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OPEN PEER REVIEW

Effects of Interval and Power Training on the Physical, Physiological, and Training Characteristics of Trained Distance Runners

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About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

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1 Original submission

1 comment · 12 Jul 2024

Referee 1 Reviewer

MAJOR REVISION 12 Jul 2024

Comments to the Author
In the manuscript entitled “Effects of Interval and Power Training on Trained Distance Runners’ Physical, Physiological, and Training Characteristics,” the authors attempted to address the importance of Interval and Power Training for Physical, Physiological, and Training Characteristics. However, the authors must address more points before publication of this research.
- Abstract: The abstract needs a general revision. You can easily do this by following the pattern of previously published articles in this journal. For instance, you should write an introductory sentence as the Background section. Then, state the Objectives of your own article. It is recommended to refer to your research Method in this section. Specify the number of subjects in each group. Provide a brief mention of your training protocols; specifically, mention the number of sessions per week, duration, and intensity of exercises. Clearly indicate the indices you assessed, i.e., mention what Physical, Physiological, and Training Characteristics were included. Additionally, I don't think there is a need to mention the statistical methods used in this section.
The results section also requires an overall review. There is no need to report the F values and indicate the p-values for each index within parentheses.
Consider the following example as a reporting template: Results: This study showed a meaningful difference between the intervention groups and the control group ($P < 0.05$) in the level of power in the upper body ($P = 0.001$), lower torso strength ($P = 0.001$), static balance ($P = 0.001$), dynamic balance ($P = 0.001$), and the psychological and behavioral components.
The conclusion is also unclear, and it somewhat renders the significance of this research irrelevant.
Please review and revise the abstract accordingly.

- Introduction:
The introduction requires a general rewrite.
In line 38, what is meant by the term "Moderate" in "Moderate high-intensity interval training"?
Similarly, in line 39, what is meant by aerobic $\dot{V}O_2Max$?
You have not addressed the scope of the article in lines 38-41; there was no need to discuss blood flow restriction (BFR).
Lines 48-57 also have no place in this current article. In the initial lines of the introduction, you could briefly mention them and instead provide a brief introduction to Plyometric training. This could have been done in line 58 as well, followed by a discussion of the effects of Plyometric training. For example, in lines 67-68, addressing "So further research is..." was not necessary.
Overall, the introduction needs a complete overhaul. The importance and necessity of the topic are not clearly defined, and it lacks a coherent structure.

- Methods:
How was the sample size calculated?
What is meant by the statement in line 84, "The study consisted of both observational and interventional components."?
Why was a 32-week exercise intervention conducted? Was there a specific reason for this duration? Would 12 or 16 weeks not have been sufficient for this study?
What were the criteria for inclusion and exclusion in the study? Is the absence of injuries and regular training experience sufficient? Did participants need to have a training history, a specific fitness level, a history of bone fractures, a specific age range, or restrictions on the use of sport supplements such as performance-

enhancing substances?
Were participants informed of their participation in the study and its potential consequences? Was written informed consent obtained from participants?
Line 90, under Assessments, did not need to mention the importance of the evaluated indices. It was only necessary to discuss the assessment methods, timing, tools, tool sensitivity, and other relevant details.
Please reference reputable articles for the method used to estimate an athlete's $\dot{V}O_2Max$. Provide precise details on how all studied indices were assessed, including the tool name, model, country of manufacture, tool sensitivity, and assessment method.
Line 108, in the Training Protocol section, could benefit from more detailed explanations. For example, details on intensity range, duration, recovery periods, etc., should be included to provide a clear and comprehensive understanding of the exercise protocols as presented in Table 1.
In line 147, under Statistical Analyses, and from line 151, "Paired sample t-tests were...," I have doubts as a reviewer about whether the statistical methods used in this study are appropriate. Do you have references for selecting these statistical methods?

- Results:
In my opinion, this entire section requires rewriting. You can perform this task by modeling it on previously published articles in this journal.
In this section, some indices have been categorized redundantly as Physiological and Physical Characteristics. Is there a specific reason for this classification? Briefly explain the categorization of indices and the necessity of examining them, with reference to reputable sources.

- Discussions:
The Discussions section requires a general revision. You can accomplish this task by modeling it on previously published articles in this same journal.
For example, here is a sample excerpt from the beginning of an article previously published in this journal that you can use as a template for your revision. You can write the first paragraph like this:
The results of the present study indicated that there was a meaningful difference between the mean scores in the intervention groups and those in the control group. Specifically, the levels of upper body strength, lower body strength, static balance, and dynamic balance in the experimental groups increased significantly after six weeks of training compared to the control group. Also, the high-intensity functional training (HIFT) group was better than the aerobic group in other functional components except for dynamic balance. On the other hand, regarding psychological factors and cognitive function, the experimental groups showed a meaningful decrease in depression scores, stress, and anxiety compared to the control group. When comparing the two experimental groups, the aerobic group showed better results in stress and depression variables than the high-intensity functional training group. In contrast, anxiety had worse results.

