

**EFFECTS OF VIRTUAL REALITY WITH  
SENSORY INTEGRATION ON GROSS  
MOTOR FUNCTION IN CHILDREN WITH  
SPASTIC DIPLEGIC CEREBRAL PALSY**

**SYNOPSIS**



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**Registration Number**

**Master of Science in Physical Therapy**  
**(Sports Physical Therapy)**

**Riphah College Of Rehabilitation & Allied Health Sciences**  
**RIPHAH INTERNATIONAL UNIVERSITY**  
**ISLAMABAD**  
**Fall 2020**

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In Partial Fulfilment of Requirements For the Award of Degree of  
Master in Science of Physical Therapy (Sports Physical Therapy)

**Riphah College of Rehabilitation & Allied Health Sciences**  
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**Fall 2020**

# RIPHAH INTERNATIONAL UNIVERSITY ACADEMIC PROGRESS REPORT

As on \_\_\_\_\_

For the period from \_\_\_\_\_ to \_\_\_\_\_

## 1. Personal Information of Scholar:

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## 2. Academic Progress:

Admission Date:	September'2018.
Status of Coursework (Credit hours completed and remaining):	3 <sup>rd</sup> Semester in progress.
Expected Date of Completion of Research Work:	6 Months after the approval.
Expected Date of Completion of Program:	July'2020.
Last GPA and CGPA (Please attach result of each semester):	3.1 GPA.

## 3. Research Topic:

Topic of Research:	Effects of Vestibular Rehabilitation Therapy (VRT) on Balance, Speed and Agility in Post-Concussion Football Players.
No of article reviewed for synopsis	10
Date of Approval	15 June 2019.
Name of Supervisor	Dr. Waqar Ahmad Awan.
Name of Co-Supervisor (if any):	NA
Status of Research Work	In progress.

## 4. Employment Status:

Unemployed	N/A.
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*Please Note: The scholars under HEC Indigenous 5000 Fellowship Program shall not undertake any employment whether paid or otherwise at any stage during their course of study of the program.*

Dated: \_\_\_\_\_

Signature of Scholar: \_\_\_\_\_

**5. Remarks of the Supervisor:**


**6. Overall progress: (please tick only one)**

<b>Poor</b>	<b>Satisfactory</b>	<b>Good</b>	<b>Very Good</b>	<b>Excellent</b>

<b>Verified/Certified by Supervisor</b>	<b>Countersigned by Associate Dean PG&amp;R</b>
Name:	Name: Prof Waqar Ahmed Awan
Signature:	Signature:
Date:	Date:

**SIGNATURES**

**Effects of Vestibular Rehabilitation Therapy (VRT) on  
Balance, Speed and Agility in Post-Concussion Football  
Players**

**Name of Student: Syed Alamdar Hussain**

**Registration No: 25936**

1	Dr		Supervisor	
2	Dr		Co-Supervisor (If any)	

## 1. INTRODUCTION

Football (Soccer) is a famous sport and is played for both recreational and professional occupation (1). Football which is one of the contact sport and the main portion of athletes life is spend on the playing field in situations where physical injury is at high risk (2). Football athlete need to be fit mentally and physically in order to cater the grand demands of sports and training which involves the exceptional levels of memory, planning, attention, and other diverse mental functions though good balance is a vital prerequisite for a good sport performance and to musculoskeletal injuries and concussion (3). Players injured during sports by concussions are a public health concern and a burden to healthcare system (2). A concussion is defined as mild traumatic brain injury caused from a sudden impact or alteration in the direction of motion causes the brain to stop normal functionality (4).The causes for concussions include falls, car accidents, etc while physical impact sports are responsible for a major proportion among them (5).In the field of sports medicine the topic of concussion is on the hotfoot today (6). Research surrounding concussion has experienced significant growth recently especially in the areas of incidence, assessment, and recovery. However, there is limited research on the most effective rehabilitation approaches for this injury (6).

Among the symptoms related to concussion the three most common symptoms headaches (55.0%), dizziness (41.8%), and blurred vision (16.3%) respectively (7). It has been speculated from research that injury of threshold 70 to 75 g result for concussions in football players (8). Following concussion balance impairments have been reported subjectively by approximately 40 % of athletes in the first few days after injury (9). Concussions related to sports are reported to be 1.6 to 3.8 million annually (10). As a result of concussion appear the areas to be damaged are neurocognitive functioning, postural and balance control and self-report symptoms (11). Variations occur in rates of reported concussions due to difference in sport and age however American football accounts about 63% of high school concussions (11). Despite the enhancements to facial and head protection, and increased stress on appropriate tackling strategies, the amount of athletes with sustain concussions remains dominant at the college level (12). Balance disorders following concussion are due to dysfunction in sensory integration in which the vestibular system plays key role for normal functioning (13). Recently, researchers have stated that vestibular

