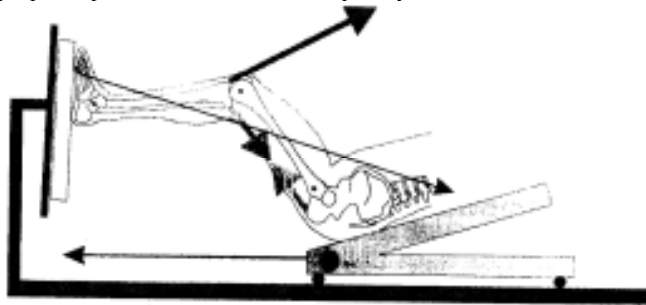


## THE VALIDITY OF ACTIVE SQUAT KEEN JOINT PROPRIOCEPTION TEST

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### INTRODUCTION

Proprioception is a sense of position and movement of one's own limbs and body in the absence of vision, termed "limb-position sense" and "kinesthesia," respectively. Proprioception has been shown to diminish with injury, age, and so on. Position sensibility can be measure by many methods. Several different testing techniques have been developed to measure the conscious submodalities of Proprioception. There are 3 submodalities (joint position sense, JPS; Kinaesthesia and sense of tension). The JPS test measures the accuracy of position replication and can be conducted actively or passively in both open and closed kinetic chain position. Variety of equipment and instrument were developed to measure conscious appreciation of Proprioception, such as commercial isokinetic dynamometers, electromagnetic tracking devices, custom-made jigs, and some new device. Recently a functional squat system (FSS) was introduced by MONITORED REHAB SYSTEMS that mimics the movement co-ordination pattern of squat jump, under the control of an external load. This device can be measure Proprioception in actively closed kinetic chain. Compared to some open chain device, it shows more similar to daily activity. Therefore, some test need to investigate the reliability for FSS. The intraclass correlation coefficient (ICC) is used to measure inter-rater reliability. Although Pearson's r may be used to assess test-retest reliability, ICC is preferred when sample size is small (<15) or when there are more than two tests (one test, one retest) to be correlated. Therefore, The purpose of the present study was to compare repeat-measures proprioceptive test in Functional Squat System.



**Figure 1:** Functional Squat System when performed repetitive squat exercises with one leg in standardized pace.

### METHODS

Eighteen college students participated in this study (male=9, female=9; mean age, 22.1 ± 3.5 years). Subject were used FSS in Proprioception test program to measured low extremity in 25, 50 and 75 three different knee joint angel. For intrasession intratester reliability of the figure-of-two measurement, ICC (2,1) and the SEM were used. The ICC (2,1) was based on a subjects ×2-way analysis of variance (Shrout & Fleiss, 1979).

### RESULTS AND DISCUSSION

The ICC (2,1) for repeat-measures knee proprioceptive test was 0.94 (P< .05). The means, SDs, and SEMs for these measurements and the repeat-measures proprioceptive test are summarized in table 1. the results of the correlations between two test are summarized in Table 2. In order to get an accurate measurements, the reliability coefficients should exceed 0.90 to ensure valid interpretations (Portney and Watkins, 1993). In this study, results demonstrated excellent intrasession intratester reliability and small measurement error for the repeat-measures proprioceptive test.

**Table 1:** Means, SDs, and SEMs, for 3 different knee angles repeat measurement test in FSS.

Measurement	Distance (cm)		
	Mean	SD	SEM
25°	16.04	11.05	5.41
50°	15.81	11.81	7.06
75°	9.22	4.29	3.49

\*Means based on 3 measurements obtained from 25 subjects.

**Table 2:** Pearson Product Moment correlation coefficients ( ) of the relationship between repeat-measures proprioceptive test in FSS.

Measurement	r*
25°	0.89
50°	0.84
75°	0.96

\*p < .001

### CONCLUSIONS

This study was conducted to determine the intrasession-intratester reliability and criterion-related validity of the repeat-measures knee proprioceptive test. The result shows that the FSS Proprioception test was reliable and valid indirect method of measuring knee Proprioception in individuals with this test.

### REFERENCES

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