

## PEER-REVIEW REPORT

**Name of journal:** *World Journal of Cardiology*

**Manuscript NO:** 83557

**Title:** Effectiveness of high intensity interval training on cardiorespiratory fitness and endothelial function in type 2 diabetes: a systematic review

**Provenance and peer review:** Invited Manuscript; Externally peer reviewed

**Peer-review model:** Single blind

**Reviewer's code:** 03848898

**Position:** Editorial Board

**Academic degree:** PhD

**Professional title:** Full Professor

**Reviewer's Country/Territory:** Iran

**Author's Country/Territory:** Greece

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**Reviewer chosen by:** AI Technique

**Reviewer accepted review:** 2023-01-31 04:40

**Reviewer performed review:** 2023-01-31 19:41

**Review time:** 15 Hours

Scientific quality	<input type="checkbox"/> Grade A: Excellent <input type="checkbox"/> Grade B: Very good <input checked="" type="checkbox"/> Grade C: Good <input type="checkbox"/> Grade D: Fair <input type="checkbox"/> Grade E: Do not publish
Novelty of this manuscript	<input type="checkbox"/> Grade A: Excellent <input type="checkbox"/> Grade B: Good <input checked="" type="checkbox"/> Grade C: Fair <input type="checkbox"/> Grade D: No novelty
Creativity or innovation of this manuscript	<input type="checkbox"/> Grade A: Excellent <input type="checkbox"/> Grade B: Good <input checked="" type="checkbox"/> Grade C: Fair <input type="checkbox"/> Grade D: No creativity or innovation

<b>Scientific significance of the conclusion in this manuscript</b>	<input type="checkbox"/> Grade A: Excellent <input type="checkbox"/> Grade B: Good <input checked="" type="checkbox"/> Grade C: Fair <input type="checkbox"/> Grade D: No scientific significance
<b>Language quality</b>	<input checked="" type="checkbox"/> Grade A: Priority publishing <input type="checkbox"/> Grade B: Minor language polishing <input type="checkbox"/> Grade C: A great deal of language polishing <input type="checkbox"/> Grade D: Rejection
<b>Conclusion</b>	<input type="checkbox"/> Accept (High priority) <input type="checkbox"/> Accept (General priority) <input type="checkbox"/> Minor revision <input checked="" type="checkbox"/> Major revision <input type="checkbox"/> Rejection
<b>Re-review</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Peer-reviewer statements</b>	Peer-Review: <input checked="" type="checkbox"/> Anonymous <input type="checkbox"/> Onymous
	Conflicts-of-Interest: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

## SPECIFIC COMMENTS TO AUTHORS

Dear Colleague I write you in regards to SYSTEMATIC REVIEW manuscript ID "83557" entitled " Effectiveness of high intensity interval training on cardiorespiratory fitness and endothelial function in type 2 diabetes: a systematic review", which you submitted to World Journal of Cardiology. Comments and suggestions This study investigated "Effectiveness of high intensity interval training on cardiorespiratory fitness and endothelial function in type 2 diabetes: a systematic review". Although researchers have faced many difficulties in conducting current research, there are several challenges in this study that make it difficult to manuscript approve for publication in a valuable journal. Some of the concerns are: First, The question of the present study (The aim of this systematic review is to evaluate the effectiveness of high intensity interval training on cardiorespiratory fitness and endothelial function in patients with type 2 diabetes and present the most updated knowledge in literature. Please, see the abstract as well as the final paragraph of the introduction to the manuscript) has already been reviewed and answered by other researchers. In other words, the positive effect of HIIT exercises on various indicators related to metabolic syndrome and cardiorespiratory fitness is quite

