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Effect of physical exercises on different surfaces to develop some types of speed for 100m sprinters in the 46T category

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Abstract
One of the most important aspects to focus on during training is improving the specific physical requirements of runners, which is the fundamental foundation upon which a player can perform well during competition. This improvement can only be achieved by finding the most advanced training methods for these specific physical requirements. Determining the best training method can only be achieved through experimentation and determining that this method positively develops these specific physical abilities and movement. It is noteworthy that short-distance runners, particularly the 100-meter sprint for the deaf and mute, require explosive power and strength, along with speed, as basic physical requirements. The academic utilized the experimental method, implementing a two-group design, as it aligns with the study's procedural requirements. Experimental study is distinguished by its accuracy and control over the variables under investigation, wherein certain variables are deliberately manipulated while others are held constant. Consequently, it is regarded as the sole research approach that effectively illustrates the causal relationship between effect and cause. The exercises prepared by the researcher on different surfaces had a positive impact on developing the types of speed for deaf and mute 100m runners. Training on different and varied surfaces adds a kind of excitement and motivation to the training. Training on different surfaces has a positive impact on the psychological and physical levels. Training on different surfaces helps a lot in reducing time through the rapid development of capabilities, unlike what is usual in specialized stadiums.

Keywords: Physical exercises, different surfaces speed, 100 m sprint

1. Introduction
One of the most important things to focus on during the training process is raising the level of the special physical requirements of the runners, which is the basic foundation through which the player can perform well during the competition. This process of raising the level can only be done by finding the most developed training methods for these special physical requirements. The process of determining the best training method can only be done through experimentation and arriving at the fact that this method works to develop these special physical abilities and movement in a very positive way. It is noted that short-distance runners, especially the 100 meters for the deaf and mute, need explosive ability and strength distinguished by speed as basic physical requirements in implementing their various abilities. This is due to the nature of these abilities, which require strong, fast and sudden movement of the legs during the competition (Silva Sahak Karkin, 2000) [3]. One of the methods that is concerned with developing speed in its various forms is the use of different floors in training, which uses body weight instead of other tools used in strength training, in order to gain the muscle to mobilize the largest number of muscle fibers during muscular work. Thus, speed can be developed in its various types. The research is important because it aims to raise the level of speed types for deaf and dumb 100-meter runners by experimenting with the use of exercises on different surfaces and demonstrating the extent of their impact on the speed types for deaf and dumb 100-meter runners, as well as the impact of this development on performance during competition. Strength is the fundamental cornerstone in developing speed, and the above information explains why this research is so important (Hassan Ghazi, 2009) [2]. The researcher formulated the research problem with the following question: Is there an effect of physical exercises on different surfaces on developing some types of speed for 100m sprinters with upper limb torsion?

2. Research Objectives

- Preparing activities on various surfaces to cultivate distinct forms of speed for the experimental group.
- Learn about the effect of exercises on different surfaces to develop types of speed. For the experimental group.
- The process of determining the contrasts between the pre-tests and post-tests of the experimental group and the control group in relation to the variables that are being investigated.

3. Research Hypotheses

- Positive effect of exercises on different surfaces to develop the types of speed for the experimental group.
- There are statistically significant differences between the pre- and post-tests in favor of the post-test for the experimental and control groups in the variables under study.
- There are statistically significant differences between the post-tests of the experimental and control groups in favor of the experimental group in the variables under study.

4. Research Areas

- **Location:** Maysan Olympic Stadium in Maysan Governorate.
- **Time frame:** From 10/12/2023 to 29/6/2024.
- **Human field:** Deaf and mute Paralympic 100m runners.

5. Research Methodology: The researcher used the experimental method using the two-group method. Because of the fundamental characteristics of the techniques included in the study, both the experimental and control groups are appropriate. The precision and control that experimental research have over the variables that are being investigated are what define it. This type of study permits the intentional modification of certain variables while simultaneously regulating others. As a consequence of this, it is considered to be the only study method that accurately elucidates the connection between the cause and the effect. The research sample was selected intentionally, as it was freely chosen to meet the objectives of the study conducted by the researcher. The research community consists of eight players from the Maysan Governorate team for the deaf and mute. These players were assigned to two groups, a control group and an experimental group, through simple random selection, resulting in three players in each group (Sareeh Al-Fadhli, 2003) [4].

6. Information Collection Methods and Devices Used

- References.
- Assembly of professionals and specialists.
- Researcher's experience.
- Surveys.
- M Dhamar Square and Field.
- Different training floors.
- High speed cameras.
- Banners.
- Indicators and cones.

