

Critical Analysis of a Research Paper

The paper I am going to analyse is taken from the journal of strength and conditioning research. It was written by Ledford, A., and Branch, J.D. The paper focuses on the effects of creatine supplementation on peak power production and work capacity. The author develops this theory by performing repetitive wingate tests in women. The paper includes research methods and statistical results.

Title

The title of the paper is very simple and direct. It has all the key words needed to notify the reader of the subject of the research. The language is specific to sport by using key terminology like 'creatine' and 'wingate test.' The title is written in a large bold font which signifies the importance of the text. The authors are listed in a smaller font, informing who contributed to the paper.

Abstract

This section elaborates on the title and declares the hypothesis of the study. It is very informative and clearly states what the research is about. When people access the journal via the electronic database, this small section is understandable, interesting and makes the reader want to carry on. The abstract follows on to give a more detailed account of the research with a summary of results. There is also a sentence at the end which outlines the conclusions found. It states that *'the practical application of the study is that 5 days of creatine monohydrate supplementation did not increase wingate test peak power production and work capacity in women.'* (Ledford, A., Branch, J.D. 1999) The abstract uses a lot of abbreviations which makes it easier for the author to write. The reader may find this difficult to follow. There are two small sections at the end, the first listing key words used, the second detailing reference data. I think the reference data is very useful and will stop plagiarism. I think the abstract could have been laid out better, by having the main section, results and conclusion separate.

Introduction

The introduction gives a short history of creatine and the process it's involved in. It is very clear and again uses helpful abbreviations. The results of similar studies are summarised to show that the study in hand has evidence to support it. The results also show the other side of the argument, where the author states '*other studies reported no improvement in cycle ergometer tasks*' (Ledford, A., Branch, J,D. 1999). This gives a non biased view to the study. There is also a paragraph which states that there are '*few investigations involving women*' (Ledford, A., Branch, J,D. 1999). Another journal states this fact, where '*although creatine supplementation remains a widely investigated topic, much information is available for males, but little is available for females*' (Rosene, J,M., Whitman, S,A., Fogarty, T,D. 2004). The last sentence sums up the introduction and states the clear and precise aims of the study.

Methods

Subjects

The first section of the method is headlined 'subjects'. The participants' details and descriptions are given. Their dietary plans and levels of physical activity are mentioned and their informed consent was approved in accordance with the Institutional Review Board of Old Dominion University. I think that having the participant's details in a separate sub section is easy to read and follow. This section doesn't state how many participants are tested. Only 9 people were used in the study, this small sample size does not show a true and fair representation of the population. In another study on effects of creatine '*36 competitive male tennis players were tested*' (Pluim, B,M., et al 2006).

Testing Protocol

This is a large section which gives an in depth description of how the wingate test is performed. It is clearly written with explanations of all the figures and abbreviations, also with equations. There is a sufficient amount of information that can be used again instead of having to recreate the research, as it states exactly how it is going to be carried out and what the results are expected to

be. The makes and models of the equipment used are clearly defined and the instructions are clear.

Design

The design section is a large paragraph which states exactly when and how the testing was performed. This section also mentions other studies that have similar results. The authors declare that '*in a double blind, counterbalanced treatment order manner, subjects in each pair were randomly assigned to creatine monohydrate or glucose polymer placebo supplementation regimes*' (Ledford, A., Branch, J.D. 1999). A double blind procedure is when neither the participant nor the assessor is aware which treatment the subject is receiving. The double-blind technique is very common to maintain the fairness of the testing. '*The subjects, randomly assigned to two groups, ingested in a double-blind manner either creatine monohydrate or placebo*' (Chwalbinska-Moneta, J. 2003). Counterbalancing is done by administering each experimental treatment in different orders and to different groups of people. '*Subjects were randomly assigned in a double-blind counterbalanced manner*' (Branch, J.D., Schwarz, W.D., Van lunen, B., 2007) This is also a commonly used method as the counterbalancing element is a control technique that controls the order effects of the design. The variables are listed, like the time of day the supplements are taken.

Statistical Analysis

This is a small section listing the way the data was collected, which has been shown in a table. The data was analysed using the repeated -measures design using SAS version 6.09 PROC GLM. This method of analysis was used to increase reliability and give more valid and accurate results.

Results

The results section is very large, so is split into a number of sub -sections. There is a table which is easily interpreted, but there are no graphs which would have made the results more diverse. The tables are clearly labelled and all the data seems to be presented in SI units which make it easier to read. The first sub-section is titled 'Subject Characteristics at Baseline and

Following Washout.' This section clearly states that there were '*no differences in body mass or peak power production at baseline compared to power postwashout*' (Ledford, A., Branch, J.D., 1999). Another study also came to this conclusion when testing creatine supplementation '*creatine did not influence body weight,*' '*no differences were observed between groups for initial total work*' (Brenner, M., Walberg Rankin, J., Sebolt, D. 2000). Validity was tested by using a McNemar X2 test. This showed that participants were effectively blinded to the treatments they were being given. The second section has a table which is clearly readable as long as you remember the abbreviations. The figures show that the '*supplementation did not improve peak power production*' (Ledford, A., Branch, J.D., 1999). The third section also states that there was no change following the treatment allocated to the participants. The '*response to the wingate test did not differ*' (Bentue-Ferrer, D. et al 2002). The fourth and final section starts off by stating '*body mass was unchanged*' (Ledford, A., Branch, J.D., 1999) and then lists some figures to prove that statement.

Discussion

This is the largest section of the journal and carries a lot of interesting and valuable information. This section starts off re-iterating that there is no research on women available. Many scientists find this problem, including Brenner '*most studies have used short-term supplementation in men, even though many women use the supplement and most individuals take it for prolonged periods*' (Brenner, M., Walberg Rankin, J., Sebolt, D. 2000). The next paragraph reveals the limitations of the study, including the fact that direct sex comparisons should be used. This shows that the author is open minded and will accept other explanations for the hypothesis. I agree with this statement, as direct comparisons leads to stronger and more valid results. Rosene et al performed his study on males and females and found significant differences. '*Time effect and difference between the sexes for systolic blood pressure were both significant*' (Rosene, J.M., Whitman, S.A., Fogarty, T.D. 2004). The last paragraph of the discussion is a summary of the results and how it reflects the findings of other researchers with regard to the topic in hand.

Conclusion

I feel that the paper as a whole is very informative and useful. The terminology is relevant and scientific. There are a lot of abbreviations which can be confusing at times. There should be a small key at the bottom of every page. There needs to be a bigger sample size and participants with varied levels of training should be tested. *'There is no evidence in the literature of an effect of gender or training status on effect size following creatine supplementation'* (Branch, J.D., 2003). I don't think the participants should be termed as 'subjects' as this can seem inhumane. The word 'participant' is a better option. The authors could have made the experiment over a longer period of time, although they would have had no evidence to back them up as *'there have been no studies to date that address the issue of long term creatine monohydrate usage'* Bembien, M.G., Lamont, H.S. (2005). This would make the experiment more representative of the population being targeted. I also think the experiment should have been comparative between males and females. More data would be collected allowing the authors to make more findings and comparisons. A variable that the authors have not taken into account, is when testing women, the menstrual cycle can affect training. Research shows that the *'mean post-exercise increase of glycerol concentration in the luteal phase was significantly higher than in the follicular phase'* (Gajewski, A.K., et al. 2001). This can affect women's lactate levels. Overall this a good experiment with valid expectations, but a larger sample size is needed.

References

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