

Comparison of Grip and Pinch Strength Measurements Across Sitting, Standing, and Supine Positions

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Introduction

This study investigated the impact of postural variations, specifically sitting, standing, and supine positions, on grip and pinch strength to determine the clinical feasibility of strength assessments in diverse physical conditions.

Methods

Ten healthy adults participated in the study. **Grip and pinch (tip, lateral, and palmar) strengths were assessed using a hydraulic hand dynamometer and a pinch gauge in three distinct positions: sitting, standing, and supine.** All measurements were conducted using the dominant hand, and the highest value from three trials for each test was recorded for analysis. Due to the small sample size, the Friedman test was utilized to compare differences between positions, while Spearman's rank correlation coefficient was used to evaluate the consistency of measurements across the different positions.

Table 1. Subjects' general characteristics

Classification		$M \pm SD / n (%)$
Age		27.40 ± 5.27
Gender	Male	3 (30.0)
	Female	7 (70.0)

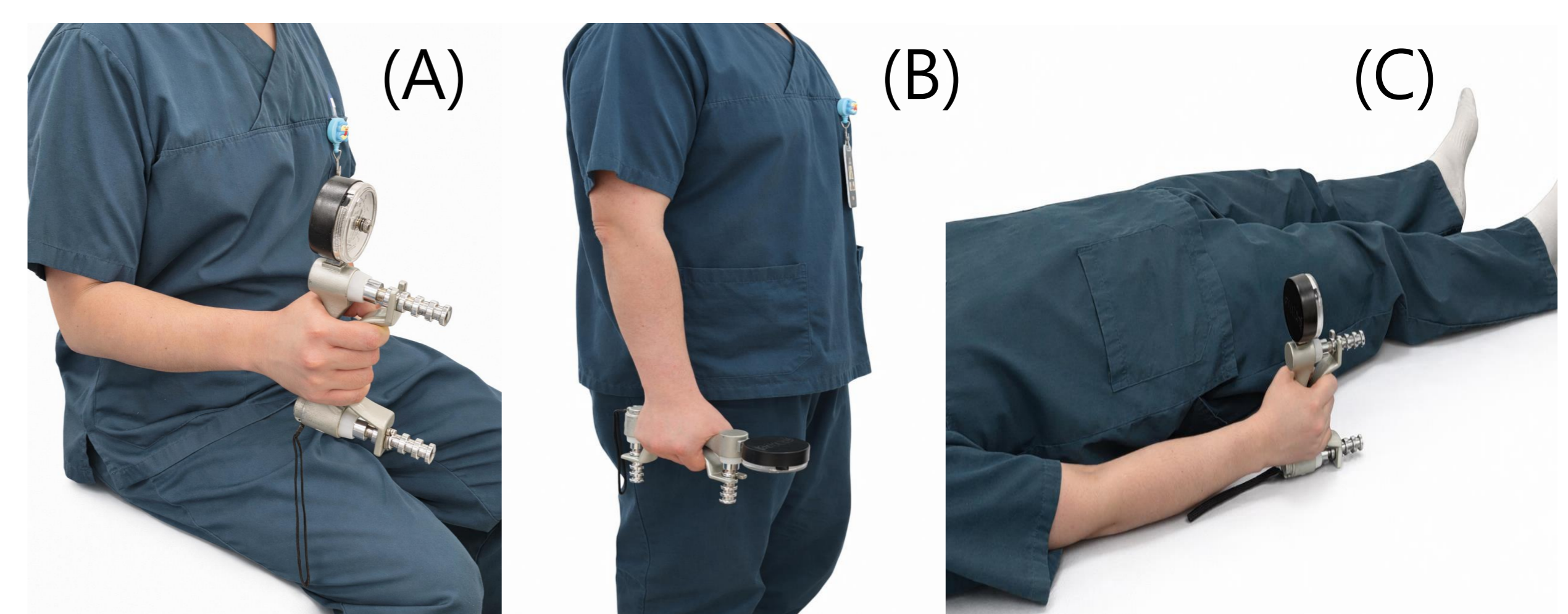
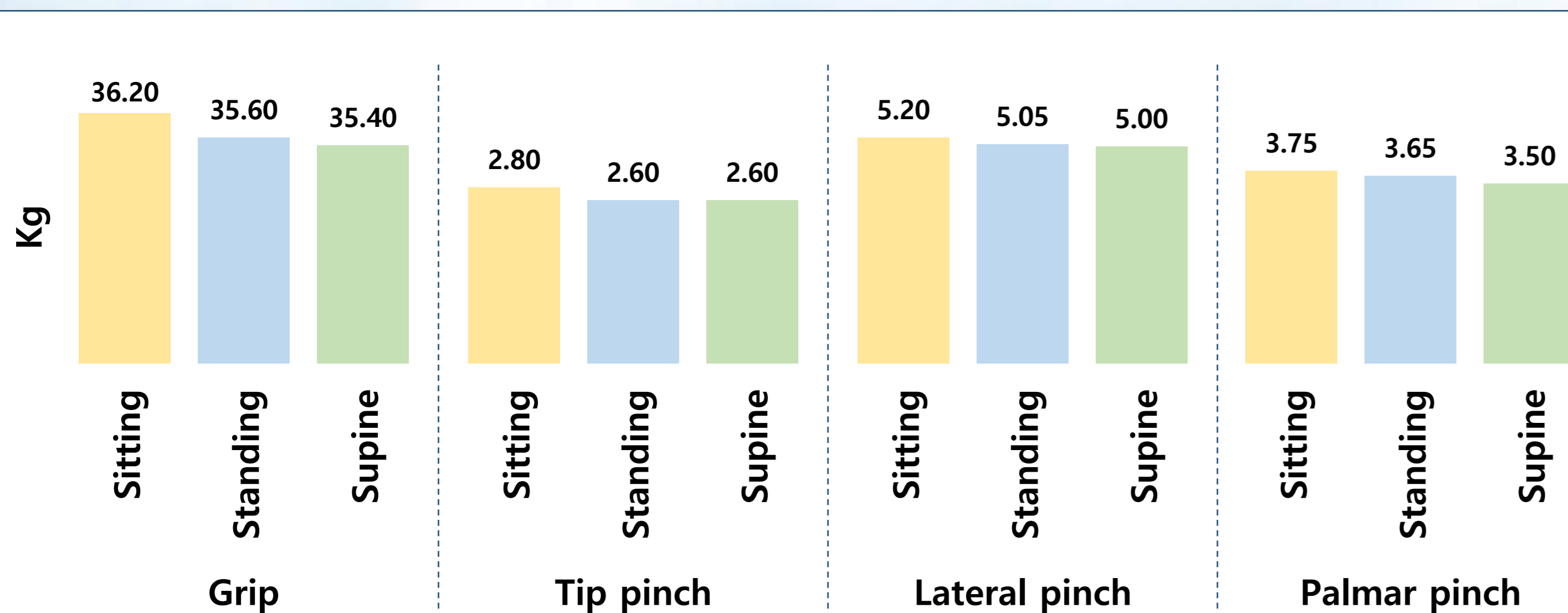


Figure 1. Positions for strength measurement

- (A) Sitting position (standard)
 (B) Standing position (natural arm hang)
 (C) Supine position (elbow supported)

Results

No statistically significant differences were observed in grip or pinch strength among the sitting, standing, and supine positions ($p > .05$). Furthermore, correlation analysis revealed a very high positive correlation ($\rho > .80$, $p < .01$) across all three positions, indicating strong measurement consistency regardless of body position.



No significant differences in grip or pinch strength by position ($p > .05$).

Figure 2. Comparison of strength by position

Table 2. Correlation of strength by position ($N=10$)

ρ	Grip	Tip pinch	Lateral pinch	Palmar pinch
Sitting × standing	.988**	.959**	.972**	.975**
Sitting × supine	.972**	.975**	.988**	.979**
Standing × supine	.988**	.941**	.984**	.991**

** $p < .01$

Conclusion

The findings demonstrate that hand grip and pinch strength remain consistent across various positions. **This suggests that for patients unable to maintain a standard sitting position due to limited mobility, standing or supine positions may serve as reliable alternatives for obtaining accurate strength data.**