impairment is common as a result of concussion (14). Dizziness and balance disorders after concussion can be reduced by vestibular rehabilitation exercises (15). Despite the high incidence of dizziness and balance as result of concussion, reports of vestibular and balance rehabilitation in the treatment of concussion are limited (15). Gurr et al. reported that vestibular rehabilitation consist of graded exposure to head and body movements, management of anxiety, coping techniques and training causes reduction of vertigo and dizziness complains, and improved the balance of individuals (16). Hoffer et al. reported that in patients with concussion injury, vestibular rehabilitation exercises consisting of somatosensory exercises combined with aerobic activity, vestibulo-ocular reflex, and cervico-ocular reflex activities reduced the symptoms of dizziness and accelerate the rate of returning to work (17).

Proper evidence behind vestibular rehabilitation therapy in concussion management of an athlete is sparse and is based on different clinical experiences and a less number of studies with limited methodological design. This study will contribute in describing the severity of balance dysfunction in athletes who had sustained the concussion and were directed to be the part of vestibular rehabilitation therapy and define the effects of vestibular rehabilitation therapy on balance dysfunction, speed and agility after concussion, and to check whether the amount of regaining is similar between athletes undergoing Vestibular rehabilitation therapy with routine training and those with only routine training.

## 2. OBJECTIVE & HYPOTHESIS OF STUDY

### 2.1. Objectives

To determine the effectiveness of Vestibular Rehabilitation Therapy on balance, speed and agility, in Post-Concussion Football Players

### 2.2. Hypothesis

2.2.1. **Research Hypothesis:** Vestibular Rehabilitation Therapy will improve balance, speed and agility, in Post-Concussion football players.

2.2.2. **Null Hypothesis:** Vestibular Rehabilitation Therapy will not improve balance, speed and agility, in Post-Concussion football players.

### **3. MATERIAL & METHODS**

#### **3.1. Design**

The study design used for this literature would be Randomized Control Trial. (Experimental (VRT) & Control (conventional training))

#### **3.2. Sample Size**

This study would include total 40 participants which would be divided into two groups, 20 each.

#### **3.3. Study Duration**

The study duration would 6 months after the approval of the research board.

#### **3.4. Sampling Technique**

Non probability Purposive Sampling would be used

#### **3.5. Study Setting**

The study will be conducted in Hayatabad Sports Complex Peshawar, it would work as research lab for the researcher too.

#### **3.6. Selection Criteria**

##### **3.6.1. Inclusion Criteria**

Participants falling in this category would be recruited into the study.

- Active Male football player.
- Age between 15-25 years.
- Registered with history of concussion will be included in the study.
- Patients score falling above 15 on BESS.
- Patient with vertigo & participating in sports

##### **3.6.2. Exclusion Criteria**

Participant failing to fall in this category would be excluded of the study.

- Concussion other than sports.
- History of metabolic diseases.
- History of recent fractures.

#### **3.7. Tools**

Following tools would be used for the ‘Pre’ & ‘Post’ assessment of football athlete during the study.

- Balance Error Scoring Scale (BESS) (18)
- Physical Performance tests (Speed, agility)
  - a. 30-Ft Agility Shuttle Run (Agility)
  - b. 30 Meter Dash (Speed)

