Work Productivity Loss and Activity Impairment in Patients with IBS-Constipation: An Analysis of the National Health and Wellness Survey

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Introduction

- Irritable bowel syndrome with constipation (IBS-C) can negatively affect employees' productivity.
- Bloating and abdominal discomfort have been associated with having a negative impact on a patient's quality of life.[1]
- Approximately 14 productivity hours in a 40-hour work-week may be lost because of IBS symptoms.[2]
- Absenteeism and presenteeism associated with IBS symptoms have been estimated to cost as much as $20 billion each year,[3] and have been attributed to more work days missed and reduced work productivity.

Objective

- To evaluate the effects of irritable bowel syndrome with constipation on work productivity loss.

Methods

- Data were taken from the 2007 U.S. National Health and Wellness Survey (NHWS), an annual cross-sectional internet survey of the healthcare attitudes and behaviors of adults (aged ≥18 years). Respondents who self-reported that they suffered from IBS in the past 12 months were directed to answer a series of questions about the condition, including a question about the subgroups of IBS they experienced (IBS-C, IBS with diarrhea or IBS mixed).
- Employed IBS-C respondents were compared to a control group of employed respondents without IBS or functional constipation. The validated Work Productivity and Activity Impairment (WPAI)[4] questionnaire was used to collect data on productivity loss, including absenteeism, presenteeism, total work productivity loss, and activity impairment. Higher scores indicate higher levels of impairment.
- Multivariate linear regression models were developed to compare the two groups with respect to WPAI subscales, adjusting for covariates:
  - **Demographics:** gender, ethnicity, age, education, and marital status
  - **Health-indicators:** cancer treatment, opioid use, body weight, alcohol use, smoking, and exercise
  - **Presence of GI comorbidities:** Crohn's disease, ulcerative colitis, ulcers, abdominal bloating, abdominal pain, diarrhea, gastroesophageal reflux disease, or heartburn
  - **Presence of psychiatric comorbidities:** bipolar disorder, anxiety, depression, generalized anxiety disorder, obsessive compulsive disorder, panic disorder, phobia, post-traumatic stress disorder, or social anxiety disorder
  - **Number of other comorbidities:** angina, arrhythmia, atrial fibrillation, chronic obstructive pulmonary disease, congestive heart failure, deep vein thrombosis, diabetes, hypertension, high cholesterol, nasal allergies, osteoporosis, osteopenia, peripheral vascular disease, psoriasis, thyroid condition, asthma, epilepsy, insomnia, and migraines

Results

- Of the 63,012 respondents in the survey, there were 271 and 35,206 employed subjects in IBS-C and control groups, respectively.
- Few demographic differences were observed between the IBS-C group and the control group. Although the IBS-C group was comprised of significantly less males (30% vs. 54%, *p* < .0001), the groups were equivalent in terms of age (*Mean* = 42.8 vs. *Mean* = 43.1, *p* = .65), percentages of non-Whites (34% vs. 29%, *p* = .07), those married (58% vs. 55%, *p* = .46), and those college educated (38% vs. 44%, *p* = .08) (**Table 1**).
- In terms of health indicators, the IBS-C group was comprised of more smokers (33% vs. 25%, *p* = .003) and more current opioid users (11% vs. 4%, *p* < .0001). However, the IBS-C and control groups, respectively, had equivalent levels of BMI (*Mean* = 28.0 vs. *Mean* = 28.7, *p* = .12), proportions of current exercisers (12 days or more of exercise per month) (30% vs. 28%, *p* = .33), current alcohol users (68% vs. 73%, *p* = .10), and those undergoing cancer treatments (1% vs. 1%, *p* = .98) (**Table 1**).
- The IBS-C group was more likely to report a GI comorbidity (77% vs. 43%, *p* < .0001), a psychiatric comorbidity (62% vs. 31%, *p* < .0001), and reported a greater number of other comorbidities (*Mean* = 3.75 vs. *Mean* = 2.12, *p* < .0001) (**Table 1**).

