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Is manager support related to workplace productivity for people with depression: findings from 15 countries

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3 **Is manager support related to workplace productivity for people with depression: findings**
4 **from 15 countries**

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Abstract

Objectives: To examine variations in manager reactions and support for people with depression and to investigate how these reactions are related to (i) absenteeism and (ii) presenteeism among employees with depression across 15 diverse countries.

Design: Secondary data analysis of cross-sectional survey data.

Setting: 15 countries, diverse in geographic region and GDP: Brazil, Canada, China, Denmark, France, Germany, Great Britain, Italy, Japan, Mexico, Spain, South Africa, South Korea, Turkey and the USA.

Participants: 16,018 employees and managers (approximately 1,000 per country).

Primary and secondary outcome measures: We assessed level of absenteeism as measured by number of days taken off because of depression and presenteeism score.

Results: On average, living in a country with a greater prevalence of managers saying that they avoided talking to the employee about depression was associated with employees with depression taking more days off of work (B: 4.13, 95%CI: 1.68, 6.57). On average, living in a country with a higher GDP was *marginally* associated with employees with depression ($p=0.09$). On average, living in a country with a greater prevalence of managers actively offering help to employees with depression had higher levels of presenteeism (B: 7.08, 95% CI: 6.59, 7.58). Higher country GDP was associated with greater presenteeism among employees with depression 3.09 (2.31, 3.88).

Conclusions: Manager reactions were at least as important as country financial resources. When controlling for country GDP, working in an environment where managers felt comfortable to offer help and support to the employee rather than avoid them was independently associated with less absenteeism and more presenteeism.

Strengths and limitations of this study

- Our data come from a unique dataset including both employee and manager experiences of depression from fifteen diverse countries.
- Data were cross-sectional, so it was not possible to examine pathways or mechanisms to increased productivity.
- Depression diagnosis was determined via self-report and did not include severity or type of symptoms, though distribution of respondent characteristics with depression are similar to other epidemiological studies.
- Response rates were relatively low, though our samples were geographically representative and we used quota sampling to ensure equal distributions of age and gender.
- We did not have information on mental health policies or employment assistance programmes available in the workplace.

Background

Although depression is experienced by a large proportion of employees, it is often seen as a taboo issue. More than 70% of people with mental illness actively conceal their mental illness from others, and most of those who conceal do so because they fear discrimination when looking for or keeping a job [1,2]. We know that supportive managers and workplace practices are associated with greater openness and disclosure, in addition to more positive attitudes towards employees with depression [3]. However, many individuals with depression face discrimination in the workplace [2,4]. As a result, individuals with mental health problems such as depression often avoid disclosing their problem at work or getting help because they fear negative employer and co-worker reactions, as well as repercussions for their career [5,6]. Workplace disability policy covers mental illness in many countries; however, people with mental illness face significant disadvantage in finding and keeping work, in part because employers often lack training and understanding of mental health issues [7,8]. Indeed, relative to other disabilities, mental illness is associated with the greatest disadvantage in terms of employment rates [4,9]. All of these issues contribute to low levels of disclosure and help-seeking for depression among employees.

Given the high economic costs of depression to employers [10,11], workplace interventions have been developed to support individuals with depression. There is also preliminary evidence that general health promotion programmes can improve productivity in the workplace [12]. Yet there are additional barriers for mental health-related programmes as many individuals choose not to seek help for mental health problems in the workplace [6] due to underlying issues of stigma and discrimination. Thus, before implementing programmes for prevention and treatment of mental illness in the workplace, it may be important to address underlying issues related to stigma and support. Indeed, these could represent key factors which allow individuals to return to or remain in work and to be productive in their roles. Consequently, we investigate the relationship between manager reactions and support for people with depression and workplace productivity across 15 countries, diverse in geographic region and GDP: Brazil, Canada, China, Denmark, France, Germany, Great Britain, Italy, Japan, Mexico, Spain, South Africa, South Korea, Turkey and the USA. First, we examined variation in active strategies to support an employee with depression rather than an approach which avoids or ignores the issue by calculating country

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3 prevalence of managers reporting: (i) offering help to employees with depression and (ii)
4 avoiding talking about depression with the employee. Second, we considered how these
5 reactions alongside individual employee characteristics related to (i) absenteeism and (ii)
6 presenteeism among employees with depression.
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10 11 12 **Methods**

13 *Data source*

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15 We performed secondary data analysis on the Global IDEA (Impact of Depression in the
16 Workplace in Europe Audit) survey data which collected data from employed persons across
17 15 diverse countries, seven in Europe: Denmark, France, Germany, Italy, Spain, UK, Turkey, -
18 - and eight others -- Brazil, Canada, China, Japan, South Korea, Mexico, South Africa and the
19 USA. Participants were recruited through an online market research panel. Before joining
20 the panel, participants went through a screening process to validate their personal data
21 which included: removal of duplicates, validation of name and surname through
22 name/gender match or mismatch/ misspelling as compared to library of names, country
23 validation based on IP address (internet protocol address used to identify unique users),
24 validation of town and zip/postal code according to official lists, checking for valid
25 correlations between sociodemographic data (gender, age of parents and children) and
26 validation of contact information. Individuals who worked in advertising and / or market
27 research, and those aged under 16 years old were excluded.
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38 Employed people across the selected countries were sampled from the online research
39 panels. Selected panel members were invited to participate in the survey by Ipsos MORI
40 (www.ipsos-mori.com/) via email. Quotas were set to include equal distributions of age and
41 gender, and the sample was designed to be geographically representative of each country.
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43 In addition, as managers were considered of key interest, 10% of the sample for each
44 country was represented by managers. Response rates varied by country and ranged from
45 around 5% in China to 39% in France. Questionnaires were collected from approximately
46 1,000 respondents per country.
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53 *Measures*

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3 *Sociodemographic information* included gender, age band (16-24, 25-44, and 45-64 years),
4 gender, education level completed (tertiles were created for each country to indicate locally
5 relevant high, medium and low education categories). Individuals were also asked to
6 describe whether the company in which they were employed was small (1-50 employees),
7 medium (51-250 employees) or large (more than 250 employees).
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13 *Previous diagnosis of depression* was determined via self-report by asking respondents:
14 Have you ever personally been diagnosed as having depression by a doctor/medical
15 professional?
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19 20 *Country variables*

21 We used data from the IDEA survey to describe the overall population prevalence of
22 employees with a diagnosis of depression. Managers who said that they had one or more
23 employees with depression in the past were asked how they responded to the employee.
24 We calculated national prevalence of those who reported they: (i) avoided talking to them
25 about it and (ii) discussed with them and asked if there was anything I [the manager] could
26 do to help. Figures for GDP per capita (US \$) for each participating country were taken from
27 the World Bank (World Bank, 2014).
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34 *Work performance*

35 Absenteeism was assessed using the following question: 'The last time you experienced
36 depression, how many working days did you have to take off work because of your
37 depression'. Absenteeism data were available in all fifteen countries. Presenteeism was
38 assessed using the WHO Health and Work Performance Questionnaire (HPQ) [14,15].
39 Presenteeism data were only available in a subset of eight countries (Brazil, Canada, China,
40 Japan, South Korea, Mexico, South Africa, and the USA) in which the surveys were
41 conducted at a slightly later date.
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49 *Statistical analysis*

50 Individual (gender, age, education and income) participant and aggregated country
51 characteristics were described overall and for individuals with and without depression.
52 There were no missing data on variables of interest. Two generalised linear models were
53 used to examine the multivariable factors associated with: (i) greater absenteeism as
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3 measured by number of days taken off because of depression (ii) a higher presenteeism
4 score. Country contextual characteristics were computed as an average rating for each
5 country across respondents, and each variable was standardized (i.e., z score was
6 computed). Post-stratification weights, based on gender, age and region, which were
7 aligned with nationally representative figures, were used in all analyses. We used
8 generalized estimating equations (GEE) with robust variance estimates to model within-
9 country correlations [16]. We selected GEE instead of mixed regression models as we were
10 interested in understanding the influence of overall cultural factors rather than individual
11 country-level effects. Thus, a population average model was more appropriate for our
12 research question. As GEE is a non-likelihood based method, Pan's QIC (quasi-likelihood
13 under the independence model criterion) was used for variable selection and selecting the
14 working correlation matrix. QIC is a statistic which generalizes AIC (Akaike Information
15 Criterion) to GEE models by replacing likelihood estimation with quasi-likelihood estimation
16 and making adjustments for the penalty term. A lower QIC value indicates better model fit.
17 [21]. All analyses were carried out using SAS version 9.3 and Stata version 11. This study was
18 classified as exempt by the King's College London, Psychiatry, Nursing, and Midwifery
19 Research Ethics Subcommittee.

32 33 34 35 **Results**

36 Individual sociodemographic and employment characteristics are described in Table 1 for
37 individuals with and without a reported history of depression.

38 39 40 41 42 **Table 1 about here**

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44 As expected, given the diversity of countries -- and hence diversity of workplace cultures,
45 policies and economic and employment contexts-- there was wide variation in responses by
46 managers to responses to employees with depression and reported training and / or
47 support for managers across the 15 countries. In general, managers in Asian countries
48 tended to avoid employees with depression rather than use active support strategies.
49 Managers in China and South Korea also reported low levels of support in dealing with
50 depression in the workplace and were less likely to offer active support (See Figures 1-2).

Figure 1-2 about here*Factors associated with greater absenteeism*

Table 2 describes the individual and country contextual characteristics associated with greater absenteeism among employees with depression. In terms of individual characteristics, individuals with high levels of education relative to those with low levels of education took more days off of work because of their depression. Those working in larger companies relative to smaller companies took fewer days off work. In terms of country contextual characteristics, on average, living in a country with a greater prevalence of managers saying that they avoided talking to the employee about depression was associated with employees with depression taking more days off of work. On average, living in a country with a higher GDP was *marginally* associated with employees with depression ($p=0.09$).