- Next, delve into your findings and compare the results with those of other relevant studies, discussing the reasons for alignment and discrepancies in the findings. Additionally, it is necessary to present explanations of the reasons or mechanisms related to these changes in this section.

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Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Reply #1 to Reviewers of the manuscript Asian Journal of Sports Medicine (149375)

Journal: Asian Journal of Sports Medicine
Manuscript ID: 149375
Manuscript Title: Effects of Interval and Power Training on Trained Distance Runners' Physical, Physiological, and Training Characteristics

First of all, we would like to thank all the reviewers for their interest in reading our manuscript, for the effort made in the evaluation and for their didactic and constructive comments, which undoubtedly have helped us to improve the original version. We would also like to thank the editor for providing us the opportunity to reflect on the reviewers' comments.

Hopefully, the changes introduced in the manuscript will make it of enough quality for being accepted in the Asian Journal of Sports Medicine. Please find below detailed replies (in blue text) to any comment/suggestion made by the reviewers and the editors.

The new changes introduced in the new version of the manuscript as a result of the revision appeared yellow highlighted in the text.

Reviewers' Comments:
Reviewer #1:
Comments to the Author
In the manuscript entitled "Effects of Interval and Power Training on Trained Distance Runners' Physical, Physiological, and Training Characteristics" authors attempted to address the importance of Interval and Power Training on Physical, Physiological, and Training Characteristics. However, authors must address more points before publication of this research.

We particularly appreciate and respect your comments and thoughtful suggestions on our manuscript. Based on these comments and suggestions, we have made careful modification on the new version of the manuscript to enhance clarity.

- Abstract: The abstract needs a general revision. You can easily do this by following the pattern of previous published articles in this journal. For instance, you should write an introductory sentence as the Background section.

We very much appreciate Reviewer #1 comments. We apologize for not included the *background in the abstract section*. We have revised the abstract by followed the pattern of previous published articles (Asian Journal of Sports Medicine) as a model and/or template to enhance logicality and readability. We thank again the advices for improving the quality of the manuscript.

Then, state your Objectives from your own article. It is recommended to refer to your research Method in this section.

Thank you very much for your valuable comment and suggestion. As recommended, we have referred/ updated the abstract and the method section in the new revised manuscript.

It is recommended to refer to your research Method in this section. Specify the number of subjects in each group. Provide a brief mention of your training protocols; specifically, mention the number of sessions per week, duration, and intensity of exercises. Clearly indicate the indices you assessed, i.e., mention what Physical, Physiological, and Training Characteristics were included.

We have modified the method section as per the suggestion.

Additionally, I don't think there is a need to mention the statistical methods used in this section. The results section also requires an overall review. There is no need to report the F values and indicate the p-values for each index within parentheses. Consider the following example as a reporting template: Results: This study showed a meaningful difference between the intervention groups and the control group ($P < 0.05$), in the level of power in the upper body ($P = 0.001$), lower torso strength ($P = 0.001$), static balance ($P = 0.001$), dynamic balance ($P = 0.001$). the psychological and behavioral components.

We appreciate Reviewer #1 for the fruitful comments and kind input about statistical methods. In our opinion, we have made careful modification on the revised version of the manuscript to improve its quality.

The conclusion is also unclear, and it somewhat renders the significance of this research irrelevant. Please review and revise the abstract accordingly.

Thank you very much for your constructive comments. We have revised the abstract and conclusions as per the suggestion accordingly in the revised version of the manuscript to make further good and interesting to the reader.

- Introduction:

The introduction requires a general rewrite. In line 38, what is meant by the term "Moderate" in "Moderate high-intensity interval training"?

We appreciate this feedback. As recommended, we have rewritten the introduction in the revised manuscript.

Similarly, in line 39, what is meant by aerobic V̇O2Max?

Thanks for the kind comment. To avoid any confusion/misunderstanding, the term *aerobic V̇O2Max* has been defined as maximal oxygen consumption in the main document to improve clarity.

You have not addressed the scope of the article from lines 38-41; there was no need to discuss blood flow restriction (BFR).

We highly appreciate Reviewer #1 comments. It is done accordingly.

Lines 48-57 also have no place in this current article. In the initial lines of the introduction, you could briefly mention them and instead, provide a brief introduction to Plyometric training. This could have been done in line 58 as well, followed by a discussion of Plyometric training effects. For example, in lines 67-68, addressing "So further research is..." was not necessary.

We also strongly appreciate Reviewer #1 comments. It is also done accordingly.

Overall, the introduction needs a complete overhaul. The importance and necessity of the topic are not clearly defined, and it lacks a coherent structure.

We appreciate the valid comment provided by the reviewer. We apologize for not being able to not clearly defined, and it lacks a coherent structure. Based on these comments and suggestions, we have made careful modification on the new version of our manuscript to improve its clarity and coherent.

- Methods:

How was the sample size calculated?

