



# Effects of Pre-Pregnancy Exercise on Anxiety Behaviors and Oxidative Stress Factors in Pregnant Mice

Farnaz Torabi<sup>1\*</sup>, Zohreh Eslami<sup>2</sup>, Mohammad Mohammadi<sup>3</sup>

<sup>1</sup> Associate Professor, Department of Physical Education, Payame Noor University, Tehran, Iran

<sup>2</sup> M.A, Department of Physical Education, Payame Noor University, Tehran, Iran

<sup>3</sup> Department of Sports Sciences, Faculty of Literature and Humanities, Malayer University, Malayer, Iran

\* Corresponding author email address: f.torabi@pnu.ac.ir

---

## E d i t o r

Cain C. T. Clark  
Faculty of Health, Education, and  
Life Sciences, Birmingham City  
University, Birmingham, B15 3TN,  
U.K.  
scain.clark@coventry.ac.uk

## R e v i e w e r s

Reviewer 1: Mohammad Reza Khodabakhsh  
Department of Psychology, Neyshabour Branch, Islamic Azad University,  
Neyshabour, Iran. Email: hodabakhsh@ut.ac.ir  
**Reviewer 2:** Yaghob Badriazarin  
Associate Professor of Sport Sciences, Tabriz University, Tabriz, Iran.  
Email: badriazarin@tbzmed.ac.ir

---

## 1. Round 1

### 1.1 Reviewer 1

Date: 02 August 2024

Reviewer:

The phrase "the environment she provides during pregnancy" is vague. Consider specifying what aspects of the environment (e.g., nutritional, psychological) are most impactful based on existing literature.

The study focuses on swimming as the exercise modality. Can you provide more context or justification for why swimming, specifically, was chosen over other types of exercises (e.g., running, cycling)? This can be supported by referencing additional studies.

The subject selection process states that the rats were "purchased from the Pasteur Institute of Iran." Please clarify the ethical protocols followed during the purchase and handling of the animals. Were they screened for diseases or other conditions before inclusion in the study?

The description of the tank setup includes the use of four wave-making motors. Were there any controls or measures in place to ensure uniform wave generation across the tanks? A more detailed description of this apparatus would be helpful for replicability.

The sentence "A decrease in this measure was considered an anxiety-like behavior in the animal" could benefit from further explanation. Please provide more information on how this behavioral metric was validated in previous studies.

Figure 2 shows changes in glutathione levels between groups. It would be beneficial to add error bars representing variability (e.g., standard error) to the figure. This would help readers visually assess the reliability of the data presented.

The authors state that the results are consistent with prior findings but do not elaborate on the specific ways in which these findings align or diverge. Consider a more detailed comparison, particularly in terms of the magnitude of the effect sizes observed in your study versus those of previous studies.

The statement "Anxiety during pregnancy is a risk factor for both mothers and children and is associated with shorter pregnancy duration" should be followed by specific examples or studies supporting this claim. This will strengthen the argument.

Authors revised the manuscript and uploaded the updated document.

## 1.2 Reviewer 2

Date: 06 August 2024

Reviewer:

The citations within the introduction are dense. Consider reorganizing to include more synthesis of the studies cited, discussing broader themes or findings rather than listing individual studies. For instance, the sentence "Cancela-Carral et al. (2020) reported that regular physical exercise..." could be better integrated into a larger discussion about exercise's psychological benefits during pregnancy.

The statement "Pregnancy is a critical period for fetal growth and development" is well-known. Consider adding more depth by specifying the biological mechanisms by which stress impacts fetal development, such as the effects on the HPA axis or cortisol levels.

The description of the statistical analysis using one-way ANOVA is succinct, but the rationale for using ANOVA versus other potential statistical tests (e.g., repeated measures ANOVA if testing on multiple days) should be explained.

Table 1 presents statistical values for anxiety behaviors and oxidative stress factors. Please clarify in the table legend whether the values reported are mean  $\pm$  standard deviation or mean  $\pm$  standard error. This distinction is important for interpretation.

The phrase "several samples showed non-normal distributions indicating outliers" is somewhat vague. Please clarify the method used for detecting outliers. Was the Mahalanobis test used solely for detecting outliers or also for normalization? This section could benefit from further elaboration.

When mentioning the significant impact of pre-pregnancy swimming on anxiety and oxidative stress factors, it would be helpful to contextualize these findings within a broader biological framework. For example, how does the increase in glutathione mechanistically reduce anxiety behaviors?

Authors revised the manuscript and uploaded the updated document.

## 2. Revised

Editor's decision after revisions: Accepted.

Editor in Chief's decision: Accepted.