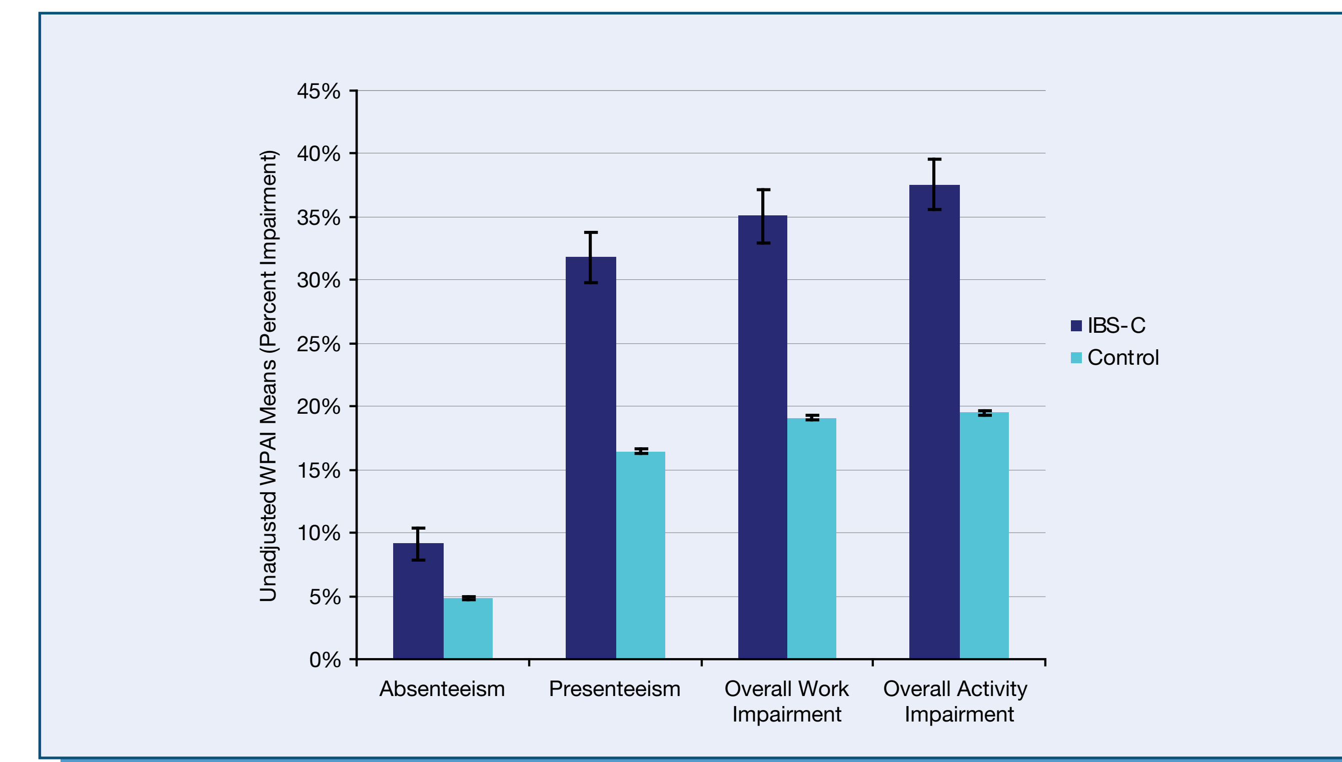
Table 1: Demographic, Health Indicator, and Comorbidity Variables for Employed IBS-C and Control Groups

	Employed IBS-C (N = 271)	Employed Controls (N = 35,206)	*p*-value
Demographics			
Male, n (%)	80 (30%)	18,750 (54%)	< .0001
Age (years), mean (SD)	42.8 (12.5)	43.1 (13.13)	0.65
White, n (%)	180 (66%)	24,949 (71%)	0.07
Married, n (%)	156 (58%)	19,335 (55%)	0.46
College educated, n (%)	104 (38%)	15,257 (44%)	0.08
Health Indicators			
BMI (kg/m^2), mean (SD)	28 (7.58)	28.7 (6.90)	0.12
Exercise ≥ 12 days/month, n (%)	82 (30%)	9,647 (28%)	0.33
Current smoker, n (%)	89 (33%)	8,691 (25%)	0.003
Current alcohol user, n (%)	185 (68%)	25,415 (73%)	0.10
Undergoing cancer treatment, n (%)	3 (1%)	391 (1%)	0.98
Current opioid use, n (%)	31 (11%)	1,425 (4%)	< .0001
Comorbidities			
GI comorbidity, n (%)	209 (77%)	14,904 (43%)	< .0001
Psychiatric comorbidity, n (%)	169 (62%)	10,975 (31%)	< .0001
Number of other comorbidities, mean (SD)	3.75 (2.63)	2.12 (2.03)	< .0001

SD = Standard Deviation

- Respondents with IBS-C had significantly greater productivity loss relative to controls (**Figure 1**):
  - Absenteeism (*Mean* = 9.1% vs. *Mean* = 4.85%, *p* = .0007)
  - Presenteeism (*Mean* = 31.8% vs. *Mean* = 16.4%, *p* < .0001)
  - Overall work impairment (*Mean* = 35.1% vs. *Mean* = 19.1%, *p* < .0001)
  - Overall activity impairment (*Mean* = 37.6% vs. *Mean* = 19.5%, *p* < .0001)
- This corresponded to almost 2 hours (*Mean* = 3.2 hours vs. 1.6 hours) more of missed work per week and double the productivity loss while working (*Mean* = 3.2 hours vs. 1.6 hours) for IBS-C patients compared to controls.

