Normative grip and pinch strengths in multi-ethnic Asian adults: a Singapore perspective

Ananda Sidarta[1], Li Jing Soh[1], Eloise Lie[1], Wai Hang Patrick Kwong[2], I-Ling Yeh[3], Phyllis Liang[1] & Wei Tech Ang[1]

[1]Rehabilitation Research Institute of Singapore, Nanyang Technological University, Singapore;
[2]Singapore Institute of Technology , Singapore [3]The Hong Kong Polytechnic University, Hong Kong SAR, China

BACKGROUND

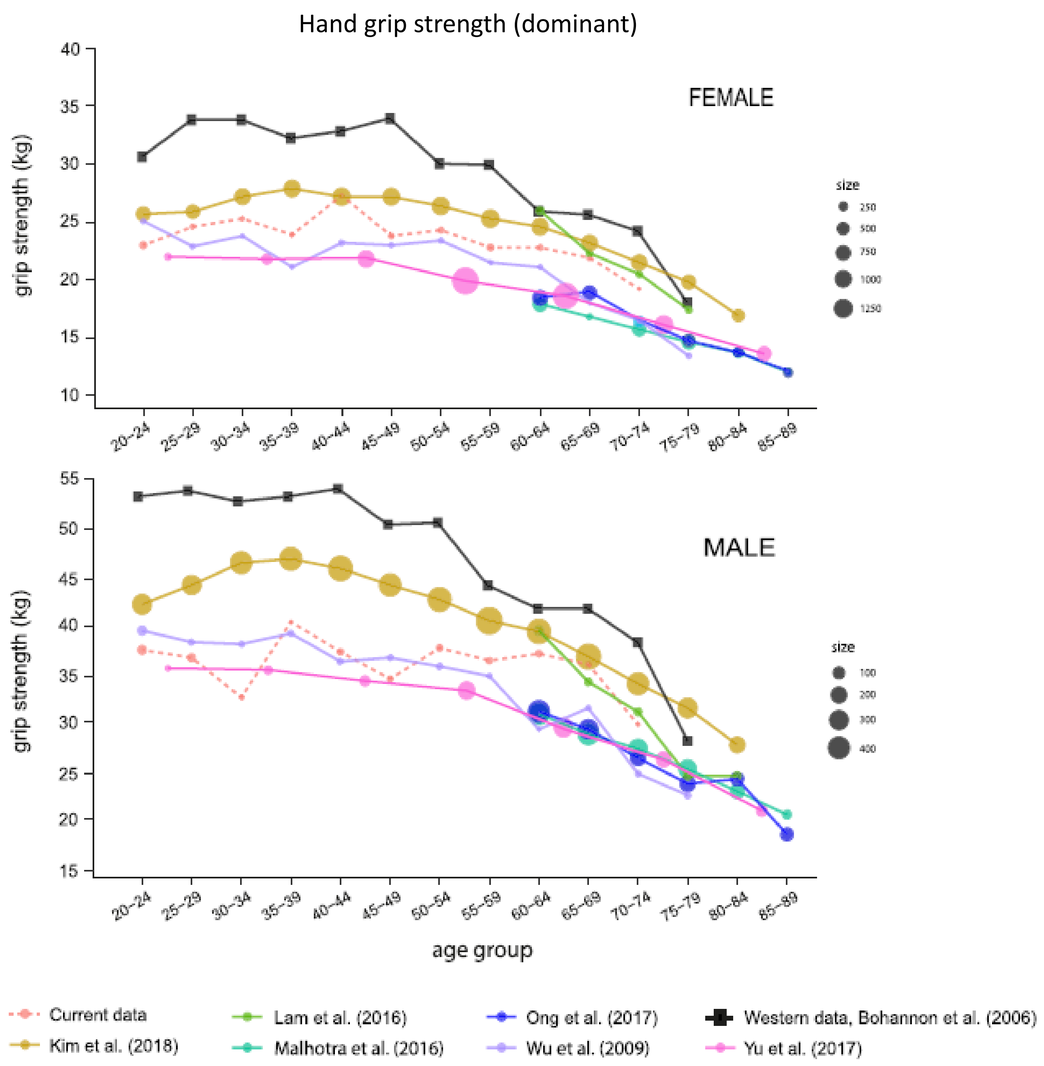
- It has been widely accepted that grip and pinch strengths can be **vital indicators** of upper limb function, musculoskeletal health, and overall health.
- While most research **has focused on older** individuals, it is crucial to build normative data for younger adults. Additionally, **normative pinch strength** in different parts of the world **is lacking**, let alone in Asian countries.
- **Singapore is unique** in Southeast Asia as it is considered an island country with a high GDP and standard of living.