Thanks to Reviewer #1 for this particular comment. We perfectly understand his/her point. Unfortunately, we didn't have a special sample size formula, just census 100% sampling technique was used in all middle and long distance endurance athletes due to a small number of participants obtained from each three place of the study groups. In fact we reconsidered Yamane Taro (1967) sample size formula, equation 5, as he said 100 - 500 samples as small number of participants take all, no need to use this formula according Yamane. Therefore, all the details of the methods incorporated in the revised manuscript.

What is meant by the line 84 statement "The study consisted of both observational and interventional components?"

We apologize for the oversight and not defined *both observational and interventional components*. We have justified the observational and interventional *components.* Firstly, the physiological assessments was conducted at pre-test then followed observational assessment on physical and training characteristics conduct as a complement before the main intervention. Secondly, during intervention observational activities were collected. Thirdly, at post-test after conducting as the major experiment of physiological tests then the remain observational check list activities and structured survey questions with a focus on the 3 constructs such as physical, physiological and training characteristics and 49 different item indices conduct especially on physical and training characteristics were collected for obtained sufficient supplementary data.

Why was a 32-week exercise intervention conducted? Was there a specific reason for this duration? Would 12 or 16 weeks not have been sufficient for this study?

We thank the reviewer for the invaluable comments provided. Accordingly, we have already conducted a 32-weeks exercise intervention, but 12 or 16 weeks exercise intervention may be sufficient, but not restricted for 32 weeks. In fact it is a big deal like interval and power training in the experimental research. Because of: (i) the longevity of training duration increase the feasibility and quality of those observed training outcome significantly improve the endurance performance, particularly after 32 weeks exercise intervention than 12 and/ or 16 weeks. Durability large sample size is good for conclusion and for future implication in the training method literature allows assessing additional factors in large experimental research increase our expectation in little touch to see nutrition, altitude and season variation may an impact for the outcomes of this research. To support our discussion for instance:

J. Strength Cond. Res. 2017;31(1):9–23

As evidence 'a 40-week strength-training program significantly improves maximal and reactive strength, RE, and $v\dot{V}O_2Max$ in competitive endurance distance runners, without causing concurrent

hypertrophy’; (ii) conventionally durability is highly encouraging the present researchers why not 32, another supporting reason of the 32 longevity according to world athletics (WA formerly called IAAF) training and performance coaching theory analysis. Athletics is a let specialization sport. Because individual athletes to arrive a meaningful peak performance take 2-3 decades after long intervention specific training log bring meaningful changes; (iii) the number of 108 athlete participants (100% observant) which is huge for experimental research to reach out these number of athletes not simple task need sufficient time, in fact this sample may not be big for survey research according to Yamane (1967) in fact it is small; and (iv) immensity assessment tools by itself need long time observation in addition to intervention because tools /instruments sensitivity, imagine three major constructs and around 49 items in total grouping under physical, physiological and training characteristics.

What were the criteria for inclusion and exclusion in the study? Is the absence of injuries and regular training experience sufficient? Did participants need to have a training history, a specific fitness level, a history of bone fractures, a specific age range, or restrictions in the use of sport supplements such as performance-enhancing substances?

Thank you very much for the insightful comment. Obviously, we have considered regular training experience and the past training history from 1-8 years training age, bone fracture, diseases especially chronic illness and specific fitness level like speed endurance, age range chronologically included 18-24 years and performance enhancing supplements, all these as inclusion factors. Therefore, we strongly and completely accept, incorporate and reconsider as it is within the revised version of the manuscript to enhance the clarity.

Were participants informed of their participation in the study and its potential consequences? Was written informed consent obtained from participants?

Thank you very much for your concerns. We have informed consent not in written format but they were fully showed their willingness verbally you can find the details in the method section in the revised version of the manuscript. We will however, include it in our future similar correspondence.

Line 90, under Assessments, did not need to mention the importance of the evaluated indices. It was only necessary to discuss the assessment methods, timing, tools, tool sensitivity, and other relevant details.
Please reference reputable articles for the method used to estimate an athlete's V̇O2Max. Provide precise details on how all studied indices were assessed, including the tool name, model, country of manufacture, tool sensitivity, and assessment method.

Thank you very much for the insightful comment. We have accepted and reconsidered all the mentioned concerns as much as possible including, timing, test instruments, tool name, and model, country of

manufacture, tool sensitivity, and assessment method. Off course, we share your doubt on the *assessment methods* because of resource limitation including fund, as a third world nation coming up to other research in the near future, PhD student, we come across by filling the present limitation, with incorporating all assessment methods by using field tests within 400m circular track, assisted by two experienced coaches applied their Garmin forerunners stop watch. The results record into the score sheet and then the data run by version 25 SPSS model. Finally results change it into prediction equation using conventional and reputable sources cited and stated in the revised version of the manuscript.

