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The Clinical and Occupational Correlates of Work Productivity Loss Among Employed Patients With Depression

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Abstract

Employers who are developing strategies to reduce health-related productivity loss may benefit from aiming their interventions at the employees who need them most. We determined whether depression's negative productivity impact varied with the type of work employees performed. Subjects (246 with depression and 143 controls) answered the Work Limitations Questionnaire and additional work questions. Occupational requirements were measured objectively. In multiple regression analyses, productivity was most influenced by depression severity ($P < 0.01$ in 5/5 models). However, certain occupations also significantly increased employee vulnerability to productivity loss. Losses increased when employees had occupations requiring proficiency in decision-making and communication and/or frequent customer contact ($P < 0.05$ in 3/5 models). The Work Limitations Questionnaire can help employers to reduce productivity loss by identifying health and productivity improvement priorities.

A wealth of research now shows that depression can exact a heavy economic toll on businesses and their employees.¹⁻⁴ Depression in the working-age population is estimated to cost this nation at least \$12.4 billion annually in medical care and at least another \$44 billion annually in lost productive work time.^{4,5} Researchers estimate that approximately half of the employers' total costs for depression are the result of employee work absences and disability claims.³ One of the main reasons for these staggering costs is that one in eight working-age adults, 18 to 54 years of age, is estimated to be clinically depressed, and half will experience a recurrence within 1 year of remission.⁶

Employers have relied mainly on medical care for help in treating their employees' depression. By doing so, some companies have hoped to minimize the condition's secondary

impact on employee work performance and productivity. There is some rationale for this approach. In addition to the depression impact studies cited previously,¹⁻⁴ studies suggest that patients whose symptoms improve subsequently have less work impairment.⁷⁻¹⁰ Recently, a few treatment trials have found that compared with patients receiving usual care, those getting high-quality depression treatment have fewer work absences and less unemployment (Rost K, Smith JL, Elliott CE, Dickinson M, Duan N, submitted).¹¹

In previous depression research, productivity loss has been included as a secondary outcome and few explanatory variables, other than depression symptoms or depression treatment, were included. This study addresses productivity loss as its primary outcome among employees with depression. The aims of this study are to (1) describe the impact of depression and specific depression symptoms on multiple dimensions of employee productivity and (2) determine whether depressed employee's vulnerability to productivity loss is increased by the type of work he or she performs.

Researchers in occupational medicine,¹² disability and rehabilitation research,¹³ and social epidemiology¹⁴ generally agree that after the onset of a health problem, a person's ability to return to an effective level of functioning will be influenced by variables such as the characteristics of the person, the social and physical environment and available supports and resources. For instance, within this framework, a person's job demands are important variables for explaining the impact of illness on his or her ability to work.

We hypothesize that productivity loss among employees with depression will be greater when the jobs they perform involve demands for cognitive skills (such as effective decision-making, use of judgment, and extensive concentration) and interpersonal interactions. We measure productivity loss in terms of absenteeism (time spent away from the job because of health) and "presenteeism" (impaired job performance and productivity while at work).

Presenteeism is a relatively new concept, which is generally measured by self-report questionnaire.^{4,15} In this study, we use the 25-item Work Limitations Questionnaire (WLQ).¹⁶ The WLQ has been extensively validated in patient and employee samples, including employees with depression.¹⁷ It has been shown to be associated with objectively-measured criteria including employee work productivity, adverse work events (such as injuries) and income loss.¹⁷⁻¹⁹

Until now, the WLQ, as well as other related instruments, have been used in research mainly to quantify the magnitude of productivity loss due to illness. However, the WLQ assesses work loss in terms of an employee ability to perform a specific set of job demands and may help researchers identify some of the key variables that contribute to employee productivity loss. Understanding both the impact of an illness on employee productivity and the variables that contribute to this problem can help employers and other stakeholders set priorities for intervention. Thus, this study's results may eventually help reduce productivity loss and assist depressed employees function better in the workplace.

Methods

This study uses baseline data from employed adults with dysthymia, major depressive disorder (MDD), or both (double depression, DD), and a healthy control group. The study, which we refer to as the Health and Work Study, uses a longitudinal observational design to assess the impact of depression on multiple aspects of employment and the importance of the employee's job and work characteristics for explaining outcomes. The study's protocols were approved by the Tufts-New England Medical Center Human Investigations Review Board and by the boards of the participating sites.

