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Training for Muscular Fitness among Athletes: Towards Improving Attention and Concentration

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Abstract: This study was conducted at Zhengzhou University, Henan Province, China, with the aim of investigating the effects of muscle fitness training on athletes' attention and concentration. The study used descriptive experimental research methods to assess the effects of this training on student athletes participating in different sports such as basketball, volleyball, soccer, track and field, aerobics and tennis. The study focused on the experimental group and conducted several trials for different sports. The study found that different sports require different levels of muscularity. Interestingly, the study found that factors such as age, gender, grade level, and athletic specialization did not have a significant effect on the assessment of student's muscle demands. In light of these findings, the researchers recommend an integrated approach to fitness and exercise. The researchers suggest that each individual should begin exercising by choosing an intensity that matches his or her current fitness level and gradually increase intensity as strength and endurance improve. Finally, the study emphasizes the importance of monitoring muscle discomfort and seeking professional guidance when persistent pain or fatigue occurs. Additionally, the study highlights the importance of tailoring muscle fitness training and overall fitness programs for athletes, as well as the importance of injury prevention and overall health.

Keywords: Muscular Fitness; Training; Athletes' Attention and Concentration.

1. Introduction

This paper discusses previous literature that has examined the influence of muscular strength on various factors associated with athletic performance and the benefits of achieving greater muscular strength among athletes in Zhengzhou University, Zhengzhou City in Henan Province, China.

Greater muscular strength is strongly associated with improved force-time characteristics that contribute to an athlete's overall performance. Much research supports the notion that greater muscular strength can enhance the ability to perform general sports skills such as jumping, sprinting, and change of direction tasks. Further research indicates that stronger athletes produce superior performances during sports-specific tasks. Greater muscular strength allows an individual to potentiate earlier and to a greater extent, but also decreases the risk of injury. Sports scientists and practitioners may monitor an individual's strength characteristics using isometric, dynamic, and reactive strength tests and variables. Relative strength may be classified into strength deficit, strength association, or strength reserve phases. The phase an individual falls into may directly affect their level of performance or training emphasis. Based on the extant literature, it appears that there may be no substitute for greater muscular strength when it comes to improving an individual's performance across a wide range of both general and sports specific skills while simultaneously reducing their risk of injury when performing these skills.

Therefore, sports scientists and practitioners should implement long-term training strategies that promote the greatest muscular strength within the required context of each sports/event. Future research should examine how force-time characteristics, general and specific sports skills, potentiation ability, and injury rates change as individuals transition from certain standards or the suggested phases of strength to another.

2. Related Literature

Basketball is a high-intensity complex team sports characterized by the interaction of tactical, technical, psychological, and physiological components (Stojanović et al., 2018). Multiple explosive jumps, sprints, accelerations, decelerations, and changes of direction based on specific movements such as shooting, rebounding, defending, and dribbling are key factors for match-play performance, particularly two-point shots and defensive rebounds (Malarranha et al., 2020). Thus, understanding the physical demands encountered during competition could help strength and conditioning coaches and sports scientists to optimize players' preparation. Game demands in senior players have been described using video-based movement analysis methodologies (Torres-Ronda et al., 2016), which are based on a subjective visual prediction of the intensity and activity pattern load (Hulka et al., 2019). In addition to the emergence of global positioning systems for outdoor activities (Puente et al., 2017), advances in technology have permitted the use of inertial micro-sensors to quantify physical demands such as high-intensity accelerations and decelerations, among others, in semi-professional (Fox et al., 2018; Scanlan et al., 2019) and professional male basketball players (Svilar et al., 2018; Vázquez-Guerrero et al., 2018) during competition. While some information is available about physical demands in senior players during games, little is known about youth basketball (Ben Abdelkrim et al., 2020). In addition to video analysis, inertial microtechnology combined with local positioning systems (LPS) have also enabled sports professionals to obtain positional data in U18 players during elite basketball tournaments (Vázquez-Guerrero et al., 2019a, 2019b).

Although the most common method used to analyze player physical exertion during competition has been the study of the average demands, in recent years, state-of-the-art technology has rendered it possible to quantify the most demanding

scenarios of match-play in numerous intermittent team sports such as soccer, rugby, Gaelic football, and Australian football using different rolling averages (Whitehead et al., 2018). This novel methodology examines the pre-defined time frames, for instance, 30, 60, or 120 s, with the greatest demands on any physical variable chosen, namely total distance covered, high-speed running, or the number of high-intensity accelerations.

In addition to improving training, the identification of the most demanding scenarios would also optimize rehabilitation programs geared towards restoring a player's specific fitness and locomotor performance related to the peak physical demands required during match play. To date, the authors are only aware of one preliminary study that has reported the most demanding scenarios during one official basketball game, covering only total distance and player load data (Salazar and Castellano, 2019).

Regardless of whether its origins are pragmatic or therapeutic, athletes' interest in consulting psychologists is particularly noticeable at the elite grade of sports performance because at this level there are minimal differences between competitors in technical ability and/or physical fitness (G. Jones, Hanton and Connaughton, 2022). This observation is endorsed by the English tennis player Tim Henman who proposed that "the mental side is the difference between the top guys and the rest" (cited in Pitt, 2018b, p. 13).

3. Methods and Procedures

3.1. Research Design

This study will make use of the descriptive-experimental research design employing the one-way quasi-experimental research.

Descriptive-experimental research is an approach in research where a variable is described through the use of numeral data (Bieger & Gerlach, 2020). Likewise, specific research designs are to be utilized in the study.

