May 25, 2023  
  
Dr. Tracey Revenson,

Editor-in-Chief*, Annals of Behavioral Medicine*

Dear Dr. Revenson,

On behalf of my co-authors, we submit an *Original Research Article* titled, “Estimating treatment effects of physical activity on subdomains of mental health: A propensity score analysis among a global sample of 341,956 adults” for consideration by *Annals of Behavioral Medicine*. Engaging in an inadequate amount of physical activity is known to have downstream effects on mental health. However, there is a dearth of literature that has considered which aspects of mental health may be impacted most, let alone during different periods of the adult lifespan. At the same time, advanced analytical approaches that can strengthen inferences made from cross-sectional data have received limited attention in the literature investigating physical activity and mental health.

To address these knowledge gaps, we estimated the treatment effects of physical activity engagement on a comprehensive indicator of mental health and its subcategories using propensity score weighted regression methods, and whether these effects may differ across age cohorts among a global sample of 341,956 adults living in 229 countries. This cross-sectional study used data from the Mental Health Million project, which included the novel Mental Health Quotient (MHQ) instrument. Advanced covariate balancing techniques were employed to reduce bias in our estimates. Our results showed that for adults who are inactive, becoming physically active could provide significant small beneficial effects for overall mental health and each of the six subdomains of the MHQ, although differences in the magnitude of these effects were observed across the subdomains. Furthermore, evidence indicated the strongest associations between physical activity and mental health appear to occur during the early and middle-aged adult life stages, with effects becoming weaker into old age. Collectively, our findings further buttress the growing body of evidence in support of promoting physical activity to improve various aspects of mental health and well-being among the population.

All authors have participated in the work and have reviewed and agreed with the content of the article. The material in this manuscript is original research, and none of the article contents are under consideration for publication elsewhere. All individuals listed as authors meet the appropriate authorship criteria, nobody who qualifies for authorship has been omitted from the authorship list and contributors and their funding sources have been properly acknowledged.

Thank you in advance for considering our article,

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Christopher Huong, BA  
  
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Denver Brown, PhD