Table 2 about here*Factors associated with greater presenteeism*

Table 3 describes the individual and country contextual characteristics associated with greater presenteeism among employees with depression. In terms of individual characteristics, employees with depression who were male, in the older age group (age 45-64 relative to 16-24) and in the medium relative to low education level tended to have higher levels of presenteeism. Employees with depression who were in the middle age group (25-44 relative to 16-24) tended to have lower levels of presenteeism. In terms of country contextual characteristics, on average, living in a country with a greater prevalence of managers actively offering help to employees with depression had higher levels of presenteeism. Higher country GDP was associated with greater presenteeism among employees with depression.

Table 3 about here

Discussion

Substantial research demonstrates that depression is experienced by a large proportion of the workforce and associated with high costs to employers [11,17]. Our findings add to this literature and suggest that manager reactions to employees with depression can reflect broad cultural and organisational features that directly relate to employee productivity. This strengthens the economic case for supporting the development and implementation of effective policies and practices for managers to be able to actively support an employee with depression. Additionally, certain personal characteristics may make individuals prone to take more days off of work (absenteeism) and / or reduce workplace performance (presenteeism) suggesting that additional support might be provided to more vulnerable subgroups.

Workplace policies and practices in relation to mental illness vary widely across countries and organisations [18,19]. Our findings show that there is substantial variation across countries in terms of how managers were able to actively support rather than avoid employees with depression in the workplace, and likely also variation in terms of how managers were supported to do so. Existing research suggests that even in high-income countries, effective workplace policies for prevention and support of mental health problems are often lacking: a 2015 OECD report noted that no countries demonstrated an advanced strategy for helping employees with mental health problems at work, though some individual companies are developing rigorous approaches [20]. Few studies have reported data including low- and middle-income countries and further research is needed to better understand the range of strategies and practices used in countries with low or moderate financial resources [21].

Workplace policies and practices are likely to reflect broader socio-cultural attitudes and beliefs about mental health and societal values about investment in prevention and support for people with mental health problems [20,22]. Country GDP and financial resources can influence the availability of support and potential for investment. Our study found that country GDP was positively related to presenteeism and marginally negatively related to absenteeism. However, our study also showed that manager reactions were at least as important as country financial resources. We found that, when controlling for country GDP,

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3 working in an environment where managers felt comfortable to offer help and support to
4 the employee rather than avoid them was independently associated with less absenteeism
5 and more presenteeism. Interestingly, the positive active strategy by the manager to
6 support the employee was associated with greater presenteeism, but not significantly
7 associated with absenteeism. On the other hand, the negative reaction by a manager to
8 avoid an employee with depression was particularly important in terms of greater
9 absenteeism, but was not significantly related to presenteeism. It may be that a supportive
10 manager is most important in helping employees to remain motivated and feel valued while
11 performing their duties in the workplace. It could also be that if employees feel supported
12 by their manager, then they will also feel that it is acceptable to take the time off to recover
13 sufficiently so that when they return to work they have greater capacity to perform their
14 workplace role. Working in a setting where managers actively avoid employees with
15 depression, on the other hand, may encourage avoidant behaviour among those employees,
16 resulting in a tendency to take more days off work.

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28 Our previous work found that working in a context where managers are actively supporting
29 employees with depression was associated with greater comfort around the issue of
30 depression among employees [3] and more openness among those with depression.
31 Additionally, managers who have support and training in dealing with mental health issues
32 are more likely to recognise and act on problems earlier, which can prevent further
33 worsening of the problem [23]. However, some literature has noted a tendency among
34 management to instigate disciplinary sanctions as a way to improve productivity among
35 underperforming employees rather than trying to understand the underlying issues and
36 provide support to overcome them [24]. This may increase concealment of problems and
37 thereby work against facilitating an environment of social acceptance and disclosure [25]
38 which could be important to optimising productivity.

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47 There were also some individual-level factors associated with absenteeism and
48 presenteeism. In relation to *presenteeism*, our findings suggest that females, individuals
49 with low education and those in the middle-age group might need most support in the
50 workplace as they tended to report lower levels of presenteeism in relation to their
51 depression. Interestingly, these characteristics are also common risk factors associated with
52 depression [26–28] and it may be that these individuals are more impacted on by

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3 depressive symptoms and / or have greater levels of severity. In relation to *absenteeism*,
4 individuals working for small companies and with high levels of education tended to take
5 more days off work. Some research has suggested that productivity losses are higher among
6 employees with jobs which require skilled decision-making and communication which may
7 be associated with higher education levels. Other research has also shown that individuals
8 working in smaller companies [7,29] tend to have higher levels of absenteeism. It may be
9 that large companies offer more structure in terms of transitioning back to work, including
10 offering part-time return to work. It has also been suggested that smaller companies have
11 lower awareness of the resources available to them to support employees with mental
12 health problems [19].
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20 21 *Strengths and limitations*

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23 Our study addresses a gap in the literature in terms of developing our understanding of how
24 manager reactions and workplace practices are associated with productivity among
25 individuals with depression. Our findings come from a unique dataset including both
26 employees and managers from fifteen diverse countries, and information on employees'
27 and managers' experiences of depression in the workplace. The sample was designed to be
28 geographically representative of each country.
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34 There are, however, several limitations which need to be considered. Although symptom
35 severity is an important factor related to workplace productivity [30], unfortunately the
36 survey was not able to collect information on severity or type of symptoms. Additionally,
37 depression diagnosis was determined via self-report. Nevertheless, the distribution of
38 characteristics among respondents with depression are similar to other epidemiological
39 studies, as study respondents reporting a diagnosis of depression were more likely to be
40 female, divorced and working part-time. In addition, prevalence of depression diagnosis
41 was lowest in Asian countries. [26,27]
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49 We recognise that national mental health policies, employment assistance programmes
50 available in the workplace and other policies could be important factors which help
51 explain relationships between depression and productivity in the workplace, and it is a
52 limitation that we were not able to include this information in our analyses. There is
53 considerable within-country variation in terms of support and understanding for depression,
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3 but this paper focuses on the broad macro-level factors. Given the relationships which we
4 identified by averaging reactions and practices within countries, our findings suggest that
5 broad country-level policies can make a difference to the lives of individuals with
6 depression. Additional limitations are that data from this study did not include information
7 on variables such as ethnicity or migration which might be associated with workplace
8 exclusion, as well as associations with mental illness. Additionally, response rates were
9 relatively low. Finally, these data were cross-sectional, so it was not possible to examine
10 pathways or mechanisms to increased productivity.
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16 17 *Conclusions*

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20 This study highlights the importance of effective policies and practices which help managers
21 to actively support employees with depression, including strategies to facilitate better
22 workplace performance. The business case for intervention through better managerial
23 response is exemplified by the substantial costs associated with mental health problems and
24 evidence from a number of studies that mental health can improve through workplace
25 programmes, with economic benefits to employers [31,32]. Consequently, benefits which
26 would result from a well-implemented support programme should encourage employers to
27 act. Support is needed for managers to directly support employees to feel open and
28 comfortable in discussing mental health issues. This is in addition to programmes which
29 effectively facilitate early intervention practices and support for and recognition of
30 depression among employees, as well as clear transition and referral pathways for
31 employees who need to take time off and for those returning to work.
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4
5 had no role in study design, data collection and analysis or decision to publish. *H. Lundbeck*
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7 *A/S* put together the questionnaire together with the European Depression Association.
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12 **Competing interests statement:** SEL and MK received consulting fees from *H. Lundbeck A/S*.
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15 16 17 **Authors' contributions**

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20 The original study design and protocol was written by SEL and MK. SEL performed data
21
22 analysis and initial drafting of the manuscript with contributions from MK. All authors
23
24 participated in interpretation of the analysis, editing and rewriting of the manuscript and all
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26 authors have approved the final manuscript.
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31 32 **Acknowledgments**

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34 We would like to acknowledge *H. Lundbeck A/S* and IPSOS Mori for sharing the IDEA survey
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36 data.
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39 40 **Data sharing**

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42 No additional unpublished data are available.
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Table 1. Characteristics of employee respondents, overall and by history of depression (weighted percent, 95% Confidence Interval)

	Overall sample n= 16,018	Individuals reporting a history of depression n= 2,985	Individuals with no history of depression n= 13,033
Respondent characteristics			
Gender			
Male	55.2 (54.4, 56.0)	43.3 (41.4, 45.1)	58.0 (57.1, 58.9)
Female	44.8 (44.0, 45.6)	56.7 (54.9, 58.6)	42.0 (41.1, 42.9)
Age			
16-24	34.7 (33.9, 35.5)	32.8 (31.0, 34.6)	35.2 (34.3, 36.1)
25-44	51.4 (50.6, 52.2)	53.2 (51.3, 55.1)	51.0 (50.1, 51.9)
45-64	13.9 (13.3, 14.5)	14.0 (12.7, 15.4)	13.9 (13.2, 14.5)
Education			
Low	42.5 (41.2, 43.8)	41.9 (39.0, 44.9)	42.6 (41.1, 44.2)
Medium	22.3 (21.2, 23.4)	23.5 (21.1, 26.0)	22.0 (20.8, 23.2)
High	35.2 (33.9, 36.5)	34.5 (31.6, 37.4)	35.3 (33.9, 36.8)
Working status			
Full time	72.6 (71.9, 73.4)	66.4 (64.6, 68.2)	74.1 (73.3, 74.9)
Part time	22.3 (21.6, 23.0)	27.3 (25.7, 29.0)	21.1 (20.4, 21.9)
Previously employed in last 12 months	5.1 (4.7, 5.4)	13.7 (5.3, 7.1)	4.8 (4.4, 5.1)
Marital status			
Single	28.3 (27.6, 29.1)	29.0 (26.8, 31.3)	28.3 (27.5, 29.1)
Married/cohabitating	62.8 (61.6, 64.2)	58.0 (53.8, 62.2)	64.0 (62.5, 65.9)
Divorced Separated	7.3 (6.8, 7.9)	10.9 (8.8, 13.0)	6.3 (5.7, 6.9)
Widowed	0.9 (0.7, 1.0)	1.7 (1.1, 2.3)	0.7 (0.6, 0.9)
Refused	0.7 (0.5, 0.9)	0.3 (0.1, 0.7)	0.7 (0.5, 0.9)
Company size			
Small (1-50 employees)	45.1 (44.0, 46.1)	44.1 (41.7, 46.5)	45.3 (44.2, 46.4)
Medium (51-250 employees)	18.9 (18.1, 19.7)	19.0 (17.1, 21.0)	18.8 (17.9, 19.7)
Large (250+ employees)	32.2 (31.2, 33.2)	33.7 (31.4, 36.1)	31.9 (30.9, 33.0)
Don't know	3.8 (3.4, 4.2)	3.1 (2.3, 4.0)	4.0 (3.5, 4.4)