clear, and even meta-analysis articles have been published in this field(Please, see the references of 1 to 13 ). 1. da Silva DE, Grande AJ, Roever L, Tse G, Liu T, Biondi-Zoccai G, de Farias JM. High-Intensity Interval Training in Patients with Type 2 Diabetes Mellitus: a Systematic Review. *Curr Atheroscler Rep*. 2019 Feb 2;21(2):8. doi: 10.1007/s11883-019-0767-9. PMID: 30712240. 2. de Oliveira Teles G, da Silva CS, Rezende VR, Rebelo ACS. Acute Effects of High-Intensity Interval Training on Diabetes Mellitus: A Systematic Review. *Int J Environ Res Public Health*. 2022 Jun 9;19(12):7049. doi: 10.3390/ijerph19127049. PMID: 35742298; PMCID: PMC9223048. 3. Wormgoor SG, Dalleck LC, Zinn C, Harris NK. Effects of High-Intensity Interval Training on People Living with Type 2 Diabetes: A Narrative Review. *Can J Diabetes*. 2017 Oct;41(5):536-547. doi: 10.1016/j.jcjd.2016.12.004. Epub 2017 Mar 30. PMID: 28366674. 4. Liu, Jx., Zhu, L., Li, Pj. et al. Effectiveness of high-intensity interval training on glycemic control and cardiorespiratory fitness in patients with type 2 diabetes: a systematic review and meta-analysis. *Aging Clin Exp Res* 31, 575–593 (2019). <https://doi.org/10.1007/s40520-018-1012-z> 5. De Nardi AT, Tolves T, Lenzi TL, Signori LU, Silva AMVD. High-intensity interval training versus continuous training on physiological and metabolic variables in prediabetes and type 2 diabetes: A meta-analysis. *Diabetes Res Clin Pract*. 2018 Mar;137:149-159. doi: 10.1016/j.diabres.2017.12.017. Epub 2018 Jan 9. PMID: 29329778. 6. Jiménez-Maldonado A, García-Suárez PC, Rentería I, Moncada-Jiménez J, Plaisance EP. Impact of high-intensity interval training and sprint interval training on peripheral markers of glycemic control in metabolic syndrome and type 2 diabetes. *Biochim Biophys Acta Mol Basis Dis*. 2020 Aug 1;1866(8):165820. doi: 10.1016/j.bbadis.2020.165820. Epub 2020 Apr 29. PMID: 32360396. Review 7. Martland R, Mondelli V, Gaughran F, Stubbs B. Can high-intensity interval training improve physical and mental health outcomes? A meta-review of 33 systematic reviews across the lifespan. *J Sports Sci*. 2020

Feb;38(4):430-469. doi: 10.1080/02640414.2019.1706829. Epub 2019 Dec 31. PMID: 31889469. 8. Sultana RN, Sabag A, Keating SE, Johnson NA. The Effect of Low-Volume High-Intensity Interval Training on Body Composition and Cardiorespiratory Fitness: A Systematic Review and Meta-Analysis. *Sports Med.* 2019 Nov;49(11):1687-1721. doi: 10.1007/s40279-019-01167-w. PMID: 31401727. 9. Ramos JS, Dalleck LC, Tjonna AE, Beetham KS, Coombes JS. The impact of high-intensity interval training versus moderate-intensity continuous training on vascular function: a systematic review and meta-analysis. *Sports Med.* 2015 May;45(5):679-92. doi: 10.1007/s40279-015-0321-z. PMID: 25771785. 10. Way KL, Sultana RN, Sabag A, Baker MK, Johnson NA. The effect of high Intensity interval training versus moderate intensity continuous training on arterial stiffness and 24h blood pressure responses: A systematic review and meta-analysis. *J Sci Med Sport.* 2019 Apr;22(4):385-391. doi: 10.1016/j.jsams.2018.09.228. Epub 2018 Sep 22. PMID: 30803498. 11. Qiu S, Cai X, Yin H, Sun Z, Zügel M, Steinacker JM, Schumann U. Exercise training and endothelial function in patients with type 2 diabetes: a meta-analysis. *Cardiovasc Diabetol.* 2018 May 2;17(1):64. doi: 10.1186/s12933-018-0711-2. PMID: 29720185; PMCID: PMC5930739. 12. You Q, Yu L, Li G, He H, Lv Y. Effects of Different Intensities and Durations of Aerobic Exercise on Vascular Endothelial Function in Middle-Aged and Elderly People: A Meta-analysis. *Front Physiol.* 2022 Jan 21;12:803102. doi: 10.3389/fphys.2021.803102. PMID: 35126182; PMCID: PMC8814456. 13. Khalafi M, Sakhaei MH, Kazeminasab F, Symonds ME, Rosenkranz SK. The impact of high-intensity interval training on vascular function in adults: A systematic review and meta-analysis. *Front Cardiovasc Med.* 2022 Nov 17;9:1046560. doi: 10.3389/fcvm.2022.1046560. PMID: 36465439; PMCID: PMC9713318. 14. Holmes, D. High-intensity interval training benefits patients with T2DM. *Nat Rev Endocrinol* 11, 632 (2015). <https://doi.org/10.1038/nrendo.2015.171> 15. Li J, Cheng W, Ma H. A Comparative Study of Health Efficacy Indicators in Subjects with T2DM Applying

