

Introduction

- Dietary fibre has been demonstrated to play a protective role against GI disorders, through its effects on microbial composition, and the production of short-chained fatty acids¹.
- Fibre metabolites like short-chained fatty acids facilitate gut-brain communication via the gut-brain axis potentially optimising both bowel function and mood².
- The development of therapeutic dietary fibre interventions is an area of interest to potentially reduce the burden of metabolic and mental disorders in high-income countries.

Methods

1. An online questionnaire encompassing three previously validated questionnaires was created to assess participants' fibre intake³, typical bowel habits⁴, and mood status⁵.
2. The questionnaire was distributed via email and posters to members of the Technological University Dublin. The survey went live in February of 2023 and closed after 13 days.
3. Quantitative data was received. Crosstabulations, Pearson-Chi Square, Mann-Whitney U, and Kruskal-Wallis tests were performed on SPSS to statistically analyse the data.

Aim

This study primarily aimed to assess the association between dietary fibre intake and bowel function in Irish adults. This study also aimed to explore the relationship between bowel function and mood in the study population.

Results

Demographic Characteristic

- 275 valid responses: 69.5% female, and 26.9% male
- Most participants were aged between 17-20 (42.2%) or 21-25 (39.3%)
- 66.5% of respondents were from the faculty of science and health

1. Fibre Status across Demographic Subgroups

	Fibre Intake Status, n(%)			p-value
	Low	Moderate	High	
Total	139 (50.5)	46 (16.7)	90 (32.7)	
Gender, n (%)				
Female	85 (44.5)	35 (18.3)	71 (37.2)	0.034
Male	46 (62.2)	10 (13.5)	18 (24.3)	
Other	8 (80)	1 (10)	1 (10)	
Age, n (%)				
17-20	62 (53.4)	17 (14.7)	37 (31.9)	0.212
21-25	45 (41.7)	23 (21.3)	40 (37.0)	
26-30	11 (84.6)	1 (7.7)	1 (7.7)	
31-40	6 (46.2)	3 (23.1)	4 (30.8)	
41-50	8 (53.3)	2 (13.3)	5 (33.3)	
50+	7 (70)	0 (0)	3 (30)	
Field of Study, n (%)				
Science & Health	77 (42.1)	34 (18.6)	72 (39.3)	<0.001
Other	62 (67.4)	12 (13.0)	18 (19.6)	

- Majority of participants (50.5%) had a low-fibre status
- Excluding those identifying as "other", females were more likely to have high fibre status than males (p<0.039)
- Those within the Faculty of Science and Health were more likely to have a high fibre status than others (p<0.001)

2. Stool Frequency and Fibre Status

Fibre Intake Status	n	Stool Frequency			p-value
		Every 2/3 days	1-2 a day	3+ a day	
Low	139	46 (33.1)	80 (57.6)	13 (9.4)	0.008
Moderate	46	7 (15.2)	35 (76.1)	4 (8.7)	
High	90	14 (15.6)	61 (67.8)	15 (16.7)	

- Those who defecate once every 2 or 3 days were found to have significantly lower fibre intakes to those who defecate once a day or more

3. Bowel Function Status and Fibre Status

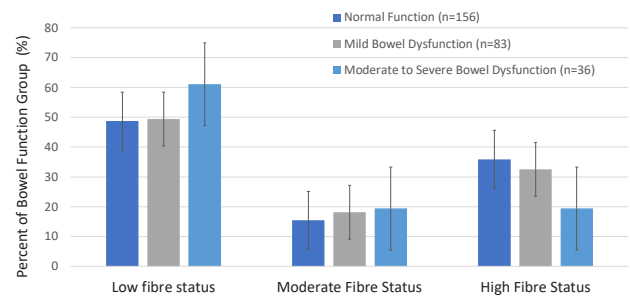


Figure 1. Bar Chart Illustrating Percentage of those according to Bowel Function Category with Low, Moderate and High Fibre Status

- Of those with a low fibre status, moderate-severe symptoms of bowel dysfunction were prevalent
- Of those with a high fibre status, normal bowel function was prevalent
- When analysed as a continuous variable, a significant decrease was found in estimated fibre intake in those with moderate to severe symptoms of bowel dysfunction compared to those with normal bowel function (p=0.033)

4. Bowel Function Status and Mood/Stress

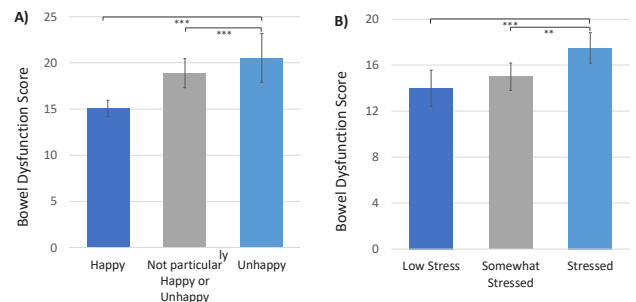


Figure 2. Bar Chart Illustrating Bowel Dysfunction score according to A) Mood Status and B) Stress Status *p<0.05 **p<0.01 ***p<0.001

- Significant associations were observed between mood status and bowel dysfunction score, and between stress levels and bowel dysfunction score.

Discussion & Conclusion

- Findings of this study suggest a strong relationship exists between fibre status and stool frequency, and there is an association between fibre intake and bowel function habits.
- This study demonstrates an association between mood and bowel function, with results suggesting a correlation between low mood and disordered bowel function. Results also establish a significant relationship between high stress levels and increased symptoms of bowel dysfunction.
- Given that this study suggests fibre demonstrates beneficial effects on bowel function, and normal bowel function is associated with improved mood and lower stress status, it can be postulated that fibre may positively impact both mood and bowel function via the bidirectional gut-brain axis.
- Given the prevalence of suboptimal fibre intakes observed in this study, further research in this area should evaluate the need for dietary fibre intervention strategies to potentially decrease the prevalence of gastrointestinal and physiological diseases.

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