Coding Instructions

Physical Therapy Literature

Modified from Twomey et al. (2021)

Twomey, R., Yingling, V., Warne, J., Schneider, C., McCrum, C., Atkins, W., ... & Caldwell, A. (2021). The nature of our literature: A registered report on the positive result rate and reporting practices in kinesiology. Communications in Kinesiology, 1(3).

Enter the surname (lastname) of the lead (first) author.

- You would enter “Park” for this article

Skeletal muscle microvascular insulin resistance in type 2 diabetes is not improved by eight weeks of regular walking

Lauren K. Park,[1,2] Elizabeth J. Parks,[1,3] Ryan J. Pettit-Mee,[1,2] Makenzie L. Woodford,[1,2] Thaysa Ghiarone,[2] James A. Smith,[1,2] Allan R. K. Sales,[2,4,5] Luis A. Martinez-Lemus,[2,6] Camila Manrique-Acevedo,[2,7,8] and Jaume Padilla[1,2]

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Enter the DOI for the article you are currently reviewing

- For the example I would enter: “10.1152/japplphysiol.00174.2020”
- Do NOT enter “doi:”

J Appl Physiol 129: 283–296, 2020.
First published July 2, 2020; doi:10.1152/japplphysiol.00174.2020.

Copy and paste the title of article

- Again, easy enough, I would copy and paste title below into this answer box

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Which of the following categories best describes this research?

- For the example, since it is focused on an intervention in humans and physiology, I would select “Applied exercise physiology (human)”

Which of the following categories best describes this research?

- Basic physiology (animal and cell physiology)
- Applied exercise physiology (human)
- Environmental physiology (heat, cold, & altitude)
- Clinical research
- Biomechanics
- Motor learning/control/behavior
- Epidemiology
- Sport/exercise psychology
- Sport performance

Now go through and briefly skim the article

- Optional, but this step may make future steps easier
- Look for details in the introduction and discussion for details regarding hypotheses and methods utilized.
  - Check for words like “hypothesis” and “prediction” in the last paragraph of the introduction and the first paragraph of the discussion

“According to the authors, is this study a replication of previous work?”

- Look for language in the introduction that this work was intended to directly, or indirectly, replicate previous work
  - E.g., “This study will attempt to replicate the work of Smith et al. 1992”
- If no language in the manuscript indicates this intention then answer “No”
  - For the example, the answer is **no**

Does this study involve testing a hypothesis? E.g., "We hypothesized that..." or "We predicted that..."

- Check the discussion or introduction for language that a hypothesis was tested
- For the example, the answer is “yes”

Accordingly, we hypothesized that, relative to healthy control subjects, individuals with T2D would exhibit suppressed leg vascular conductance and skeletal muscle capillary perfusion in response to hyperinsulinemia and that both variables would be positively correlated. Subsequently, we hypothesized that in T2D such indexes of skeletal muscle microvascular insulin resistance, as well as overall vascular dysfunction, would be ameliorated by an 8-wk walking intervention.

"How many hypotheses were stated in the manuscript"?

- In this example, there are 2 specific *hypothesis statements* stated so I would select 2 on the survey

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Does the study find support for the hypothesis?

- Now we would check the results/discussion to see if the authors believe they have found support for their *first* stated hypothesis
- In the example we should answer “Yes”
- And we would answer the next question as “Full support”
- If the authors are extremely ambiguous or fail to state whether or not the hypothesis is supported state “Unclear or not stated”

DISCUSSION

The main findings of the present investigation are twofold. First, we demonstrate that, relative to healthy subjects, individuals with T2D exhibit depressed insulin-stimulated increases in leg vascular conductance and capillary perfusion in skeletal muscle. Of interest, we also report that within subjects with T2D those with lesser increases in leg vascular conductance in response to insulin exhibited the lowest increases in capillary perfusion. Second, we found that an 8-wk walking

Copy and paste language stating hypothesis…

- The top image is the stated hypothesis and the bottom image is the result of the hypothesis

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Is any effect size reported? This includes, but is not limited to: Cohen's d, correlation coefficients, mean differences, odds ratio, and measures of model fit (R^2). This does not include descriptive statistics of the sample (e.g., participant age, weight, or other characteristics).