Line 108, in the Training Protocol section, could benefit from more detailed explanations. For example, details on intensity range, duration, recovery periods, etc., should be included to provide a clear and comprehensive understanding of the exercise protocols as presented in Table 1.

Thanks for the Reviewer #1 comments and thoughtful suggestions on our manuscript. We have been explained and incorporated all concerns in order to make clear and comprehensive understanding of the exercise protocols in the revised version of the manuscript.

In line 147, under Statistical Analyses, and from line 151 "Paired sample t-tests were...," I have doubts as a reviewer about whether the statistical methods used in this study are appropriate. Do you have references for selecting these statistical methods?

Thank you very much for your plausible comments and concerns. Of course, we have already references for selecting these statistical methods as presented pre and post-tests measured by paired t test to see intervention effects within group. However, to elucidate further we have been considered further, in detail your comments in the revised manuscript.

- Results:
In my opinion, this entire section requires rewriting. You can perform this task by modelling after previously published articles in this journal.

In this section, some indices have been categorized redundantly as Physiological and Physical Characteristics. Is there a specific reason for this classification? Briefly explain the categorization of indices and the necessity of examining them, with reference to reputable sources.

Thank you very much once again. Following this advice given by Reviewer#1, we have revised the result section in the new version of the manuscript. In our opinion, the core of this research such as physical,

physiological and training characteristics as a major construct held together around 49 test items. The physiological variables statistically it has two phases the inferential result presented first then followed the descriptive result in text wise and in tabular order but it seems repetition but not. Therefore, our work is sufficient (in our opinion) after modification accordingly.

- Discussions:
The Discussions section requires a general revision. You can accomplish this task by modelling after previously published articles in this same journal.

For example, here is a sample excerpt from the beginning of an article previously published in this journal that you can use as a template for your revision. You can write the first paragraph like this:
The results of the present study indicated that there was a meaningful difference between the mean scores in the intervention groups compared to the control group. Specifically, the level of upper body strength, lower body strength, static balance, and dynamic balance, in the experimental groups increased significantly after six weeks of training compared to the control group. Also, the high-intensity functional training (HIFT) group was better than the aerobic group in other functional components except for dynamic balance. On the other hand, regarding psychological factors and cognitive function, the experimental groups showed a meaningful decrease in depression scores, stress, and anxiety compared to the control group. When comparing the two experimental groups, the aerobic group showed better results in stress and depression variables than the high-intensity functional training group. In contrast, anxiety had worse results.

- Next, delve into your findings and compare the results with those of other relevant studies, discussing the reasons for alignment and discrepancies in the findings. Additionally, it is necessary to present explanations of the reasons or mechanisms related to these changes in this section.

Thanks for the Reviewer #1 comment. In our opinion, we have made careful revision on this section accordingly as shown in the revised version of the manuscript to improve its quality.

Reviewer #2

We highly appreciate and respect your comments and thoughtful suggestions on our manuscript. Dear reviewer #2 as you insists notably for quick grasp and further elaboration under statistical methods, first we consider effect size as a complement of p value in the new revised version.

Second you demand and insist about production of graph and chart. We include graphic abstract, for simplified our methodological concern you may obtained more clarity. So based on your input we have interest tried to sketch the following rigorous figure as a methodological flow chart may offers a holistic insight about the intent of this research. To support our discussion for instance:

PeerJ. 2019;7(e6787):1–21.

After to explore several studies the sketch is important so this chart design concept select from one former study as the model which is found revised manuscript with major modification

