

Strategy and Effectiveness of Contrast Water and Cold Water Bath Recovery Techniques for Elite Female Handball Players after Maximum Strength Training

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Abstract

The study aims to highlighting and enlightening the use of « contrast water therapy » technique and « cold water bath » after the maximum strength training quotas of handball players of the elite level. And that's via relying on « immersion process protocol » in water with different degrees, in which it helps in recovering from burden of training loads quotas .To apply this study and reach its goals , the researchers used the « descriptive approach » since it fits the subject's nature,in which they rely on a questionnaire consists of three (3) parts and twenty one (21) statements distributed on the sample of the required study which is the « coaches of the excellent national section » (15 coach). The researchers used in the statistical study on percentage and chi-square test for goodnessfit, through which a set of results were reached. After analysis they found: the most of the excellent national section coaches used these two techniques (2) in the recovery process after training maximum strength. And at the end of the study. The researchers recommended about other studies on how to apply the two (2) techniques (technologies) and their Long-term effects.

Keywords: *Recovery Techniques, Contrasting Water, Cold Water Bath, Extreme Strength, Handball.*

INTRODUCTION AND PROBLEM OF THE STUDY

The expansion of the scope of sports training and the rise in the numbers of sports events, reaching record numbers that were never expected from global and local championships and competitions in various sports, and achieving global and continental titles in light of the fierce race to win the first places and snatch the title of the cup holder, far from the obsession of the round witch and the world of stars Pele and Maradona, it is another sport that the world has been captivated by its spectacle and its fans' love, so they have placed on the shoulders of its practitioners a greater responsibility than the responsibilities of achieving personal titles, and this was not limited to male practitioners, as this qualitative leap was accompanied by another leap of another kind, which is the emergence of the female element to shine in various local, continental and even global events and demonstrations, so women's handball shone inside the halls and won the bet on seizing popularity and directing attention towards them, thus winning an audience that loves the spectacle of handball, as the enthusiasm seen during the match made it a very popular sport (Saidi Abdel Majid, Ben Charnoun, 2020, p. 325), and this matter, as it was honorable for them, placed them In front of other bets to achieve athletic achievement, which made training operations more serious and strict by applying training principles and ensuring the achievement of training session objectives to ensure progress and raise the level of physical condition and raise all its elements, and among the training sessions that have become focused on are sessions related to maximum strength training, through which players

gain a good level of strength degrees necessary during performance. This urgent need to increase training amounts requires trainers to be familiar with the methods that allow the completion of those loads that have been planned for training sessions and the required level of performance to suit the player's ability, especially those related to elite level training, as modern trends in sports training require training patterns that include everything that supports the training methods followed (Mihoubi Radwan, Taous, 2022, p. 60), and from here we move towards the principle of work and recovery, as it is one of the most important factors influencing the rise in the level of athletic achievement and its development.

While planning recovery processes has become as important as planning training processes, planning training sessions with maximum load has become not as difficult as it was before, as reliance has become on the existence of many recovery methods to quickly and effectively get rid of the remnants of these difficult training sessions. This recovery has actually become the new trend to influence the athlete and raise the level of performance and effectiveness of achievement. After training with maximum load or when performing high efforts or after competition, the phenomenon of fatigue occurs, which means a temporary decline in the ability to perform, or the ability to continue physical effort (Hussein Abdul-Kazem Fayrouz, 2001, p. 23). This is the result of a significant decline in the efficiency of internal devices and an increase in some physiological indicators indicating reaching the stage of fatigue, as the intensity and concentration of fatigue indicators differ according to the intensity of physical effort and increase especially at high levels. Recovery methods differ in modern sports training. In addition to the conventional means and techniques, modern methods have emerged that have become relied upon primarily by senior players and senior clubs in various disciplines and sports, whether individual or collective, according to the style or method specialized in the process. Training, and among the most prominent techniques used in the recovery process is the immersion method, which is a widely used recovery technique by athletes (Hamlin MJ, 2006, p14). Water immersion to restore athletes' performance has been divided into 4 techniques depending on the temperature of the immersion water, cold water immersion (CWI, water temperature 20). Hot water immersion (HW) more than 36 degrees. And immersion in neutral water (TW) from 20° to 36° with alternating water, which is alternating between CW and HW (Akkoyunlu Y, 2013, p639). These methods have become among the most important techniques used for recovery at the high level, as it has become largely dependent on recovery by immersion in water of different degrees, whether cold, depending on the cold water bath and immersion in cold water, or by alternating between cold and hot degrees through the contrast water therapy technique. This is to get rid of the result of physical work during training sessions with maximum load, including maximum strength training sessions, which necessitated conducting a study on the reality of the existence of this use among handball players, especially at the higher levels, and the extent of the coaches' awareness of the existence and importance of these techniques and the ways to use them in the field to get rid of the burdens of training and complete recovery in the shortest possible time without the need for expensive means.

