

FUNCTIONAL DYSPEPSIA DECREASES PRODUCTIVITY AND INCREASED MEDICAL COSTS

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ABSTRACT:

OBJECTIVES: Functional dyspepsia is a common, morbid condition but data are limited on the indirect and direct costs for employees with functional dyspepsia or on its impact on productivity. Few data on absenteeism and no objective information are available. This study aimed to assess functional dyspepsia's incremental health benefit costs and effects on absenteeism and work output (productivity). **METHODS:** We performed a retrospective analysis of payroll data and adjudicated health insurance medical and prescription claims collected over a 4-year study period (January 1, 2001–December 31, 2004) from more than 300,000 employees. Data from employees with and without (controls) functional dyspepsia were compared using 2-part regression techniques. Outcome measures included direct and indirect costs paid by the employer, absenteeism, direct costs by the place of service where care was performed, and objectively measured productivity output. **RESULTS:** Employees with functional dyspepsia (N=1669) had greater average annual direct medical and prescription drug costs and indirect costs (due to sick leave, short- and long-term disability absences) than controls (N=274,206). Compared with controls, the functional dyspepsia employees incurred health benefit costs that were \$5,138 greater and had greater costs for each place of service (all $P<0.0001$). The employees with functional dyspepsia had an additional 0.83 absence days per year and produced 12% fewer units per hour than controls (both $P<0.05$). **CONCLUSIONS:** Employees with functional dyspepsia have greater costs at all places of service and lower productivity than employees without functional dyspepsia.

This poster presented at the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 15th Annual Meeting, Atlanta, GA. May 17th, 2010.

Citation: Brook RA, Kleinman NL, Choung RS, Melkonian AK, Smeeding J, Talley NJ. Functional Dyspepsia Decrease Productivity and Increased Medical Costs. *Value Health* 2010;13:A70-71.

Please note: Since this abstract was submitted, these data have been published as:

Brook RA, Kleinman NL, Choung RS, Melkonian AK, Smeeding JE, Talley NJ. Functional Dyspepsia Impacts Absenteeism and Direct and Indirect Costs. *Clin Gastroenterol Hepatol*. 2010 Mar 19. [Epub ahead of print]

INTRODUCTION:

- Functional dyspepsia (FD) is a common, morbid condition with dyspeptic symptoms not obviously explained by an organic disease and was previously called non-ulcer or idiopathic dyspepsia.^{1,2}
- FD has not received much public health attention. In a recent study of the burden of digestive diseases in the United States by the National Institutes of Health, no data on FD were included.³
- Data are limited on FD's impact on:
 - indirect and direct costs,
 - absenteeism, and
 - productivity.
- To assess the impact of FD from an employer's perspective, a wide array of health-related employee outcomes must be quantified.

OBJECTIVE:

This study aimed to assess FD's incremental health benefit costs and effects on absenteeism and work output (productivity) from the employer's perspective.

METHODS:

- An analysis was performed on retrospective data (2001 to 2004) from the Human Capital Management Services (HCMS) Research Reference Database. The database:
 - Consists of employee records representing the retail, service, health, manufacturing, and financial industries.
 - Contains hours missed from work for employees, payments made to employees (from payroll records and disability claims) for paid absences, and employee-specific objective at-work productivity output data for a subset of the employee population.
 - Is HIPAA Compliant.
- ICD-9 codes were used to identify employees with a primary, secondary, or tertiary diagnosis of FD (536.8x). Non-FD employees were defined as the control group.
- The index date:
 - For each employee with FD, was three months before the first date of service associated with the disease.
 - For controls, was the average index date of subjects with FD.
- All subjects needed to be continuously employed and eligible for health benefits for at least 1 year after their index date.
- Outcome measures included direct and indirect costs paid by the employer, lost time for absences, direct costs by the place of service where care was performed, and objectively measured productivity output.
- For the population subset that had place-of-service data, the direct medical claims were assigned to the following places of service: doctor's office, inpatient hospital, outpatient hospital or clinic, emergency department, laboratory, or other.

