

Higher anthocyanin intake is associated with lower depression scores in adults with and without major depressive disorder

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Mental health disorders, particularly depression, are a leading cause of global disability.⁽¹⁾ Dietary factors are likely to play a role in depression onset and symptom management.⁽²⁾ Dietary flavonoids are bioactive, plant-based compounds comprised of six subclasses: flavonols, flavan-3-ols, anthocyanins, flavones, flavanones and isoflavones. Flavonoids are hypothesized to influence biochemical pathways associated with depression pathophysiology⁽²⁾; however their role in mood and depressive disorders remains under-researched, limiting the understanding of potential therapeutic interventions in this group. This study aimed to quantify habitual dietary flavonoid intake and assess the association between depressive symptomatology in adults with major depressive disorder (MDD) and without (non-depressed participants). MDD participants met the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria for a current major depressive episode, while non-depressed participants had no history of psychiatric diagnoses. Participants were unmedicated and without concurrent neurological or endocrine disorders. Depressive scores were assessed using the Depression, Anxiety and Stress Scale-21 (DASS-21). Habitual dietary intake was assessed via diet history interviews and analysed using FoodWorks (Version 10, Xyris Software). PhenolExplorer food composition database was used to quantify dietary intake of the six flavonoid subclasses, which were summed for total flavonoid intake. A Mann–Whitney U Test compared flavonoid intake between participants with MDD and non-depressed participants. Multivariate linear regression adjusting for age and sex examined the relationship between total flavonoid variables and DASS-21 Depression (DASS-Dep) score in the total sample. Participants with MDD ($n = 44$; mean age: 26.3 years, 77% female, mean BMI: 28.9 kg/m²) had a median DASS-dep score of 26 (IQR = 19.5–32.5) and non-depressed participants ($n = 49$; mean age: 25.6 years, 73% female, mean BMI: 22.0 kg/m²) had a median DASS-dep score of 2 (IQR = 0–4). Non-depressed participants had significantly higher intakes of anthocyanins (11.7 mg/day) and flavones (0.9 mg/day) compared to those with MDD who consumed 0.1 mg/day ($U = 712$, $p = 0.004$) and 0.4 mg/day ($U = 789$, $p = 0.026$), respectively. There was no significant difference between MDD and non-depressed participants for intake of total flavonoids (median = 173.7 mg/day), flavanones (median = 0.9 mg/day), isoflavones (median = 0.0 mg/day), flavonols (median = 14.1 mg/day) and flava-3-ols (median = 38.4 mg/day). In the multivariate model, anthocyanin intake significantly predicted DASS-Dep score ($B = -0.092$; $SE = 0.033$; 95% CI $[-0.157, -0.026]$; $p = 0.007$). Our study indicates that habitual intake of total flavonoids and most flavonoid subclasses are similar between people with and without MDD. However, a dietary deficit of anthocyanins (provides the purple/red pigmentation in fruits and vegetables) was evident in our sample of adults with MDD. The relationship between anthocyanin intake and depressive symptomatology is novel and warrants further investigation to facilitate potential therapeutic dietary interventions in this group.

References

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