Subjects

The current sample ($n = 389$) consists of 246 employees with depression (dysthymia = 64; MDD = 89 and DD = 93) and 143 healthy controls. All subjects in the depression and control groups were recruited between February 2001 and February 2003 from primary care physicians' offices in Massachusetts. Physicians were affiliated with the Tufts Health Plan, the Fallon Clinic and/or Harvard Pilgrim Health Care. Patients qualified for the study even if they were not insured by these health plans.

Eligible individuals were 18 to 62 years old and working for pay at least 15 hours/week. Persons eligible for the depression group also had a positive screening result for dysthymia, MDD, or DD, but none of the exclusion criteria listed below. Persons eligible for the control group had to be free of depression symptoms (one or fewer symptoms) and have none of the following exclusions.

The exclusion criteria were: planning to retire within 2 years; receiving disability benefits or having a disability claim pending; either actively alcoholic or abusing drugs; currently pregnant or had delivered a baby within the past 6 months; diagnosed with bipolar disorder; unable to speak and/or read English; and/or diagnosed with one or more of 12 potentially seriously disabling medical conditions (eg, migraine and osteoarthritis). Such conditions may influence productivity and, therefore, could bias results.

Procedures

A three-part process was used to evaluate eligibility: (1) a 5-minute office-based self-administered screening survey; (2) a physician-reported checklist; and (3) an in-depth interview with the potentially eligible subject conducted by phone or mail survey. This process was used to achieve accuracy in the assessment of depression and to decrease response burden.

Office-Based Screener—During routine scheduled office visits, patients were approached by a study representative and invited to complete a self-administered study screening form. The office screener asked the patient about current employment status, number of work hours, whether planning to retire and whether a disability claim had been filed. It also included an alcoholism screener²⁰ and a three-item depression pre-screener.²¹ Depending on the answers given on the prescreener, some patients were instructed to answer more questions, which were used to further assess dysthymia and/or major depression.²²

The screening forms were electronically scanned and scored onsite. The results indicated which patients were eligible for the next part of the process. Because, typically, a large number of potential controls are identified in primary care offices (more than we required for adequate statistical power), we randomly selected 1 out of every 10 potential controls and excluded the rest.

Physician Checklist—When a potentially eligible subject was identified, his/her physician was asked to complete a brief eligibility checklist to indicate the presence of any of the exclusionary diagnoses. If a patient had screened positive for MDD, we informed the physician of that result and asked him or her to rule out depression secondary to an underlying medical condition (ie, hypothyroidism) or medical treatment (ie, antihypertensive medication).

In-Depth Interview—Any person not excluded at this point received a mailing consisting of a baseline questionnaire, consent form, explanatory materials and an opt-out postcard. Next, an interviewer attempted to make phone contact. Individuals declining a phone interview or unreachable after at least ten tries were sent another mail questionnaire and again invited to complete the baseline questionnaire and consent form. Each interview asked about general health, employment, depression and other topics necessary for determining eligibility.

Consent—Any person who was eligible and returned a baseline questionnaire and a signed consent form was enrolled in the study. Enrollees were asked to complete mail surveys every six months for eighteen months. A \$20 cash incentive was provided with the baseline survey and \$10 was offered for each followup. To encourage responses, we used a modified Dillman technique of timed postcard and phone reminders.²³

Measurement

The following section lists the main concepts measured, their variable names and measurement methods.

Presenteeism—The WLQ was originally developed for clinical trials and is applicable to employees with many different types of physical and mental health problems, across many different job situations. It has 25 items, which are subsumed under four scales. Each scale focuses on the employee's ability to perform a specific set of job demands. These include: mental and interpersonal demands, physical demands, time management and output demands. Each WLQ scale score reflects the percent of work time (in the past 2 weeks) that a person's physical and/or emotional health problems interfered with his or her ability to perform each group of demands. The WLQ also generates a summary score, known as the WLQ Productivity Loss Index.²⁴ The Index gives an estimate of the amount of healthrelated productivity loss caused by difficulties working. The WLQ Mental-Interpersonal scale (WLQ Mental-Interpersonal) contains nine items (eg, difficulty doing work carefully, concentrating on work, and meeting with people). The Physical scale (WLQ Physical) has six items (eg, ability to walk to different work locations and stay in the same position). The Time scale (WLQ Time) has five items (eg, difficulty working required hours and working

without stopping to take breaks or rests). The Output scale (WLQ Output) contains five items (eg, difficulty handling the workload and finishing work on time). After reverse-coding item scores in three scales (WLQ Mental/Interpersonal, Time and Output), item scores within each scale are averaged. The resulting average scores are transformed to a 0 (limited none of the time) to 100 (limited 100% of the time) scale.^{16,24}