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Table 2. Individual, manager and country contextual characteristics associated with greater absenteeism among individuals with depression^a (Multivariable linear regression, n=2,715)^b

	Unadjusted GEE parameter estimates Odds Ratio (95% CI)	p-value	Adjusted GEE parameter estimates Odds Ratio (95% CI)	p-value
Individual characteristics				
Gender				
Male	0.47 (-1.96, 2.89)	0.71	0.87 (-0.49, 2.23)	0.21
Female	Reference		Reference	
Age				
45-64	-3.64 (-5.93, -1.35)	0.002	-1.16 (-3.29, 0.96)	0.28
25-44	-8.70 (-14.09, -3.31)	0.002	-3.88 (-8.58, 0.81)	0.11
16-24	Reference		Reference	
Education				
High	3.43 (2.05, 4.83)	<0.0001	2.29 (0.97, 3.60)	0.0007
Medium	2.56 (1.30, 3.82)	<0.0001	1.09 (-1.01, 3.19)	0.31
Low	Reference		Reference	
Working in a larger company	-0.93 (-1.41, -0.45)	<0.0001	-0.82 (-1.54, -0.09)	0.03
Country contextual characteristics				
Offered help	-1.28 (-2.92, 0.13)	0.05	-1.06 (-2.39, 0.27)	0.12
Avoided talking about it	7.27 (1.06, 13.92)	<0.0001	4.13 (1.68, 6.57)	0.0009
Country GDP	2.59 (1.87, 3.30)	<0.0001	2.97 (-0.48, 6.42)	0.09

^a Unemployment rates were taken from the International Labor Organization http://www.ilo.org/global/research/global-reports/global-employment-trends/2014/WCMS_233936/lang-en/index.htm

^b GDP taken from the World Bank: <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

^c Model controlled for country dummy variables

Table 3. Individual, manager and country contextual characteristics associated with greater presenteeism among individuals with depression^a (Multivariable linear regression, n=2,715).

	Unadjusted GEE parameter estimates Odds Ratio (95% CI)	p-value	Adjusted GEE parameter estimates Odds Ratio (95% CI)	p-value
Individual characteristics				
Gender				
Male	5.38 (0.17, 10.59)	0.04	3.79 (2.54, 5.03)	<0.0001
Female	Reference		Reference	
Age				
45-64	5.19 (2.97, 7.41)	0.02	4.53 (3.42, 5.64)	<0.0001
25-44	0.91 (-1.36, 2.54)	0.74	-1.14 (-2.46, 0.17)	0.09
16-24	Reference		Reference	
Education				
High	0.79 (-0.95, 1.88)	0.55	0.05 (-1.07, 1.17)	0.93
Medium	1.82 (0.70, 2.95)	<0.001	1.22 (0.22, 1.69)	<0.001
Low	Reference		Reference	
Working in a larger company	0.29 (-0.35, 1.22)	0.43	-0.37 (-1.19, 0.46)	0.39
Country contextual characteristics				
Offered help	7.82 (5.46, 11.12)	<0.001	7.08 (6.59, 7.58)	<0.001
Avoided talking about it	0.41 (-1.97, 2.78)	0.63	0.52 (-0.59, 1.63)	0.36
Country GDP (standardised)	2.55 (0.55, 4.55)	0.01	3.09 (2.31, 3.88)	<0.001

^a Unemployment rates were taken from the International Labor Organization http://www.ilo.org/global/research/global-reports/global-employment-trends/2014/WCMS_233936/lang-en/index.htm

^b GDP taken from the World Bank: <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

^c Model controlled for country dummy variables

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Figure 1. Country differences in manager responses in relation to depression: Manager offered help to employee with depression

Figure 2. Country differences in manager responses in relation to depression: Manager avoided talking about depression with the employee

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References

- 1 Corker E, Hamilton S, Robinson E, *et al*. Viewpoint survey of mental health service users' experiences of discrimination in England 2008-2014. *Acta Psychiatr Scand* 2016;**134**:6–13. doi:10.1111/acps.12610
- 2 Lasalvia A, Zoppei S, Van BT, *et al*. Global pattern of experienced and anticipated discrimination reported by people with major depressive disorder: a cross-sectional survey. *Lancet* 2012.
- 3 Evans-Lacko S, Knapp M. Importance of social and cultural factors for attitudes, disclosure and time off work for depression: findings from a seven country European study on depression in the workplace. *PLoS One* 2014;**9**:e91053. doi:10.1371/journal.pone.0091053
- 4 OECD. Sick on the Job?: Myths and Realities about Mental Health and Work, Mental Health and Work. 2012. <http://dx.doi.org/10.1787/9789264124523-en>
- 5 Brohan E, Henderson C, Wheat K, *et al*. Systematic review of beliefs, behaviours and influencing factors associated with disclosure of a mental health problem in the workplace. *BMC Psychiatry* 2012;**12**:11.
- 6 Dewa CS. Worker attitudes towards mental health problems and disclosure. *Int J Occup Environ Med* 2014;**5**:175–86. <http://www.ncbi.nlm.nih.gov/pubmed/25270007> (accessed 2 Jun 2017).
- 7 Biggs D, Hovey N, Tyson PJ, *et al*. Employer and employment agency attitudes towards employing individuals with mental health needs. *J Ment Heal* 2010;**19**:505–16. doi:10.3109/09638237.2010.507683
- 8 Henderson C, Williams P, Little K, *et al*. Mental health problems in the workplace: changes in employers' knowledge, attitudes and practices in England 2006-2010. *Br J Psychiatry* 2013;**202**. <http://bjp.rcpsych.org/content/202/s55/s70.full> (accessed 1 May 2017).
- 9 M M. Fair Society, Healthy Lives: Strategic review of health inequalities in England post-2010 (The Marmot Review). 2010. <http://www.ucl.ac.uk/gheg/marmotreview/>
- 10 Ekman M, Granstrom O, Omerov S, Jacob J LM. The societal cost of depression: Evidence from 10,000 Swedish patients in psychiatric care. *J Affect Disord* 2013;**13**:00227–9.
- 11 Evans-Lacko S, Knapp M. Global patterns of workplace productivity for people with depression: absenteeism and presenteeism costs across eight diverse countries. *Soc Psychiatry Psychiatr Epidemiol* 2016;**51**:1525–37. doi:10.1007/s00127-016-1278-4
- 12 Cancelliere C, Cassidy JD, Ammendolia C, *et al*. Are workplace health promotion programs effective at improving presenteeism in workers? A systematic review and best evidence synthesis of the literature. *BMC Public Health* 2011;**11**:395. doi:10.1186/1471-2458-11-395
- 13 World Bank. GDP per capita. 2014.
- 14 Kessler RC, Barber C, Beck A, *et al*. The World Health Organization Health and Work Performance Questionnaire (HPQ). *J Occup Environ Med* 2003;**45**. http://journals.lww.com/joem/Fulltext/2003/02000/The_World_Health_Organization_Health_and_Work.7.aspx
- 15 Kessler RC, Ames M, Hymel PA, *et al*. Using the World Health Organization Health and Work Performance Questionnaire (HPQ) to Evaluate the Indirect Workplace Costs of Illness. *J Occup Environ Med* 2004;**46**. http://journals.lww.com/joem/Fulltext/2004/06001/Using_the_World_Health_Organization_Health_and.4.aspx
- 16 Zeger SL, Liang KY. Longitudinal data analysis for discrete and continuous outcomes.