Statistical analysis

- Descriptive characteristics between cohorts were compared using student *t*-tests for continuous variables and chi-square tests for discrete variables.
- Separate two-part regression analyses were used to model the cost differences between the FD and non-FD cohorts.
 - Part 1: logistic regression was first used to predict the likelihood of subjects having any costs.
 - Part 2: generalized linear models with a gamma distribution and a log link function to model costs for subjects with more than zero costs.
 - Results from the two parts were combined to produce cost estimates for each cohort.
 - The models controlled for differences in age, gender, marital status, race, job-related variables, region, and the Charlson Comorbidity Index Score.⁴
- The at-work productivity models used only the second part (generalized linear model) because employees with zero at-work productivity during the year were excluded.
- Only employees eligible for a specific component were included in regression models for that component.
- All cost variables were inflated to August 2009 U.S. dollars.⁵
- Differences were considered statistically significant when $P \leq 0.05$.
- All models and statistics were generated via version 9.1 of the SAS System for Windows.

RESULTS:

- A total of 275,875 employees were eligible. Demographic variables for the FD and control cohorts are compared in **Table 1**.
- The comparisons of direct and indirect annual costs per employee for employees with and without FD are shown in **Table 2**.
 - All cost differences, except LTD, were significant ($P < 0.05$).
 - Total annual costs were approximately \$5,138 higher for employees with FD compared to those without FD (\$10,133 versus \$4,995).
- The comparisons of adjusted annual direct cost of medical care per employee by PoS are presented in **Figure 1**.
 - All cost categories were significantly higher for the FD cohort ($P<0.0001$).
 - Total direct costs for the employees with FD were \$5,504 (181%) higher than for controls (\$8,544 versus \$3,039).
- The comparisons of adjusted annual absence days are presented in **Table 3**:
 - FD employees had 1.58 more annual health-related work absence days than the controls, missing an average of 10.76 workdays per year, while control employees missed 9.18 days per year.
 - The only significant difference was for sick leave (FD subjects had 0.83 more days absent per year).
- The comparisons of hourly and annual objective at-work productivity are presented in **Figures 2A and 2B**, respectively. Employees with FD processed:
 - 12% fewer units per hour worked than the controls ($P=0.0345$).
 - 13% fewer adjusted mean units per year ($P>0.05$).

LIMITATIONS:

- The study was restricted to individuals with ICD-9-CM diagnosis codes of FD, and the findings may not be representative of persons with FD who are not diagnosed, who are misdiagnosed, or who do not have a diagnosis in their medical records.
- Because the annual time period began three months prior to the initial diagnosis, it may be unclear if the episodes of care are in the pre- or post-diagnosis period.
- The objective measures of productivity at work used in this analysis were from a subset of employees who work in task-oriented positions and may not be easily generalized to other employee populations.

CONCLUSIONS:

- Compared with controls, employees with functional dyspepsia have:
 - Higher health benefit costs for all categories except workers' compensation.
 - 2 to 3 times higher direct medical costs for all medical services, including doctor's office, inpatient hospital, outpatient hospital, and emergency department visits.
 - Significantly higher (0.83) annual sick leave absence days and 12% lower productivity while at work.

Table 1. Demographics for the Overall, Point of Service, and Productivity Samples

Variable	Employees with Functional Dyspepsia		Employees without Functional Dyspepsia		Difference in Means
	N	Mean (S.E.) or percent	N	Mean (S.E.) or percent	
Overall Sample:					
Age ¹	1,669	41.91 (0.24)	274,188	40.56 (0.02)	1.35*
Tenure ¹	1,669	9.42 (0.20)	274,206	9.58 (0.02)	-0.17
Female	1,669	54.1%	274,206	42.7%	11.4%*
Married	1,518	57.4%	248,251	57.8%	-0.4%
White	1,302	61.5%	197,279	65.9%	-4.4%*
Black	1,302	17.1%	197,279	18.9%	-1.8%
Hispanic	1,302	17.0%	197,279	10.3%	6.7%*
Exempt	1,669	27.6%	274,198	28.8%	-1.3%
Full Time	1,669	93.5%	274,206	87.9%	5.6%*
Annual Salary	1,669	\$48,969 (\$764)	270,701	\$49,593 (\$173)	-\$623
Charlson Index	1,669	0.425 (0.025)	274,206	0.195 (0.001)	0.231*
PoS Sample:					
Age	922	42.17 (0.34)	88,964	41.70 (0.03)	0.47
Tenure ¹	922	7.81 (0.25)	88,982	8.07 (0.03)	-0.26
Female	922	54.8%	88,982	51.1%	3.7%*
Married	888	59.3%	85,721	58.6%	0.8%
White	922	61.2%	88,982	67.5%	-6.3%*
Black	922	13.2%	88,982	12.1%	1.1%
Hispanic	922	21.1%	88,982	14.0%	7.1%*
Exempt	922	29.8%	88,982	31.7%	-2.1%
Full Time	922	97.9%	88,982	96.6%	1.4%*
Annual Salary	921	\$50,092 (\$1,200)	88,913	\$51,259 (\$161)	-\$1,167
Charlson Index	922	0.476 (0.037)	88,982	0.221 (0.002)	0.255*
Productivity Sample:					
Age ¹	73	39.95 (0.91)	27,633	37.88 (0.05)	2.07*
Tenure ¹	73	9.39 (0.73)	27,633	8.33 (0.04)	1.06
Female	73	51.5%	27,633	22.0%	9.6%*
Married	73	53.4%	27,633	59.7%	-6.3%
White	73	63.0%	27,633	64.7%	-1.7%
Black	73	24.7%	27,633	21.2%	3.5%
Hispanic	73	9.6%	27,633	11.3%	-1.7%
Exempt	73	0.0%	27,633	0.2%	-0.2%
Full Time	73	79.5%	27,633	73.4%	6.1%*
Annual Salary	73	\$33,294 (\$512)	27,631	\$33,521 (\$27)	-\$227
Charlson Index	73	0.205 (0.055)	27,633	0.096 (0.003)	0.109*