Productivity Lost Because of Presenteeism (WLQ Index)—Productivity loss associated with on-the-job difficulty is reflected by scores on the WLQ Productivity Loss Index. The Index is a weighted sum of scale scores. The weights given to each scale score were derived from linear regression and factor analysis. These coefficients were obtained by modeling the relationship of WLQ scale scores to objectively-measured productivity.^{17,24,25} The Index score is interpreted as the percentage reduction in health-related productivity compared to a benchmark group of employees with no work limitations.

Absences (Number of Days Missed)—Time lost from work is measured using two items: “In the past 2 weeks, how many full workdays did you miss because of your health or medical care” and “In the past 2 weeks, what was the total number of days you missed part of a workday because of your health or medical care.” A full workday missed is given the value of 1 and a part day is 0.5. The accuracy of self-reported absence days has been established by Revicki.²⁶

Productivity Lost Because of Absences (Productivity Lost Absences)—This is the ratio of the total number of hours missed in the past 2 weeks divided by the usual number of weekly work hours (multiplied by 2). In contrast to the WLQ Productivity Loss Index, this ratio does not reflect a difference from an external benchmark. It reflects the portion of the person’s own usual work time that was missed.

The following explanatory variables are included in the analyses.

Condition Group (Dysthymia, MDD, DD, and Control)—Condition group reflects the assignment resulting from the eligibility screening process.

Depression (Symptoms; Severity)—The number of depression symptoms is measured using the PHQ-9, a self-report tool for assessing MDD.²⁷ The PHQ-9 asks about the frequency of DSM-IV specific depression symptoms in the past 2 weeks. Symptoms range from 0 to 9. Depression Severity (range, 0 to 27) is the sum of symptoms weighted for frequency of occurrence as reported on the PHQ-9 questionnaire.²⁸

Specific Depression Symptoms (concentrate/fidget and tired/sleep)—Two symptom variables were defined using PHQ-9 questionnaire data. “Concentrate/fidget” indicates the frequency of difficulty concentrating and/or distractibility (the item addressing fidgeting or moving too slowly). “Tired/sleep” indicates the frequency of feeling tired and/or having difficulty sleeping. “Tired/sleep” taps into fatigue, which Swindle and colleagues found predicted productivity loss with depression.²⁹ The depression variables were created by adding each symptom pair score and calibrating the result between 0 and 1.

Physical Health (SF-12 Physical Health and Number of Comorbidities)—

Physical health was assessed using the SF-12 Physical Component Summary score (PCS-12).³⁰ The PCS-12 variables represent the eight domains of the SF-36 and scores range from 10 (worst health) to 70 (best health). Number of comorbidities is based on the number of “yes” responses to a physical condition checklist.

Occupation (Manager/Professional/Technical; Sales/Support/Service; Construction/Production/Repairs/Transportation)—Subjects were assigned six-digit occupational codes using the 1990 Standard Occupational Classification system.³¹ A trained coder assigns an occupational code to each subject based on the subject’s answers to a series of openended questions. Each six-digit code is also assigned to one of 23 major occupational groups. To facilitate analysis, we grouped these categories into three broad groups. In multiple regression, the manager/professional/technical group is the reference group.

Occupational Requirements (Judgment/Communication Skills; External Customers)—We included two objectively measured variables reflecting occupational requirements. “Judgment/communication skills” reflects the degree to which a person’s occupation typically requires proficiency in judgment and decision-making and/or effective communication. “External Customers” is the extent to which an occupation requires interaction with others outside of an employee’s own organization. Each variable is scored on the occupational-level. Mean scores for each variable were obtained from the federal O*NET database.³² The O*NET database contains information on key characteristics of more than 1000 US occupations. O*NET information was obtained by collecting data from expert job raters and by surveying actual job incumbents. O*NET scores for the Judgment and Communication variables were added and rescored on a 0 to 1 scale. External customers is a single O*NET variable and was also rescored on a 0 to 1 scale.