- 1
2
3 *Biometrics* 1986;**42**:121–30.<http://www.ncbi.nlm.nih.gov/pubmed/3719049> (accessed 14 Jan
4 2015).
- 5
6 17 Birnbaum HG, Kessler RC, Kelley D, *et al.* Employer burden of mild, moderate, and severe
7 major depressive disorder: mental health services utilization and costs, and work
8 performance. *Depress Anxiety* 2010;**27**:78–89. doi:10.1002/da.20580
- 9
10 18 Wagner SL, Koehn C, White MI, *et al.* Mental Health Interventions in the Workplace and Work
11 Outcomes: A Best-Evidence Synthesis of Systematic Reviews. *Int J Occup Environ Med*
12 2016;**7**:1–14.<http://www.ncbi.nlm.nih.gov/pubmed/26772593> (accessed 17 Aug 2017).
- 13
14 19 McDaid D. Mental health in workplace settings. Luxembourg: 2008.
15 [http://ec.europa.eu/health/ph_determinants/life_style/mental/docs/consensus_workplace_](http://ec.europa.eu/health/ph_determinants/life_style/mental/docs/consensus_workplace_en.pdf)
16 [en.pdf](http://ec.europa.eu/health/ph_determinants/life_style/mental/docs/consensus_workplace_en.pdf)
- 17
18 20 OECD. Fit Mind, Fit Job: From Evidence to Practice in Mental Health and Work, Mental Health
19 and Work. Paris: 2015. [http://www.oecd-ilibrary.org/employment/fit-mind-fit-](http://www.oecd-ilibrary.org/employment/fit-mind-fit-job_9789264228283-en)
20 [job_9789264228283-en](http://www.oecd-ilibrary.org/employment/fit-mind-fit-job_9789264228283-en)
- 21
22 21 Bloom, D.E., Cafiero, E.T., Jané-Llopis, E., Abrahams-Gessel, S., Bloom, L.R., Fathima, S., Feigl,
23 A.B., Gaziano, T., Mowafi, M., Pandya, A., Prettner, K., Rosenberg, L., Seligman, B., Stein, A.Z.,
24 & Weinstein C. The Global Economic Burden of Noncommunicable Diseases. Geneva: 2011.
25 [http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicab](http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf)
26 [leDiseases_2011.pdf](http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf)
- 27
28 22 Evans-Lacko S, Knapp M, McCrone P, *et al.* The mental health consequences of the recession:
29 economic hardship and employment of people with mental health problems in 27 European
30 countries. *PLoS One* 2013;**8**:e69792.
- 31
32 23 Commission E. Mental health compass database of policies and good practices. Mastro Proj. to
33 reduce Depress. Relat. Work Disabil.
34 2015.https://webgate.ec.europa.eu/sanco_mental_health/public/POLICY/422/show.html
35 (accessed 31 Jul 2015).
- 36
37 24 Lockwood G, Henderson C, Stansfeld S. An assessment of employer liability for workplace
38 stress. *Int J Law Manag* 2017;**59**:202–16. doi:10.1108/IJLMA-10-2015-0053
- 39
40 25 Brohan E, Evans-Lacko S, Henderson C, *et al.* Disclosure of a mental health problem in the
41 employment context: qualitative study of beliefs and experiences. *Epidemiol Psychiatr Sci*
42 2014;**23**:289–300. doi:10.1017/S2045796013000310
- 43
44 26 Kessler RC, Akiskal HS, Ames M, *et al.* Prevalence and effects of mood disorders on work
45 performance in a nationally representative sample of U.S. workers. *Am J Psychiatry*
46 2006;**163**:1561–8. doi:10.1176/appi.ajp.163.9.1561
- 47
48 27 Kessler RC, Bromet EJ. The epidemiology of depression across cultures. *Annu Rev Public*
49 *Health* 2013;**34**:119–38. doi:10.1146/annurev-publhealth-031912-114409
- 50
51 28 Alonso J, Buron A, Rojas-Farreras S, *et al.* Perceived stigma among individuals with common
52 mental disorders. *J Affect Disord* 2009;**118**:180–6. doi:10.1016/j.jad.2009.02.006
- 53
54 29 Koopmans PC, Roelen CAM, Groothoff JW. Sickness absence due to depressive symptoms. *Int*
55 *Arch Occup Environ Health* 2008;**81**:711–9. doi:10.1007/s00420-007-0243-7
- 56
57 30 Trivedi MH, Morris DW, Wisniewski SR, *et al.* Increase in Work Productivity of Depressed
58 Individuals With Improvement in Depressive Symptom Severity. Published Online First: 15
59 October 2014.<http://ajp.psychiatryonline.org/doi/full/10.1176/appi.ajp.2012.12020250>
60 (accessed 4 Dec 2014).
- 31
32 31 Evans-Lacko S, Koeser L, Knapp M, *et al.* Evaluating the economic impact of screening and
33 treatment for depression in the workplace. *Eur Neuropsychopharmacol* 2016;**26**:1004–13.

1
2
3 doi:10.1016/j.euroneuro.2016.03.005

- 4 32 Michael MDKDP. Workplace screening for depression and anxiety disorders. In: Knapp
5 Martin, McDaid David PM, ed. *Mental health promotion and prevention: the economic case*.
6 London, UK: : Personal Social Services Research Unit, London School of Economics and
7 Political Science 2011.
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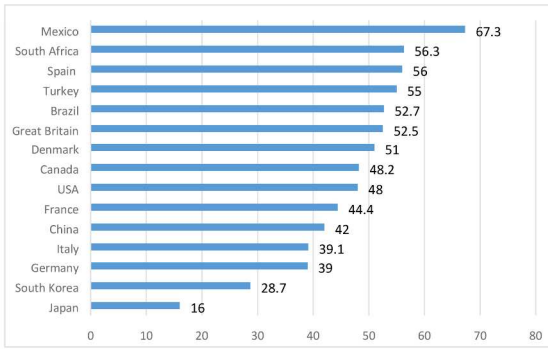


Figure 1. Country differences in manager responses in relation to depression: Manager offered help to employee with depression

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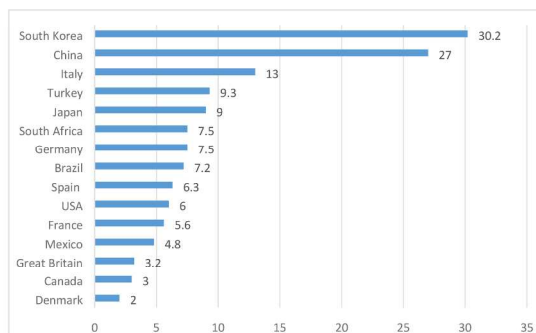


Figure 2. Country differences in manager responses in relation to depression: Manager avoided talking about depression with the employee

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract [Within the title page 1 and method section of the abstract page 2] (b) Provide in the abstract an informative and balanced summary of what was done and what was found [See results section of abstract page 4]
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported [Page 4]
Objectives	3	State specific objectives, including any prespecified hypotheses [Pages 4-5]
Methods		
Study design	4	Present key elements of study design early in the paper [Page 5]
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection [Pages 5]
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up [NA] <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants [Pages 5] (b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable [Pages 5-6]
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group [Pages 5-6]
Bias	9	Describe any efforts to address potential sources of bias [Page 6-7]
Study size	10	Explain how the study size was arrived at [Page 5]
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why [Pages 6-7]
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding [Pages 6-7] (b) Describe any methods used to examine subgroups and interactions [Page 6-7] (c) Explain how missing data were addressed [Page 6] (d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses

Continued on next page

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed [Page 8] (b) Give reasons for non-participation at each stage [NA] (c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders [Pages 7, 14] (b) Indicate number of participants with missing data for each variable of interest [6] (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount) [NA]
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time [Pages 7, 14] <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure [NA] <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures [7, 14]
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included [Pages 7-8, 17-18] (b) Report category boundaries when continuous variables were categorized [17-18] (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period [NA]
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses [NA]

Discussion

Key results	18	Summarise key results with reference to study objectives [Pages 9-10]
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias [Pages 11-12]
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence [Page 12]
Generalisability	21	Discuss the generalisability (external validity) of the study results [Page 11-12]

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based [Page 13]
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*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Is manager support related to workplace productivity for people with depression: A secondary analysis of a cross-sectional survey from 15 countries

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Secondary Subject Heading:	Health economics, Public health, Epidemiology, Occupational and environmental medicine
Keywords:	MENTAL HEALTH, PUBLIC HEALTH, OCCUPATIONAL & INDUSTRIAL MEDICINE

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3 **Is manager support related to workplace productivity for people with depression: A**
4 **secondary analysis of a cross-sectional survey from 15 countries**
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Abstract

Objectives: To examine variations in manager reactions and support for people with depression and to investigate how these reactions are related to (i) absenteeism and (ii) presenteeism due to depression among employees with self-reported depression across 15 diverse countries.

Design: Secondary data analysis of cross-sectional survey data.

Setting: 15 countries, diverse in geographic region and GDP: Brazil, Canada, China, Denmark, France, Germany, Great Britain, Italy, Japan, Mexico, Spain, South Africa, South Korea, Turkey and the USA.

Participants: 16,018 employees and managers (approximately 1,000 per country).

Primary and secondary outcome measures: We assessed level of absenteeism as measured by number of days taken off work because of depression and presenteeism score.

Results: On average, living in a country with a greater prevalence of managers saying that they avoided talking to the employee about depression was associated with employees with depression taking more days off work (B: 4.13, 95%CI: 1.68, 6.57). On average, living in a country with a higher GDP was *marginally* associated with employees with depression taking more days off of work ($p=0.09$). On average, living in a country with a greater prevalence of managers actively offering help to employees with depression was associated with higher levels of presenteeism (B: 7.08, 95% CI: 6.59, 7.58). Higher country GDP was associated with greater presenteeism among employees with depression (B: 3.09, 95%CI: 2.31, 3.88).

Conclusions: Manager reactions were at least as important as country financial resources. When controlling for country GDP, working in an environment where managers felt comfortable to offer help and support to the employee rather than avoid them was independently associated with less absenteeism and more presenteeism.

Strengths and limitations of this study

- Our data come from a unique dataset including both employee and manager experiences of depression from fifteen diverse countries.
- Data were cross-sectional, so it was not possible to examine pathways or mechanisms to increased productivity.
- Depression diagnosis was determined via self-report and did not include severity or type of symptoms, though distribution of respondent characteristics with depression are similar to findings from other epidemiological studies.
- Response rates were relatively low, though our samples were geographically representative and we used quota-sampling to ensure equal distributions of age and gender.
- We did not have information on mental health policies or employment assistance programmes available in the workplace.

