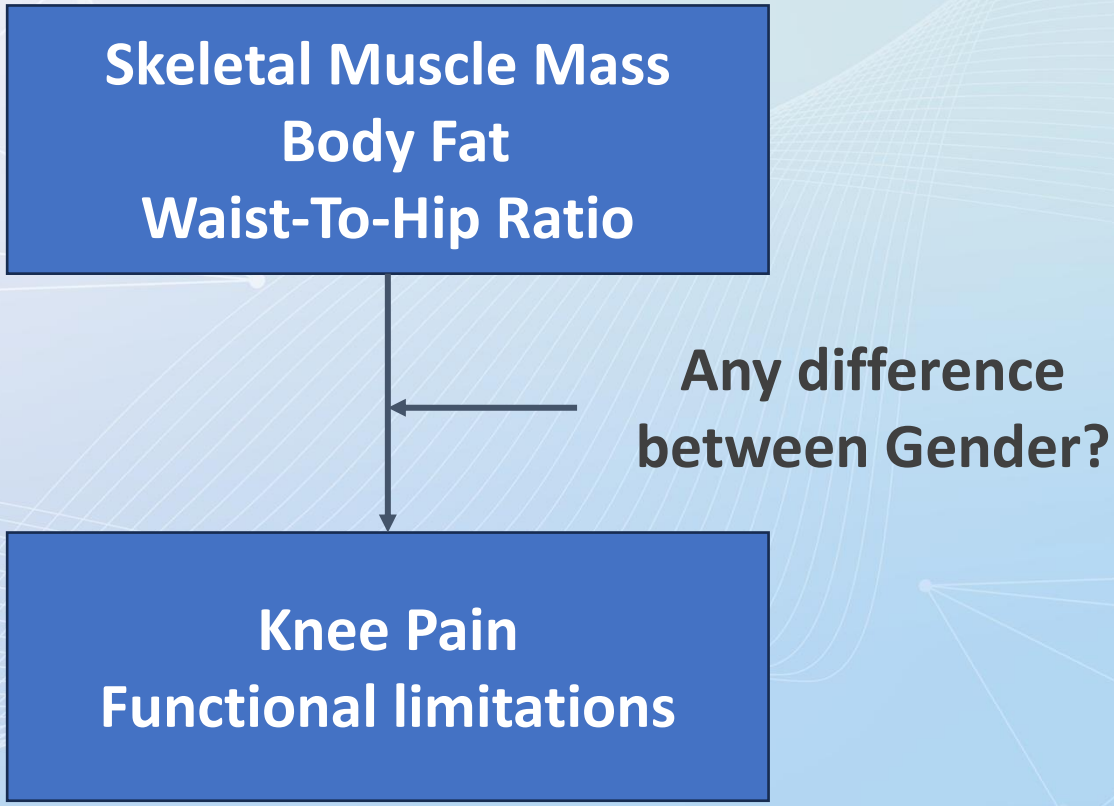
Fast Track to AJR FU (Consideration of TKR)

Continue Physiotherapy (PT) for Optimization

Follow Routine ORT

Research Gap

Assessment under SAFE Program



Christiansen et al., 2020; Davis et al., 2020; Park et al., 2018)

Objectives of the Study

- Influence of gender on the relationships between Skeletal Muscle Mass, Body Fat, and Waist-To-Hip Ratio concerning knee pain and function
- Development of gender-specific strategies

Methodology

Study Design

Cross-sectional study with 100 SAFE program patients

Body Composition Assessment

Bioelectrical Impedance Analysis (InBody)
Skeletal Muscle Mass, Body Fat, and Waist-To-Hip Ratio

Pain Measurement

Numeric Pain Rating Scale
Knee Injury Osteoarthritis Outcome Score pain subscale (KOOS-P)

Functional Assessment

Knee Injury Osteoarthritis Outcome Score function subscale (KOOS-PS)
Walking Tolerance

(Cheung et al., 2016)