Demographics—These include mean years of age (age) and mean years of education (education), indicator (0,1) variables for sex (female or male), race/ethnicity (white or non-white), and marital status (married or not married), median annual income adjusted for age and gender (yearly income), usual weekly work hours (weekly hours), number of years in the job (years in job) and a self-employed (self-employed or not) indicator variable.

Analyses

Response rates and descriptive statistics are presented for all of the variables as frequencies, percentages, means and 95% confidence intervals. Condition-group differences in the main dependent variables, the four WLQ scale scores and the number of days missed, were tested with analysis of variance. *P* values reflect the difference between all five condition groups. When there are differences among the depression groups, these *P* values are also reported.

To test the hypothesis (that certain job characteristics influence the outcomes of depression), we used multivariate linear regression models, adjusted for age and gender. The dependent variables included each of the four WLQ scales (WLQ MentalInterpersonal, Physical, Time and Output) and absences (the number of days missed).

The first series of models tested the explanatory value of depression severity, physical health, the subject's occupation, education and an interaction term for depression severity and occupation. A second set of regression analyses tested the explanatory value of specific depression symptoms (concentrate/fidget and tired/sleep) and the objectively measured occupational requirement variables (judgment/communication and external customers). Each model also included variables for physical health, age, sex, education and an interaction term for depression symptoms and occupational requirements.

In all regression analyses, depression severity, physical health, and the O*NET occupational demand variables are defined on a 0 (minimum) to 1 (maximum) scale. We performed all analyses by using STATA 7.0 (Stata Corporation, College Station, TX).³³

Response

A total of 12,982 patients were screened in physician offices. A total of 11,444 (88%) were determined to be ineligible before telephone screening, including the unselected controls. Of the 1538 employed patients considered potentially eligible after initial screening, 822 (53%) agreed to be fully assessed for participation and 716 (47%) refused further participation. After completing the process, 324 (39% of nonrefusals) were deemed ineligible and 498 (61% of non-refusals) were eligible and enrolled. This analysis includes the 389 employees who were en-rolled in the depression or control groups.

We tested for differences between the 389 enrolled individuals and the 716 who did not complete the screening. We found no statistically significant differences with regard to their SF-12 physical and mental health component scores, number of dysthymia symptoms, number of MDD symptoms, history of bipolar disorder and alcoholism screener scores ($P > 0.05$). The latter group, however, was younger and had more males ($P > 0.05$).

Results

Sample Characteristics

Enrollees were predominantly female (88%) and white (90%), 50% were married, with mean age of 40 years and mean education of 14.7 years. Compared to each of the depression groups, the controls had more married subjects ($P = 0.001$) and a higher mean education level ($P < 0.001$). Age and sex-adjusted median income was not significantly different between the groups ($P > 0.05$; Table 1).

Average depression severity scores within the MDD and DD groups (means, 20 and 19) were higher than in the dysthymia group (mean, 15). The control group's average severity score was 8, and the overall group difference was significant ($P < 0.001$).

Although patients with severe comorbid conditions were excluded from the research design, employees with depression still had significantly more comorbid conditions than the controls ($P < 0.001$). Mean SF-12 physical health scores were also poorer in each of the depression groups compared to controls ($P < 0.001$; Table 1).

Approximately two-thirds of employees with depression had a history of medication use for an emotional problem such as depression or anxiety, compared with approximately one fourth of controls ($P < 0.001$). In the prior 3 months, between 45 and 54% of subjects in the depression groups and 18% of the controls reported having obtained professional help for an emotional problem ($P < 0.001$).

Approximately one third (32%) of employees with MDD and slightly fewer of those with dysthymia (28%) and DD (26%) reported that their physicians had asked them about their work during a recent visit. The rate for controls was 11% ($P = 0.001$). Less than 20% in the depression groups ever received advice from their physicians to cut back on work or change to a different line of work versus 6% of the controls ($P = 0.014$).

Occupations in the depression and control groups were not significantly different ($P > 0.05$; Table 2). Most subjects were managers, professionals or technical workers (54%). Forty percent held sales, service or support occupations. The rest (7%) were in construction, production, repair or transportation occupations.