Background

Although depression is experienced by a large proportion of employees, it is often seen as a taboo issue. More than 70% of people with mental illness actively conceal their mental illness from others, and most of those who conceal do so because they fear discrimination when looking for or keeping a job [1,2]. We know that supportive managers and workplace practices are associated with greater openness and disclosure, in addition to more positive attitudes towards employees with depression [3]. However, many individuals with depression face discrimination in the workplace [2,4]. As a result, individuals with mental health problems such as depression often avoid disclosing their problem at work or seeking help because they fear negative employer and co-worker reactions, as well as repercussions for their career [5,6]. Workplace disability policy covers mental illness in many countries; however, people with mental illness face significant disadvantage in finding and keeping work, in part because employers often lack training and understanding of mental health issues [7,8]. Indeed, relative to other disabilities, mental illness is associated with the greatest disadvantage in terms of employment rates [4,9]. All of these issues contribute to low levels of disclosure and help-seeking for depression among employees.

Given the high economic costs of depression to employers [10,11], workplace interventions have been developed to support individuals with depression. There is also preliminary evidence that general health promotion programmes can improve productivity in the workplace [12]. Yet there are additional barriers for mental health-related programmes as many individuals choose not to seek help for mental health problems in the workplace [6] due to underlying issues of stigma and discrimination. Thus, before implementing programmes for prevention and treatment of mental illness in the workplace, it may be important to address underlying issues related to stigma and support. Indeed, these could represent key factors which allow individuals to return to or remain in work and to be productive in their roles.

Consequently, we investigate the relationship between manager reactions and support for people with depression and workplace productivity across 15 countries, diverse in geographic region and GDP: Brazil, Canada, China, Denmark, France, Germany, Great Britain, Italy, Japan, Mexico, Spain, South Africa, South Korea, Turkey and the USA. First, we

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3 examined variation in active strategies to support an employee with depression rather than
4 an approach which avoids or ignores the issue by calculating country prevalence of
5 managers reporting: (i) offering help to employees with depression and (ii) avoiding talking
6 about depression with the employee. Second, we considered how these reactions alongside
7 individual employee characteristics related to (i) absenteeism and (ii) presenteeism among
8 employees with depression.
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15 **Methods**

16 *Data source*

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18 We performed secondary data analysis on the Global IDEA (Impact of Depression in the
19 Workplace in Europe Audit) survey data which collected data from employed persons across
20 15 diverse countries, seven in Europe: Denmark, France, Germany, Italy, Spain, UK, Turkey, -
21 - and eight others -- Brazil, Canada, China, Japan, South Korea, Mexico, South Africa and the
22 USA. Participants were recruited through an online market research panel. Before joining
23 the panel, participants went through a screening process to validate their personal data
24 which included: removal of duplicates, validation of name and surname through
25 name/gender match or mismatch/ misspelling as compared to library of names, country
26 validation based on IP address (internet protocol address used to identify unique users),
27 validation of town and zip/postal code according to official lists, checking for valid
28 correlations between sociodemographic data (gender, age of parents and children) and
29 validation of contact information. Individuals who worked in advertising and / or market
30 research, and those aged under 16 years old were excluded.
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42 Employed people across the selected countries were sampled from the online research
43 panels. Selected panel members were invited via email to participate in the survey by Ipsos
44 MORI (www.ipsos-mori.com/). Quotas were set to include equal distributions of age and
45 gender, and the sample was designed to be geographically representative of each country.
46 In addition, as managers were considered of key interest, 10% of the sample for each
47 country was represented by managers. Response rates varied by country and ranged from
48 around 5% in China to 39% in France. Questionnaires were collected from approximately
49 1,000 respondents per country.
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Measures

Sociodemographic information included gender, age band (16-24, 25-44, and 45-64 years), gender, education level completed (tertiles were created for each country to indicate locally relevant high, medium and low education categories). Individuals were also asked to describe whether the company in which they were employed was small (1-50 employees), medium (51-250 employees) or large (more than 250 employees).

Previous diagnosis of depression was determined via self-report by asking respondents: Have you ever personally been diagnosed as having depression by a doctor/medical professional?

Country variables

We used data from the IDEA survey to describe the overall population prevalence of employees with a diagnosis of depression. Managers who said that they had one or more employees with depression in the past were asked how they responded to the employee. We calculated national prevalence of those who reported they: (i) avoided talking to them about it and (ii) discussed with them and asked if there was anything I [the manager] could do to help. Figures for GDP per capita (US \$) for each participating country were taken from the World Bank [13].

Work performance

Absenteeism was assessed using the following question: 'The last time you experienced depression, how many working days did you have to take off work because of your depression'. Absenteeism data were available in all fifteen countries. Presenteeism was assessed using the WHO Health and Work Performance Questionnaire (HPQ) [14,15]. Presenteeism data were only available in a subset of eight countries (Brazil, Canada, China, Japan, South Korea, Mexico, South Africa, and the USA) in which the surveys were conducted at a slightly later date.

Statistical analysis

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3 Individual participant (gender, age, education and income) and aggregated country
4 characteristics were described overall and for individuals with and without depression.
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6 There were no missing data on variables of interest. Two generalised linear models were
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8 used to examine the multivariable factors associated with: (i) greater absenteeism as
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10 measured by number of days taken off work because of depression (ii) a higher
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12 presenteeism score. Country contextual characteristics were computed as an average rating
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14 for each country across respondents, and each variable was standardized (i.e., z score was
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16 computed). Post-stratification weights, based on gender, age and region, which were
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18 aligned with nationally representative figures, were used in all analyses.

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20 We used generalized estimating equations (GEE) with robust variance estimates to model
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22 within-country correlations [16]. We selected GEE instead of mixed regression models as we
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24 were interested in understanding the influence of overall cultural factors rather than
25
26 individual country-level effects. Thus, a population average model was more appropriate for
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28 our research question. As GEE is a non-likelihood based method, Pan's QIC (quasi-likelihood
29
30 under the independence model criterion) was used for variable selection and selecting the
31
32 working correlation matrix. QIC is a statistic which generalizes AIC (Akaike Information
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34 Criterion) to GEE models by replacing likelihood estimation with quasi-likelihood estimation
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36 and making adjustments for the penalty term. A lower QIC value indicates better model fit.
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38 [17] . All analyses were carried out using SAS version 9.3 and Stata version 11.

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40 This study was classified as exempt by the King's College London, Psychiatry, Nursing, and
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42 Midwifery Research Ethics Subcommittee. Data collection was performed independently by
43
44 Ipsos MORI in accordance with the standards of ESOMAR, AIMRI, and EFAMRO in Europe,
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46 and is in line with the data protection act 1998.

47 *Patient and public involvement*

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49 There was no patient and public involvement in the development of the research question
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51 or the selection of outcome measures. All analyses were performed on secondary data.
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54 **Results**

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3 Individual sociodemographic and employment characteristics are described in Table 1 for
4 individuals with and without a reported history of depression.
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7 **Table 1 about here**
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10 As expected, given the diversity of countries -- and hence diversity of workplace cultures,
11 policies and economic and employment contexts -- there was wide variation in responses by
12 managers to responses to employees with depression and reported training and / or
13 support for managers across the 15 countries. In general, managers in Asian countries
14 tended to avoid employees with depression rather than use active support strategies.
15 Managers in China and South Korea also reported low levels of support in dealing with
16 depression in the workplace and were less likely to offer active support (See Figures 1 and
17 2).
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24 **Figures 1 and 2 about here**
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26 *Factors associated with greater absenteeism*
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29 Table 2 describes the individual and country contextual characteristics associated with
30 greater absenteeism among employees with depression. In terms of individual
31 characteristics, individuals with high levels of education relative to those with low levels of
32 education took more days off work because of their depression. Those working in larger
33 companies relative to smaller companies took fewer days off work. In terms of country
34 contextual characteristics, on average, living in a country with a greater prevalence of
35 managers saying that they avoided talking to the employee about depression was
36 associated with employees with depression taking more days off of work. On average, living
37 in a country with a higher GDP was *marginally* associated with employees with depression
38 taking more days off work (p=0.09).
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47 **Table 2 about here**
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49 *Factors associated with greater presenteeism*
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3 Table 3 describes the individual and country contextual characteristics associated with
4 greater presenteeism among employees with depression. In terms of individual
5 characteristics, employees with depression who were male, in the older age group (age 45-
6 64 relative to 16-24) and in the medium relative to low education level tended to have
7 higher levels of presenteeism. Employees with depression who were in the middle age
8 group (25-44 relative to 16-24) tended to have lower levels of presenteeism. In terms of
9 country contextual characteristics, on average, living in a country with a greater prevalence
10 of managers actively offering help to employees with depression had higher levels of
11 presenteeism. Higher country GDP was associated with greater presenteeism among
12 employees with depression.
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21 **Table 3 about here**
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26 **Discussion**