Methodology

Study Design

Cross-sectional study with 100 SAFE program patients

Body Composition Assessment

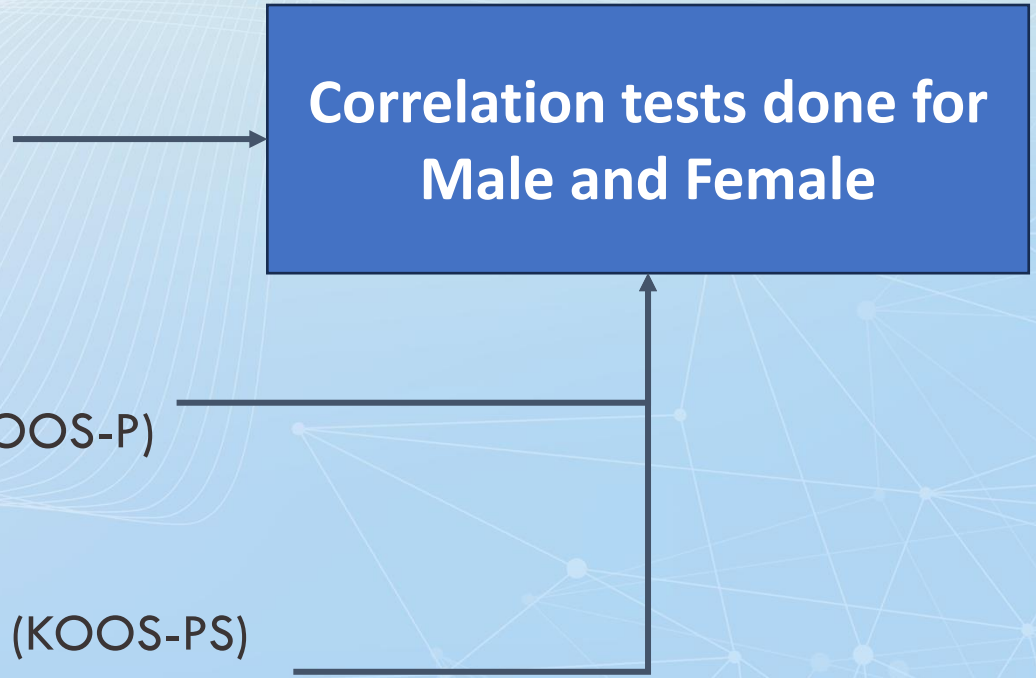
Bioelectrical Impedance Analysis (InBody)
Skeletal Muscle Mass, Body Fat, and Waist-To-Hip Ratio

Pain Measurement

Numeric Pain Rating Scale
Knee Injury Osteoarthritis Outcome Score pain subscale (KOOS-P)

Functional Assessment

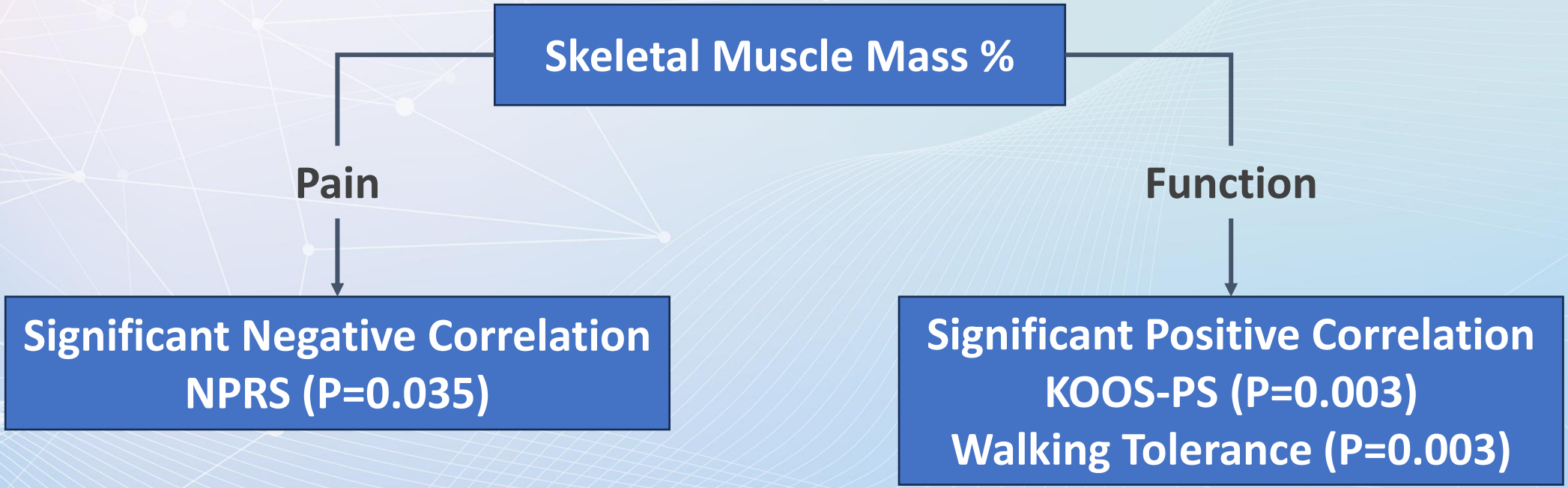
Knee Injury Osteoarthritis Outcome Score function subscale (KOOS-PS)
Walking Tolerance