- If the study reports some form of effect size, this includes, but is not limited to: Cohen's d, correlation coefficients, mean differences, odds ratio, and measures of model fit (R^2), answer “Yes”
- For the example, I would answer “Yes” since percentage changes are reported

Subjects with T2D Exhibited Increased Aortic Stiffness, Lower Limb Vascular Dysfunction, and Impaired Insulin-Stimulated Leg Blood Flow

Aortic stiffness, as assessed by cfPWV, was elevated in subjects with T2D compared with healthy subjects ($P = 0.03$; Fig. 2*B*). Additionally, participants with T2D exhibited a 57% reduction in popliteal artery FMD ($P = 0.01$; Fig. 2*C*) and a delay in the time to peak dilation (Table 2). Plasma insulin and

"Does this study/manuscript include information regarding the preregistration or clinical trial registration? This should include an external link or a clinical trial registration number"

- Scan the methods section to see if the study has information regarding preregistration and/or clinical trial registration
- The "NCT03203694" would be the registration in the example
- But could also appear as a link to a website like OSF (Open Science Framework)

METHODS

Ethical Approval and Participants

The study was approved by the University of Missouri Institutional Review Board (IRB, no. 2008181), registered at ClinicalTrials.gov (NCT03203694), and conducted in accordance with the Declaration of Helsinki. Patients ($n = 26$) who had a clinical diagnosis of T2D [age = 51 ± 2 yr, weight = 110.2 ± 4.8 kg, body mass index (BMI) = 36.1 ± 1.1 kg/m^2] were recruited, along with 15 age-matched, healthy control subjects (age = 49 ± 3 yr, weight = 68.9 ±

“Does this manuscript provide a statement describing if and where study data are available?”

- This information is likely included in the Methods section or at the end of the article as additional information.
- In the example article, this information is not included, so we would answer “No”
- If this information was included we would then answer a question related to if the data or data supplements are available
    - So long as there is a link leading to external data/code supplements you would answer “yes” so long as it is accessible (i.e., not behind a paywall)

Did the authors include any language related to statistical significance? E.g., "there was significant correlation between X and Y" or "significance was considered at a $p < .05$"

- This will be tricky for complicated composite hypotheses (like in the example)
- For the example we would answer “yes” since the p-values appear to be used as a significance test

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Significant p-values

- You will have 2-3 question about p-values
  - 1) whether p-values were reported
  - 2) whether they were interpreted as significant
  - 3) were exact or relative (or a mix) p-values were reported
- For the example we would answer “Yes”, “Yes” and “exact”
- Relative would be if they reported “p < .05” or some kind

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Non-Significant p-values

- Do authors accept the null hypothesis based on failure to reject the null hypothesis. In other word, do they interpret an absence of significance as an absence of effect.

“Does the study/manuscript include information about the sample size”

- Again, you should only have to check the methods section where it should be directly stated
- As we see, both the total and individual group numbers are available.
  - Some studies may not have groups so
- The next question will have you enter the total sample size
- Does the manuscript specify the number of women/females and men/males?

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Table 2. *Popliteal artery hemodynamics in healthy subjects and in subjects with type 2 diabetes*

	Healthy Subjects	Subjects with T2D	P Value	n (healthy/T2D)
Baseline diameter, cm	0.54 ± 0.02	0.59 ± 0.02	0.09	15/26
Time to peak diameter, s	68.7 ± 7.4	97.5 ± 8.2	**0.02**	15/26
Hyperemic shear rate (s^{-1}) AUC	9,582 ± 2,164	6,063 ± 1,496	0.18	14/20
ANCOVA-corrected FMD, %	4.2 ± 0.8	2.9 ± 0.6	0.22	14/20
FMD, change in mm	0.30 ± 0.07	0.12 ± 0.02	**<0.01**	15/26

Data are presented as means ± SE for n subjects. Significant P values are in bold. ANCOVA, analysis of covariance; AUC, area under the curve; FMD, flow-mediated dilation; T2D, type 2 diabetes.

“Was a justification of sample size (e.g., power analysis) included in the manuscript?”

- Look in the Methods section to see if they included a reason/justification for the sample size.
- In the example there was no mention of power analysis or how the concluded on their final sample size
    - A justification could be as simple as “A previous study had a sample size of 12 which we found sufficient”.
- Type of justification: SESOI, previous studies, pilot studies, benchmark

“Was the article preprinted?”

- Look for “preprint” or “pre-print” in the article.
- Copy-paste the title in google scholar and check whether one of the versions is a preprint