Employees worked an average of 38 hours per week; there were no significant depression and control group differences ($P > 0.05$). The number of years employed in the current position was longer on average in the control group ($P = 0.045$). Small proportions in each of the condition groups were self-employed (5% to 12%; $P > 0.05$).

Presenteeism

Compared with the control sample, employees with depression were two to three times more likely to indicate that health problems interfered with their ability to meet job demands (Table 3). Differences for the Mental-Interpersonal scale, the Time scale and the Output scale were larger than the Physical scale, but all were significant ($P < 0.001$). Employees with major depression or DD reported higher average impairment than those with dysthymia.

According to the WLQ Productivity Loss Index, the summary score for mean productivity loss, the average subject with dysthymia had an on-the-job productivity loss of 6.6% in the past 2 weeks, compared to 11.4% for the MDD group, 10.1% for the DD group, and 2.6% for the controls ($P < 0.001$).

Absenteeism

The mean number of workdays missed in the past 2 weeks was greater among employees with depression. Controls missed about a half-day on average during the past 2 weeks (0.6 of a day) compared to 1.4 days, 2.2 days, and 1.7 days for the three respective depression groups ($P < 0.001$).

Mean productivity loss because of absenteeism (the ratio of time missed to total time subjects usually worked) was significantly greater in the depression groups (dysthymia = 13.6%, MDD = 28.4%, DD = 22.0% and controls = 7.4%; $P < 0.001$).

Model Results

In models testing the explanatory value of the health and occupation variables simultaneously, more severe depression ($P < 0.01$) and poorer physical health ($P < 0.01$) significantly explained scores on each of the four WLQ scales and the number of days missed. Occupation was also significant in some of the models. Having a sales, service, or support occupation impaired ability to handle mental and interpersonal demands (WLQ Mental-Interpersonal $P = 0.032$) and physical job demands (WLQ Physical $P = 0.015$) but it had no significant influence on WLQ Time, WLQ Output or the number of days missed. The interaction term for occupation and depression severity was not significant but its coefficients were in the expected direction (greater work loss for more depressed employees in sales, service and support occupations); (Table 4). With education added to the model (not shown), the effect of occupation became not significant.

The next models focused on specific depression symptoms and the occupational demand variables. Results indicated that occupational demands explained each of the WLQ scale scores. The WLQ Time and Output scale scores were each significantly greater when employees held occupations involving the use of judgment and communication skills ($P = 0.056$ and 0.014 , respectively; Table 5). Employees in jobs requiring high levels of interaction with external customers also had higher (worse) WLQ Mental-Interpersonal scale scores ($P = 0.031$) and WLQ Physical scale scores ($P = 0.04$).

Depression symptoms also explained the variance in some of the WLQ scales. Difficulty concentrating and fidgeting had a $P < 0.0001$ in the WLQ Mental-Interpersonal, Time and Output scale models, and $P = 0.056$ for the WLQ Physical scale model. Tiredness and sleep problems had a significant effect in each WLQ scale model, except for the WLQ Physical scale ($P > 0.05$), and predicted the number of days missed ($P = 0.015$). The interaction terms measuring demand for judgment and communication and depression symptoms were in the predicted direction but not statistically significant.

Conclusions

This is the first study to identify specific occupational characteristics that contribute to productivity loss among employees with depression. When depressed employees had occupations that required proficiency in exercising judgment and communication, health problems resulted in more work limitations and more absences. When employees' occupations required them to have a high degree of contact with the public, their health problems resulted in greater losses in ability to handle mental and interpersonal demands and physical job demands.

Occupations with these requirements are common in the US economy. For instance, in the O*NET classification system, high judgment occupations include registered nurses, benefit coordinators, social workers, engineers, marketing managers, attorneys, and financial analysts.³² Occupations involving high levels of interpersonal proficiency include teachers, customer service managers, salespeople, and consultants as well as social workers, registered nurses and attorneys.

This study also identified two clusters of specific depression symptoms that increase employee productivity loss. In particular, employees having difficulty concentrating and distractibility had poorer WLQ scale scores and more on-the-job productivity loss (shown by the WLQ Productivity Loss Index). Employees reporting tiredness and sleep disturbance had more difficulty performing Mental-Interpersonal, Time and Output-related tasks and more days missed.