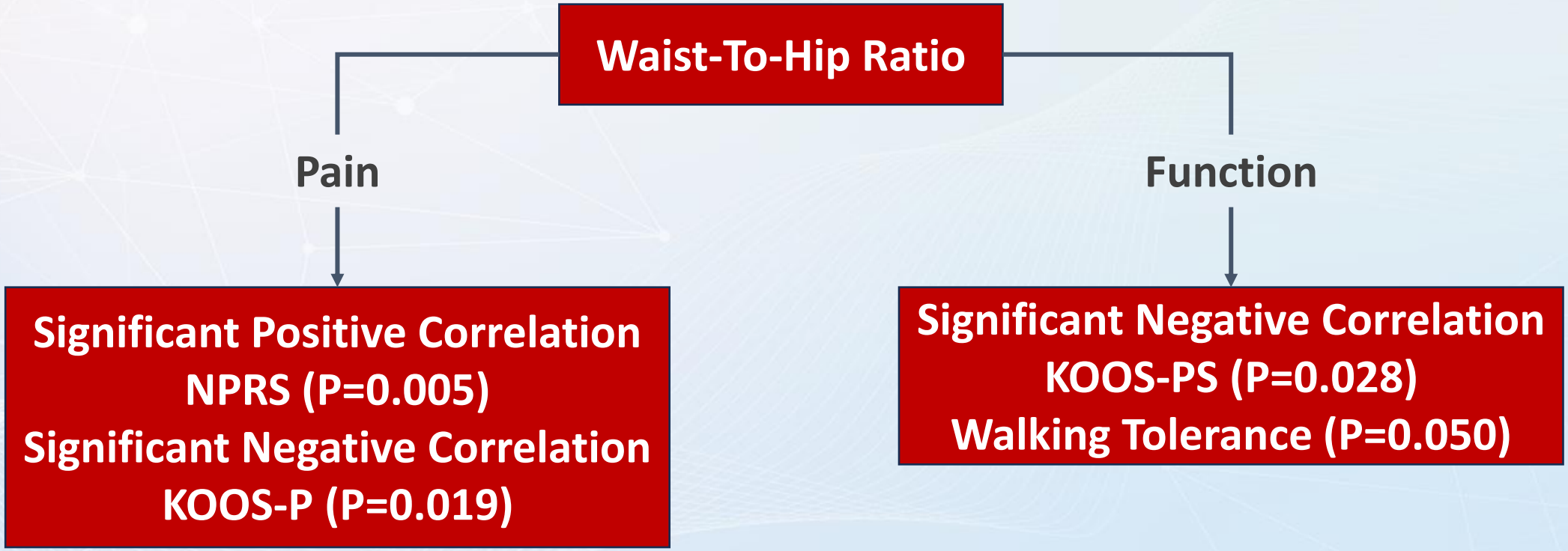
Participant Demographics

Gender	Number	Skeletal Muscle Mass % Mean	Body Fat % Mean	Waist-Hip Ratio Mean
Male	34	37.8%	30.8%	0.90
Female	66	32.9%	37.6%	0.88

Correlation Findings in Males



Correlation Findings in Females



Implications of Findings

Male

↑ Skeletal Muscle Mass %

↓ Pain & ↑ Function

Female

↓ Waist-To-Hip Ratio

↓ Pain & ↑ Function

Gender-specific management strategies

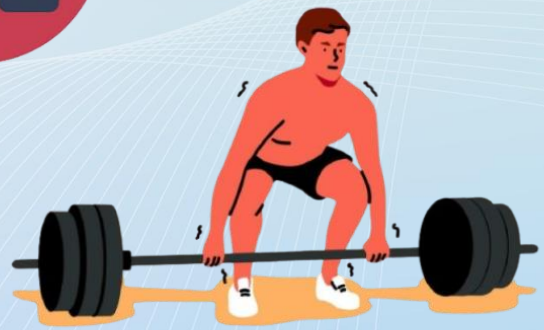
Research Limitations

- Cross-sectional design
  - Fail to establish causal relationships
- Sample size
  - Suggest larger sample

Future Directions

Male

Resistance training & Neuromuscular Stimulation



Female

Weight Management

Conclusion

- SAFE Program: Early intervention
- Gender-difference in correlations between body composition, knee pain, and functional ability
- Gender-specific Protocols & SAFE Program Enhancement
- Prevention of Locomotive Syndrome and associated Comorbidities

Reference

Cheung, R. T., Ngai, S. P., & Ho, K. K. (2016). Chinese adaptation and validation of the Knee Injury and Osteoarthritis Outcome Score (KOOS) in patients with knee osteoarthritis. *Rheumatology international*, *36*, 1449-1454.

Christiansen, M. B., Thoma, L. M., Master, H., Voinier, D., & White, D. K. (2020). The association of an increasing waist circumference and risk of incident low physical function in adults with knee osteoarthritis. *The Journal of rheumatology, 47*(10), 1550-1556.

Davis, H. C., Blue, M. N., Hirsch, K. R., Luc-Harkey, B. A., Anderson, K. C., Smith-Ryan, A. E., & Pietrosimone, B. (2020). Body composition is associated with physical performance in individuals with knee osteoarthritis. *JCR: Journal of Clinical Rheumatology, 26*(3), 109-114.

Park, H. M., Kim, H. J., Lee, B., Kwon, M., Jung, S. M., Lee, S. W., ... & Song, J. J. (2018). Decreased muscle mass is independently associated with knee pain in female patients with radiographically mild osteoarthritis: A nationwide cross-sectional study (KNHANES 2010–2011). *Clinical Rheumatology, 37*, 1333-1340.

Hospital Authority Convention 2025

Thank you

醫院管理局
HOSPITAL AUTHORITY

HONG KONG EAST CLUSTER
港島東醫院聯網