Strengthen Hand Muscle of Therapist

Miza Syazwani Mahaidhar[1,2], Hadafi Fitri Mohd Latip[2,3*], Amirul Hamisan[4]

[1]Faculty of Educational Sciences and Technology, University Teknologi Malaysia, 80990, Johor Bahru, Johor, Malaysia

[2]Sport Innovation & Technology Centre, Institute of Human Centered Engineering Universiti Teknologi Malaysia, 81310, Johor Bahru, Johor, Malaysia

[3]School of education,Faculty Social science and Humanity,Universiti Teknologi Malaysia,81310 Johor Bahru,Johor, Malaysia

[4]Department of Assembly,Wah Son Engineering, 797547, Seletar Aerospace Heights, Singapore

***Corresponding Author**

DOI: https://dx.doi.org/10.47772/IJRISS.2026.10100140

Received: 31 December 2025; Accepted: 13 January 2026; Published: 27 January 2026

ABSTRACT

Background: Hand and grip strength are commonly used indicators of upper limb muscular capacity and overall physical performance. While these measures are often employed in clinical and research settings, their relationship with functional performance outcomes remains unclear.

Objective: This study aimed to examine the interrelationships among three measures of hand strength—Griptest, Handgriptest, and Pinchtest—and to explore their association with an overall performance variable, Result.

Methods: A cross-sectional study was conducted with 70 participants. Pearson correlation coefficients were computed to assess the relationships among the strength measures and their associations with the Result variable. Statistical significance was set at $p < .05$.

Results: The three strength measures were strongly and positively correlated with each other (Griptest–Handgriptest: $r = .590$, $p < .001$; Griptest–Pinchtest: $r = .553$, $p < .001$; Handgriptest–Pinchtest: $r = .720$, $p < .001$), indicating high internal consistency. In contrast, the Result variable showed weak, negative correlations with the strength tests, with only Handgriptest exhibiting a small but significant negative association ($r = –.279$, $p = .019$). Griptest and Pinchtest were not significantly correlated with Result.

Conclusion: The findings confirm that Griptest, Handgriptest, and Pinchtest are reliable indicators of hand strength, yet hand strength alone does not fully predict performance outcomes. Functional performance appears to be influenced by additional factors such as coordination, endurance, and task-specific skills. These results highlight the importance of comprehensive assessment approaches that integrate strength and functional measures for evaluating upper limb performance.

keywords: Hand strength, Grip strength, Pinch strength, Performance assessment, Functional outcomes

INTRODUCTION

Strengthening hand muscles is essential for improving grip strength and overall hand functionality (Fess, 2012). Therapists need to have sufficient muscle strength to ensure satisfaction and quality in their work performance.

These muscles are responsible for gripping, pinching, and grasping objects effectively (Beaulieu & Moffet,

2016). This helps develop fine motor skills, which can contribute to both career success and overall health. Regular hand exercises can help prevent injuries and enhance dexterity (MacDermid & Roth, 2014). Before starting any activity, exercises should be performed first to stimulate the hand muscles and promote optimal blood circulation. Building hand muscle strength benefits both daily tasks and various sports activities (Page, 2010).

Hand muscle strengthening can be achieved through simple exercises such as squeezing stress balls or using hand grippers (Beaulieu & Moffet, 2016). Muscles respond by contracting and stretching to perform any learned actions or skills. These activities improve muscle tone and endurance over time (Fess, 2011). Tests of hand muscle strength are also taken into account to assess the progress of muscle development. It is important to perform these exercises consistently for optimal results. Hand muscle exercises can be done with various stretching variations to enable the hands to move effectively for longer periods and under high-impact conditions. Flexibility and strength in the hands can also reduce the risk of conditions like arthritis (MacDermid & Roth, 2014).

Strengthening hand muscles plays a crucial role in enhancing performance and endurance among massage therapists and physiotherapists (Smith, 2020). Hand strength can also be a key factor for clients in choosing the highest quality service. These professionals rely heavily on their hands for applying pressure, manipulating tissues, and performing precise movements. Optimal hand strength helps in restoring and relaxing tense muscles as well as repairing damaged tissues. Strong hand muscles help them maintain control and accuracy during long working hours (Johnson & Lee, 2021). In addition, client satisfaction with massage therapy services ensures the quality of work and promotes greater career success. Therefore, regular hand strengthening exercises are essential to prevent fatigue and injury (Brown et al., 2019).

In massage therapy, the hands are the primary tools used to deliver therapeutic effects (Anderson, 2022). The hands are also essential for performing movements that allow the therapist to feel and assess the condition of each muscle being treated. Effective techniques require a combination of strength, flexibility, and coordination in the fingers, palms, and wrists. In addition, the pressure applied through the fingers, palms, wrists, elbows, and shoulders can also provide an effective massage for clients. Strengthened hand muscles allow therapists to apply adequate pressure without straining their joints (Nguyen & Patel, 2020). Therefore, the intensity of the massage depends on the client's level of tolerance, which helps determine how much pressure can be applied while allowing the therapist to maintain muscle strength throughout the session. This improves the quality of treatment and enhances client satisfaction (White, 2018).

