

Balance and its Relationship to Some Kinematic Variables for the Back Handspring move (standing on the arms in the flipped position) on the floor mat in gymnastics

D. Abi Ramiz Albakri [1]

[1] University of Mosul/College of Physical Education

ABSTRACT

The researcher seeks to study some biomechanical variables of the Back Handspring move (which is the flip of the body onto both hands and holding in the flipped position) and if the chosen biomechanical variables are related to the type of the body balance system, whether static or dynamic. Another problem that led us to this study is that the training process in Iraq is not based of biomechanical analysis, which is important and fundamental for the improvement process and gymnastics players do not relay on clear scientific basis inferred from the analysis which if done , it can aid them in investing their abilities better..

Keywords:

INTRODUCTION

THE RESEARCH OBJECTIVES:

- * Expounding the values of static balance and dynamic balance tests of children gymnastics players in the 6-8 years age category.
- * Expounding some of the biomechanical values of the sitting position supported on the arms in the reverse position on the floor mat for children gymnastics players in the 6-8 years age category.
- * Expounding the relationship between static balance and dynamic balance and some Biomechanical variables of the sitting position of high backward position supported on the arms from the upper flipped position on the floor mat for children gymnastics players in the 6-8 years age category.
- * Expounding the relationship between static balance and dynamic balance and some biomechanical variables of the sitting position of low backward position on the floor mat for children gymnastics players in the 6-8 years age category

Research Methodology:

The researcher used the descriptive method adopting an analysis and relation approach appropriate with the nature of the study.

The sample of the study

The researcher conducting the experiment field with the aid of a sample of (4) players in the children category representing the Nineveh governorate team of 6-8 years old national champions .They were deliberately selected as

the sample of the study. The standard for their selection was their ability to perform Back Handspring move (standing on the arms in the flipped position) while rising the hip from the backwards and upwards position .

Means of data collection:

A questionnaire form, measuring, testing, and technical and scientific observation methods were used to collect the data.

the research adopted the following tests :-

* The Static balance test (Bondraiejowski test). In this test , the gymnastic player stands in balance while supporting the right leg on the left knee while the position of the right knee point outwards (Alshazly, 2009, 239-240).

* The dynamic balance test Johansson's modification of the dynamic balance test by (Bass) (a test of moving over signs) (Alshazly, 2009, 2009, 246-248).

The Programs used in the analysis:

I Filme: Premera: Auto cad 2000i:

Statistical methods:

Arithmetic Mean , standard deviation , simple correlation (r) , coefficient of difference (d) (Alsumaida'ie, et al 2010.29-60)

PRESENTATION AND DISCUSSION OF RESULTS:

Table 2 , the values of static and dynamic balance and some biomechanics variables of the gymnastic players

| static and equilibrium balance and biomechanics variables | Unit | Arithmetic mean | Standard deviation | Coefficient of difference |
|---|--------|-----------------|--------------------|---------------------------|
| Static balance with eyes opened | Second | t | 23,4 | 32,45 |
| Static balance with eyes closed | second | 17,32 | 7,75 | 44,75 |
| Dynamic balance | Degree | 72,5 | 9,57 | 10,7 |
| Upper position | | | | |
| The ankle angle at the moment the heel is raised | Degree | 149,5 | 1,29 | 0,86 |
| The knee angle at the moment the heel is raised | Degree | 176,5 | 1,29 | 0,73 |
| The hip angle at the moment the heel is raised | Degree | 131 | 0,82 | 0,63 |
| The ankle angle at the moment the hip is raised | Degree | 152,3 | 0,96 | 0,06 |
| The knee angle at the moment the hip is raised | Degree | 179 | 0,82 | 0,46 |
| The hip angle at the moment the hip is raised | Degree | 43,3 | 0,96 | 2,22 |
| The ankle angle with backward balance | Degree | 151,3 | 0,96 | 0,64 |
| The knee angle with backward balance | Degree | 180,5 | 1,3 | 0,72 |
| The hip angle with backward balance | Degree | 25,5 | 1,3 | 5,1 |
| The ankle angle at maximum extension | Degree | 149 | 0,82 | 0,55 |
| The knee angle at maximum extension | Degree | 172,5 | 1,29 | 0,75 |

| static and equilibrium balance and biomechanics variables | Unit | Arithmetic mean | Standard deviation | Coefficient of difference |
|---|--------|-----------------|--------------------|---------------------------|
| The hip angle at maximum extension | Degree | 178 | 0,82 | 0,46 |
| Lower backward position | | | | |
| The ankle angle at the moment the heel is raised | Degree | 151,5 | 1,29 | 0,85 |
| The knee angle at the moment the heel is raised | Degree | 174,5 | 1,29 | 0,74 |
| The hip angle at the moment the heel is raised | Degree | 130,5 | 1,29 | 0,99 |
| The ankle angle at the moment the hip is raised | Degree | 154,5 | 1,29 | 0,84 |
| The knee angle at the moment the hip is raised | Degree | 177,5 | 1,29 | 0,73 |
| The hip angle at the moment the hip is raised | Degree | 51,5 | 1,29 | 2,51 |
| The ankle angle with backward balance | Degree | 154,5 | 1,29 | 0,84 |
| The knee angle with backward balance | Degree | 175,5 | 1,29 | 0,74 |
| The hip angle with backward balance | Degree | 28,5 | 1,29 | 4,53 |
| The ankle angle at maximum extension | Degree | 168,8 | 0,96 | 56,87 |
| The knee angle at maximum extension | Degree | 177,5 | 1,29 | 0,73 |
| The hip angle at maximum extension | Degree | 170,5 | 1,29 | 0,76 |