Physicians and other health professionals (such as disability case managers) could benefit from having information about the work impact of these symptoms. For instance, physicians might help their employed patients to better cope with depression by discussing their vulnerabilities to work problems and the role that treatment can have in improving concentration and sleep. In this study, survey responses indicated that less than a third of depressed patients were asked about work by their physicians during the last 4 weeks.

Poorer physical health in general (even with serious medical problems excluded) also increased productivity loss. Of all the indicators, physical health had the strongest impact on ability to perform physical job demands (WLQ Physical) and absenteeism, where its effects were larger than those for depression severity. These results suggest that attention to health problems, which may include somatic manifestations of the depression, may be important to achieving a positive outcome.

This study builds upon prior research by measuring important outcomes such as presenteeism, using a new sensitive, validated methodology, the WLQ and by including a category of explanatory variables— objectively measured work characteristics—for the first time.

This study is limited by its crosssectional design and emphasis on patients who made doctor's office visits, who may be sicker than the general employed population. We also omitted variables measuring absence policies and other workplace practices that could influence productivity loss, and did not account for the possible impact of depression history and treatment on current employment. Finally, we did not have external objective measures of the psychosocial work environment.

As fields such as occupational medicine, ergonomics and vocational rehabilitation have long recognized a chronically ill or injured employee's successful return to optimal work capacity is a complex process that involves more than just medical treatment and symptom relief. For example, disability case management which helps translate medical restrictions into acceptable work behavior and worker accommodations such as assignment to light duty work have become relatively conventional methods for helping Workers' Compensation and disability insurance claimants return to a safe level of work performance.^{34,35} However, we rarely find such programs for managing productivity loss aimed at employees with depression (especially before they have filed disability claims). Employee Assistance Programs usually address substance abuse, violence and severe performance problems and typically do not provide services to address employment problems because of depression.

Although the strong relationship between depression symptoms and both presenteeism and absenteeism supports current efforts to improve employees' access to quality depression

treatment,^{36,37} our study also points to the importance of helping employees manage their work requirements. Finally, this study demonstrates the value of the WLQ for establishing priorities for employee health and productivity improvement.

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TABLE 1

Sample Characteristics

	Control	Dysthymia	Major Depression	Double Depression	P-value
N = 389	143	64	89	93	
% Female	71 (63–78)	83 (74–92)	82 (74–90)	83 (75–91)	.057
% White	93 (89–97)	88 (79–96)	91 (85–97)	86 (79–93)	.317
% Married	63 (55–71)	42 (30–54)	40 (30–51)	44 (34–54)	.001
Mean age (years)	41 (39–43)	40 (37–43)	38 (36–40)	38 (36–41)	.161
Mean education (years)	15 (15–16)	15 (14–15)	14 (13–14)	14 (14–15)	<.001
Adjusted median yearly income (\$)	42,675 (39,655–45,695)	39,150 (34,675–43,625)	37,500 (33,725–41,275)	39,470 (35,900–43,030)	.206
Number of depression symptoms					
% 0–1	90 (85–95)	33 (21–44)	11 (5–18)	14 (7–21)	<.001
% 2–4	10 (5–15)	41 (29–53)	30 (21–40)	36 (26–45)	<.001
% 5–6	0 (0–0)	22 (12–32)	24 (15–33)	26 (17–35)	<.001
% 7–9	1 (0–2)	5 (0–10)	35 (25–45)	25 (16–33)	<.001
Mean depression severity score (0–27)	8 (7–8)	15 (14–16)	20 (18–21)	19 (18–20)	<.001
% Took psych meds in past	27 (19–34)	66 (54–77)	67 (57–77)	73 (59–79)	<.001
% Taking psych meds now	10 (5–15)	52 (39–64)	40 (30–51)	51 (40–61)	<.001
% Had services for personal or emotional problems past 3 months	18 (12–25)	45 (33–58)	54 (44–64)	53 (43–63)	<.001
% Advised by doctor to cut back on or change work	6 (2–11)	14 (6–23)	20 (11–28)	18 (10–26)	.014
% Whose doctors asked about work during recent visit	11 (6–17)	28 (17–39)	32 (22–42)	26 (17–35)	.001
Mean PCS-12 physical health score (10–70)	58 (57–59)	51 (49–53)	49 (47–51)	51 (49–53)	<.001
Mean no. medical comorbidities	1 (0–1)	2 (1–2)	2 (1–2)	2 (1–2)	<.001

Numbers in parentheses represent the 95% Confidence Interval.