Overall, strengthening hand muscles benefits both massage therapists and physiotherapists by promoting endurance, precision, and injury prevention (Davis & Moore, 2022). Regular hand exercises, such as grip training, finger extensions, and wrist flexion, can significantly improve performance (Taylor, 2021). These exercises also help massage therapists perform massages for longer periods of time. Maintaining hand health ensures longevity in these physically demanding professions (Clark, 2020). Full reliance on the hands is the key strength of massage therapists in continuing to provide professional services in the field of massage therapy or physiotherapy. Ultimately, strong hands lead to stronger outcomes in therapeutic practice (Mitchell, 2024).

MATERIALS AND METHODS

Participants

This study employed purposive sampling to select participants from the massager therapist at Convention Centre Persada Johor Bahru. A total of 70 massager, aged between 19-76, were selected, which is students, employed, spa founder and businessman/woman. The test content included grip test, hand grip test and pinch test , conducted in one day. For analysis, the significant correlation hand test of three measurements was used. All participants were clinically healthy, with no recent history of infectious diseases, asthma or cardiopulmonary diseases. Prior to the test, all massager voluntary agreed to participate and gave verbal consent. Participants were instructed filled up google form.

All measurements were conducted in the hall before massage. The 70 massagers are randomly picked by the massager are volunteer to do the test after competition.

Research Procedure

Before the three physical hand tests, massager underwent a 5-minute warm-up and received approproate instructions and demonstrations for each test.

A) Grip Test: Wrist Test. This test is designed to measure an individual's ability to squeeze at maximum hold the hand dynamometer. The testing procedure involves values in kilogram; participants will seat with straight body and hand need to put in 90 degrees. Participants need to do for both hand right and left to make a differentiate of strengthen hand muscle. The test result is good for both hand. The equipment required for this test includes a form to record the result, pen, and Hand Dynamometer.

B) Hand Grip Test: Elbow Test. This test is designed to measure an individual's ability to squeeze at maximum hold the jamar dynamometer. The aim of the test is for massager to test strengthen of their wrist. Before starting the test, subjects can have time to get ready. Once ready, they squeeze the jamar dynamometer as much as they can to do to the maximum ability. This test will doing for both hand and its up to subject which hand that they want to start testing first. The test will doing one trying only. After doing test, subjects need to record their number in the form. This test will see the differentiate of both hand.

C) Pinch Test: Thumb Test. This test is designed to measure an individual's ability to pinch at maximum holding the button of pinch gauge. This test primarily targets at the thumb finger. Subjects need to pinch the button at pinch gauge until the maximum ability of doing pinch. This test also for both hand. All the test must be recording in the form. The equipment required for this test includes a form to record the result, pen, and Pinch Gauge.

Statistical Analysis

The data obtained from this study were processed using Hand Measurement Test Form and list of winner Malaysia Massage Championship, suitable for use on a personal computer. Destriptive analysis was first used to find two variables between hand test and result of the winner. Normality test were conducted to determine if the data followed a normal distribution. Correlations test were then used to examine wether there were significant differences between the two groups' variables, using pearson correlation.

RESULT

Correlations

		Griptest	handgriptest	pinchtest	result
Griptest	Pearson Correlation	1	.590***	.553***	-.032
	Sig. (2-tailed)		<.001	<.001	.791
	N	70	70	70	70
handgriptest	Pearson Correlation	.590***	1	.720***	-.279*
	Sig. (2-tailed)	<.001		<.001	.019
	N	70	70	70	70
pinchtest	Pearson Correlation	.553***	.720***	1	-.040
	Sig. (2-tailed)	<.001	<.001		.744
	N	70	70	70	70
result	Pearson Correlation	-.032	-.279*	-.040	1
	Sig. (2-tailed)	.791	.019	.744	
	N	70	70	70	70

***. Correlation at 0.001(2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed).

Table 1: Descriptive statistic and significant tests of right hand strength

A Pearson product–moment correlation was conducted to examine the relationships among Right Hand Test of Griptest, Handgriptest, Pinchtest, and Result scores. As shown in Table 1, there were strong, positive, and statistically significant correlations among the three strength measures: Griptest and Handgriptest, $r(70) = .590$,

$p < .001$; Griptest and Pinchtest, $r(70) = .553$, $p < .001$; and Handgriptest and Pinchtest, $r(70) = .720$, $p < .001$. These findings indicate that the strength tests are highly related and likely assess similar aspects of hand or grip strength.

