

Additionally, exercise leads to better overall health, and most individuals with PTSD show decreased involvement in physical activity; there is also a well-established link between PTSD and poor health status.

Aims:

The aim of this study was to provide the first empirical examination of the concurrent association between exercise and trauma symptoms in a community sample, hypothesizing that engagement in physical activity of at least moderate intensity—such as running or cycling—as compared to light intensity activities, such as walking, would show an inverse relationship with PTS symptom severity. The authors were particularly interested in the relationship between moderate- and vigorous intensity exercise involvement and a cluster of specific symptoms including PTS re-experiencing, avoidance/numbing, and hyperarousal.

Based on this promising area of inquiry, the authors examined 108 trauma-exposed adults Mage (23), without a current or lifetime history of DSM-IV Axis I disorder. Individuals were assessed with structured clinical interviews to rule out DSM-IV mental health disorders and Foa's

Posttraumatic Stress Diagnostic Scale. They completed a self-report Exercise Habits Questionnaire-Revised, a self-report measure consisting of 29 different physical activities (e.g. running, swimming, yoga) and the frequency and duration of each identified activity within the previous two weeks. A hierarchical linear model was developed based on log-transformed PTS symptoms, covariates including sociodemographic, predictor, and criterion variables, and exercise intensity levels (light-, moderate-, and high-intensity).

Findings:

The majority of the sample was young ($M = 23.9$, $SD = 10.22$), female (54.6%) and single (90.7%). Sociodemographic data skewed Caucasian (91.7%) and high school educated (64.5%). Participants endorsed an average of two traumatic events and a mean score of 7.6 on the PDS, a relatively low level of PTS symptom severity. Women were less likely than men to engage in vigorous intensity exercise at the outset. As would be expected, the number of trauma types and PTS re-experiencing symptoms were positively associated with one another. Results of the hierarchical regression models revealed that only high-intensity exercise was

inversely associated with PTS hyperarousal symptoms ($\beta = -.22$, $p = .04$). This association held true after controlling for gender and number of trauma exposure types. Neither light- or moderate-intensity exercise was associated with any symptom clusters.

Authors's Conclusions

The authors situate their findings within a larger body of research documenting exercise's inverse effect on PTS symptoms. The specific contribution of high-intensity versus other forms of activity is notable, though the effect size is fairly small: approximately 4% of the variance in PTS hyperarousal symptomatology explained by vigorous exercise. Nonetheless, these results are similar to what other studies have reported regarding levels of exercise intensity and health. Despite the constraints of the data and the modest results, findings are promising enough to warrant further exploration with a time-series design, in both community and clinical samples. For instance, exercise at varying levels of intensity, versus treatment as usual, could be incorporated into an intervention for individuals with

PTSD, to determine whether and to what extent physical activity decreases symptoms (and if so, stratifying analyses by traumatic event type, symptom cluster, and number of symptoms). Physical activity interventions could also be tested as a prophylaxis against PTS symptom development or PTSD among community samples of trauma-exposed individuals. The type of event and the resultant effect of exercise on symptom reduction, if any, would be a major contribution to the field of traumatic stress studies. Generally speaking, the contribution of physical activity to treatment for any mental health disorder, including major depression and substance abuse, would be a fruitful area for future study (and one topic which is currently gaining interest at the National Institutes of Health). The ramifications of such interventions for individuals having experienced interpersonal violence and abuse are manifold; such persons are among those most vulnerable to traumatic stress, mental health disorders, substance abuse, and PTSD.

Limitations:

The authors note study limitations including a largely psychiatrically healthy sample, relatively small sample size possibly limiting statistical power to detect significant

differences and cross-sectional analysis prevention identifying of causal relationships. Additionally, the exercise measure relied on self-report; future study designs may seek to triangulate findings gleaned by self-report by objective measures of exercise intensity and duration. Although the authors noted gender differences in exercise intensity levels and frequency of physical activity—specifically, that men exercised more and harder than women—this observation was not remarked upon further. It is also interesting to note that the only symptom cluster affected by high-intensity exercise was hyperarousal, which may have ramifications for individuals who may associate the normal byproducts of intense exercise—heart pounding, heavy breathing—with those of hyperarousal from traumatic re-experiencing. Stratifying the results of these analyses in such a way as to examine whether event type (e.g. loss-based or fear-based, which may result in greater symptoms of hyperarousal) may have helped explain this curious finding, but data were not collected in such a way as to allow for trauma type.

Reviewer's Comments:

The association between PTSD and poor overall health is well established, yet treatments for PTSD rarely, if ever, address health-related behaviors

such as diet, exercise, and sleep. A major benefit of intervention studies that address the bodily reaction to traumatic stress is to chip away at the assumption inherent to much clinical research that treating the brain and body as separate entities is possible. Harte and colleagues have sought to do just this, and their modest results form part of a growing body of literature that acknowledges the necessity of including physical measures in trauma treatment. Notably, they discovered that effects were not significant unless the exercise was of high intensity, suggesting future research on physical activity type and traumatic stress is warranted. This is particularly important given the composition of their sample—young, majority white, healthy, and experiencing relatively low levels of PTS symptom severity. The present study's findings beg the following questions for future research, among others: Would a sample with more severe symptoms and poorer health status at baseline experience greater benefits from less rigorous exercise? Why are the benefits of physical activity associated with some symptom clusters but not others? What are the mediating effects, if any, of PTS symptoms on exercise and other mental health disorders, such as anxiety and depression?

Implications:

It is promising to see the growing awareness of holistic approaches to trauma treatment generally. A renewed focus on addressing brain and body health during treatment for traumatic stress, tailored to the symptom severity and physical age or capability of the individual experiencing PTSD, may yield meaningful results for survivors of trauma while improving overall health.