Power Cycling to 12 Weeks of Low-Volume High-Intensity Interval Training and Moderate-Intensity Continuous Training. *J Diabetes Res.* 2022 Jan 13;2022:9273830. doi: 10.1155/2022/9273830. PMID: 35071605; PMCID: PMC8776485. 16. Costa EC, Hay JL, Kehler DS, Boreskie KF, Arora RC, Umpierre D, Sz wajcer A, Duhamel TA. Effects of High-Intensity Interval Training Versus Moderate-Intensity Continuous Training On Blood Pressure in Adults with Pre- to Established Hypertension: A Systematic Review and Meta-Analysis of Randomized Trials. *Sports Med.* 2018 Sep;48(9):2127-2142. doi: 10.1007/s40279-018-0944-y. PMID: 29949110. 17. Leal JM, Galliano LM, Del Vecchio FB. Effectiveness of High-Intensity Interval Training Versus Moderate-Intensity Continuous Training in Hypertensive Patients: a Systematic Review and Meta-Analysis. *Curr Hypertens Rep.* 2020 Mar 3;22(3):26. doi: 10.1007/s11906-020-1030-z. PMID: 32125550. 18. Sawyer BJ, Tucker WJ, Bhammar DM, Ryder JR, Sweazea KL, Gaesser GA. Effects of high-intensity interval training and moderate-intensity continuous training on endothelial function and cardiometabolic risk markers in obese adults. *J Appl Physiol* (1985). 2016 Jul 1;121(1):279-88. doi: 10.1152/japplphysiol.00024.2016. Epub 2016 Jun 2. PMID: 27255523; PMCID: PMC4967258. 19. O'Brien MW, Johns JA, Robinson SA, Bungay A, Mekary S, Kimmerly DS. Impact of High-Intensity Interval Training, Moderate-Intensity Continuous Training, and Resistance Training on Endothelial Function in Older Adults. *Med Sci Sports Exerc.* 2020 May;52(5):1057-1067. doi: 10.1249/MSS.0000000000002226. PMID: 31876667. 20. Francois ME, Little JP. Effectiveness and safety of high-intensity interval training in patients with type 2 diabetes. *Diabetes Spectr.* 2015 Jan;28(1):39-44. doi: 10.2337/diaspect.28.1.39. PMID: 25717277; PMCID: PMC4334091. Almost, in all articles published, the effect of high intensity interval training on cardiorespiratory fitness and endothelial function in type 2 diabetes has been investigated, even in the older individuals. Second, really, what is the main challenge and question of the respected researchers in this study? In such a