TABLE 2

Work Characteristics

	Control	Dysthymia	Major Depression	Double Depression	P-value
N = 389	143	64	89	93	
Occupation					
% Manager, professional, technical	59 (51–68)	50 (38–62)	45 (35–55)	55 (45–65)	.171
% Sales, service, support	35 (27–43)	42 (30–54)	48 (38–59)	38 (28–48)	.221
% Construction, production, repairs, transportation	6 (2–9)	8 (1–14)	7 (2–12)	8 (2–13)	.918
Mean years in job	6 (5–7)	5 (4–6)	5 (4–6)	4 (3–5)	.045
Mean weekly hours	39 (38–43)	37 (34–41)	39 (37–42)	37 (34–40)	.420
% Self-employed	12 (7–17)	8 (1–15)	8 (2–14)	5 (0–10)	.361

Numbers in parentheses represent the 95% Confidence Interval.

TABLE 3**Work Productivity Lost in the Past 2 Weeks by Condition**

	Control	Dysthymia	Major Depression	Double Depression	P-value
N = 389	143	64	89	93	
% Time health interfered with job demands (WLQ Scales)					
Mean WLQ Mental-Interpersonal	10 (7–12)	26 (21–31)	42 (38–46)	37 (34–41)	–.001
Mean WLQ Physical	8 (5–11)	18 (13–26)	21 (16–25)	19 (15–24)	<.001
Mean WLQ Time	10 (7–12)	27 (22–33)	40 (35–45)	37 (33–41)	<.001
Mean WLQ Output	8 (6–11)	23 (18–28)	44 (39–49)	40 (35–46)	<.001
Mean % productivity loss on-the-job					
WLQ index	2.6 (2–3)	6.6 (6–8)	11.4 (10.4–12.5)	10.1 (9.1–11.2)	<.001
Absences					
Number of days missed	0.6 (0.4–0.9)	1.4 (0.9–2.0)	2.2 (1.7–2.7)	1.7 (1.3–2.2)	<.001
% Productivity loss due to absences	7.4 (4.7–10.1)	13.6 (9.0–18.2)	28.4 (19.9–36.9)	22.0 (15.1–28.7)	<.001

Numbers in parentheses represent the 95% Confidence Interval.

TABLE 4

Relationship of Productivity Loss to Depression Symptom Severity and Occupation

Variable	WLQ Mental-Interpersonal			WLQ Physical			WLQ Time			WLQ Output			Number of Days Missed		
	β	SE	(95% CI)	P	β	SE	(95% CI)	P	β	SE	(95% CI)	P	β	SE	(95% CI)
Occupation															
Sales, service and support occupations *	3.9	1.8	(0.3, 7.5)	.032	5.0	2.0	(1.0, 9.0)	.015	-2.2	2.1	(-6.3, 1.8)	.276	0.2	0.2	((-0.2, 0.6)
Production, construction, repairs and trans, occupations	3.5	3.7	(-3.8, 10.8)	.347	5.6	4.4	(-14.2, 3.0)	.198	-5.2	4.1	(-13.3, 3.0)	.214	-1.0	0.4	(-1.1, 0.6)
Depression severity (0-1)	50.8	3.9	(43.2, 58.4)	<.001	12.9	4.4	(4.3, 21.6)	.004	46.4	4.4	(37.7, 55.1)	<.001	59.7	0.5	(1-4, 3.2)
PCS-12 physical health (0-1)	-25.0	7.0	(-38.7, -11.3)	.001	-48.5	7.9	(-64.1, -32.9)	<.001	-28.9	8.1	(-44.8, -13.1)	<.001	-21.2	0.8	(-4.7, -1.5)
Age	-5.3	8.1	(-21.3, 10.7)	.513	1.2	9.2	(-16.9, 19.3)	.895	2.6	9.1	(-15.4, 20.6)	.777	5.4	0.5	(-1.4, 2.4)
Male	1.9	2.2	(-2.3, 6.2)	.375	5.8	2.4	(1.1, 10.6)	.018	-1.4	2.4	(-6.2, 3.4)	.561	3.5	0.1	(-0.4, 0.6)
_Cons.	26.6	7.1	(12.5, 40.6)	<.001	42.4	8.0	(26.5, 58.2)	<.001	31.0	8.2	(14.9, 47.1)	<.001	18.1	0.8	(0.9, 4.2)
N			377				372				376				384
r ²			.459				.208				.369				.168
P			<.0001				<.0001				<.0001				<.0001

