

The impact of gastroesophageal reflux disease on work productivity: a systematic review

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Background

- Gastroesophageal reflux disease (GERD) is a chronic, potentially debilitating condition characterized by frequent and persistent heartburn and acid regurgitation.
- The prevalence of GERD, as defined by at least weekly symptoms of heartburn and/or regurgitation, is 10–20% in Western countries.¹
- GERD causes work productivity loss through two main mechanisms: absence from work (absenteeism) and reduced productivity while at work (presenteeism).

Objectives

- The objective of this study was to evaluate the effects of GERD on work productivity by evaluating work absenteeism and presenteeism through a systematic review and analysis of the published literature.

Methods

- Studies quantifying health-related work productivity loss in individuals with GERD were identified using a systematic literature search of PubMed (1 January 1966 to 15 October 2004) using the following terms: [gastroesophageal reflux or heartburn] and [productivity or work or absenteeism or presenteeism]. Additional references were identified from bibliographies.
- The inclusion criterion was the quantification of health-related reductions in work productivity in individuals with GERD.
- Exclusion criteria were changes in productivity in non-work settings only and studies that did not quantify reductions in work productivity in terms of time lost from work.
- Data on the work productivity impairment in GERD patients were collected from the literature. Authors were approached to provide unpublished data quantifying work productivity losses in terms of hours or as a proportion of total working time where these data were not documented.
- Absenteeism was expressed as number of work hours lost and as a percentage of the total employed time (i.e. the sum of total hours absent for health reasons, the total hours absent for other reasons and the total hours actually worked). Presenteeism was expressed as number of work hours lost (self-rated reduced effectiveness while present at work multiplied by the total number of hours actually worked), and as the percentage reduced effectiveness while at work.
- Overall work productivity loss was also calculated (absenteeism and presenteeism), and expressed both as total number of work hours lost and as a percentage of the total employed time.
- Where lost work productivity was converted from a percentage to work hours lost, this was done on the basis of an assumed 40-hour working week.

Figure 1. Key elements of the Work Productivity and Activity Impairment questionnaire for gastroesophageal reflux disease (WPAI-GERD).

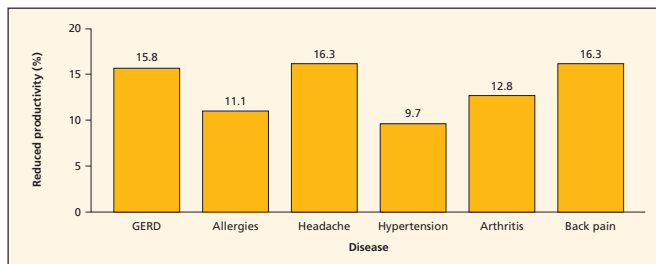
The following questions ask about the effect of your **reflux symptoms** on your ability to work and perform regular daily activities. We use the term reflux symptoms to mean heartburn or acid regurgitation.

Q1: Are you currently employed (working for pay)?
 Q2: During the past 7 days, how many hours did you miss from work because of problems associated with your reflux symptoms?
 Q3: During the past 7 days, how many hours did you miss from work because of any other reason, such as vacation, holidays, time off to participate in this study?
 Q4: During the past 7 days, how many hours did you actually work?
 Q5: During the past 7 days, how much did your reflux symptoms affect your productivity while you were working?*

Q6: During the past 7 days, how much did your reflux symptoms affect your productivity while doing your regular daily activities, other than work at a job?*

Q, question number. *Responses result in a value between 0 and 100% reduced productivity.

Figure 2. Percentage total reduced work productivity for GERD and other diseases (adapted from Dean et al., 2003).¹⁰



- Overall productivity losses were converted into a monetary cost using the human capital method,² by applying the average hourly employment cost of a US employee (\$25.36 in September 2004) to the total number of hours lost.³

Results

- Six publications covering five studies conducted in the USA, Canada and Sweden were eligible for inclusion (results of these studies are provided in Table 1).^{4–9}
- All five studies used the patient-completed Work Productivity and Activity Impairment questionnaire (WPAI). The WPAI for GERD is shown in Figure 1.
- Reported work productivity losses among individuals with GERD ranged from 6% to 39%, and were primarily due to presenteeism (6%–40%) rather than absenteeism (<1%–6%).
- Work productivity impairment correlated with symptom severity, and was greatest in patients experiencing sleep disturbance due to GERD symptoms and lowest in GERD patients taking prescription medication.
- Acid-suppressive therapy improved productivity at work, especially in individuals with GERD-associated sleep disturbances.
- The mean overall productivity loss per employee with GERD was estimated at \$61–\$396 per week, assuming a 40-hour working week and average US wages.

