



EXPLORING INFLUENTIAL FACTORS ON STATIC BALANCE AMONG UNDERGRADUATE STUDENT



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BACKGROUND

Static Balance is the ability to maintain postural stability and centre of gravity orientation to static, immobile base of support.

Static balance plays an important role in optimizing motoric performance in various physical activities, sports and exercises. Static balance disturbances were crucial intrinsic factors in the event of falling and other related injuries, which was one of the leading causes of death and disability, leading to financial loss around the globe

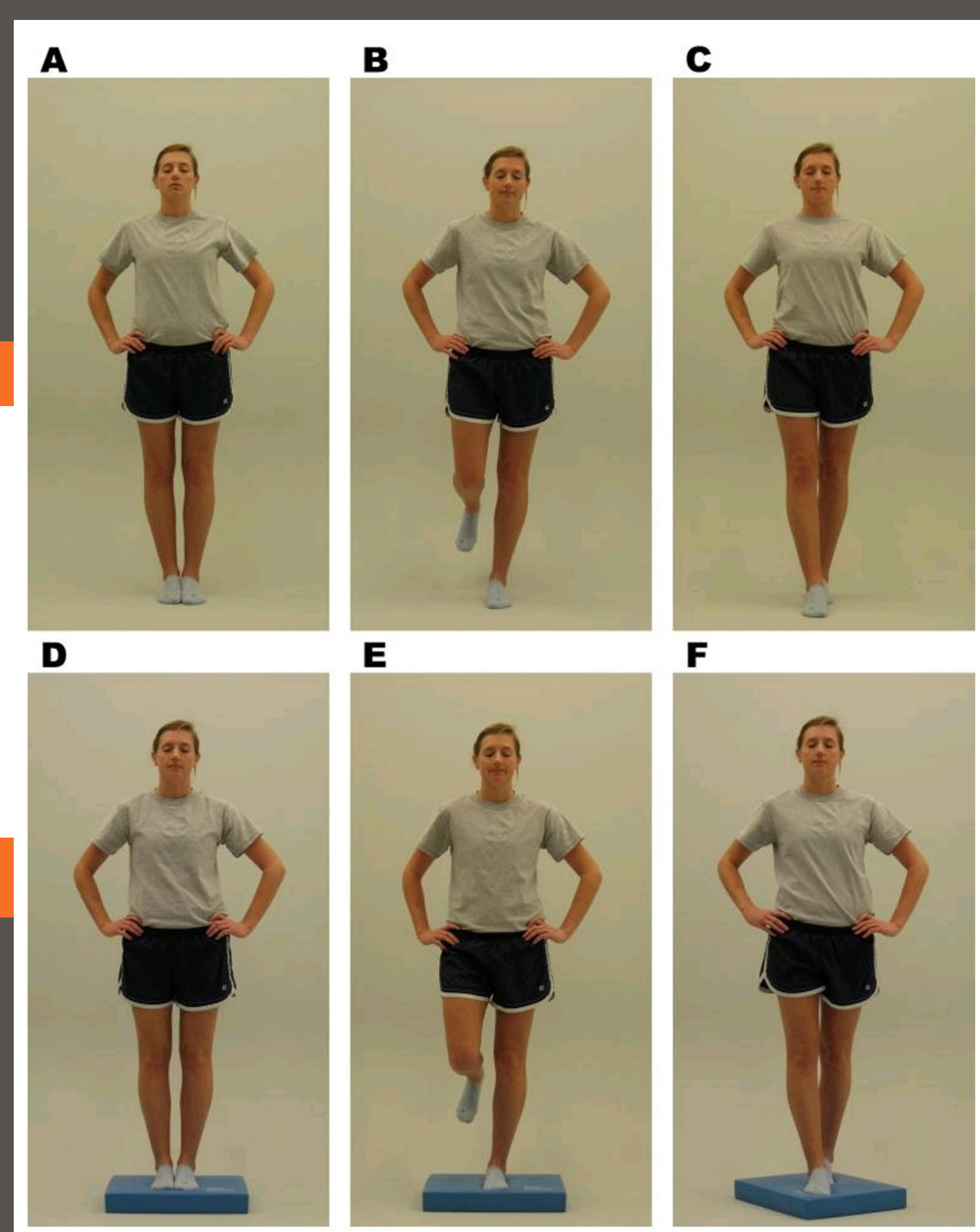
OBJECTIVES

To examine the correlations between various factors and static balance, including gender, age, weight, height, body mass index (BMI), waist and hip circumferences, waist-hip ratio, support base area, and lower extremity muscle strength.

METHODS

This study adopts an analytic observational approach using a cross-sectional design. The participants selected for this research are preclinical students enrolled in the undergraduate program at the Faculty of Medicine, Universitas Sumatera Utara, recruited through consecutive sampling. Information regarding gender and age was collected using a questionnaire, while other variables were obtained through direct measurements. The assessment of static balance was conducted utilizing the BESS (Balance Error Scoring System) test.

The respondents were instructed to take off their footwear before the test began. Every subtest was done with both hands on the waist and with both eyes closed. The test was done in 6 subtest (timed for 20 seconds each) with 3 different stance (double leg stance, single leg stance, and tandem stance) and 2 different surfaces (a hard surface/floor and a foam surface using a foam pad).



BESS Subtests

RESULTS & DISCUSSION

The evaluation of static balance revealed that the highest number of errors occurred during the single-leg stance on a foam surface subtest (with a median score of 7 out of a maximum of 10). The average total BESS score was calculated as 13.57, with the highest observed score reaching 27. Upon conducting a bivariate analysis, notable correlations were found between age, weight, body mass index (BMI), and hip circumference with static balance. However, the analysis indicated that gender, height, waist-hip ratio, support base area, and lower extremity muscle strength did not exhibit statistically significant correlations with static balance.

Subject static balance score measured with BESS test

BESS Subtests		Mean (±SD)	Median (Min-Max)
Firm surface	Double leg stance	0 ± 0	0 (0-0)
	Single leg stance	2.26 ± 2.345	2 (0-10)
	Tandem stance	0.74 ± 0.988	0 (0-4)
Foam surface	Double leg stance	0.36 ± 0.819	0 (0-4)
	Single leg stance	6.77 ± 2.024	7 (3-10)
	Tandem stance	3.45 ± 2.457	3 (0-10)
Total BESS score		13.57	13 (5-27)

The correlation between independent variables and BESS score

Indicators	BESS Score (Static Balance)	
	r score	p value
Gender	-	0.761
Age	0.312	0.033
Weight	0.335	0.021
Height	0.084	0.572
Body Mass Index	0.338	0.020
Waist circumference	0.269	0.067
Hip circumference	0.304	0.038
Waist Hip Ratio	0.135	0.366
Support base area	0.245	0.096
Lower extremity muscle strength	-0.011	0.944

CONCLUSION

Static balance demonstrated significant correlations with age, weight, body mass index (BMI), and hip circumference

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