Theoretical and conceptual framework

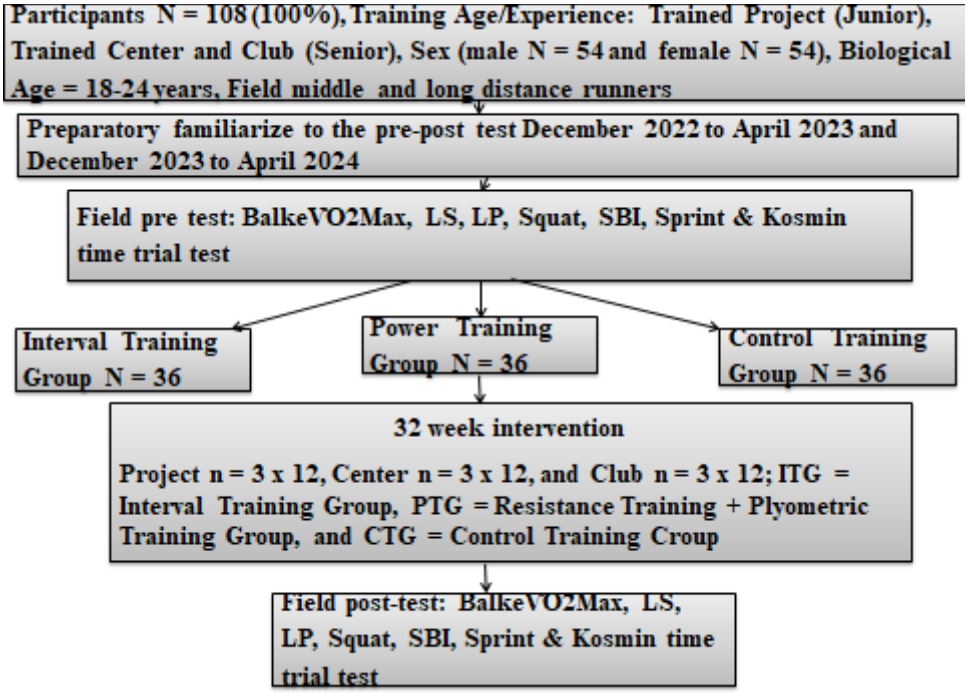


Figure 1. Experimental study methodological flow chart

Reviewer 2:
Thank you for considering me as a reviewer for your prestigious journal. Overall, this appears to be a solid and valuable contribution to the literature on training methods for distance runners. The large sample size and comprehensive assessment of multiple variables provide robust data to support the conclusions. With some revisions to improve clarity and highlight key points, this study would likely be suitable for publication in this journal.

We particularly appreciate and respect your comments and thoughtful suggestions on our manuscript. Based on these comments and suggestions, we have made careful modification on the new version of the manuscript to enhance clarity.

Abstract:
- The abstract could be more concise and clearly state the key findings

We appreciate Reviewr#2 for your constructive comments and insightful suggestions on our manuscript. In our opinion, we have made careful modification on the revised version of the manuscript to be more concise and clear for readers; hopefully you get find well.

Introduction:
The introduction provides a good overview of the importance of interval and power training for distance runners and identifies gaps in the current literature. However, it could be strengthened by:
- More clearly stating the specific research gap this study aims to fill
- Providing a more focused literature review on the most relevant previous studies
- Clearly stating the hypotheses earlier in the introduction

We really appreciate Reviewer #2 for your kind, constructive comments and amazing direction. Changes have been made in the introduction section to provide a good overview of the importance of interval and power training for distance runners and identifies gaps; as well as to help the readers easily understand the idea and finding of this work.

Method:
Some sections of the methods and results could be streamlined for clarity
- More details on the specific training protocols for each group
- Clearer description of how running economy was measured

- Information on how adherence to training protocols was monitored
- Consideration of potential confounding variables (e.g., diet, outside training)

Thanks to Reviewer #2 for this particular comment. Based on these comments and suggestions, we have made careful modification on the new version manuscript to make our description /discussions clearer. Assessment methods is one of the tough concerns of authors the only thing, RE is measured by course specific time trial tests such as 400m, 1500m and 3000m and Balke $\dot{V}O_2$Max test in addition to Cooper 12 minute run test were did as the researchers adopted as a physiological test.

Results section:
- Some results are presented in a confusing manner, making it difficult to quickly grasp key findings
- Lack of clear organization in presenting results for different variables

Thank you for this insightful comment. We apologize for our write-up being able to in a confusing manner and lack of organization. Based on these comments, we have made careful modification on the new version manuscript to minimize the confusion and organization in the result section, to make further good and interesting to the reader.

- Insufficient explanation of some statistical analyses
- Absence of effect sizes to complement p-values

We are especially grateful for this insightful suggestion. We did it accordingly. For data normality and homogeneity test assumption apply Shapiro Wilk and Levenes test. To address this result section within group pre to post-test difference we used paired t test, and to see the mean difference between intervention groups compared to control group, we applied ANOVA statistics. And finally to see the mean comparison among the three groups we employed Bonferroni correction. One of the main emphases of this result section touches on effect size. It is a quantitative measure of the magnitude of the experimental effect, or the difference between groups indicates how much the change in the

dependent variables can be explained by the independent variables. As a result showed F statistics is the main complement of P-values.

- Limited visual representation of data (e.g., graphs, charts)

We highly wonder your suggestion about visual representation. However, our ANOVA statistical model is not produces line graphs except few tables. We have tried to incorporate graphs and charts in the result sections in the revised version of the manuscript. Tabular representation substitute's graphs and charts already incorporated after your feedback.

Discussion:
The authors could improve the discussion by:

- More clearly summarizing the key findings at the beginning

- Providing more in-depth analysis of why certain results were observed

We appreciate the advice you provided. We have revised this section as shown in the revised version of the manuscript to make clearly summarizing the key findings. In fact this certainty happening on one major interventional component followed by observational complement and its detail reply under the method section. Still depth analysis provided on the discussion section especially in its own feathers of the third constructs known as training characteristics within the revised manuscript.

- Comparing results more explicitly to previous studies

Done accordingly, thanks.

- The implications and practical applications of the findings could be expanded on

- Addressing limitations of the study more comprehensively

- Suggesting specific directions for future research

Thanks for your appreciated comments and thoughtful suggestions on our manuscript. Based on these comments and suggestions, we have made careful modification on the new version manuscript.