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28 Substantial research demonstrates that depression is experienced by a large proportion of
29 the workforce and associated with high costs to employers [11,18]. Our findings add to this
30 literature and suggest that manager reactions to employees with depression can reflect
31 broad cultural and organisational features that directly relate to employee productivity. This
32 strengthens the economic case for supporting the development and implementation of
33 effective policies and practices for managers to be able to actively support an employee
34 with depression. Additionally, certain personal characteristics may make individuals prone
35 to take more days off work (absenteeism) and / or reduce workplace performance
36 (presenteeism). This suggests that additional support might be provided to more vulnerable
37 subgroups to address this difference in experience.
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46 Workplace policies and practices in relation to mental illness vary widely across countries
47 and organisations [19,20]. Our findings show that there is substantial variation across
48 countries in terms of how managers were able to actively support rather than avoid
49 employees with depression in the workplace, and likely also variation in terms of how
50 managers were supported to do so. Existing research suggests that even in high-income
51 countries, effective workplace policies for prevention and support of mental health
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3 problems are often lacking: a 2015 OECD report noted that no countries demonstrated an
4 advanced strategy for helping employees with mental health problems at work, though
5 some individual companies are developing rigorous approaches [21]. Few studies have
6 reported data including low- and middle-income countries and further research is needed to
7 better understand the range of strategies and practices used in countries with low or
8 moderate financial resources [22].
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14 Workplace policies and practices are likely to reflect broader socio-cultural attitudes and
15 beliefs about mental health and societal values about investment in prevention and support
16 for people with mental health problems [21,23]. There is research which highlights relatively
17 high levels of concealment in Asian countries such as Japan and China, in comparison to
18 other Western countries [24–27], and this may influence workplace culture in relation to
19 openness and comfort in discussing mental health issues. Previous research has shown that
20 a cultural context which is more open and accepting of mental illness is associated with
21 higher rates of help-seeking, antidepressant use and empowerment [28,29].
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29 Other country contextual factors such as country GDP and financial resources can also
30 influence the availability of support and potential for investment. Our study found that
31 country GDP was positively related to presenteeism and marginally negatively related to
32 absenteeism. However, our study also showed that manager reactions were at least as
33 important as country financial resources. We found that, when controlling for country GDP,
34 working in an environment where managers felt comfortable to offer help and support to
35 the employee rather than avoid them was independently associated with lower
36 absenteeism and more presenteeism. We know from other research that economic
37 indicators such as unemployment rate and decline in GDP can be positively correlated with
38 stigma [29,30]. However, both stigma and manager reactions seem to represent important
39 societal indicators in their own right and probably influence openness about depression and
40 performance in the workplace independently.
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50 Interestingly, the positive active strategy by the manager to support the employee was
51 associated with greater presenteeism, but not significantly associated with absenteeism. On
52 the other hand, the negative reaction by a manager to avoid an employee with depression
53 was particularly important in terms of greater absenteeism, but was not significantly related
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3 to presenteeism. It may be that a supportive manager is most important in helping
4 employees to remain motivated and feel valued while performing their duties in the
5 workplace. It could also be that if employees feel supported by their manager, then they will
6 also feel that it is acceptable to take the time off to recover sufficiently so that when they
7 return to work they have greater capacity to perform their workplace role. Working in a
8 setting where managers actively avoid employees with depression, on the other hand, may
9 encourage avoidant behaviour among those employees, resulting in a tendency to take
10 more days off work.
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20 Our previous work found that working in a context where managers are actively supporting
21 employees with depression was associated with greater comfort around the issue of
22 depression among employees [3] and more openness among those with depression.
23 Additionally, managers who have support and training in dealing with mental health issues
24 are more likely to recognise and act on problems earlier, which can prevent further
25 worsening of the problem [31]. However, some literature has noted a tendency among
26 management to instigate disciplinary sanctions as a way to improve productivity among
27 under-performing employees rather than trying to understand the underlying issues and
28 provide support to overcome them [32]. This may increase concealment of problems and
29 thereby work against facilitating an environment of social acceptance and disclosure [33]
30 which could be important to optimising productivity.
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42 There were also some individual-level factors associated with absenteeism and
43 presenteeism. In relation to *presenteeism*, our findings suggest that females, individuals
44 with low education and those in the middle-age group (25-44) might need more support in
45 the workplace as they tended to report lower levels of presenteeism in relation to their
46 depression. Interestingly, these characteristics are also common risk factors associated with
47 depression [34–36] and it may be that these individuals are more impacted on by depressive
48 symptoms and / or have greater levels of severity.
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3 In relation to *absenteeism*, individuals working for small companies and with high levels of
4 education tended to take more days off work. Although it is well established that education
5 and higher socioeconomic group more generally are inversely related with prevalence of
6 depression, the link between education and absenteeism due to depression seems less clear
7 from the literature. One systematic review found only limited evidence to support a
8 relationship between increased work disability and low education [37]. However, when
9 looking at absenteeism in particular, other large studies, based on nationally representative
10 populations have found that absenteeism associated with depression was higher among
11 those with more education and higher incomes [38]. It may be that productivity losses are
12 higher among employees with jobs which require skilled decision-making and
13 communication which may be associated with higher education levels. Those with higher
14 education levels and higher pay have more control over their jobs and working hours
15 compared to those with lower education and lower salaries whose jobs are often more
16 vulnerable and less flexible. Other research has also shown that individuals working in
17 smaller companies [7,39] tend to have higher levels of absenteeism. It may be that large
18 companies offer more structure in terms of transitioning back to work, including offering
19 part-time return to work. It has also been suggested that smaller companies have lower
20 awareness of the resources available to them to support employees with mental health
21 problems [20].
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36 *Strengths and limitations*

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39 Our study addresses a gap in the literature in terms of developing our understanding of how
40 manager reactions and workplace practices are associated with productivity among
41 individuals with depression. Our findings come from a unique dataset including both
42 employees and managers from fifteen diverse countries, and information on employees'
43 and managers' experiences of depression in the workplace. The sample was designed to be
44 geographically representative of each country.
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50 There are, however, several limitations which need to be considered. Although symptom
51 severity is an important factor related to workplace productivity [40], unfortunately the
52 survey was not able to collect information on severity or type of symptoms. Additionally,
53 depression diagnosis was determined via self-report. Nevertheless, the distribution of
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3 characteristics among respondents with depression are similar to other epidemiological
4 studies, as study respondents reporting a diagnosis of depression were more likely to be
5 female, divorced and working part-time. In addition, prevalence of depression diagnosis
6 was lowest in Asian countries. [34,35] and Italy had the lowest prevalence within the
7 European countries [41]. Additionally, the anonymized format of data collection online
8 increased participants' willingness to disclose mental health problems [42]. Although we
9 feel that these data provide an initial important step to understand depression in the
10 workplace in relation to managers reactions and productivity across diverse settings, the
11 results should be interpreted with caution given these limitations.
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19 We recognise that national mental health policies, employment assistance programmes
20 available in the workplace and other policies could be important factors which help
21 explain relationships between depression and productivity in the workplace, and it is a
22 limitation that we were not able to include this information in our analyses. There is
23 considerable within-country variation in terms of support and understanding for depression,
24 but this paper focuses on the broad macro-level factors. Given the relationships which we
25 identified by averaging reactions and practices within countries, our findings suggest that
26 broad country-level policies can make a difference to the lives of individuals with
27 depression. Additional limitations are that data from this study did not include information
28 on variables such as ethnicity or migration which might be associated with workplace
29 exclusion, as well as associations with mental illness. Additionally, response rates were
30 relatively low. Finally, these data were cross-sectional, so it was not possible to examine
31 pathways or mechanisms to increased productivity.
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42 *Conclusions*

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44 This study highlights the importance of effective policies and practices which help managers
45 to actively support employees with depression, including strategies to facilitate better
46 workplace performance. The business case for intervention through better managerial
47 response is exemplified by the substantial costs associated with mental health problems and
48 evidence from a number of studies that mental health can improve through workplace
49 programmes, with economic benefits to employers [43,44]. Consequently, benefits which
50 would result from a well-implemented support programme should encourage employers to
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3 act. Support is needed for managers to directly support employees to feel open and
4 comfortable in discussing mental health issues. This is in addition to programmes which
5 effectively facilitate early intervention practices and support for and recognition of
6 depression among employees, as well as clear transition and referral pathways for
7 employees who need to take time off and for those returning to work.
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4
5 had no role in study design, data collection and analysis or decision to publish. *H. Lundbeck*
6
7 *A/S* put together the questionnaire together with the European Depression Association.
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12 **Competing interests statement:** SEL and MK received consulting fees from *H. Lundbeck A/S*.
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15 16 17 **Authors' contributions**

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20 The original study design and protocol was written by SEL and MK. SEL performed data
21
22 analysis and initial drafting of the manuscript with contributions from MK. All authors
23
24 participated in interpretation of the analysis, editing and rewriting of the manuscript and all
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26 authors have approved the final manuscript.
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31 32 **Acknowledgments**

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34 We would like to acknowledge *H. Lundbeck A/S* and IPSOS Mori for sharing the IDEA survey
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36 data.
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39 40 **Data sharing**

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42 No additional unpublished data are available.
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Table 1. Characteristics of employee respondents, overall and by history of depression (weighted percent, 95% Confidence Interval)

	Overall sample n= 16,018	Individuals reporting a history of depression n= 2,985	Individuals with no history of depression n= 13,033
Respondent characteristics			
Gender			
Male	55.2 (54.4, 56.0)	43.3 (41.4, 45.1)	58.0 (57.1, 58.9)
Female	44.8 (44.0, 45.6)	56.7 (54.9, 58.6)	42.0 (41.1, 42.9)
Age			
16-24	34.7 (33.9, 35.5)	32.8 (31.0, 34.6)	35.2 (34.3, 36.1)
25-44	51.4 (50.6, 52.2)	53.2 (51.3, 55.1)	51.0 (50.1, 51.9)
45-64	13.9 (13.3, 14.5)	14.0 (12.7, 15.4)	13.9 (13.2, 14.5)
Education			
Low	42.5 (41.2, 43.8)	41.9 (39.0, 44.9)	42.6 (41.1, 44.2)
Medium	22.3 (21.2, 23.4)	23.5 (21.1, 26.0)	22.0 (20.8, 23.2)
High	35.2 (33.9, 36.5)	34.5 (31.6, 37.4)	35.3 (33.9, 36.8)
Working status			
Full time	72.6 (71.9, 73.4)	66.4 (64.6, 68.2)	74.1 (73.3, 74.9)
Part time	22.3 (21.6, 23.0)	27.3 (25.7, 29.0)	21.1 (20.4, 21.9)
Previously employed in last 12 months	5.1 (4.7, 5.4)	13.7 (5.3, 7.1)	4.8 (4.4, 5.1)
Marital status			
Single	28.3 (27.6, 29.1)	29.0 (26.8, 31.3)	28.3 (27.5, 29.1)
Married/cohabitating	62.8 (61.6, 64.2)	58.0 (53.8, 62.2)	64.0 (62.5, 65.9)
Divorced Separated	7.3 (6.8, 7.9)	10.9 (8.8, 13.0)	6.3 (5.7, 6.9)
Widowed	0.9 (0.7, 1.0)	1.7 (1.1, 2.3)	0.7 (0.6, 0.9)
Refused	0.7 (0.5, 0.9)	0.3 (0.1, 0.7)	0.7 (0.5, 0.9)
Company size			
Small (1-50 employees)	45.1 (44.0, 46.1)	44.1 (41.7, 46.5)	45.3 (44.2, 46.4)
Medium (51-250 employees)	18.9 (18.1, 19.7)	19.0 (17.1, 21.0)	18.8 (17.9, 19.7)
Large (250+ employees)	32.2 (31.2, 33.2)	33.7 (31.4, 36.1)	31.9 (30.9, 33.0)
Don't know	3.8 (3.4, 4.2)	3.1 (2.3, 4.0)	4.0 (3.5, 4.4)

