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Exploring associations between eating habits, gastrointestinal health and perceived stress and anxiety symptoms in adults

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Gastrointestinal (GI) disorders are becoming increasingly common in young people in India and globally [(1)]. Diet (eating habits, nutrient intake, and dietary diversity) and mental health (stress and anxiety levels) factors can independently and synergistically regulate gut health through dietary modulation of gut microbiota composition and gut-brain axis-related mechanistic pathways [(2-3)]. However, few studies have investigated the associations between diet, mental health, and GI-related disturbances. Hence, this observational study was conducted to explore the possible effects of eating behaviors and stress and anxiety symptoms on self-reported measures of gastrointestinal health among 18-45-year-old adults in India.

A purposive cluster sampling method guided the recruitment of participants (n=407). Two non- consecutive day 24-hour diet recalls were conducted to estimate nutrient intakes and calculate Individual Diet Diversity (IDD) and Food Variety Scores (FVS). Gastrointestinal health was assessed using a validated instrument comprising 35 items related to gastric, small intestine, and colon function, and GI inflammation. Perceived Stress Scale (PSS-10 scores 0 to 40 with higher scores representing higher levels of stress), and Generalized Anxiety Disorder Scale (GAD-7 scores >5 (mild), >10 (moderate), and >15 (severe)) were used to evaluate perceived stress and anxiety [(4-5)]. Socioeconomic status and eating habits were self-reported and the anthropometry measurements were recorded. Multivariable logistic regression analysis was performed using sociodemographic characteristics, anthropometry measurements, eating habits, and stress and anxiety levels as independent (predictor) variables, and composite gastrointestinal health risk scores as the dependent variables.

Participants reported mild anxiety (mean (M) = 7.09, standard deviation (SD)= 3.25) and moderate stress (M=18.44; SD= 9.89) with preponderance among females, higher age groups (> 35 years), and lower socioeconomic status. Overall, 38.8% and 45.3% were at high-risk score categories for gastric function and GI inflammation respectively. Higher energy and fat consumption, frequent breakfast skipping, and lower IDDS and FVS scores were associated with higher scores for stress and anxiety. Moreover, participants having moderate to severe anxiety reported a higher frequency of GI symptoms such as indigestion (M= 3.23 SD= 2.1-4.6, p= 0.023), excessive belching (M= 2.36 SD =1.21, p=0.043), and post-meal lower abdominal discomfort and cramps (M= 3.07, SD = 2.22, $p < 0.001$) as compared to those having nominal/mild anxiety. Age-adjusted regression models showed higher waist circumference (OR= 4.69, 95% CI =1.33- 7.28, p= 0.034), and stress scores (OR= 1.66, 95% CI= 1.32-1.90, p = 0.042), lower IDDS (OR= 2.34, 95% CI=1.80- 2.91, $p <0.001$) and presence of > 2 co-morbid conditions (OR= 8.12, 95% CI = 5.34- 11.21, $p < 0.001$) as predictors of higher GI disorder risk scores.

The preliminary findings of the study highlight associations between diet, stress, and GI health, presenting opportunities to modulate diet and optimize mental health to prevent and reduce the severity of GI disorders.

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