References:
The references appear to be relatively up-to-date and relevant. Many citations are from the past 5 years, which is good. However, the authors could:
- Include more recent systematic reviews or meta-analyses if available
- Ensure all key concepts discussed are supported by appropriate citations
- Consider including some seminal older papers for historical context if relevant

We appreciate Reviewr#2 once again for your constructive comments and insightful suggestions on our manuscript. In our opinion, we have made careful checking the references on the revised version of the manuscript.

Associate Editor's Comments:

Associate Editor* 3*:
Your paper has been examined by 2 external reviewers and then re-evaluated in-house. The reviewers believe that your manuscript is interesting but not publishable in its current form. They have raised some points, listed below for your convenience.

Thanks for your appreciated comments and thoughtful suggestions on our manuscript. Based on these comments and suggestions, we have made careful modification on the new version manuscript to make further good and interesting to the reader and /or to make our explanations/discussions clearer. It is true that our manuscript contains interesting findings, which has been properly delimited in its new version.

EIC Decision 4:

Thank you for submitting your manuscript to Asian J Sports Med. Your manuscript has now been reviewed by two reviewers and an Associate Editor. I now have the reports of the Referees, which suggest that your manuscript might be suitable for publication following a number of revisions. I attach some reviewer comments and invite you to submit a revised version of your manuscript addressing the points made.

We appreciate your constructive and thoughtful comments and suggestions; as well as for recognizing its potential importance regarding our work. We have made careful modification on the new version of the manuscript to enhance the clarity of the document. Also, as recommended by Reviewer #1,-#2 and Associate Editor 3, changes and/or corrections have been made accordingly.

2 Revision 1

1 comment · 9 Sep 2024

Referee 1 Reviewer

REJECT 9 Sep 2024

Dear Professor Vahid Ziaei,

I hope this message finds you well. I am writing to provide feedback on the manuscript titled "Effects of Interval and Power Training on Trained Distance Runners' Physical, Physiological, and Training Characteristics," which I reviewed recently.

I had previously suggested several revisions that the author was encouraged to implement in order to enhance the quality of the paper. Unfortunately, it appears that the author has not been able to make the necessary changes. As a result, the manuscript does not meet the required standards for further consideration for publication in the Asian Journal of Sports Medicine.

Thank you for your attention to this matter. Please let me know if you need any further information.

Best regards,

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Revision 2

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Reply #2 to Reviewers of the manuscript Asian Journal of Sports Medicine (149375)

Journal: Asian Journal of Sports Medicine
Manuscript ID: 149375
Manuscript Title: Effects of Interval and Power Training on Trained Distance Runners' Physical, Physiological, and Training Characteristics

We would like to express our gratitude to Reviewer #2 for your thoughtful engagement with our manuscript. Your constructive comments and insights have significantly contributed to enhancing the original version. We also appreciate the associate editor and editor-in-chief for allowing us the opportunity to reflect on the reviewers' feedback again.

In our opinion, we hope that the revisions made to the manuscript will meet the quality standards for acceptance in the Asian Journal of Sports Medicine. Below, you will find our detailed responses (in blue text) to the comments and suggestions provided by Reviewer #2.

The changes made in this revised version of the manuscript are highlighted in yellow within the main body of the text.

Reviewer 2:
Thank you for considering me as a reviewer for your prestigious journal. Overall, this appears to be a solid and valuable contribution to the literature on training methods for distance runners. The large sample size and comprehensive assessment of multiple variables provide robust data to support the conclusions. With some revisions to improve clarity and highlight key points, this study would likely be suitable for publication in this journal.

Dear reviewer **#2**, we sincerely appreciate once again for your insightful comments and thoughtful suggestions. Your encouragement to improve our manuscript for publication is truly valued. In response to your feedback, we have made careful revisions to the revised version of the manuscript to enhance its clarity for readers.

Abstract:
- The abstract could be more concise and clearly state the key findings

We appreciate Reviewer #2's constructive feedback regarding the abstract. In response, we have revised it to clearly convey our key findings in the 32-week study focus on physical and physiological performance yielded significant changes observed in strength and speed endurance, alongside a marked enhancement in running economy. This comprehensive investigation underscores the positive impact of the training interventions on overall athletic performance.

Introduction:
The introduction provides a good overview of the importance of interval and power training for distance runners and identifies gaps in the current literature. However, it could be strengthened by:
- More clearly stating the specific research gap this study aims to fill

We appreciate Reviewer #2 for your constructive feedback and valuable suggestions regarding the research gap. We have made efforts to clearly articulate the specific research gap this study addresses in the Introduction section, providing a comprehensive overview of the manuscript. We hope these improvements meet your expectations, particularly in the third paragraph from the end of the Introduction on page 4, just before the hypothesis.

