# INTERNATIONAL GRADUATE COLLOQUIUM *j*-SPEAK2025

SPORTS AND PHYSICAL EXERCISE ASSEMBLY OF KNOWLEDGE SHARING

COLLOQUIUM PROCEEDINGS

## EXTENDED ABSTRACT

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### EXPLORING THE RELATIONSHIP BETWEEN STRENGTH AND FLEXIBILITY IN MIDDLE-AGED ADULTS

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Keywords: Hand-grip strength, Flexibility, Middle-aged adults, Physical fitness, Correlation analysis

#### I. INTRODUCTION

Hand-grip strength and flexibility are key markers of physical health in middle-aged adults. Despite their importance, limited research explores their correlation, especially in diverse populations and real-world settings. This study addresses gaps by examining their interrelationship and potential combined impact on health outcomes, contributing to a deeper understanding of functional independence and aging.

#### II. Methods

A stratified random sample of 23 middle-aged adults (40–60 years) was selected at UiTM Seremban 3. Hand-grip strength was measured using a digital dynamometer, while flexibility was assessed with the sit-and-reach test. Pearson's and Spearman's correlation analyses were conducted to determine the relationship between hand-grip strength and flexibility.

#### III. RESULTS AND DISCUSSION

#### A. Hand-Grip Strength On Middle-Aged Adults

The mean hand grip strength was 23.4 kg, representing the average performance of participants. A standard deviation of 6.71 kg indicated moderate variability in hand grip strength among the group (Table 1).

| TABLE I<br>Descriptive Statistic of Hand-Grip Strength |      |      |
|--|------|------|
| Variable   | Mean | SD   |
| Hand-Grip Strength                                     | 23.4 | 6.71 |

#### B. Flexibility For Middle-Aged Adults.

The average score for the sit and reach test was 19.8 cm, showing the typical flexibility level of the participants. The standard deviation was 6.44 cm, which means the scores varied by about 6.44 cm from the average, indicating moderate differences in flexibility among the participants (Table 2).

| Descriptive Statistic of Flexibility |      |      |  |
|--------------------------------------|------|------|--|
| Variable                             | Mean | SD   |  |
| Flexibility                          | 19.8 | 6.44 |  |

#### C. Correlation Of Hand-Grip Strength Towards Flexibility In Middle-Aged Adults.

The correlation between hand-grip strength and flexibility (sit and reach) is very weak (Spearman's rho = 0.158). The p-value (0.471) shows that this weak correlation is not significant, meaning the relationship might just be due to chance. No strong connection between hand-grip strength and flexibility in this study (Table 3).

| TABLE III  |  |  |
|--|--|--|
| $SPEARMAN \ CORRELATION \ OF \ Hand-Grip \ Strength \ Towards$ |  |  |
| FLEXIBILITY IN MIDDLE-AGED ADULTS                              |  |  |

|                       | Flexibilit    | y     |
|-----------------------|---------------|-------|
| Hand-Grip<br>strength | Spearman' rho | 0.158 |
|                       | df            | 21    |
|                       | p-value       | 0.471 |
|                       | Ν             | 23    |

#### IV. CONCLUSIONS

There was almost no connection between handgrip strength and flexibility (r = 0.158, p = 0.471). This means strength and flexibility are separate abilities and improving one doesn't automatically improve the other. Both should be trained separately for better overall fitness.

#### ACKNOWLEDGMENT

The authors thank the communities of Universiti Teknologi MARA, Seremban 3 for their invaluable support.

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W.M., Syafiq, et al., Proceedings of the International Graduate Colloquium: Sports and Physical Exercise Assembly of Knowledge Sharing, i-SPEAK, 2025, 05th–06th February, Malaysia.