Our research did not start from scratch, and since science is cumulative, it was based on similar studies that were completed in this context, including: a study (Ghoul, et al., 2016) entitled: "Using a cold water bath after strenuous training doses to improve recovery in football players." This study aimed to know the effect of using a cold water bath after strenuous training doses to improve response speed in football players. It relied on a research sample of 16 players under 21 years old who are active in the second professional division, where the experimental design was adopted for two groups, a control and an experimental group. The study reached a

set of points represented in that using a cold water bath after training doses is sufficient to improve the recovery process, prevent microscopic injuries, speed up recovery, and increase the player's efficiency in competition. In light of these results, the researchers concluded with a set of recommendations, the most important of which is studying the effects of a cold water bath in getting rid of chemical compounds resulting from fatigue during the training process, including lactic acid. A study (Joanna & al, 2007) entitled: "The effect of contrast water therapy on delayed muscle soreness symptoms", this study aimed to examine the effects of a commonly used Cwtprotocol on strength loss and subsequent recovery, muscle swelling, muscle damage markers and perceived pain after leg exercises that cause muscle damage. The experimental approach was adopted, pre-test and post-test after 6 weeks. The study was applied to a sample of 30 players. This study resulted in a set of results represented in strength and pain symptoms Doms improve after CWT compared to passive recovery, these results support the recovery profile of CWT as a scientific and low-cost strategy, so it seems that CWT is a recovery strategy that can be adopted for its ease of integration into athlete recovery programs. Hamlin, M, 2015 conducted a study entitled: "The effect of temperature contrast water therapy on lactic acid clearance in the blood of students of Mazandran University of Science and Technology after strenuous activity". This study aimed to investigate the effect of temperature contrast water therapy on the clearance of lactic acid in the blood of students of Mazandran University of Science and Technology after strenuous activity. The researcher adopted the experimental product and followed the experimental design on two groups, control and experimental, where these groups represented 30 students who were randomly selected to represent the study sample and were divided equally (15 control samples and 15 experimental). Statistical data were collected and analyzed and through this study a set of results were recorded, which were represented in several points where lctwt reduced the concentration of lactic acid in the blood after exhausting performance significantly than the effect of the negative recovery method. While lctwt had no significant effect on the accumulation of lactic acid in strenuous performance. In addition, it is believed that lctwt facilitates recovery through blood circulation, vascular pumping and hydrostatic pressure due to immersion, reducing metabolic waste and stimulating the nervous system.

The applied aspect

1- Methodological methods used:

1-1- Exploratory study:

The exploratory study is considered a procedure carried out by the researcher to evaluate the study problem and control the variables of his research and identify the difficulties and problems that he may encounter before conducting the field study, as its purpose is to remove ambiguity and form visions on all the conditions and components of the research (Sulaiman Laosin, Muwaffaq, 2019, p. 309).

The exploratory study includes the theoretical survey by collecting the heritage and theoretical background of the study, as previous studies similar to this study were searched for and a theoretical background was built in order to prepare the research base, as for the field study, the study was applied in the field to the coaches of women's handball clubs for the National Premier Division by distributing the questionnaire to them to ensure its suitability for the study in terms of understanding and clarity of the phrases, and then this sample was removed from the actual study.

1-2- Study Methodology:

The researcher is not the one who chooses the method as much as the nature of the study imposes it on him, as the method in scientific research represents a set of rules and examples that are established in order to obtain knowledge (Ikhlas Muhammad, Hussein, 2000, p. 35).

