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Exercise Interventions for Relieving Anxiety Symptoms for People with Autism Spectrum Disorder: A Systematic Review

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Purpose

The purpose of this systematic review was to examine the effectiveness of the use of exercise as an intervention to reduce anxiety in people with ASD.

Methods

- **Identification**
  - Records Identified From:
    - Databases (n=2)
    - Pubmed & Medline
  - Records Removed before Screening: Duplicate Records Removed (n = 778)
  - Records Excluded (n = 880)
  - Records screened (n = 919)
    - Reports sought for retrieval: (n = 39)
    - Reports Not Retrieved (n=4)
  - Reports Assessed for Eligibility: (n=35)
    - Studies included in Review (n=9)

Results

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Participants</th>
<th>Intervention</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peters, B; Castell, Wood, Wendy; Hopfinger, Susan; Moody, Eric J (2021)</td>
<td>24 participants with ASD, ages 6-13</td>
<td>10-weeks of occupational therapy in an equine environment</td>
<td>Significantly reduced irritability, significant improvements in social motivation (p = 0.05)</td>
</tr>
<tr>
<td>Tsu (2020)</td>
<td>27 participants with ASD, ages 8-12</td>
<td>12-week jogging intervention 4 sessions per week; 30 min per session</td>
<td>Significant improvement in emotion regulation (p=0.3)</td>
</tr>
<tr>
<td>Howells, Sivarasum, Lindell, Hyde, McCallum, Whitenice, Blaisdell (2020)</td>
<td>61 participants with ASD, Ages 5-12</td>
<td>29—with program at local Austink clubs—practicing football 60 minutes a week for 6 weeks in a controlled group</td>
<td>on the DSM-oriented anxiety problems the intervention group showed a significant decrease in scores (p&lt;0.01)</td>
</tr>
<tr>
<td>Spratt, Mercer, Grimes, Papa, Norton, Serpa, Shaffer, Eckert, Harris, Blackmon, Duran &amp; Newton (2018)</td>
<td>12 adolescents with ASD ages 15-27</td>
<td>12 weeks sessions twice a week for six weeks: 24 min of exercise, 15-30 minutes of stress reduction or mindfulness strategies, 15-30 min of nutrition education</td>
<td>significantly decreased PBI-9 depression scores (p = 0.00677)</td>
</tr>
<tr>
<td>Capute, Ippolito, Mazerra, Settena, Monte, Salzano, &amp; Conson (2018)</td>
<td>26 children with ASD</td>
<td>Intervention - 13, 15 month swimming program &amp; conventional language therapy and psychomotorism Control - 13 - conventional language therapy and psychomotorism</td>
<td>significantly lower scores than controls on Emotional Response (p = 0.05) on the CARS</td>
</tr>
<tr>
<td>Duffy, Bolte, Wellman, &amp; Ream (2017)</td>
<td>8 males with severe ASD ages 13-29</td>
<td>6 months</td>
<td>significant changes in emotional response behaviors scored by the GARS</td>
</tr>
<tr>
<td>Morales, Fukuda, Garcia, Piramansi, Curin, Martínez-Ferrer, Gomez, Carballera, and Caceres-Balle (2021)</td>
<td>11 participants with ASD, ages 9-13</td>
<td>8 weeks of Juda Classes, 75 minutes, once a week (N=11) Control: 8 weeks of no intervention. (N=10)</td>
<td>Significant improvement (p = 0.05) following the 8-week adapted Juda training intervention at Time 3 in the emotional response subscale of the GARS</td>
</tr>
<tr>
<td>Brand, Jouom, Elbissos-Teachcoke, Pahos, &amp; Garber (2015)</td>
<td>10 kids with ASD, mean age 10</td>
<td>60-minute sessions of aerobic exercise training and motor skills training, 3 times a week for 3 weeks</td>
<td>Deep-eficiency increased, sleep onset latency shortened, and wake time after sleep onset decreased Mood in the morning, as rated by parents, improved</td>
</tr>
<tr>
<td>Keino, Hirono; Fukansaki, Akihisa; Keino, Hiroomi; Mito, Chiharu; Hoshikawa, Massanori; Hayashi, Yoichiro; Kawakita, Kori (2009)</td>
<td>4 kids, two with ASD and two with Pervasive developmental disorders</td>
<td>2 sessions of Procedure of Psycho-Educational Horseback Riding Program (PEHR)</td>
<td>Fear of nervousness’ decreased measured by the HEIM scale</td>
</tr>
</tbody>
</table>

Discussion

- Four out of the nine articles reported a decrease in behavioral issues/problem behaviors for people with ASD who participated in an exercise intervention
- Four out of the nine articles reported improvements in emotion regulation as reported by the Childhood Autism Rating Scale (CARS) and the Gilliam Autism Rating Scale, third edition (GARS) for people with ASD who participated in an exercise intervention
- 30,000,000 individuals around the world have been diagnosed with both ASD and anxiety
- Anxiety for people with ASD can cause more isolation, avoidance of social interactions, and increased internalization of problems
- This systematic review provides moderate evidence that exercise could be an effective option for helping people with ASD reduce anxiety symptoms

Conclusions

Anxiety affects nearly half of the adults diagnosed with ASD, therefore it is imperative that we investigate accessible, reliable interventions to help alleviate anxiety symptoms. Results from this systematic review suggest that exercise may be an effective intervention. Exercise interventions improved measures of mood, sleep quality, and emotion regulation which can all be related to an improvement in anxiety. However, more research must be done to fully understand the effects exercise can have on anxiety for people with ASD.

References


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