EFFECT OF BODY WEIGHT ON POSTURAL STABILITY, GAIT STABILITY AND RISK OF SLIPPING.

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INTRODUCTION

- Injuries resulting from slip, trip and fall accidents are a significant public health problem in the United States [BLS, 2003], with a majority of slip-related falls occurring during gait.
- Obese individuals fall twice as much as non obese individuals.
- Another important consequence from obesity is deviation from normal gait patterns, low cadence, reduced speed, and impaired balance.
- This imposes functional limitations, pertaining to the biomechanics of daily living activities that may predispose obese individuals to injury.
- The **objective** of the study is to empirically evaluate the influence of body weight on postural stability, and the gait characteristics with the associated risks of slip, trips and falls.

METHODOLOGY

The study was conducted at the Center for Neuromotor and Biomechanics Research (CNBR). It consisted of twelve subjects, 8 females and 4 males (18 - 30years).

Two procedures were used to analyze the cross sectional study.

1. Postural stability was measured using the Neurocom system.

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Conditions 1, 2, and 3 had the platform fixed and conditions 4, 5, and 6 had the platform moving. Each trial lasted for 20 seconds and an equilibrium score was calculated.

❖ In the second condition it consisted of COP, COG data: fixed vision with eyes open and closed for 3 minutes each, two trials were conducted and the data was recorded using one way ANOVA

2. Gaitrite dynamic stability was collected during normal tread mill walking and also using the

gait rite walkway system.

Two trials were conducted at normal walking speeds and their velocities were recorded. The following table summarizes the information.

Group	Age (Years)	Height (Meters)	Weight (Kg)	BMI	Walking Velocity (m/s)
Normal	18-26	1.66	62	21	1.29
Overweight	18-23	1.62	103	28	1.26

RESULTS

➢ One-way ANOVA test was conducted with weight as the independent variable and the above measurements as dependent variables. Significant level was set as $\alpha = 0.05$.

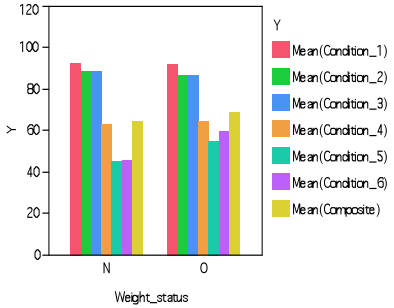
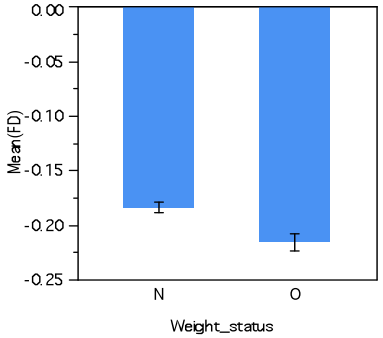


Fig 1: ANOVA tests didn't indicate any significant effect of weight on standing balance test scores. This might be due to limited sample size.

➢ This chart shows a mean and standard error of Friction Demand (FD)



One-way ANOVA results F = 13.85, p = 0.004

Fig: 2 Indicates that FD (friction demand) is significantly higher for the overweight group than the normal weight group.

CONCLUSIONS

Our study demonstrates that the risk of slipping is significantly higher for over weight individuals than normal weight.

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