The Comparison of Balancing between Male and Female Student at Faculty of Sports Science in Chulalongkorn University

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ABSTRACT

Balance can be defined as the state of having weight spread equally so that it will not fall, balance is the ability to move or to remain in a position without losing control or falling. The objective of this study is to investigate whether any gender differences exist in balance performance during quiet one leg standing among Chulalongkorn University (CU) students. This study is an experimental research design. An experimental study been used to test the hypothesis in this study. In this study, the independent variable is gender while the dependent variable is the balancing. The controlled variable is the subject must first do helicopter spinning for 5 complete rounds before proceeding to the balancing test. The samples are from the students of Faculty of Sports Science in Chulalongkorn University. Based on the Cohen's table, total sample size for this study is 34 students which consist of 17 females and 17 males. The sampling method will be used is purposive non-random sampling. The experiment results collected and the score recorded. The SPSS Statistics version 20.0 be used for all statistical analysis. The results be analyzed using an Independent Sample t-test analysis to find out whether there is a balance difference among the gender. The dependent variable is numerical and the observation is independent. The distribution data is normal which is based on Central Limit Theorem (CLT) n>30. Descriptive analysis used to assess mean and standard deviation (SD) of all the variables. There is an equal score for both gender; male and female in overall stability index. For normal score, both male and female get 6 out of 17 while 11 out of 17 of both genders obtained a good score which is better than the norms.

Keywords*: Balance, Stability, Gender, Injury, Limb.*

Introduction

Based on Merriam-Webster's Learner's Dictionary (2016) balance can be defined as the state of having weight spread equally so that it will not fall, balance is the ability to move or to remain in a position without losing control or falling and a state in which different things occur in equal or proper amounts or have an equal or proper amount of importance. In the human body, the high centre of gravity, together with the small base of support in standing, place the body in unstable equilibrium. Balance is continually challenged by destabilising internal perturbations from neuromuscular noise DeLuca et al. (1982) and hemody-namics Conforto et al. (2001), as well as by the force of gravity, perturbations from volitional movement (e.g. turning, bending) and interactions with the environment. Consequently, it is impossible to stand motionless as even when standing quietly on both feet, the body sways over its base of support. The basic requirement for standing balance is that the position of the body's centre of mass is held within the boundaries of the base of support established by the feet (Maki and McIlroy,1998). The ability to control postural balance is a prerequisite to perform many activities in daily life and underpins the ability to

maintain an independent lifestyle. Several studies have looked at gender differences when analysing different aspects of balance performance. Results have been conflicting with some studies reporting women having better balance than men Era et al., 1997; Ekdahl et al. (1989), and others reporting men having better balance than women (Overstall et al., 1977; Panzer et al., 1995). Further studies have reported that there is no gender differences in balance performance after normalising the data, relative to the subjects' height (Era et al., 2002). Maki et al. (1990) carried out a smaller scale study on two age groups of healthy Canadians (n= 32, mean age of 25 years old, and n= 32 mean age of 69 years old). Both studies used CoP (Centre of Pressure) displacement measurements to assess balance performance. The inconsistencies in the literature concerning gender difference in balance performance may exist as a result of differing balance tasks performed, as well as differing measurement and analysis techniques and subject groups/ages. Furthermore, some studies have failed to normalise the measurements (Overstall et al., 1977; Panzer et al., 1995). This appears to have a marked effect as shown in the work of Era et al. (2002) and (Maki et al., 1990). By referring to the conflict that have been concluded by several research, we are interested to test the balance between gender for Chulalongkorn University's student to know either male or female are more stable.

Literature Review

Defining balance - Balance cannot be "seen", "heard", or "felt", and so is not easily defined or described. Balance responds to movements of the head often without awareness to the individual. Balance is the ability to maintain a certain posture, or to move without falling (Howely ED and Franks BD., 1997). Another term used synonymously with balance is equilibrium. Equilibrium can be divided into two components: 1) the vestibule receptors that are responsible for static equilibrium and 2) semi-circular canals that control dynamic balance.

Biodex Balancing Machine - Featuring five test protocols, six training modes and intuitive "touch-screen" operation, the Balance System SD allows testing and training in both static and dynamic formats. Extremely versatile, it is the only system that provides fast, accurate Fall Risk Screening and Conditioning for older adults, which is used as a balance assessment tool for concussion management, plus closed-chain, weight-bearing assessment and training for lower extremity patients. Using this unique device, clinicians can assess neuromuscular control by quantifying the ability to maintain dynamic bilateral and unilateral postural stability on a static or unstable surface.

