

Depression and the Impact on Productivity in the Workplace: Findings from a South African Survey on Depression in the Workplace

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Abstract

Objectives: The World Health Organization predicts the rise of the global burden of depression to become the leading cause of disability by 2030. The study aimed to 1) address a gap in the literature in terms of baseline data for assessing the burden and impact of depression in the South African workplace, and 2) quantify the links between depression, cognitive dysfunction, absenteeism and presenteeism by means of the Impact of Depression in the Workplace in Europe Audit (IDEA) online survey.

Methods: 1061 employed adults in South Africa were recruited for the IDEA online survey. Self-reported answers were recorded for various demographic variables, diagnosis of depression, number of days taken off for depression (absenteeism), and work performance ratings and behaviours while working with depression (presenteeism). The responses pertaining to absenteeism and presenteeism were analysed according to the presence or absence of cognitive dysfunction.

Results: 278 or 26.2% of respondents reported an experience of diagnosed depression. Depression was significantly associated with being older, female, divorced and working in a small company compared to a large company. Cognitive dysfunction while depressed had a highly significant association with presenteeism, as shown by a substantial drop in subjective ratings of job performance ($p < 0.001$) and significantly poorer working behaviours. Respondents without cognitive dysfunction were absent from work for fewer days than those with cognitive dysfunction (13.2 versus 21.5 days) but this did not reach significance.

Conclusion: Presenteeism is a more pressing concern than absenteeism in the South African workplace. There is a vital need to improve employees' access to quality treatment preferably through programs based on integrated care models.

Keywords: Depression; Workplace; Absenteeism; Presenteeism; Cognitive dysfunction

Introduction

Major depressive disorder (MDD) has long been considered a leading cause of disability worldwide affecting an estimated 350 million people [1,2]. Depression frequently has an early onset and can become chronic or recurrent leading to substantial impairments in daily functioning [2]. More attention has been focussed on MDD and other depressive disorders in recent years with a World Health Assembly calling on the World Health Organisation (WHO) to take action to curb depression and other mental health disorders [2]. This is due to the fact that, with the world's growing populations and aging, there are increasing costs in terms of years lived with disability [1]. Indeed, according to the most recent Global Burden of Disease 2010 statistics, the global burden of disease due to MDD has risen by nearly 40% in two decades [3]. Even in sub-Saharan Africa where many communicable diseases remain dominant causes of disease burden (in contrast to the shift to non-communicable diseases globally), neuropsychiatric disorders account for nearly 10% of the total burden of disease [4]. In Southern sub-Saharan Africa, MDD holds a burden of disease ranking of 10; higher than the global ranking of 11 for all causes of disability-adjusted life years [3]. Thus, results from studies in South Africa showing 9.7% of the adult population with a diagnosis of MDD [4,5] and a life-time prevalence of 9.8% [6], have crucial implications for bearing the costs of this treatable disorder. In fact, a recent survey reported that 18.3% of the South African population receives treatment for depression at any given time [7].

Depression causes a heavy economic burden in the workplace in

terms of both direct and indirect costs [8]. In America, only 31% of the costs of depression are reported as direct medical expenses, while the remaining 69% are difficult to quantify but include lost productivity resulting from absenteeism, disability, premature mortality and lost wages [9-11]. Absenteeism causes increased workload for other employees, reduced output, and lost income from hiring temporary workers. In addition, reduced productivity at work, or 'presenteeism', is a major but less acknowledged concern for employers, and may be even more costly than absenteeism. It has been reported that employees who suffer from depression, work at about 70% of their optimal productivity [12-15]. This is related to the severity of the disease, with major depression being associated with more disability and weakened work functionality [16]. Even mild depression is linked to significant productivity losses [17-19]. A significant factor here is poor cognitive functioning which ultimately affects depressed workers' output and time management. Indeed, decreased mental functioning has been

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reported in 62% of American employees [11]. Depression has cost employers an estimated \$51.5 billion in the USA [8], and 92 billion euros in the European Union [20], with the majority of these costs borne by the employer due to loss of productivity from absenteeism, presenteeism and early retirement [8,20].

In South Africa, there is a similar huge impact of depression on work performance, although the current data are limited. A recent study observed that people who reported that they suffer from depression, as well as those who were unsure whether they suffered from depression, experience lower work engagement levels, higher burnout levels and more symptoms of stress-related ill health, than individuals who reported that they do not suffer from depression [7]. Furthermore, those who suffer from depression have 27 days out of role (defined as the inability to work or perform day-to-day activities at work) per annum [21-23]. Consequently, depression and anxiety disorders are estimated to lead to a total of R3.6 billion in loss of earnings in South Africa [24].