Table 2. Individual, manager and country contextual characteristics associated with greater absenteeism among individuals with depression^a (Multivariable linear regression, n=2,715)^b

	Unadjusted GEE parameter estimates (95% CI)	p-value	Adjusted GEE parameter estimates (95% CI)	p-value
Individual characteristics				
Gender				
Male	0.47 (-1.96, 2.89)	0.71	0.87 (-0.49, 2.23)	0.21
Female	Reference		Reference	
Age				
45-64	-3.64 (-5.93, -1.35)	0.002	-1.16 (-3.29, 0.96)	0.28
25-44	-8.70 (-14.09, -3.31)	0.002	-3.88 (-8.58, 0.81)	0.11
16-24	Reference		Reference	
Education				
High	3.43 (2.05, 4.83)	<0.0001	2.29 (0.97, 3.60)	0.0007
Medium	2.56 (1.30, 3.82)	<0.0001	1.09 (-1.01, 3.19)	0.31
Low	Reference		Reference	
Working in a larger company	-0.93 (-1.41, -0.45)	<0.0001	-0.82 (-1.54, -0.09)	0.03
Country contextual characteristics				
Offered help	-1.28 (-2.92, 0.13)	0.05	-1.06 (-2.39, 0.27)	0.12
Avoided talking about it	7.27 (1.06, 13.92)	<0.0001	4.13 (1.68, 6.57)	0.0009
Country GDP	2.59 (1.87, 3.30)	<0.0001	2.97 (-0.48, 6.42)	0.09

^a Unemployment rates were taken from the International Labor Organization http://www.ilo.org/global/research/global-reports/global-employment-trends/2014/WCMS_233936/lang-en/index.htm

^b GDP taken from the World Bank: <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

^c Model controlled for country dummy variables

Table 3. Individual, manager and country contextual characteristics associated with greater presenteeism among individuals with depression^a (Multivariable linear regression, n=2,715).

	Unadjusted GEE parameter estimates (95% CI)	p-value	Adjusted GEE parameter estimates (95% CI)	p-value
Individual characteristics				
Gender				
Male	5.38 (0.17, 10.59)	0.04	3.79 (2.54, 5.03)	<0.0001
Female	Reference		Reference	
Age				
45-64	5.19 (2.97, 7.41)	0.02	4.53 (3.42, 5.64)	<0.0001
25-44	0.91 (-1.36, 2.54)	0.74	-1.14 (-2.46, 0.17)	0.09
16-24	Reference		Reference	
Education				
High	0.79 (-0.95, 1.88)	0.55	0.05 (-1.07, 1.17)	0.93
Medium	1.82 (0.70, 2.95)	<0.001	1.22 (0.22, 1.69)	<0.001
Low	Reference		Reference	
Working in a larger company	0.29 (-0.35, 1.22)	0.43	-0.37 (-1.19, 0.46)	0.39
Country contextual characteristics				
Offered help	7.82 (5.46, 11.12)	<0.001	7.08 (6.59, 7.58)	<0.001
Avoided talking about it	0.41 (-1.97, 2.78)	0.63	0.52 (-0.59, 1.63)	0.36
Country GDP (standardised)	2.55 (0.55, 4.55)	0.01	3.09 (2.31, 3.88)	<0.001

^a Unemployment rates were taken from the International Labor Organization http://www.ilo.org/global/research/global-reports/global-employment-trends/2014/WCMS_233936/lang-en/index.htm

^b GDP taken from the World Bank: <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

^c Model controlled for country dummy variables

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Figure 1. Country differences in manager responses in relation to depression: Manager offered help to employee with depression

Figure 2. Country differences in manager responses in relation to depression: Manager avoided talking about depression with the employee

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References

- 1 Corker E, Hamilton S, Robinson E, *et al*. Viewpoint survey of mental health service users' experiences of discrimination in England 2008-2014. *Acta Psychiatr Scand* 2016;**134**:6–13. doi:10.1111/acps.12610
- 2 Lasalvia A, Zoppei S, Van BT, *et al*. Global pattern of experienced and anticipated discrimination reported by people with major depressive disorder: a cross-sectional survey. *Lancet* 2012.
- 3 Evans-Lacko S, Knapp M. Importance of social and cultural factors for attitudes, disclosure and time off work for depression: findings from a seven country European study on depression in the workplace. *PLoS One* 2014;**9**:e91053. doi:10.1371/journal.pone.0091053
- 4 OECD. Sick on the Job?: Myths and Realities about Mental Health and Work, Mental Health and Work. 2012. <http://dx.doi.org/10.1787/9789264124523-en>
- 5 Brohan E, Henderson C, Wheat K, *et al*. Systematic review of beliefs, behaviours and influencing factors associated with disclosure of a mental health problem in the workplace. *BMC Psychiatry* 2012;**12**:11.
- 6 Dewa CS. Worker attitudes towards mental health problems and disclosure. *Int J Occup Environ Med* 2014;**5**:175–86. <http://www.ncbi.nlm.nih.gov/pubmed/25270007> (accessed 2 Jun 2017).
- 7 Biggs D, Hovey N, Tyson PJ, *et al*. Employer and employment agency attitudes towards employing individuals with mental health needs. *J Ment Heal* 2010;**19**:505–16. doi:10.3109/09638237.2010.507683
- 8 Henderson C, Williams P, Little K, *et al*. Mental health problems in the workplace: changes in employers' knowledge, attitudes and practices in England 2006-2010. *Br J Psychiatry* 2013;**202**. <http://bjp.rcpsych.org/content/202/s55/s70.full> (accessed 1 May 2017).
- 9 Marmot M. Fair Society, Healthy Lives: Strategic review of health inequalities in England post-2010 (The Marmot Review). 2010. <http://www.ucl.ac.uk/gheg/marmotreview/>
- 10 Ekman M, Granstrom O, Omerov S, Jacob J LM. The societal cost of depression: Evidence from 10,000 Swedish patients in psychiatric care. *J Affect Disord* 2013;**13**:00227-9.
- 11 Evans-Lacko S, Knapp M. Global patterns of workplace productivity for people with depression: absenteeism and presenteeism costs across eight diverse countries. *Soc Psychiatry Psychiatr Epidemiol* 2016;**51**:1525–37. doi:10.1007/s00127-016-1278-4
- 12 Cancelliere C, Cassidy JD, Ammendolia C, *et al*. Are workplace health promotion programs effective at improving presenteeism in workers? A systematic review and best evidence synthesis of the literature. *BMC Public Health* 2011;**11**:395. doi:10.1186/1471-2458-11-395
- 13 World Bank. GDP per capita. 2014.
- 14 Kessler RC, Barber C, Beck A, *et al*. The World Health Organization Health and Work Performance Questionnaire (HPQ). *J Occup Environ Med* 2003;**45**. http://journals.lww.com/joem/Fulltext/2003/02000/The_World_Health_Organization_Health_and_Work.7.aspx
- 15 Kessler RC, Ames M, Hymel PA, *et al*. Using the World Health Organization Health and Work Performance Questionnaire (HPQ) to Evaluate the Indirect Workplace Costs of Illness. *J Occup Environ Med* 2004;**46**. http://journals.lww.com/joem/Fulltext/2004/06001/Using_the_World_Health_Organization_Health_and.4.aspx
- 16 Zeger SL, Liang KY. Longitudinal data analysis for discrete and continuous outcomes.