Gender Differences - The influence of gender on balance confidence has been inconsistent across several studies with males having higher balance confidence. (Lajoie and Gallagher, 2004) identified female participants scoring higher on the balance confidence scale than the male subjects. Fortinsky et al., (2009) examined the alignment between falls risk and balance confidence in a group of community-dwelling older adults (n = 329) with a history of falls.

Injury - Risk factors for falling are classified as intrinsic or extrinsic. Intrinsic factors are internal to the individual. Increased age, histories of falls, impaired balance, poor muscle strength, and various age-related physiologic changes and chronic conditions of various body systems, particularly cardiovascular and neurological conditions are examples of intrinsic risk factors (Davis, Ross, Nevitt, & Wasnich, 1999; Mustard & Mayer, 1997; Tinetti & Williams, 1998). Craik (1989) suggests that the cause of falls can be divided into two categories: (1) the stimulus that results in the loss of balance; and (2) the inability of the older adult to correct the unexpected loss of balance. Examples of stimuli that can cause falling are dizziness, fainting, the use of medication, or uneven surfaces.

Limb - Participation in a regular physical activity program contributes to the prevention of falling in older adults by strengthening lower limbs and back muscles, enhancing postural reactions, and by improving gait, flexibility, mobility, and self-confidence in physical abilities (Spirduso,1995). Many balance training exercises that target the muscular and sensory systems of older adults reduce fall frequency and improve postural stability, strength, reaction time, and the swaying of body on firm and soft surfaces (Mazzeo et al., 1999).

Methodology

The first section describes the background of the place where the study had been conducted. This study was conducted at Faculty of Sports Science Chulalongkorn University, Bangkok Thailand. The second section describes research design that has been used in this study. An experimental research design has been used because it is a traditional type of research and it is conducted with more disciplines. It is virtually the only type of research perform in science. Experimental research is conducted to increase the body of knowledge in the discipline and to suggest what procedures should be followed in the future. The third section describes the population and number of sampling that has been used. The participants that involved in this study are male and female students in semester one class from Faculty of Sports Science. (n=34) 17 males and 17 females. The fourth section explains the procedure, the participants be administrated and monitored by the lab staff to ease their understanding about the instruction. The fifth section describes instrumentation that has been used. The main instrumentation used is Biodex Balancing Machine. This machine been used because it is one simple machine that contains everything. It can inserts data and prints out that data and it tested the balance accurately. Last but not least, the sixth section describes on data collection, and how the data been analysed by using the Statistical Package for the Social Science (SPSS) version 20.

Findings

The results from my study found that female have a good score of medial lateral index based on norms compared to male. It was because (64.71%) 11 out of 17 of the female get a normal score while for male, there were only (41.18%) 7 people out of 17. However, (58.82%) 10 out of 17 of male get a good score which is better than the norms compared to female whom only (29.41%) 5 of them obtained a good score. One female obtained an abnormal score for medial lateral index which shows bad balancing. The results for both male and female are they get equal scores in anterior/posterior index. Both male and female scores (11.76%) 2 out of 17 for their normal score while (88.24%) 15 out of 17 female and male obtained a good score which is better than the norms. The results for both male and female are they get equal scores in overall stability index. Both male and female scores (35.29%) 6 out of 17 for their normal score while (64.71%) 11 out of 17 female and male obtained a good score which is better than the norms.

Recommendation

There are some recommendations for further research with regards to the current finding. Firstly, the university students should be in a good state of consciousness when doing the balancing test. Secondly, university students should spend more time on their balancing training. There are many examples of balancing training that can be done such as standing on a balancing ball or balancing board that usually

can be found in the gym. Finally, they should be more focused and alert while standing above the Biodex balancing machine to get the accurate reading. This balancing test also can be applied in various working sector together with resume and certificates, balancing test can be one of the important elements for interview or job application. There are many sector that requires good balancing ability such as performing arts, army, stunt man, cheerleader athletes, gymnast athletes, nursing sector and many more. For example, nurses sometimes need to help patients to stand and so on. Other example, cheerleader athletes need to balance themselves while performing. This test is to make sure future employees is in a good condition and full fill the characteristic for their jobs. In the other hand, youth can offer help for elderly in doing something such as lifting heavy things due to their good balancing.

Conclusion

The objective of the study is to determine whether any differences between genders exist in balance performance during quiet one leg standing among Chulalongkorn University students. There was one dependent variable that has been tested to collect data. Independent sample T-Test is used to analyse the data to compare the means between two unrelated groups on the same continuous, dependent variable for the hypothesis testing. Returning to the hypothesis posed at the beginning of this study, it is possible to state that male is more balanced than female. This is because the percentage of male scores in good stability for medial lateral score is 29.41% which is higher and better compared to female percentage, 14.71%. The result shows an equal result in both anterior/posterior and overall balancing. This study proves that youth has no problem with their balance because both male and female have equal results for stability.

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