Figure 1: Unadjusted Means of the WPAI Subscales for Employed IBS-C Group (N = 271) Compared to Employed Controls (N = 35,206)

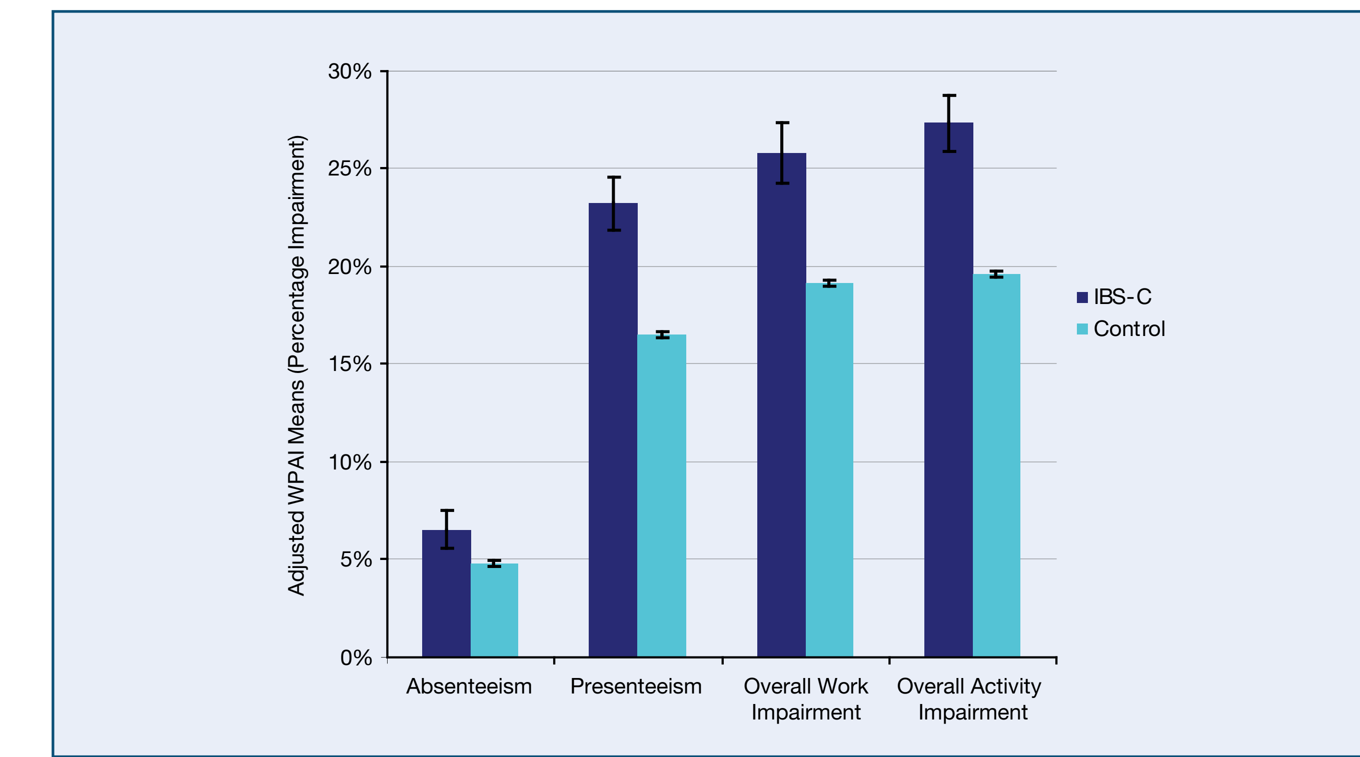


- After controlling for demographic, health indicator, and comorbidity variables in a series of multiple regressions, the differences between IBS-C and control groups, respectively, remained significant, except for absenteeism (**Figure 2**):
  - Absenteeism ($Mean_{adj}$ = 6.5% vs. 4.8%; *p* = .07)
  - Presenteeism ($Mean_{adj}$ = 23.2% vs. 16.5%; *p* < .0001)
  - Overall work impairment ($Mean_{adj}$ = 25.8% vs. 19.2%; *p* < .0001)
  - Activity impairment ($Mean_{adj}$ = 27.3% vs. 19.6%; *p* < .0001)
- This corresponded to almost 1.5 hours (Mean = 3.2 hours vs. 1.6 hours) more of missed work per week and a third more productivity loss while working (Mean = 2.3 hours vs. 1.7 hours) for IBS-C patients compared to controls.

Study Limitations

- There are limitations inherent in this study design;
  - Causality cannot be inferred due to cross-sectional design.
  - Data were patient-reported and not confirmed by clinical diagnostics; however, metrics such as the WPAI have been validated as patient-reported instruments.
  - The study was internet-based which may limit generalizability to segments of the population without internet access.

Figure 2: Adjusted Means (Controlling for Covariates) of the WPAI Subscales for Employed IBS-C Group (N = 271) Compared to Employed Controls (N = 35,206)



Conclusion

- As expected, self-reported IBS-C in adults was associated with significantly higher presenteeism, overall productivity loss, and activity impairment compared to controls.
- Appropriate management of IBS-C may reduce work loss, as well as impairment while at work and potentially decrease the financial burden on employers.
- Further research is warranted to validate the study findings.

References

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