7. Research Tests

- Transitional velocity test.
- Motor speed test.
- Response speed test.

8. Exploratory Experiment: The researcher executed a pilot experiment on December 20-21, 2023, involving two sample players to collect reliable data for use in the main experiment.

9. Pre-tests: On December 23 and 24, 2023, the researcher administered speed tests to the research sample as well as control subjects.

10. Homogeneity and Equivalence: "The groups being examined are entirely comparable in all aspects except for the experimental variable that influences the experimental group." Consequently, the researcher aimed to establish homogeneity and equivalence between the experimental and control groups by collecting the pre-test values, successfully achieving homogeneity in the research variables (Muhammad Subhi Hassanein, 2001) [6].

11. Main Experiment

The primary experiment was carried out during the special preparation phase, beginning on March 1, 2023, and continuing for a period of ten weeks over which a total of twenty-four training units were utilized. On March 18, 2024, the final training unit came to an end. During this time period, the experimental group focused on speed development by performing workouts on a variety of surfaces with three training units per week scheduled on Saturdays, Mondays, and Wednesdays. Within each unit, the experimental group performed four different exercises. On Saturdays, Mondays, and Wednesdays, the members of the control group participated in the routine workouts that the coach had planned for them during the course of their speed development.

12. Post-tests

We administered post-tests in a way that was consistent with how we had administered pre-tests once the main experiment was complete. On March 20th and 21st, 2024, participants took these post-tests to see how well they had mastered the study variables.

13. Statistical Methods

- Arithmetic mean.
- Standard deviation.
- Coefficient of torsion.
- T-law for correlated samples.
- T-law for independent samples.

14. Results

Providing and discussing the findings from the control group's pre- and post-tests on the research variables.

Table (1), displays the arithmetic means, standard deviations, calculated t values, significance levels, and the significance of differences between the pre-test and post-test results of the control group regarding the research variable

Table 1: Arithmetic means, standard deviations, calculated t values, significance levels, and the significance of differences between the pre-test and post-test

Variables	Unit of Measurement	Pre-test Mean	Pre-test St.d	Post-test Mean	Post-test St.d	T-value	Significance Level	Significance Type
Transitional velocity	meter	1.98	1.22	2.16	1.45	3.47	0.02	Sig.
Response speed	degree	4.00	1.12	9.00	1.33	3.12	0.03	Sig.
Kinetic speed	degree	3.00	1.16	8.00	1.41	3.44	0.01	Sig.

Significant at a degree of freedom of (9) and at a significance level of (0.05) or lower. Upon meticulous examination of Table no (1), one discerns a substantial and evident enhancement in the disparity between the means of the pre-test and post-test for each variable, favoring the post-test. The significance levels for each variable in the paired samples t-test were below 0.05, indicating statistically significant differences favoring the post-test (Mazen Abdel Hadi and Mazen Hadi Kazar, 2013) [5]. The researcher highlights the significance of the differences between the pre-test and post-test results for the control group players, with a preference for the post-test, across all variables related to the impact of exercises on speed-strength and explosive strength-speed within the training programmed designed by the coach. This approach is consistent with the principles of sports training aimed at improving these abilities for players with verbal and auditory impairments. The results of the pre-test and post-tests for the experimental group are presented, along with an analysis and discussion of the research variables (Muhammad Subhi Hassanein, 1987) [8].

Table 2: The arithmetic mean, test value, standard deviation, significance, and error level between the pre-test and post-test

Variables	Unit of Measurement	Pre-test Mean	Pre-test St.d	Post-test Mean	Post-test St.d	T-value	Significance Level	Significance Type
Transitional velocity	meter	1.97	1.02	2.38	1.44	2.77	0.01	Sig.
Response speed	degree	4.00	1.06	14.00	1.63	2.99	0.01	Sig.
Kinetic velocity	degree	4.00	1.27	13.00	1.58	3.65	0.02	Sig.

Significant at a degree of freedom of (9) and at a significance level of (0.05) or lower. Upon meticulous examination of Table (2), a notable enhancement is seen in the disparity between the mean scores of the pre-test and post-test for each variable, with the post-test scores prevailing. The significance levels for each variable in the paired samples t-test were below (0.05), indicating that the differences are statistically significant in favor of the post-test (Michael H stone *et.al*, 1998) [13].