- 1
2
3 *Biometrics* 1986;**42**:121–30. <http://www.ncbi.nlm.nih.gov/pubmed/3719049> (accessed 14 Jan
4 2015).
- 5 17 Pan W. Akaike's Information Criterion in Generalized Estimating Equations. *Biometrics*
6 2001;**57**:120–5. doi:10.1111/j.0006-341X.2001.00120.x
- 7
8 18 Birnbaum HG, Kessler RC, Kelley D, *et al.* Employer burden of mild, moderate, and severe
9 major depressive disorder: mental health services utilization and costs, and work
10 performance. *Depress Anxiety* 2010;**27**:78–89. doi:10.1002/da.20580
- 11 19 Wagner SL, Koehn C, White MI, *et al.* Mental Health Interventions in the Workplace and Work
12 Outcomes: A Best-Evidence Synthesis of Systematic Reviews. *Int J Occup Environ Med*
13 2016;**7**:1–14. <http://www.ncbi.nlm.nih.gov/pubmed/26772593> (accessed 17 Aug 2017).
- 14
15 20 McDaid D. Mental health in workplace settings. Luxembourg: 2008.
16 [http://ec.europa.eu/health/ph_determinants/life_style/mental/docs/consensus_workplace_](http://ec.europa.eu/health/ph_determinants/life_style/mental/docs/consensus_workplace_en.pdf)
17 [en.pdf](http://ec.europa.eu/health/ph_determinants/life_style/mental/docs/consensus_workplace_en.pdf)
- 18 21 OECD. Fit Mind, Fit Job: From Evidence to Practice in Mental Health and Work, Mental Health
19 and Work. Paris: 2015. [http://www.oecd-ilibrary.org/employment/fit-mind-fit-](http://www.oecd-ilibrary.org/employment/fit-mind-fit-job_9789264228283-en)
20 [job_9789264228283-en](http://www.oecd-ilibrary.org/employment/fit-mind-fit-job_9789264228283-en)
- 21
22 22 Bloom, D.E., Cafiero, E.T., Jané-Llopis, E., Abrahams-Gessel, S., Bloom, L.R., Fathima, S., Feigl,
23 A.B., Gaziano, T., Mowafi, M., Pandya, A., Prettnner, K., Rosenberg, L., Seligman, B., Stein, A.Z.,
24 & Weinstein C. The Global Economic Burden of Noncommunicable Diseases. Geneva: 2011.
25 [http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicab](http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf)
26 [leDiseases_2011.pdf](http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf)
- 27
28 23 Evans-Lacko S, Knapp M, McCrone P, *et al.* The mental health consequences of the recession:
29 economic hardship and employment of people with mental health problems in 27 European
30 countries. *PLoS One* 2013;**8**:e69792.
- 31 24 Yang LH, Kleinman A. 'Face' and the embodiment of stigma in China: The cases of
32 schizophrenia and AIDS. *Soc Sci Med* 2008;**67**:398–408.
33 doi:10.1016/J.SOCSCIMED.2008.03.011
- 34
35 25 Ando S, Yamaguchi S, Aoki Y, *et al.* Review of mental-health-related stigma in Japan.
36 *Psychiatry Clin Neurosci* 2013;**67**:471–82. doi:10.1111/pcn.12086
- 37 26 Corrigan PW, Shapiro JR. Measuring the impact of programs that challenge the public stigma
38 of mental illness. *Clin Psychol Rev* 2010;**30**:907–22. doi:10.1016/j.cpr.2010.06.004
- 39
40 27 Richards M, Hori H, Sartorius N, *et al.* Cross-cultural comparisons of attitudes toward
41 schizophrenia amongst the general population and physicians: a series of web-based surveys
42 in Japan and the United States. *Psychiatry Res* 2014;**215**:300–7.
43 doi:10.1016/j.psychres.2013.12.012
- 44
45 28 Evans-Lacko S, Brohan E, Mojtabai R, *et al.* Association between public views of mental illness
46 and self-stigma among individuals with mental illness in 14 European countries. *PsycholMed*
47 2012;**42**:1–13.
- 48 29 Lewer D, O'Reilly C, Mojtabai R, *et al.* Antidepressant use in 27 European countries:
49 associations with sociodemographic, cultural and economic factors. *Br J Psychiatry* Published
50 Online First: 9 July 2015. doi:10.1192/bjp.bp.114.156786
- 51 30 Schomerus G, Evans-Lacko S, Rüsçh N, *et al.* Collective levels of stigma and national suicide
52 rates in 25 European countries. *Epidemiol Psychiatr Sci* 2014;**23**:1–6.
53 doi:10.1017/S2045796014000109
- 54
55 31 European Commission. Mental health compass database of policies and good practices.
56 Mastro Proj. to reduce Depress. Relat. Work Disabil.
- 57
58
59

- 2015.https://webgate.ec.europa.eu/sanco_mental_health/public/POLICY/422/show.html (accessed 31 Jul 2015).
- 32 Lockwood G, Henderson C, Stansfeld S. An assessment of employer liability for workplace stress. *Int J Law Manag* 2017;**59**:202–16. doi:10.1108/IJLMA-10-2015-0053
- 33 Brohan E, Evans-Lacko S, Henderson C, *et al*. Disclosure of a mental health problem in the employment context: qualitative study of beliefs and experiences. *Epidemiol Psychiatr Sci* 2014;**23**:289–300. doi:10.1017/S2045796013000310
- 34 Kessler RC, Akiskal HS, Ames M, *et al*. Prevalence and effects of mood disorders on work performance in a nationally representative sample of U.S. workers. *Am J Psychiatry* 2006;**163**:1561–8. doi:10.1176/appi.ajp.163.9.1561
- 35 Kessler RC, Bromet EJ. The epidemiology of depression across cultures. *Annu Rev Public Health* 2013;**34**:119–38. doi:10.1146/annurev-publhealth-031912-114409
- 36 Alonso J, Buron A, Rojas-Farreras S, *et al*. Perceived stigma among individuals with common mental disorders. *J Affect Disord* 2009;**118**:180–6. doi:10.1016/j.jad.2009.02.006
- 37 Lagerveld SE, Blonk RWB, Brenninkmeijer V, *et al*. Work-focused treatment of common mental disorders and return to work: A comparative outcome study. *J Occup Health Psychol* 2012;**17**:220–34.
- 38 Munce SEP, Stansfeld SA, Blackmore ER, *et al*. The Role of Depression and Chronic Pain Conditions in Absenteeism: Results From a National Epidemiologic Survey. *J Occup Environ Med* 2007;**49**:1206–11. doi:10.1097/JOM.0b013e318157f0ba
- 39 Koopmans PC, Roelen CAM, Groothoff JW. Sickness absence due to depressive symptoms. *Int Arch Occup Environ Health* 2008;**81**:711–9. doi:10.1007/s00420-007-0243-7
- 40 Trivedi MH, Morris DW, Wisniewski SR, *et al*. Increase in Work Productivity of Depressed Individuals With Improvement in Depressive Symptom Severity. Published Online First: 15 October 2014.<http://ajp.psychiatryonline.org/doi/full/10.1176/appi.ajp.2012.12020250> (accessed 4 Dec 2014).
- 41 de Girolamo G, Polidori G, Morosini P, *et al*. Prevalence of common mental disorders in Italy. *Soc Psychiatry Psychiatr Epidemiol* 2006;**41**:853–61. doi:10.1007/s00127-006-0097-4
- 42 Henderson C, Evans-Lacko S, Flach C, *et al*. Responses to mental health stigma questions: the importance of social desirability and data collection method. *Can J Psychiatry* 2012;**57**:152–60.
- 43 Evans-Lacko S, Koeser L, Knapp M, *et al*. Evaluating the economic impact of screening and treatment for depression in the workplace. *Eur Neuropsychopharmacol* 2016;**26**:1004–13. doi:10.1016/j.euroneuro.2016.03.005
- 44 McDaid D, King D, Parsonage M. Workplace screening for depression and anxiety disorders. In: Knapp M, McDaid D, Parsonage M, ed. *Mental health promotion and prevention: the economic case*. London, UK: : Personal Social Services Research Unit, London School of Economics and Political Science 2011.

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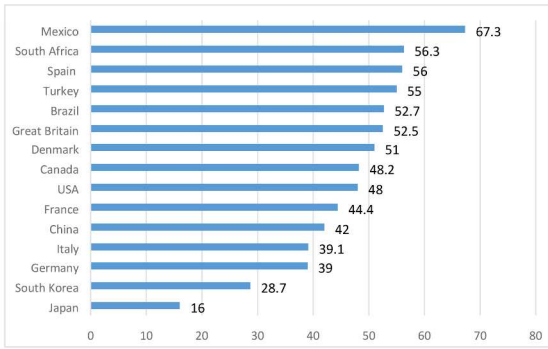


Figure 1. Country differences in manager responses in relation to depression: Manager offered help to employee with depression

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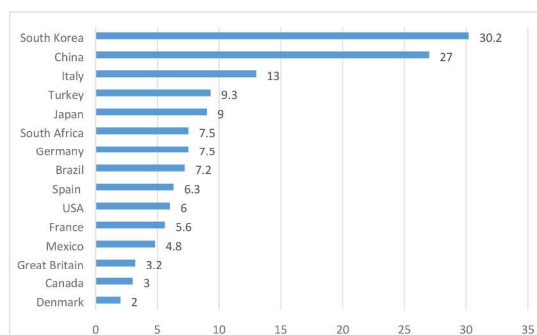


Figure 2. Country differences in manager responses in relation to depression: Manager avoided talking about depression with the employee

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract [Within the title page 1 and method section of the abstract page 2] (b) Provide in the abstract an informative and balanced summary of what was done and what was found [See results section of abstract page 4]
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported [Page 4]
Objectives	3	State specific objectives, including any prespecified hypotheses [Pages 4-5]
Methods		
Study design	4	Present key elements of study design early in the paper [Page 5]
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection [Pages 5]
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up [NA] <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants [Pages 5] (b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable [Pages 5-6]
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group [Pages 5-6]
Bias	9	Describe any efforts to address potential sources of bias [Page 6-7]
Study size	10	Explain how the study size was arrived at [Page 5]
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why [Pages 6-7]
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding [Pages 6-7] (b) Describe any methods used to examine subgroups and interactions [Page 6-7] (c) Explain how missing data were addressed [Page 6] (d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses

Continued on next page

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed [Page 8] (b) Give reasons for non-participation at each stage [NA] (c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders [Pages 7, 14] (b) Indicate number of participants with missing data for each variable of interest [6] (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount) [NA]
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time [Pages 7, 14] <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure [NA] <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures [7, 14]
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included [Pages 7-8, 17-18] (b) Report category boundaries when continuous variables were categorized [17-18] (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period [NA]
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses [NA]

Discussion

Key results	18	Summarise key results with reference to study objectives [Pages 9-10]
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias [Pages 11-12]
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence [Page 12]
Generalisability	21	Discuss the generalisability (external validity) of the study results [Page 11-12]

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based [Page 13]
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*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.