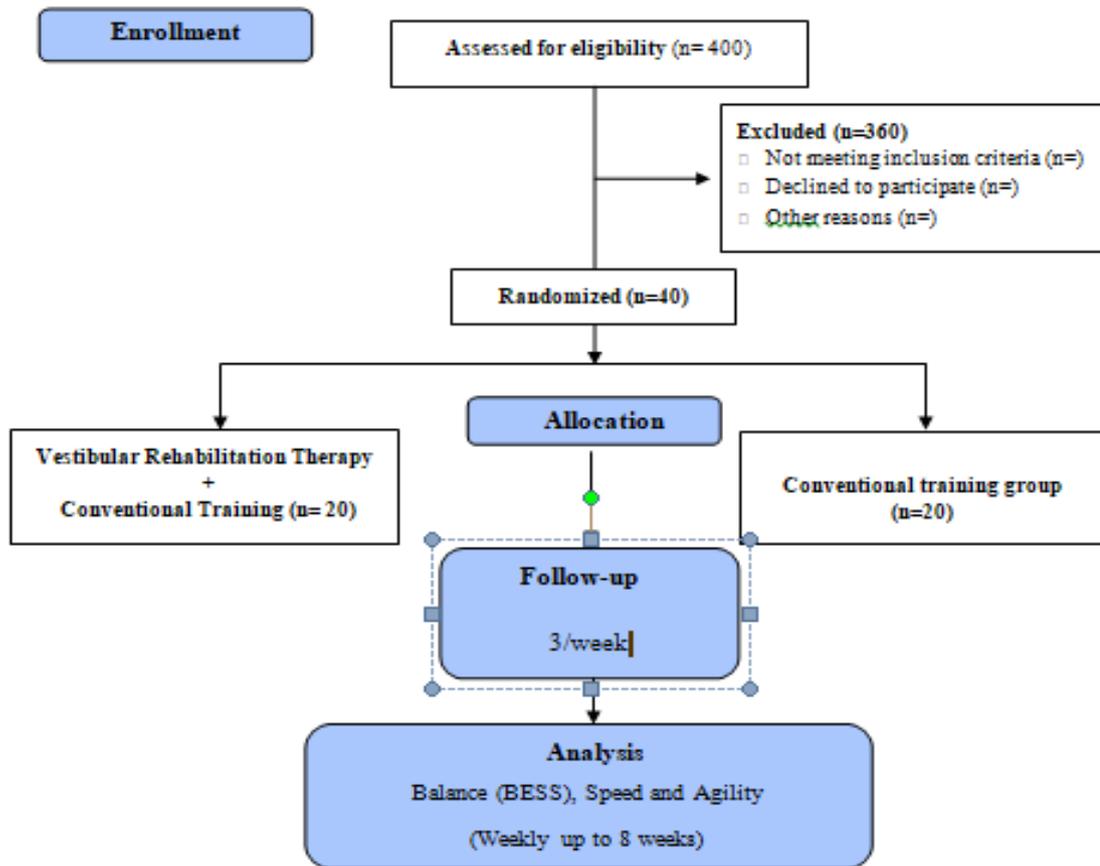
### 3.8. Intervention

Cawthorne Cooksey exercises. This protocol consisted of 4 types of progressive activities. Each type contains 2 to 4 tasks, performed in sets of 10 repetitions. Otherwise, the next therapy started from the task in which he presented the symptomatology. The protocol was performed in 10 30-minute sessions twice a week. (Table 1)

**Table 1: Detail Intervention Protocol**

	VRT	CT
<b>Week 1 &amp; 2</b>	<p><b>Activity sitting on the "Exercise Ball" swing (eye movements, first slow and then fast):</b></p> <ol style="list-style-type: none"> <li>a) Eye movements - when the body is forward, eyes up, return eyes down (anteroposterior balance);</li> <li>b) Eye0 movements from side to side during swing (laterolateral -LL-balance with contralateral eye movements to the balance sheet);</li> <li>c) Focusing on an object during the balance (anteroposterior -AP-and laterolateral);</li> </ol>	<ol style="list-style-type: none"> <li>a) Cone exercise.</li> <li>b) Advanced cone exercise.</li> <li>c) Circle of cones.</li> <li>d) Cut-backs.</li> <li>e) Shooting from a square pass.</li> <li>f) One-touch shooting.</li> <li>g) Three goal drill.</li> <li>h) Lay-offs, turns, and chest control.</li> </ol>
<b>Week 3 &amp; 4</b>	<p><b>Swing sitting activity (head movements, first slow then fast - eyes open and eyes closed):</b></p> <ol style="list-style-type: none"> <li>a) Sitting "Exercise Ball" on the swing, feet flat on the floor, throwing a small ball from hand to hand</li> <li>b) (above horizon level), following the ball with the eye;</li> <li>c) Sitting on a Exercise Ball, when the body goes forward looking at the ceiling and when the body goes backwards look at the floor;</li> <li>d) Sitting "Exercise Ball" on the swing,</li> <li>e) looking this way and that, simultaneously to the swing.</li> </ol>	

### 3.9. Data Collection Procedure



**Figure 1: Study Flow Diagram**

### 3.10. Data analysis

- Data will be tabulated using percentage distribution.
- Data will be analyzed descriptively by mean, median, mode and graphically presented using bar chart.
- Depending on normality of data, for within group changes RM-ANOVA or Friedman's Test and for between group comparison Independent-test or Mann Whitney U test will be used.
- Data will be analyzed using SPSS version 20.

**3.11. Gant Chart**

	<b>June-19</b>	<b>Oct-19</b>	<b>March-20</b>	<b>May-20</b>	<b>June-20</b>
<b>Title approval</b>	✓				
<b>Synopsis Defence</b>		✓			
<b>BASR Approval</b>		✓			
<b>Data collection</b>			✓		
<b>Report writing</b>				✓	
<b>Final presentation</b>					✓
<b>Report submission</b>					✓

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## **ANNEXURES**

### **Anexure 1: Consent form (English)**

**Anexure 2: Consent form (Urdu)**

### **Anexure 3: Demographics form & Questionnaires**

## **Anexure 4: Permission Letter**

## **Appendix 5: ERB/IRB**