The researcher illustrates the importance of the disparities between the pre-test and post-test for the control group participants, favoring the post-test across all variables, concerning the influence of exercises on speed-strength and explosive strength-speed within the training programed devised by the coach, which conforms to the principles and foundations of sports training aimed at enhancing these capabilities for athletes with verbal and auditory impairments.

The researcher emphasizes the significance of the differences noted between the pre- and post-tests of the experimental group, with the post-test showing favorable outcomes across all variables (Muhammad Subhi Hassanein, 1999) [7]. This is attributed to the impact of exercises conducted on various surfaces, which were specifically designed and implemented by the experimental group. Following scientific rules, the training load for these workouts was carefully controlled in terms of intensity, volume, and rest. This notion is supported by (Walid Muhammad, 2002) [9], who emphasized that the use of well-structured programs, executed effectively, contributes to the enhancement of physical performance, which is a key factor in achieving excellence in the sports domain.

The researcher posits that the advancement of speed tests is attributed to the proper standardization of resistances, which correspond to the body weight utilized in exercises across various surfaces (Elaine Wadih Farag, 1990) [10]. This standardization significantly influences the enhancement of strength associated with speed, stemming from the adaptation and development of muscles in response to the players' body weight. This resistance is optimal for the players' capabilities during exercises on diverse surfaces, resulting in an improved capacity of both the nervous and muscular systems. This aligns with the findings of (Sariah Abdul Karim, 2003), who states, “Muscle fibers have the ability to produce great force by changing the type of resistance, and thus the number of working motor units will increase and consequently their ability to produce energy will increase.”

Present the outcomes of the two assessments. The examination and discussion of the post-test results for the control and experimental groups for the research variables:

Table 3 Arithmetic means, standard deviations, estimated t values, error levels, and significance of the differences between the two post-tests for the control and experimental groups concerning the research variables

Variables	Unit of Measurement	Control Group Mean	Control Group St.d	Experimental Group Mean	Experimental Group St.d	T-value	Significance Level	Significance Type
Transitional velocity	meter	2.16	1.45	2.38	1.44	3.32	0.02	Sig.
Response speed	number	17.00	1.66	25.00	1.08	4.33	0.02	Sig.
Kinetic velocity	degree	9.00	1.33	14.00	1.63	4.22	0.02	Sig.

Significant at (18)degrees of freedom and at a significance level of (0.05)or lower. Table no. (3), illustrates a notable development and distinction in all research variables between the two post-tests for the experimental and control groups, favoring the experimental group. The calculated t-value for independent samples indicates significance levels

below 0.05, confirming that the differences are statistically significant. Consequently, the researcher's assumptions regarding these variables in the third hypothesis are validated (Dyson G, 1971) [12]. A significant positive development is also observed. The analysis of the remaining research variables indicates a favorable outcome for the experimental group, as evidenced by the differences in the arithmetic means of the post-tests and the calculated T values for independent samples, which demonstrated significance levels below 0.05 (Tudor O. Bompa & Michael C.Carrera, 2005) [11]. This indicates that the observed differences are statistically significant and substantiate the experimental group. Consequently, the researcher's assumptions regarding these variables in the third hypothesis have been validated. The researcher attributes the notable differences in speed type test results, favoring individuals in the experimental group, to the impact of exercises utilizing various floors (Walid Yahya Muhammad, 2002) [9]. This method is deemed more effective in enhancing speed types compared to alternative approaches. The researcher attributes the development in speed types to the exercises conducted. In the experimental group, the body weights applied by the individuals were measured, where Y Th. The exercises enhanced speed, thereby significantly influencing the outcomes of the speed test in the experimental group. Training on various surfaces enhances an athlete's movement and conditions the muscles for rapid contraction, which is advantageous for performance, as most sports involve explosive movements. In contrast, traditional weight training prioritizes muscle size over contraction speed, resulting in slower muscle fiber contractions.

15. Conclusion

- A favorable influence was observed in the development of different types of speed for deaf and mute 100-meter runners through the exercises that were designed by the researcher and performed on various surfaces.
- Training on different and varied surfaces adds a kind of excitement and motivation to the training.
- Different floor exercises have a positive effect on both the psychological and physical levels.
- Training on different surfaces helps a lot in reducing time through the rapid development of abilities, unlike what is usual in designated stadiums.

16. Recommendations

- Using training on different floors is an indispensable necessity in various games.
- The need to develop special physical requirements in different conditions.
- Applying experimental research to develop the sports training process and to identify the best methods to improve the performance of deaf and mute athletes in all athletics events.

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