- Providing a more focused literature review on the most relevant previous studies

We sincerely thank Reviewer #2 for the constructive feedback on our manuscript, particularly regarding the literature review. In response, we have refined this section to emphasize the most relevant studies, which are now cited in the revised manuscript. Specifically, we have included the following citations in the Introduction (Pages 3: 1, 2, 8, 10, 15; Pages 3 and 4: 16, 20, 21, 22, 23, 24), Methods (see for instance pages 5 and 6: 33, 34), and Discussion (pages 12, 13, and 14: 36, 37, 42, 45, 47). We

believe these changes significantly enhance the focus and relevance of our literature review.

- *Clearly stating the hypotheses earlier in the introduction*

We appreciate Reviewer #2's constructive feedback. The introduction previously did not adequately present our hypothesis about the combined effects of interval and power training for distance runners, which may have obscured existing gaps in our findings. We have now clearly stated the hypothesis in the last paragraph before the study's objectives.

Method:
Some sections of the methods and results could be streamlined for clarity
- More details on the specific training protocols for each group

We sincerely appreciate Reviewer #2 for the constructive feedback and valuable insights. In the revised version of the manuscript, we have included a detailed discussion of the training protocols for each specific group in Table 1.

- *Clearer description of how running economy was measured*

We would like to thank Reviewer #2 for their constructive feedback and valuable suggestions regarding our manuscript. In the "Assessment" subsection of the "General Method" section, we described our measurement of running economy (RE) as a primary performance metric during the time trial test:

To evaluate running economy, we conducted course-specific time trial tests, which included a 400m speed test, a 1.5km Kosmin speed endurance test, and a 3km maximal speed endurance test.

Resources and procedures: To perform the time trial test on a 400m track, we gathered the necessary resources: cones, a stopwatch, and timing assistance. Each session began with a 10-minute warm-up, after which each athlete completed the 400m run while assistants recorded their times under the supervision of the main researchers in order to minimize the variability of results.

- *Information on how adherence to training protocols was monitored*

We thank Reviewer #2 for the constructive feedback. Adherence to training protocols was closely monitored throughout by: (i) scheduled meetings between athletes and coaches (in-person) help assess adherence and discuss any challenges faced in following the training protocol, (ii) analyzing performance changes, such as improvements in race times or $\dot{V}O_2$Max, can indicate adherence, as consistent training typically leads to measurable performance benefits, (iii) self-reported measures can assess perceived adherence, motivation, and barriers encountered during training, and (iv) researchers conducted orientation sessions with three assistants, focusing on assessment protocols before the test days. Detailed information on adherence monitoring can be found in the following section of

the assessment and training protocol. Orientation included demonstrations, followed by observation and feedback. During the pre-test, assistants provided motivation and corrections under researchers' supervision. To minimize variability, the same investigator conducted both pre- and post-test measurements. To reduce circadian variation, all measurements were scheduled at the same time daily, and participants were instructed to avoid intense exercise, caffeine, and alcohol for 24 hours before the pre-test.

- Consideration of potential confounding variables (e.g., diet, outside training)

We sincerely thank Reviewer #2 for your constructive feedback and valuable insights. First, we would like to apologize for not being able to address your request, as it falls outside the scope of our current research. Nonetheless, we truly appreciate your input and will consider factors such as diet and other variables beyond the training environment in our future studies.

Results section:
- Some results are presented in a confusing manner, making it difficult to quickly grasp key findings

We appreciate the feedback from Reviewer #2 and would like to provide some clarifications. The primary objective of our study was to compare the combined effects of interval and power training with a control group. Our key findings revealed significant improvements in strength endurance, speed endurance, and running economy.

Specifically, we observed notable changes in several areas: chronological age 4.16 ($p = 0.02$), Body Mass Index (BMI) 3.54 ($p = 0.03$), and fat-free mass 11.58 ($p = 0.001$). Additionally, maximum thigh circumference increased by 23.40 ($p = 0.001$), and 400m sprint performance improved by 108.83 ($p = 0.001$). Enhancements were also noted in 1.5km Kosmin speed endurance 38.39 ($p = 0.001$), 3km maximum speed time trial 9.29 ($p = 0.001$), and maximum exercise heart rate 23.40 ($p = 0.001$). Furthermore, leg strength increased by 46.56 ($p = 0.001$), and the sprint bounding index improved by 45.66 ($p = 0.001$). We also found a significant change in sleep habits 3.43 ($p = 0.04$).

In summary, our results indicate statistically significant changes ($p < 0.05$) with a notable effect size ($\eta^2 > 0.14$), underscoring the positive impact of the training interventions on both physical and physiological fitness.

- Lack of clear organization in presenting results for different variables

Reviewer #2 thanks you for your insightful comments and suggestions. In response to your feedback, we have made careful modifications and organization to the manuscript to improve the clarity and organization of the results section, aiming to enhance the reader's experience.

We have structured the results section around three major dependent variables: physical, physiological, and training-related factors. Each category includes relevant sub-test items, with results displayed in Tables 2, 3, and 4, respectively. Additionally, the effects of the two independent variables—interval training and power training modalities—on these dependent variables have been thoroughly explored.