* P-values for 3-class occupation variable in the models are as follows:
WLQ Mental-Interpersonal, *P* = .086
WLQ Physical, *P* = .011
WLQ Time, *P* = .316
WLQ Output, *P* = .968
Days Missed, *P* = .526

TABLE 5

Relationship of Productivity Loss to Specific Depression Symptoms and Specific Occupational Requirements

Variable	WLQ Mental-Interpersonal				WLQ Physical				WLQ Time				WLQ Output				Number of Days Missed			
	β	SE	(95% CI)	P	β	SE	(95% CI)	P	β	SE	(95% CI)	P	β	SE	(95% CI)	P	β	SE	(95% CI)	P
0*NET occupational requirements																				
Judgement/Communication skills (0–1)	10.0	7.9	(–5.4, 25.4)	.204	–3.9	8.5	(–20.6, 12.9)	.651	16.9	8.8	(–0.5, 34.3)	.056	22.9	9.3	(4.6, 41.2)	.014	1.3	0.9	(–0.5, 3.1)	.159
External customers (0–1)	8.5	3.9	(0.8, 16.3)	.031	8.8	4.2	(0.4, 17.1)	.040	6.2	4.5	(–2.6, 15.1)	.166	4.4	4.7	(–4.7, 13.6)	.340	0.6	0.5	(–0.3, 1.5)	.189
PHQ-9 depression symptoms																				
Concentrate/Fidget (0–1)	29.7	4.3	(21.2, 38.1)	<.001	9.0	4.7	(–0.2, 18.2)	.056	27.1	4.9	(17.4, 36.7)	<.001	36.0	5.2	(25.9, 42.2)	<.001	0.7	0.5	(–0.3, 1.7)	.179
Tired/Sleep Problems (0–1)	15.6	3.6	(8.4, 22.8)	<.001	5.4	3.9	(–2.4, 13.1)	.175	12.7	4.1	(4.6, 20.9)	.002	18.8	4.3	(10.3, 27.3)	<.001	1.0	0.4	(0.2, 1.9)	.015
PCS-12 physical health (0–1)	–28.4	7.7	(–43.6, –13.2)	<.001	–49.6	8.4	(–66.1, –33.1)	<.001	–37.9	8.9	(–55.4, –20.5)	<.001	–23.4	9.1	(–41.4, –5.5)	.011	–3.1	0.9	(–4.9, –1.3)	.001
Age	–7.4	9.1	(–25.2, 10.5)	.418	6.1	9.9	(–13.3, 25.6)	.537	–3.5	10.2	(–23.5, 16.6)	.735	2.5	10.8	(–18.7, 23.7)	.814	–0.1	1.1	(–2.1, 2.0)	.955
Male	2.1	2.3	(–2.5, 6.6)	.377	6.8	2.5	(1.9, 11.8)	.007	–2.8	2.6	(–8.0, 2.4)	.289	2.5	2.8	(–2.9, 8.0)	.356	–0.1	0.3	(–0.6, 0.4)	.741
Education	–1.4	0.5	(–2.4, 0.3)	.012	–1.3	0.6	(–2.4, –0.1)	.027	–0.1	0.6	(–1.2, 1.2)	.987	1.0	0.6	(–2.2, 0.3)	.131	–0.2	0.1	(–0.3, –0.1)	.002
_Cons.	45.8	9.8	(26.5, 65.2)	<.001	59.2	10.6	(38.3, 80.0)	<.001	32.0	11.2	(9.9, 54.0)	.005	25.6	11.6	(2.8, 48.5)	.028	5.0	1.1	(2.8, 7.3)	<.001
N	331				325				329				330				337			
r ²	.449				.259				.345				.403				.195			
P	<.0001				<.0001				<.0001				<.0001				<.0001			