way that even the explanation of the researchers in the final part of the introduction shows that the current study did not investigate a new challenge? The researchers stated in the final part of the introduction of the manuscript that previous studies have been conducted on cardiovascular and metabolic syndrome patients, but studies on type 2 diabetes patients are limited. "However, most studies focus on the effectiveness of HIIT in patients with cardiovascular diseases and metabolic syndrome. The beneficial effects of HIIT in patients with T2DM still remain under investigation and number of studies is limited". Really, what is the distinguishing difference between patients with metabolic syndrome and type 2 diabetes? Undoubtedly, metabolic syndrome and its components have an effect on the occurrence of type 2 diabetes. It seems that the new message of the present manuscript should be rewritten. In this regard, it is suggested to evaluate the effectiveness of HIIT exercises compared to herbal supplements on vascular function or arterial stiffness. Third, limiting keywords to search for articles in the field of diabetes significantly reduced the final articles evaluated in the systematic review process (12 articles in total). In addition, using the term sprint interval training (instead of the term rehabilitation) along with HIIT training seems to have included more relevant articles in the review process. Therefore, it is necessary to review the keyword sprint interval training (exercise) or high intensity intermittent training (exercise) and evaluate the articles in this field. Moreover, unfortunately, the effect of HIIT exercises on endothelial function and arterial stiffness in type 2 diabetics, which can be an innovation in the present study, has not been considered. Therefore, it is suggested to search the above exercise keywords along with cardiorespiratory fitness and especially endothelial function in databases (Pubmed, PEDro and CINAHL). Other comments and suggestions

1. In section of the study selection criteria, what exactly is meant by the term "other indices of microcirculation"? Please mention some examples.
2. Considering the significant effect of nutrition or medication in controlling diabetes and

its related problems, it is necessary to report a separate paragraph in this issue in the method section. 3. We know very well that diabetes has different stages and the effect of HIIT exercise on people in the pre-diabetes stage, diabetes stage and advanced stages of diabetes should be separated. Therefore, it is necessary to report the results of HIIT training according to the diabetes status (diabetes stage vs. advanced stages of diabetes) and especially according to their age. 4. In the study selection criteria (Method section), the researchers announced the age of over 18 years as the inclusion criteria for entering the article into the systematic review process, while the effect of HIIT exercises on the cardiorespiratory fitness level of a young and an elderly person can be very different. In addition, the arterial stiffness of a young person is very different compared to an elderly person, and therefore, the effectiveness of HIIT training can also be different. This difference in reporting the results should also be taken seriously. 5. The authors reported in the method section that articles with duration of HIIT training of more than two weeks were included in the systematic review process. Although the implementation of HIIT exercises with a short duration has an effect on improving cardiorespiratory fitness, but its effect on arterial stiffness, especially in the elderly, is very questionable!!! To express the results more clearly, these issues should be separated. 6. In the discussion section, the mechanisms of the HIIT exercise effect on arterial stiffness should be clearly stated. 7. The practical importance of the research findings should be added in terms of performance as well as health. 8. By carefully checking the references, it can be seen that the search was not done using specialized keywords. For example, see reference 7



## PEER-REVIEW REPORT

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**Provenance and peer review:** Invited Manuscript; Externally peer reviewed

**Peer-review model:** Single blind

**Reviewer's code:** 03597656

**Position:** Peer Reviewer

**Academic degree:** PhD

**Professional title:** Associate Professor

**Reviewer's Country/Territory:** Iran

**Author's Country/Territory:** Greece

**Manuscript submission date:** 2023-01-29

**Reviewer chosen by:** AI Technique

**Reviewer accepted review:** 2023-01-30 09:31

**Reviewer performed review:** 2023-02-04 06:00

**Review time:** 4 Days and 20 Hours

Scientific quality	<input type="checkbox"/> Grade A: Excellent <input checked="" type="checkbox"/> Grade B: Very good <input type="checkbox"/> Grade C: Good <input type="checkbox"/> Grade D: Fair <input type="checkbox"/> Grade E: Do not publish
Novelty of this manuscript	<input type="checkbox"/> Grade A: Excellent <input checked="" type="checkbox"/> Grade B: Good <input type="checkbox"/> Grade C: Fair <input type="checkbox"/> Grade D: No novelty
Creativity or innovation of this manuscript	<input type="checkbox"/> Grade A: Excellent <input checked="" type="checkbox"/> Grade B: Good <input type="checkbox"/> Grade C: Fair <input type="checkbox"/> Grade D: No creativity or innovation