- *Insufficient explanation of some statistical analyses*

We sincerely thank Reviewer #2 for the constructive feedback and valuable insights. In the revised manuscript, we have added a concise yet clear explanation of the statistical analyses.

- *Absence of effect sizes to complement p-values*

We thank Reviewer #2 for the valuable suggestion to include effect sizes alongside p-values. We have now added this important metric in the revised version of the manuscript in Tables 2, 3, and 4. To enhance understanding, we have also provided a detailed discussion of the concept of effect size in the supporting information.

- *Limited visual representation of data (e.g., graphs, charts)*

We appreciate Reviewer #2 for your valuable feedback on visual representation. We apologize for the lack of visual aids in the original manuscript. While our ANOVA statistical model primarily produces tables and a few line graphs, we have worked to include additional graphs in the results section of the revised manuscript. We also believe that the tabular format effectively complements the information usually conveyed by graphs and charts.

Discussion:

The authors could improve the discussion by:

- *More clearly summarizing the key findings at the beginning*

We sincerely appreciate Reviewer #2 for the valuable feedback. To clarify our key findings, the primary aim of this study was to investigate the combined effects of interval and power training in comparison to a control group. Our results demonstrated significant improvements in several areas: participants exhibited enhanced strength endurance, notable increases in speed endurance, and marked improvements in running economy. These findings emphasize the positive effects of the training interventions on both physical and physiological fitness.

- *Providing more in-depth analysis of why certain results were observed*

We sincerely thank Reviewer #2 for your insightful comments. In response, we have clarified our analysis of the observed results in this section.

While our findings are not entirely conclusive, we note that the primary domains—physical and physiological characteristics—showed statistically significant changes. In contrast, the subgroup analysis on training characteristics yielded less significant results. It's important to emphasize that these training-related dependent variables do not influence our main conclusions but instead suggest avenues for further research, including nutritional and psychological factors. Therefore, we recommend that the analysis of training characteristics be explored in an independent study.

- *Comparing results more explicitly to previous studies*

We extend our gratitude to Reviewer #2 for the constructive feedback and valuable insights. In the revised manuscript, we have made explicit comparisons of our results with those of previous studies, as detailed in Table 5 on page 13. We encountered challenges in this comparison due to varying approaches and methodologies across the studies, which complicate further analysis. We hope Reviewer #2 will consider this not as a limitation, but as an inherent aspect of our study.

- *The implications and practical applications of the findings could be expanded on*

We are grateful for Reviewer #2's valuable insights. This study highlights the significance of integrating interval and power training over 32-week duration, examining various hypotheses and analyzing over 40 indices across three primary constructs. Our key findings demonstrate that this combined training approach positively influences strength endurance, speed endurance, and running economy in middle and long-distance runners.

Implications: A more comprehensive understanding of these long-term effects is essential for optimizing endurance performance.

Practical Applications: Tailored training strategies based on these findings can assist coaches and athletes in effectively improving endurance capabilities.

- *Addressing limitations of the study more comprehensively*

We sincerely thank Reviewer #2 for your valuable comments and suggestions. This study encountered several limitations, particularly the researchers' limited experience with performance metrics and statistical analysis, along with insufficient research facilities, especially in the area of laboratory testing.

- *Suggesting specific directions for future research*

We sincerely thank Reviewer #2 for their valuable feedback and suggestions. Future research could explore the interactions of these training methods with various factors such as exercise nutrition, exercise psychology, and the types of footwear used during training and competition. Investigating these aspects may provide important insights that could contribute to the development of future endurance running champions and pave the way for new research opportunities in this area.

References:

The references appear to be relatively up-to-date and relevant. Many citations are from the past 5 years, which is good. However, the authors could:

- *Include more recent systematic reviews or meta-analyses if available*

We appreciate Reviewer #2 for the constructive feedback and valuable suggestions regarding the inclusion of more recent systematic reviews or meta-analyses to improve the relevance and timeliness of our manuscript. In the revised version, we have incorporated and cited the following studies: Introduction (1, 3, 7, 10, 13, and 14), Methods (28, 33), Results, and Discussion (7, 10, 13, 14, 33, 38, 45, 48, 49, and 50).

- *Ensure all key concepts discussed are supported by appropriate citations*

We sincerely appreciate Reviewer #2 for your valuable comments and suggestions. We believe that all key concepts are sufficiently supported by relevant citations, which have already been incorporated into the introduction, methods, results, and discussion sections.

- *Consider including some seminal older papers for historical context if relevant*

We sincerely appreciate Reviewer #2 for their insightful comments and suggestions. In response, we have included several seminal older papers that provide important historical context in the revised version of our manuscript, alongside systematic reviews and meta-analyses. Specifically, references 18, 19, 21, 24, 25, 30, and 31 have been added.

We hope these revisions meet your expectations and encourage you to consider our manuscript for publication. Thank you for your valuable contributions to improving our work.

3 Revision 2

0 comments

No public comments in this round.