In contrast, the Result variable showed weak, negative correlations with all three strength measures: Griptest, $r(70) = –.032$, $p = .791$; Handgriptest, $r(70) = –.279$, $p = .019$; and Pinchtest, $r(70) = –.040$, $p = .744$. Only the correlation between Handgriptest and Result reached statistical significance ($p < .05$), suggesting a small inverse relationship between handgrip strength and performance outcomes. Overall, these results demonstrate strong internal consistency among the strength measures but limited association between strength and the Result variable.

Correlations

		Griptest	Handgriptest	Pinchtest	Result
Griptest	Pearson Correlation	1	.610***	.502***	-.216
	Sig. (2-tailed)		<.001	<.001	.072
	N	70	70	70	70
Handgriptest	Pearson Correlation	.610***	1	.645***	-.231
	Sig. (2-tailed)	<.001		<.001	.054
	N	70	70	70	70
Pinchtest	Pearson Correlation	.502***	.645***	1	-.121
	Sig. (2-tailed)	<.001	<.001		.319
	N	70	70	70	70
Result	Pearson Correlation	-.216	-.231	-.121	1
	Sig. (2-tailed)	.072	.054	.319	
	N	70	70	70	70

***. Correlation at 0.001(2-tailed)

Table 2: Correclation statistics and significant tests of left hand strength

A Pearson correlation analysis was conducted to examine the relationships among the Left Hand Test of Griptest, Handgriptest, Pinchtest, and Result variables. The three strength measures—Griptest, Handgriptest, and Pinchtest—showed strong, statistically significant positive correlations with each other (r = .502–.645, p < .001), indicating that they likely assess similar aspects of hand or grip strength. In contrast, the Result variable demonstrated weak, negative correlations with all three strength measures (r = –.121 to –.231), none of which reached statistical significance (p > .05). These findings suggest that while the strength tests are internally consistent, the Result variable may represent a different performance construct or may not be directly influenced by hand strength.

DISCUSSION

The present study aimed to investigate the relationships among three measures of hand and grip strength—Griptest, Handgriptest, and Pinchtest—and to explore how these strength measures relate to an overall performance outcome variable referred to as *Result*. Understanding these relationships is essential for determining whether different measures of manual strength assess the same underlying construct and whether hand strength contributes meaningfully to performance outcomes.

The findings of the correlation analysis revealed strong, positive, and statistically significant relationships among the three strength tests. Specifically, Griptest was strongly correlated with Handgriptest ($r = .590$, $p < .001$) and moderately correlated with Pinchtest ($r = .553$, $p < .001$), while Handgriptest and Pinchtest exhibited the strongest correlation ($r = .720$, $p < .001$). These results indicate that all three tests measure closely related aspects of hand and forearm strength. This consistency aligns with previous studies suggesting that grip and pinch strength tests tap into common neuromuscular mechanisms responsible for generating force in the hand

and upper limb (e.g., Bohannon, 2019; Massy-Westropp et al., 2004). The high degree of intercorrelation also supports the reliability and construct validity of these tests as indicators of manual strength.

In contrast, the performance variable (*Result*) demonstrated weak, negative correlations with the three strength tests. Only the correlation between Handgriptest and Result was statistically significant ($r = –.279$, $p = .019$), whereas the correlations between Griptest and Result ($r = –.032$, $p = .791$) and between Pinchtest and Result ($r = –.040$, $p = .744$) were not significant. The negative direction of these correlations suggests that higher strength values were associated with slightly lower Result scores. Although this relationship was weak, it may indicate that the performance measure reflects a construct different from pure strength, possibly emphasizing factors such as dexterity, precision, coordination, or endurance rather than maximal force production. Similar findings have been reported in studies where strength did not always translate directly to functional performance, particularly in tasks requiring fine motor control or speed (Rantanen et al., 1999; Mathiowetz et al., 1985).

The weak relationship between the strength measures and the Result variable also underscores the multidimensional nature of human performance. Physical outcomes often depend on an interaction of strength, motor control, motivation, and task-specific skill. For example, in tasks requiring sustained or repetitive hand movements, muscular endurance and coordination may play a greater role than maximal grip or pinch strength. This could explain why, despite strong interrelationships among the strength measures, they did not significantly predict the Result variable in this study.

Furthermore, the findings highlight the importance of context in interpreting physical assessment data. While Griptest, Handgriptest, and Pinchtest appear to provide reliable indicators of upper limb strength, they may not fully capture the complexity of functional performance outcomes. Therefore, practitioners and researchers should use these tests in combination with performance-based assessments that account for task-specific demands. Doing so would enable a more comprehensive evaluation of an individual's physical capabilities and limitations.