Conclusions

- GERD impairs work productivity to a substantial extent.
- This impairment is comparable with that of other chronic debilitating diseases (Figure 2).¹⁰
- The burden of GERD on work productivity is mainly due to reduced productivity while at work (presenteeism), though it also leads to absenteeism.
- The burden of lost productivity due to GERD may be reduced by acid-suppressive therapy, particularly in employees with nocturnal symptoms of GERD.

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Table 1. Studies of work productivity in GERD.

Reference	Country	Population	Age years (range)	Definition of GERD	Method of data collection	Mean presenteeism % (hours/week)		Mean absenteeism % (hours/week)		Overall mean productivity loss % (hours/week, equivalent weekly cost)	
						Cases	Comparators	Cases	Comparators	Cases	Comparators
Dean et al., 2003 ⁴	USA	956 employees in hotel/casino industry; 273 with GERD (cases), 683 without (comparators)	38.9 years (range not reported)	Reflux Disease Questionnaire (self-completed diagnostic tool)	WPAI-General Health self-completed via the internet	14.5% (5.8 hours)	5.2% (2.1 hours)	2.7% (1.1 hours)	1.0% (0.4 hours)	15.8% (6.3 hours, \$160)	5.8% (2.3 hours, \$58)
Dean et al., 2003 ⁵	USA	1003 employed persons taking prescription medication for chronic heartburn	50.3 years (22–82)	Self-reported chronic heartburn	WPAI-GERD completed via telephone interview	5.8% (2.3 hours)	–	<1.0% (<0.4 hours)	–	6.0% (2.4 hours, \$61)	–
Johnson et al., 2004 ⁶	USA	350 patients with GERD-related sleep disturbances and moderate-to-severe night-time heartburn, before (cases) and after (comparators) 4 weeks' treatment with esomeprazole, 20 mg/day (E20) or 40 mg/day (E40), or placebo (P).	Overall mean not reported (18–85 years)	Self-reported history of sleep disturbances and night-time heartburn of at least moderate severity	WPAI-SLEEP-GERD self-completed	E20: 40% (16.0 hours) E40: 40% (16.0 hours) P: 39% (15.6 hours)	9% (3.6 hours) 10% (4.0 hours) 23% (9.2 hours)	2.3%* (0.9 hours) 3.1%* (1.2 hours) 2.0%* (0.8 hours)	0.9%* (0.4 hours) 1.0%* (0.4 hours) 1.5%* (0.6 hours)	39%* (15.6 hours, \$396) 38%* (15.2 hours, \$385) 39%* (15.6 hours, \$396)	9%* (3.6 hours, \$91) 9%* (3.6 hours, \$91) 22%* (8.8 hours, \$223)
Wahlqvist et al., 2004 ⁷	Canada	153 employed patients recruited into a clinical trial, mainly from gastroenterology clinics, before (cases) and after (comparators) 4 weeks treatment with esomeprazole 40 mg/day	49.7 years (26–82)	Self-reported heartburn of at least moderate severity	WPAI-GERD self-completed	14.0% (5.6 hours)	3.0% (1.2 hours)	2.1%* (0.8 hours)	0.7%* (0.3 hours)	15.1%* (6.0 hours, \$152)	3.4%* (1.4 hours, \$36)
Wahlqvist, 2001 ⁸ Wahlqvist et al., 2002 ⁹	Sweden	136 employed GERD patients visiting the primary care physicians; 109 with heartburn during the previous week (cases), 27 without (comparators)	42.7 years (18–63)	Physician diagnosis	WPAI-GERD self-completed	23% (9.2 hours)	6% (2.4 hours)	6.2%* (2.5 hours)	0.3%* (0.1 hours)	26%* (10.4 hours, \$263)	5%* (2.0 hours, \$51)

* Calculated based on data presented in the original publication and unpublished data retrieved from corresponding authors.
 All variables were calculated from responses to the individual WPAI questions (Q) described in Figure 1. Absenteeism was expressed as number of work hours lost (Q2) and as a percentage of the total employed time, i.e. the sum of total hours absent for health reasons, the total hours absent for other reasons and the total hours actually worked (Q2 / (Q2 + Q3 + Q4)). Presenteeism was expressed as number of work hours lost (percentage reduced effectiveness while at work multiplied by the total number of hours actually worked (Q5 × Q4) and as a percentage reduced effectiveness while at work (Q5). Overall work productivity loss was also calculated (absenteeism and presenteeism) and expressed both as total number of work hours lost (Q2 + Q5 × Q4) and as a percentage of the total employed time (Q2 + Q5 × Q4) / (Q2 + Q3 + Q4). Lost work productivity was converted from a percentage to weekly work hours lost on the basis of an assumed 40-hour working week. The equivalent weekly cost was calculated using the average hourly labour cost for US in September 2004 of \$25.36, which consisted of wages and salaries worth \$17.96 and benefits worth \$7.40.