The descriptive analytical method will be relied upon to complete this study due to its suitability for the subject under study. The descriptive method is the method in which the researcher conducts an organized description (Rabhi Muhammad, Qandouz, 2022, p. 173).

1-3- Study Community and Sample:

The study community is the one that collects field data and it is considered part of the whole, meaning that we take a group of parts of the original community to be representative of the community in which the study is conducted (Ngal Muhammad, 2022, 21).

The current study community consists of coaches of female handball clubs, senior category, active in the National Premier Division, with a total of 20 coaches. The study sample is non-probabilistic and intentional, and the number of sample members is 15 coaches, male and female, after excluding 5 coaches who were subjected to the exploratory study. Accordingly, the remaining number of the study community is the sample estimated at 15 coaches of female handball clubs, senior category, in the National Premier Division for the 2022-2023 sports season.

1-4- Statistical Methods:

The aim of using statistical methods is to reach numerical indicators that help in the analysis. In order to be able to comment and analyze the form in a clear and easy way, we used the statistical analysis method, which is by emptying the data and then calculating the percentages. To make the results more accurate, we used the Chi-square test.

2-Presentation, analysis and discussion of the results**2-1- Presentation and analysis of the results of the personal data axis:****Table 2: Represents the personal data of the study sample.**

Percentage %	Frequencies	Answer	Variables
80	12	Male	sex
20	3	Female	
100	15	the total	
13.3	2	30-20	age
33.3	5	40-30	
33.3	5	50-40	
13.3	2	60-50	
6.7	1	60and more	
100	15	total	
20	3	10 -5	Years of experience
40	6	15-10	
20	3	20-15	
20	3	20and more	
100	15	total	

The table above, which shows the personal information of the study sample, shows that most of the sample members are male trainers, who numbered 13 trainers, representing 80%, while the number of female trainers was only 3, representing 20%. As for the ages of the

trainers, they ranged from over 20 years to nearly and over 60 years, with the most recorded age in the categories {30-40} and {40-50}, and the number of trainers was 5 trainers in each category, representing 33.3%, while there were only two trainers in the first and fourth categories, representing 13.3%, while there was one trainer who was over 60 years old. It is noted from the recorded statistics that the majority of trainers are between 30 and 60 years old. As for the statistics related to years of experience, they showed that 3 trainers had between 5 and 9 years of experience, representing 20%, then 6 trainers between 10 and 14 years of experience, representing 40%, while there were 3 trainers with between 15 and 19 years of experience, representing 20%, and the same percentage was recorded for trainers with 20 years of experience or more. The content of Table No. 03, which represents the statistical significance of the statements of the first axis related to the first research hypothesis, is shown by calculating the squared cav and comparing it with the tabulated squared cav at the significance level of 0.05 and the degree of freedom "2", where the results of the table showed that all the calculated squared cav values were between "7" and "28", while the tabulated squared cav value was "5.991", and accordingly, all the calculated squared cav values were greater than the tabulated values, and therefore all the statements in this axis are significant statements.

- Discussion of the results of the main hypothesis: In light of the statistical analysis of the results obtained, and based on the statistical study and discussion of the achievement of the first and second research hypotheses, which came in the context of the main hypothesis and were proven during the study. Accordingly, we can say that the main hypothesis, which is "the techniques of contrast water therapy and cold water bath are used after maximum strength training for elite level handball players" is a valid hypothesis.

CONCLUSIONS AND SUGGESTIONS:

Through what the results of the study contained in terms of statistical processing based on statistical methods in line with the research process in order to infer the results obtained in light of the study objectives, through which a set of points were obtained:

- The techniques of contrast water therapy and cold water bath are used after maximum strength training for elite level handball players.
- Contrast water therapy is used after maximum strength training in elite female handball players.
- Cold water bath recovery is used after maximum strength training in elite female handball players. The researchers also recommend the following:
- Conducting more in-depth studies on the use of the two techniques in the sports field, on the actual adherence to specific and standardized protocols, and on the long-term effects of the two techniques.
- Conducting experimental studies on the protocol of each technique and trying to develop an adapted protocol that has relative specifications (possibility of modification).

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