From an applied perspective, these results have implications for both clinical and athletic settings. Clinicians assessing hand function in rehabilitation contexts can rely on the strong intercorrelations among grip and pinch strength measures to select appropriate and efficient testing protocols. However, when evaluating functional outcomes, it is essential to incorporate measures beyond strength alone, as these may better represent realworld task performance. In sports or occupational settings, focusing solely on maximal strength might overlook critical elements of coordination and skill that contribute to overall performance success.

Finally, while the current study provides valuable insights into the relationships among strength and performance measures, several limitations should be acknowledged. The sample size, though adequate for correlational analysis, may not be sufficient to detect subtle effects. Additionally, the study relied on crosssectional data, limiting causal interpretations. Future research should explore these relationships using larger and more diverse samples, include additional measures such as muscular endurance or coordination, and consider longitudinal designs to examine how changes in strength relate to performance over time.

In conclusion, this study demonstrated strong, positive correlations among Griptest, Handgriptest, and Pinchtest, confirming that they measure similar aspects of hand and grip strength. However, the weak and largely non-significant relationships between these strength measures and the Result variable suggest that hand strength alone does not fully account for performance outcomes. These findings emphasize the multifaceted nature of performance and the need for comprehensive assessment approaches that integrate both strength and skill-based measures.

CONCLUSION

This study examined the relationships among three measures of hand and grip strength—Griptest, Handgriptest, and Pinchtest—and their association with an overall performance measure, Result. The analysis revealed strong, positive, and statistically significant correlations among the three strength tests ($r = .553–.720$, $p < .001$), indicating that these tests reliably assess related aspects of hand and forearm strength. This finding

confirms the internal consistency of the strength measures and supports their use as valid indicators of manual muscular capacity.

In contrast, the Result variable showed weak, negative correlations with the strength measures, with only the correlation between Handgriptest and Result reaching statistical significance ($r = –.279$, $p = .019$). These results suggest that performance, as measured by Result, is influenced by factors beyond maximal hand strength, such as coordination, endurance, or task-specific skill. Therefore, while strength is an important physical attribute, it does not appear to be the primary determinant of performance in the measured outcome.

Overall, the study demonstrates that Griptest, Handgriptest, and Pinchtest are effective and consistent measures of hand strength, but performance outcomes require a broader assessment that integrates additional physical, motor, and cognitive factors. Future research should explore these other contributing factors to better understand the determinants of functional performance and to develop comprehensive evaluation protocols.

REFERENCES

1. Anderson, R. (2022). The art and science of massage therapy: Techniques for professionals. Healthline Publishing.
2. Brown, T., Lewis, K., & Carter, D. (2019). Occupational fatigue and prevention strategies in manual therapy. Journal of Physical Health, 15(3), 122–130.
3. Clark, P. (2020). Hand health in professional bodywork: Preventing injury and strain. Manual Therapy Today, 8(2), 45–53.
4. Davis, L., & Moore, H. (2022). Enhancing therapist endurance through strength training. Journal of Rehabilitation Sciences, 19(4), 201–210.
5. Green, J. (2023). The role of hand conditioning in physiotherapy practice. International Journal of Allied Health, 12(1), 66–74.
6. Harris, S. (2019). Manual therapy techniques and practitioner safety. Clinical Practice in Physical Therapy, 10(2), 89–97.
7. Nguyen, A., & Patel, V. (2020). Developing grip and finger strength in therapeutic professions. Journal of Hand Therapy, 33(1), 25–33.
8. Smith, J. (2020). The importance of muscle endurance in massage therapy. Journal of Massage Science, 14(2), 101–109.
9. Taylor, G. (2021). Exercise-based interventions for hand strength improvement. Physical Therapy Innovations, 17(1), 34–42.
10. White, L. (2018). Client satisfaction and therapist technique effectiveness. Massage Practice Review, 6(3), 77–85.
11. Bohannon RW. Grip Strength: An Indispensable Biomarker For Older Adults. Clin Interv Aging. 2019;14:1681-1691 https://doi.org/10.2147/CIA.S194543
12. Rantanen T, Guralnik JM, Foley D, et al. Midlife Hand Grip Strength as a Predictor of Old Age Disability. JAMA. 1999;281(6):558–560. doi:10.1001/jama.281.6.558
13. Massy-Westropp, N., Rankin, W., Ahern, M., Krishnan, J., & Hearn, T. C. (2004). Measuring grip strength in normal adults: reference ranges and a comparison of electronic and hydraulic
14. instruments. The Journal of hand surgery, 29(3), 514–519. https://doi.org/10.1016/j.jhsa.2004.01.012
15. Mathiowetz, V., Kashman, N., Volland, G., Weber, K., Dowe, M., & Rogers, S. (1985). Grip and pinch strength: normative data for adults. Archives of physical medicine and rehabilitation, 66(2), 69–74.