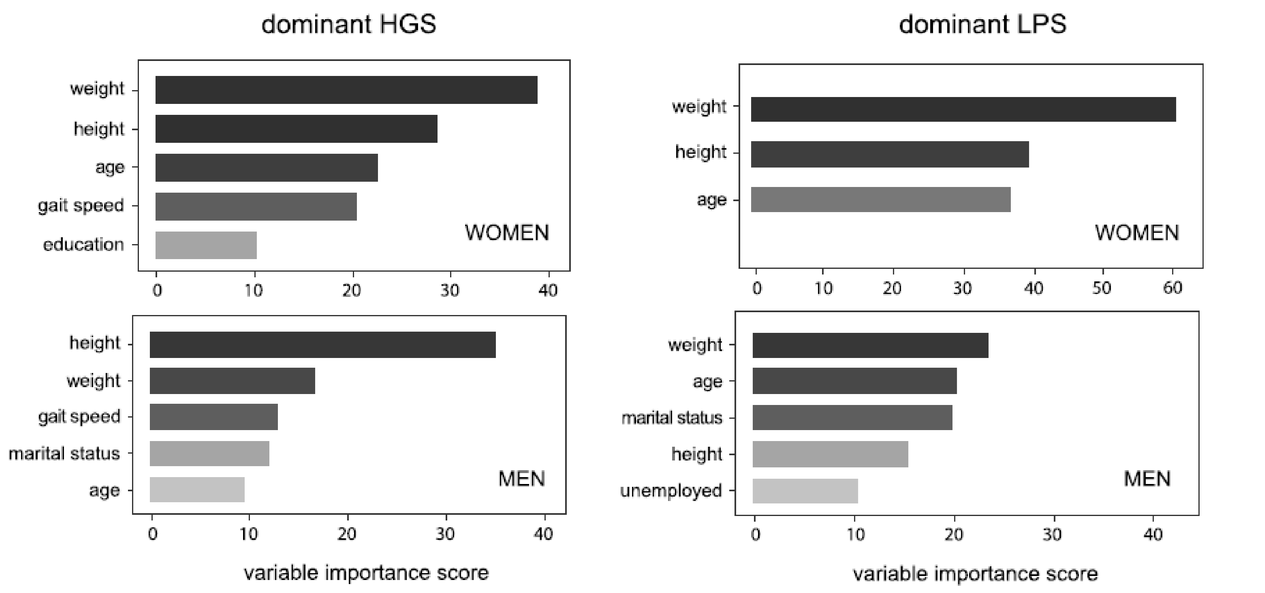
OBJECTIVES

- This cross-sectional study was conducted to determine the **normative l**ateral pinch strength (LPS) and hand grip strength (HGS) in healthy adult Singaporeans.
- To **explore** machine learning tools that reveal factors that contribute to HGS and LPS values of the dominant arm.

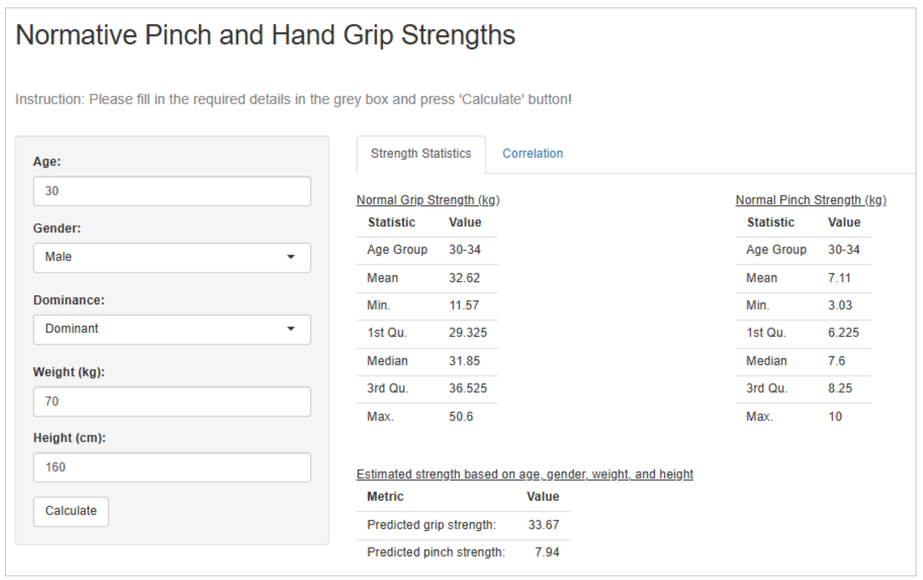
METHODS

- The study recruited **500 healthy individuals** without any serious general illnesses and upper limb pain, aged 21–80 years. LPS and HGS were measured using a standardized **JAMAR hand dynamometer**.
- Age, gender, hand dominance, and participant demographics were recorded. Normative values were then established for different age groups and hand dominance.
- Algorithms to **extract feature importance** were employed to determine the most relevant variables for dominant LPS and HGS in our data, respectively.
- An accompanying **web-based app** was created for user convenience. Please refer to the URL below!





What is my normative range given my age, weight, and gender?



CONCLUSION

Our data align with past results, but the normative values are comparatively lower than the consolidated Western norms. No statistical difference between the right- and left-handed participants in terms of dominant HGS and dominant LPS. The results can be valuable for researchers and healthcare providers working with young and older Asian adults.

Rehabilitation Research Institute of Singapore (RRIS)

Source

Web App