¹At index date

*Differences between cohorts are significant ($P<0.05$).

Table 2. Comparison of Annual Costs per Employee

Cost Category	Employees with Functional Dyspepsia		Employees without Functional Dyspepsia		Difference between means	P-Value
	N	Adjusted Mean Cost	N	Adjusted Mean Cost		
Medical	1,669	\$7,285	274,206	\$2,479	\$4,806	<0.0001
Prescription Drug	1,669	\$996	274,206	\$530	\$466	<0.0001
Sick Leave	918	\$565	143,138	\$439	\$126	<0.0001
Short-term Disability	820	\$470	126,598	\$344	\$127	0.0370
Long-term Disability	1,385	\$42	202,056	\$33	\$9	0.6551
Workers' Compensation	1,537	\$175	249,639	\$1,170	-\$996	<0.0001
Total		\$10,133		\$4,995	\$5,138	

Figure 1. Adjusted Annual Costs by Place of Service

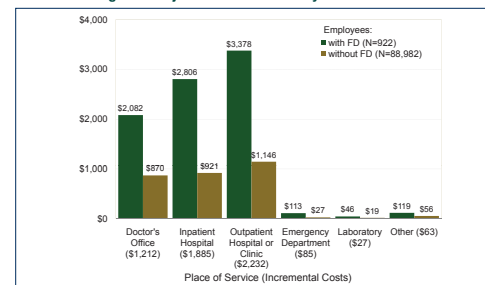


Table 3. Comparison of Annual Lost Days (Absenteeism) per Employee

Absence Category	Employees with Functional Dyspepsia		Employees without Functional Dyspepsia		Difference between means	P-Value
	N	Adjusted Mean Days Lost	N	Adjusted Mean Days Lost		
Sick Leave	918	3.93	143,138	3.10	0.83	<0.0001
Short-term Disability	820	3.75	126,598	2.99	0.75	0.1122
Long-term Disability	1,385	1.76	202,056	1.40	0.35	0.6753
Workers' Compensation	1,537	1.33	249,639	1.69	-0.36	0.2153
Total		10.76		9.18	1.58	

Figure 2A. Adjusted Objective Hourly Productivity

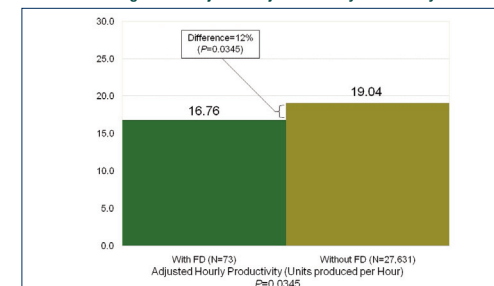
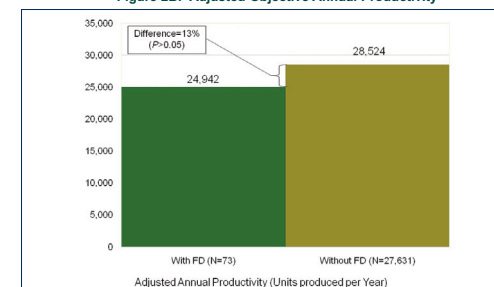


Figure 2B. Adjusted Objective Annual Productivity



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