The values and percentages were within the accepted ranges between (1-30%) in which (24) variables represent (88%) . The values that were more than the homogeneity limit were (3) variables at (11.1%) Hall, J.S. (1995) . this is an indication of the variance in the abilities of the players and the difference in their training and skill levels .The table also shows that the time of static balance increases when the eyes of the gymnastic player are open. The arithmetic mean when the eyes are open was (72.1)with a Standard deviation of (17.32) while the arithmetic mean when the eyes were closed was less at (17.32) with a standard deviation of (7.75)

Table 3 The correlation between static and dynamic balance with eyes opened or closed in children gymnastic players

| Static balance | Eyes opened | Eyes closed |
|-----------------|-------------|-------------|
| dynamic balance | 0.996 * | -0.873 |

Significant at (p=0.05 , f=3 and tabled r=0.878)

Table 4 The values of static and dynamic balance and some biomechanics variables of the gymnastic players in the upper balance position on the floor mat

| Biomechanical variable | Static balance with eyes opened | Static balance with eyes closed | Dynamic balance | Result of correlation |
|--|---------------------------------|---------------------------------|-----------------|-----------------------|
| The ankle angle at the moment the heel is raised | 0,138 – | 0,208 | 0,135 – | Not significant |
| The knee angle at the moment the heel is raised | 0,222 | 0,285 | 0,135 | Not significant |
| The hip angle at the moment the heel is raised | 0,075 | 0,311 | 0,001 | Not significant |
| The ankle angle at the moment the hip is raised | 0,403 – | 0,565 | 0,455 | Not significant |
| The knee angle at the moment the hip is raised | 0,075 | 0,311 | 0,001 | Not significant |
| The hip angle at the moment the hip is raised | 0,403 – | 0,565 | 0,455 – | Not significant |
| The ankle angle with backward balance | 0,403 – | 0,565 | 0,455 – | Not significant |
| The knee angle with backward balance | 0,138 – | 0,208 | 0,135 – | Not significant |
| The hip angle with backward balance | 0,138 | 0,208 – | 0,135 | Not significant |
| The ankle angle at maximum extension | 0,075 | 0,311 | 0,001 | Not significant |
| The knee angle at maximum extension | 0,138 | 0,208– | 0,135 | Not significant |
| The hip angle at maximum extension | 0,419 | 0,05 | 0,426 | Not significant |

Table 5. The values of static and dynamic balance and some biomechanics variables of the gymnastic players in the backward balance position on the floor mat

| Biomechanical variable | Static balance with eyes opened | Static balance with eyes closed | Dynamic balance | Result of correlation |
|--|---------------------------------|---------------------------------|-----------------|-----------------------|
| The ankle angle at the moment the heel is raised | 0,741 | 0,248 – | 0,674 | Not significant |
| The knee angle at the moment the heel is raised | 0,138 | 0,208 – | 0,135 | Not significant |
| The hip angle at the moment the heel is raised | 0,138 | 0,208 – | 0,135 | Not significant |
| The ankle angle at the moment the hip is raised | 0,138 | 0,208 – | 0,135 | Not significant |
| The knee angle at the moment the hip is raised | 0,224 – | 0,285 – | 0,135 – | Not significant |
| The hip angle at the moment the hip is raised | 0,138 – | 0,208 | 0,135 – | Not significant |
| The ankle angle with complete backward balance | 0,138 | 0,208 – | 0,135 | Not significant |
| The knee angle with complete backward balance | 0,097 | 0,305 | 0,135 | Not significant |
| The hip angle with complete backward balance | 0,657 – | 0,741 | 0,674 | Not significant |
| The ankle angle at maximum extension | 0,824 | 0,727 | 0,818 | Not significant |
| The knee angle at maximum extension | 0,138 – | 0,208 | 0,135 – | Not significant |
| The hip angle at maximum extension | 0,138 – | 0,208 | 0,135 – | Not significant |

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

The body joint differ in their effect on static and dynamic balance with various degrees.

- * A significant correlation exists between dynamic and static balance when the eyes are opened .
- * A high significant correlation exists between dynamic balance and the variable of ankle angle at the moment of lifting the hip and in backward balance position and the hip angle at the moment of lifting the hip and maximum extension when the body is balanced with the eyes closed but not significant in the upper balance position .
- * A high but not significant correlation exists between the variable of ankle angle at the moment of lifting the heel and in maximum extension when the body is in static balanced with the eyes opened in the backward support position.
- * A high but not significant correlation exists between the variable of hip angle at static balance and the ankle angle in maximum extension with the eyes closed and the body is in the backward balance position.
- * A high but not significant correlation exists between the variable of ankle angle at the moment of lifting the heel and in maximum extension and also the hip angle at backward position with dynamic balance in the backwards balance position

Recommendations

- * Paying attention to both types of balance and increase the level of the balance performance among children gymnastic players using exercises with open and closed eyes and various forms of balance apparatuses.
- * Conducting other studies on variables other than those used in the current study

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