

Research In Focus: A Weekly Digest of New Research from the NIDILRR Community

Diabetes Prevention Program May Help People with Traumatic Brain Injury (TBI) and Obesity to Lose Weight, Decrease Risk for Diabetes and Heart Disease

A study funded by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR).

According to the Centers for Disease Control ([CDC](#)), traumatic brain injuries are a major cause of death and disability in the U.S. A traumatic brain injury (TBI) results from some type of injury to a person's brain that affects how it functions. It is a chronic condition that leads to weakness, sensory loss, impaired cognition, or emotional and behavioral disorders. Research has shown that people with TBI may be at an increased risk for developing obesity and obesity-related chronic diseases such as type 2 diabetes, hypertension, and heart disease. Evidence-based chronic disease management programs can help in reducing these conditions, but currently there are no evidence-based weight loss interventions tailored to the needs of people with TBI, such as including care partners, or modifying programs to address cognitive difficulties.

In a recent NIDILRR-funded study, researchers wanted to explore how effective a modified CDC approved Diabetes Prevention Program's Group Lifestyle Balance program (DPP-GLB) was in promoting weight loss for people with TBI. Researchers also wanted to determine whether participants would be able to stick with the program and whether their compliance was linked to better outcomes.

Researchers at the [North Texas Traumatic Brain Injury Model System Center](#) enrolled 57 adults with moderate-to-severe TBI in a randomized controlled study to test a version of the DPP-GLB modified to support the physical and cognitive needs of people with TBI (GLB-TBI intervention). Participants were between 18 and 64 years old, were over 6 months post injury, and had a Body Mass Index (BMI) greater than 25, which is considered overweight or obese. Participants were recruited in two cohorts in 2019 and 2020. All participants had physician approval to partake in a weight loss program. In each cohort, half of the participants received the modified GLB-TBI program and half were assigned to an attention control group. To modify the program, the researchers focused sessions to 2 or 3 main points, developed TBI-specific handouts on weight loss and healthy lifestyles, and included caregivers to provide support. The modified GLB-TBI intervention were delivered in 22 sessions over 12 months, including 12 weekly Core Program sessions, 4 bi-monthly Transition Phase sessions, and 6 monthly Support Phase sessions. Sessions included CDC-trained lifestyle coaches as well as subject matter experts to give classes (nutrition, physical therapy) to the participants. Participants in the GLB-TBI group wore wrist-worn activity trackers and were asked to self-monitor and log in their daily dietary intake and physical activity. They then submitted their logs to their lifestyle coach during the Core program and received personalized feedback. Participants in the attention control group were enrolled in a

program called Brain Health Group (BHG) which consisted of 22 informational group sessions over 12 months aimed at improving overall health and wellness. This group received TBI factsheets and developed short-term and long-term goals. Caregivers were also invited to provide support to the attention control group participants during sessions.

At the start of the study, participants in both groups visited a lab to have their weight, blood pressure, glucose, and cholesterol measured, along with their risk assessed for metabolic syndrome. The participants also took walking tests to measure their physical fitness, and answered questions about their health and exercise habits, satisfaction with life, and their confidence in keeping up with healthy habits. They repeated these tests at 3 months, 6 months, and 12 months. The researchers also kept track of the GLB-TBI participants' compliance, defined as attendance of at least 80% of their sessions and completion of at least 85% of their tracking assignments.

The researchers found that, over the 12-month period, the GLB-TBI group improved more in their overall health and health behaviors than the attention control group. Specifically, they found that:

- The GLB-TBI group experienced significant weight loss, losing 7.9% of their weight and 3.1 inches in their waist circumference during the course of 12 months. This group significantly decreased their weight at each assessment period of 3 months, 6 months and 12 months. Participants in the attention control group had no significant weight loss observed.
- Participants in the GLB-TBI lowered their risk for metabolic syndrome to that of their average US adult risk score at 12 months.
- The percentage of participants in the GLB-TBI group with high blood pressure dropped from 44% to 20.8%, while the attention control group remained around 44%.
- Participants in the GLB-TBI group improved more in their cholesterol and walking tests than the attention control group.
- Participants in the GLB-TBI group improved in their self-rating for sticking to their dietary and health habits.
- Both groups experienced some increase in life satisfaction by the end of the 12 months.

Within the GLB-TBI group, there was an average of 89% compliance rate. The researchers found that:

- The GLB-TBI compliant participants had a significant decrease in weight and BMI at every assessment interval (3 months, 6 months, 12 months).
- The GLB-TBI noncompliant participants had a significant decrease in weight and BMI at 6 and 12 months.

- GLB-TBI compliant participants experienced improved walking capacity 6 months sooner than the noncompliant participants.

The authors noted that the COVID-19 pandemic had some impact on how the program was delivered, requiring some participants to receive virtual sessions rather than in person. The authors also noted that there was a high attendance rate of more than 89% in the GLB-TBI groups, and even those who did not complete the program lost significant weight. Finally, according to the authors, the increases in life satisfaction for the attention control group suggest that the BHG program they received had a meaningful effect on participants lives in areas other than weight loss, as the program was intended.

According to the authors, the study results show that this modified GLB-TBI program can significantly improve the health of people with TBI by promoting weight loss and lowering risk factors for hypertension, diabetes, and cardiovascular disease. The design of the program encourages participants to pay attention to and report their diet and exercise habits. The authors suggest that future efforts should include training current CDC-approved DPP-GLB coaches on the modified GLB-TBI program to reach more people with TBI. The participants in this study were mostly non-Hispanic White males. Researchers may want to study whether this program would be helpful to a more diverse group of people with TBI.

To learn more:

The [North Texas TBI Model System Center](#) has information about the Group Lifestyle Balance program and other information resources about health and wellness after TBI.

The [Model Systems Knowledge Translation Center \(MSKTC\)](#) produces evidence-based information resources for people with TBI and their caregivers, including [Staying Healthy After TBI](#).

To learn more about this study:

Driver, S., McShan, E., Swank, C., Calhoun, S., Bennett, M., Callender, L., Holden, A., Juengst, S., Bell, K., Douglas, M., Kramer, K., Dubiel, R. (2022). [Efficacy of the diabetes prevention program group lifestyle balance program modified for individuals with TBI \(GLB-TBI\): Results from a 12-month randomized controlled trial](#). *Annals of Behavioral Medicine*. (XX;1-5). This article is available from the NARIC collection under accession number J89822.

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