Experimental research design is any research conducted with a scientific approach, where one set of variables are kept constant while the other set of variables is being measured as the subject of an experiment. There are times when you don't have enough data to support your decisions. In such situations, you need to carry out experiments to discover the facts. Experimental research can gather a lot of data that can help you make better decisions.

Experimental research is one of the founding quantitative research methods.

3.2. Research Locale

The study will be conducted at Zhengzhou University, with its main campus in Zhengzhou City, Henan Province, is a university jointly established by the Ministry of Education and the People's Government of Henan Province, and is one of the "double first-class" universities in China. It is also one of the "211 Project" and "One Province One University" construction universities, and has been selected as one of the "2011 Plan", "111 Plan" and "National High Level University".

3.3. Respondents of the Study

The respondents/participants of the study are the student athletes in Zhengzhou University in the following sports events namely: basketball (25), volleyball (22), football (31), track and field (37), aerobics (46), and tennis (17).

3.4. Data Gathering Procedure

The researcher will be choosing the group of athletes who will be participating in the study. They will be given the pre-test.

After the pre-test, they will be given lecture on training muscular fitness. After the lecture, they will be asked answer the post-test. The results of the pre-tests and post-tests will be analyzed by the researcher.

4. Results

4.1. Profile of the Student Respondents

Table 1 shows the demographic profile of the student respondents in terms of their age, and sex.

Table 1. Frequency Distribution of the Student Respondents' Profile

Profile	Frequency	Percentage
Age		
17 years old	**48**	**27%**
18 years old	**82**	**46.1%**
19 years old	**46**	**25.8%**
20 years old	**2**	**1.1%**
Total	**178**	**100%**
Sex		
Male	**99**	**55.6%**
Female	**79**	**44.4%**
Total	**178**	**100%**
Grade Level		
Grade 1	**56**	**31.5%**
Grade 2	**79**	**44.4%**
Grade 3	**43**	**24.2%**
Total	**178**	**100%**
Sports		
Basketball	**25**	**14%**
Volleyball	**22**	**12.4%**
Soccer	**31**	**17.4%**
Track & Field	**37**	**20.8%**
Aerobics	**46**	**25.8%**
Tennis	**17**	**9.6%**
Total	**178**	**100%**

In terms of age, forty-eight (48) or about 27% of the student respondents are 17 years old, eighty-two (82) or about 46.1% of the student respondents are 18 years old, forty-six (46) or about 25.8% of the student respondents are 19 years old, and two (2) or about 1.1% of the student respondents are 20 years old. This means that the majority of the student respondents are 18 years old. This may be taken to mean that the students are in the appropriate grade level for their age.

4.2. Significant Differences in the Assessment

In terms of age, a computed F-value of 1.07 and a significance value of 0.36 were identified. Since the significance value is greater than 0.05 level of significance, the null hypothesis is accepted which means that there is no significant difference in the assessment of student-respondents on the muscular demands of the sports when their

age is taken as a test factor. This means that there is no difference in the assessment of student-respondents on the muscular demands of the sports despite the difference in the age of the students. This may be taken to mean that the older and younger students have similar assessment of student-respondents on the muscular demands of the sports. Thus, the factor age does not affect the assessment of student-respondents on the muscular demands of the sports.

In terms of sex, a computed F-value of 0.00 and a significance value of 0.94 were identified. Since the significance value is greater than 0.05 level of significance, the null hypothesis is accepted which means that there is no significant difference in the assessment of student-respondents on the muscular demands of the sports when the respondents are grouped according to sex. This means that there is no difference in the assessment of student-respondents on the muscular demands of the sports although there is a difference in the sex of the students. This may be taken to mean that the male and female students have similar assessment of student-respondents on the muscular demands of the sports. Thus, the factor sex does not affect the assessment of student-respondents on the muscular demands of the sports.

In terms of grade level, a computed F-value of 1.02 and a significance value of 0.36 were identified. Since the significance value is greater than 0.05 level of significance, the null hypothesis is rejected which means that there is no significant difference in the assessment of student-respondents on the muscular demands of the sports when their grade level is taken as a test factor. This means that there is no difference in the assessment of student-respondents on the muscular demands of the sports despite the difference in the grade levels of the students. This may be taken to mean that the students in the lower grade level and those in the higher grade level have the same assessment of student-respondents on the muscular demands of the sports. Thus, the factor grade level does not affect the assessment of student-respondents on the muscular demands of the sports.

In terms of sports, a computed F-value of 1.10 and a significance value of 0.36 were identified. Since the significance value is greater than 0.05 level of significance, the null hypothesis is rejected which means that there is no significant difference in the assessment of student-respondents on the muscular demands of the sports when their sports affiliation is taken as a test factor. This means that there is no difference in the assessment of student-respondents on the muscular demands of the sports although the sports affiliation of the students is different. This may be taken to mean that the students have the same assessment of student-respondents on the muscular demands of the sports despite the difference in the student's sports affiliation. Thus, the factor sports do not affect the assessment of student-respondents on the muscular demands of the sports.

5. Conclusion

The factors age, sex, grade level, and sports do not affect the assessment of student-respondents on the muscular demands of the sports. Regardless of the type of exercise, start at an intensity that matches your current fitness level. Gradually increase the intensity or duration as strength and endurance improve. Allow your muscles time to recover between workouts. Overtraining can lead to fatigue, decreased performance and increased risk of injury. Include rest days in your workout schedule and prioritize sleep and nutrition to support recovery. Incorporate stretching and mobility exercises into your workout routine to improve flexibility and reduce the risk of muscle tightness or imbalance. Stretching also helps relieve post-workout soreness. Supplement your body with proper nutrition, including protein for muscle repair and carbohydrates for energy. Proper nutrition can help muscles perform optimally and recover effectively.

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