<b>Scientific significance of the conclusion in this manuscript</b>	<input type="checkbox"/> Grade A: Excellent <input checked="" type="checkbox"/> Grade B: Good <input type="checkbox"/> Grade C: Fair <input type="checkbox"/> Grade D: No scientific significance
<b>Language quality</b>	<input checked="" type="checkbox"/> Grade A: Priority publishing <input type="checkbox"/> Grade B: Minor language polishing <input type="checkbox"/> Grade C: A great deal of language polishing <input type="checkbox"/> Grade D: Rejection
<b>Conclusion</b>	<input type="checkbox"/> Accept (High priority) <input type="checkbox"/> Accept (General priority) <input type="checkbox"/> Minor revision <input checked="" type="checkbox"/> Major revision <input type="checkbox"/> Rejection
<b>Re-review</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>Peer-reviewer statements</b>	Peer-Review: <input type="checkbox"/> Anonymous <input checked="" type="checkbox"/> Onymous
	Conflicts-of-Interest: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

## SPECIFIC COMMENTS TO AUTHORS

Why the methodological rigor and risk of bias of included RCTs assessed by PEDro instead of using the Cochrane risk of bias assessment tool? In search strategy: "The search was conducted within 1-month time period, from December 2022 until January of 2023," the length of the search is not clear. The ID for registration in PROSPERO should be presented in methods. Quality assessment in the method needs citation. The following references can be used: (10.1093/ptj/pzab144) and (10.1016/j.physio.2021.04.005) In limitation, "A significant limitation of the systematic review is that the included studies may present heterogeneity of the study samples, due to different mean age, different duration since diagnosis, and different functional capacity at baseline." Without evaluation of heterogeneity by meta-analysis, how did the authors conclude this issue? Another concern that should be mentioned in the limitation, is why the authors could not do a meta-analysis of the current results.

## RE-REVIEW REPORT OF REVISED MANUSCRIPT

**Name of journal:** *World Journal of Cardiology*

**Manuscript NO:** 83557

**Title:** Effectiveness of high intensity interval training on cardiorespiratory fitness and endothelial function in type 2 diabetes: a systematic review

**Provenance and peer review:** Invited Manuscript; Externally peer reviewed

**Peer-review model:** Single blind

**Reviewer's code:** 03597656

**Position:** Peer Reviewer

**Academic degree:** PhD

**Professional title:** Associate Professor

**Reviewer's Country/Territory:** Iran

**Author's Country/Territory:** Greece

**Manuscript submission date:** 2023-01-29

**Reviewer chosen by:** Ji-Hong Liu

**Reviewer accepted review:** 2023-03-15 08:22

**Reviewer performed review:** 2023-03-15 08:30

**Review time:** 1 Hour

<b>Scientific quality</b>	<input checked="" type="radio"/> Grade A: Excellent <input type="radio"/> Grade B: Very good <input type="radio"/> Grade C: Good <input type="radio"/> Grade D: Fair <input type="radio"/> Grade E: Do not publish
<b>Language quality</b>	<input checked="" type="radio"/> Grade A: Priority publishing <input type="radio"/> Grade B: Minor language polishing <input type="radio"/> Grade C: A great deal of language polishing <input type="radio"/> Grade D: Rejection
<b>Conclusion</b>	<input checked="" type="radio"/> Accept (High priority) <input type="radio"/> Accept (General priority) <input type="radio"/> Minor revision <input type="radio"/> Major revision <input type="radio"/> Rejection
<b>Peer-reviewer</b>	Peer-Review: <input checked="" type="radio"/> Anonymous <input type="radio"/> Onymous



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statements

Conflicts-of-Interest: [ ] Yes [Y] No

#### **SPECIFIC COMMENTS TO AUTHORS**

None