Through Weight and Diet Depression Links to Chronic Headaches

Researchers examined whether dietary iron intake, body mass index (BMI), and physical activity help account for the association between depression and chronic headaches using model-based statistical mediation analyses.

The findings indicate that the association between depression and chronic headaches is partially mediated by higher BMI and lower dietary iron intake, but not by physical activity as an independent pathway within the specified analytical model.

Study

Depression is a common and disabling mental health condition that affects mood, cognition, sleep, and quality of life. It is a major contributor to global disability and is particularly prevalent in South Asia and the Middle East, including Iran.

Chronic headaches affect a large proportion of adults and frequently co-occur with depression, suggesting a close and complex relationship. However, the biological and behavioral mechanisms linking depression to chronic headaches remain insufficiently understood.

Biopsychosocial theories highlight the interplay between psychological factors, physiological processes, and lifestyle behaviors in chronic headache disorders. Several modifiable factors are correlated with both depression and chronic headaches.

Depression has been linked to disrupted iron metabolism and lower dietary iron intake, which may increase vulnerability to headaches. Individuals with depression are also often less physically active and more likely to have higher BMI, both of which are established risk factors for chronic headache disorders.

Although previous studies have independently connected depression to physical activity, BMI, and iron intake, it remains unclear whether these factors statistically mediate the relationship between depression and chronic headaches.

Researchers analyzed cross-sectional data from the Ravansar Non-Communicable Disease (RaNCD) cohort, part of a larger population study conducted in western Iran. Participants were adults aged 35–65 years who had lived in the region for at least nine months per year.

Data were collected through face-to-face interviews using standardized electronic questionnaires that captured sociodemographic characteristics, clinical history, depression status, and headache frequency.

Findings

Physical activity was assessed using validated questionnaires and expressed as metabolic-equivalent task-hours. Height and weight were measured objectively, and BMI was calculated using standardized procedures. Dietary iron intake was estimated using validated food-frequency questionnaires and the Iranian Food Composition Table.

Depression was identified through a psychologist's assessment or self-reported antidepressant use. Chronic headaches were defined as headaches occurring on at least 15 days per month for three consecutive months. Path analyses examined direct and indirect associations, testing BMI, dietary iron intake, and physical activity as mediators.

The analysis included 9,918 adults with a mean age of 47.3 years. Most participants were female, married, and had relatively low educational attainment. The majority did not have depression or chronic headaches.

Participants, on average, had moderate physical activity levels, were overweight by BMI criteria, and consumed approximately 20 mg of dietary iron per day. Individuals with depression differed significantly from those without depression in BMI, physical activity, iron intake, and chronic headache prevalence.

Correlation analyses showed that depression was significantly associated with higher BMI, lower physical activity, lower dietary iron intake, and a greater likelihood of chronic headaches. Age, sex, marital status, and education were included as covariates.

Path analysis demonstrated excellent model fit. Depression showed a significant direct association with chronic headaches and indirect associations through higher BMI and lower iron intake. Physical activity was not independently associated with headache occurrence after accounting for other pathways.

Mediation analyses confirmed partial mediation of the depression–headache association by BMI and dietary iron intake. Physical activity contributed indirectly through its associations with BMI and iron intake rather than acting as a direct mediator.

Conclusion

The findings suggest that depression is associated with chronic headaches through both direct associations and indirect, statistically modeled pathways involving body mass index and dietary iron intake. Although depression was associated with lower physical activity, physical activity itself was not an independent mediator.

Strengths include the large population-based sample, standardized measurements, and simultaneous modeling of multiple mediators. Limitations include the cross-sectional design, which prevents causal inference, and reliance on self-reported data.

Overall, the study highlights the potential value of integrated interventions that target mental health, weight management, and nutritional adequacy to reduce the chronic headache burden.

Source:

https://www.news-medical.net/news/20260101/Depression-links-to-chronic-headaches-through-weight-and-diet-not-physical-activity-alone.aspx