This study was carried out to assess and provide a baseline report of the burden and impact of depression in the work place in South Africa, of which currently there is limited information. This research is particularly relevant given the recent WHO report which predicts the rise of the global burden of depression to become the leading cause of disability by 2030 [25]. Specifically, the study aimed to quantify the links between depression, cognitive dysfunction, absenteeism and presenteeism using a survey developed by the European Depression Association. The instrument, Impact of Depression in the Workplace in Europe Audit (IDEA; [26]) has been previously applied in seven countries (France, Italy, Spain, Germany, UK, Turkey and Denmark; [27]), and investigates the impact of depression in the workplace along three themes, namely i) the awareness of depression at work, ii) the impact of depression at work, and iii) the identification and management of depression at work. The IDEA survey questionnaire has been validated from a language and context perspective for use in South Africa by the South African based health and economic research organisation, HEXOR.

Materials and Methods

Data source

Participants were recruited for the IDEA survey through an online market research panel between 11 June 2014 and 18 June 2014 in South Africa. Before joining the panel, participants went through a screening process, and stringent quality assurance systems were imposed to ensure the validity of the data. Individuals who worked in advertising and/or market research were recruited. None of the individuals who participated in the study were between the ages of 16 and 18 years. The online tool closed the survey if any participant entered their age as being under 16 or over 64 years old. Selected panel members were invited to participate in the survey through the research agency Ipsos MORI (www.ipsos-mori.com/) if they both resided in South Africa and were currently employed full- or part-time or at some time during the 12 months prior to the survey.

Measures

Company size was measured and defined as small (1-50 employees), medium (51-250 employees), or large (> 250 employees). Other sociodemographic data included age group (16-24, 25-34, 35-44, 45-54, 55-64 years); gender; marital status (married, living together, single, widowed, divorced, separated, 'don't know or prefer not to say'); working status (working full-time, working part-time, previously

employed in the past 12 months); and highest level of education (some high school, matriculated, some university, university completed, any other post grade 12 qualification, some college or technical college education). The surveys' question on age included age ranges, and the low range was indicated as 16 – 24 (see appendix for the questionnaire administered), but no individuals who participated were between the age of 16 and 18 years. The results still illustrates the age range as asked in the survey tool.

The survey was designed to allow respondents to disclose whether a doctor or medical professional had ever diagnosed them with depression. Those who indicated such a diagnosis were then further questioned about whether they took time off work due to depression. If they gave an affirmative response to this they were then requested to provide the number of days they took off work during their latest depressive episode (1-5, 6-10, 11-15, \geq 21 days or 'don't know'). Respondents were asked to rate their usual job performance on a scale from 0 – 10 (0 being the worst and 10 being the best) when they were not depressed, and again during the last time they had depression. They were also asked about how their behaviour changed when working while depressed. Respondents who were diagnosed with depression were asked to select symptoms they experienced during the last time they had depression. Respondents were classified as having cognitive dysfunction if they selected any one or more of three symptoms from a possible ten options; trouble concentrating, difficulty making decisions and forgetfulness. If a respondent did not select one or more of these symptoms, they were classified as not having cognitive dysfunction.

The data collected thus allowed for the analysis of participants' attitudes, beliefs and behaviour related to depression in the work place. This included levels of discomfort experienced in working with depressed people, likelihood of taking time off work, the likelihood of disclosing that employees are suffering from depression and the cognitive dysfunction associated with depression.

Statistical analysis

Crude odds ratios with corresponding 95% confidence intervals (CIs) and p-values were calculated for each demographic variable, comparing respondents who were diagnosed with depression to those who had never been diagnosed with depression.

Absenteeism was analysed for respondents who were diagnosed with depression, and who stated that they took time off from work due to their depression. Specifically, the subcohort who reported being diagnosed with depression by a health care practitioner were analysed to determine the proportion who took time off work and who did not. Welch two sample t-tests were used to compare between those with and without cognitive dysfunction, for the percentage of absent and non-absent respondents and the number of days taken off work (1-5, 6-10, 11-15, \geq 21 days or 'don't know'). The mean number of days off work was also calculated for different demographic variables including gender, age and household income, and compared using the Welch two sample t-tests between respondents with and without cognitive dysfunction.

The impact of presenteeism was analysed for respondents who continued to work during the last time they had depression. Analyses for presenteeism focused on the differences between respondents with and without cognitive dysfunction. The proportion of respondents was calculated for each work job performance score for respondents with and without cognitive dysfunction. Mean work performance ratings comparing respondents with and without cognitive dysfunction during

a depression free period and during the last time they had depression, were analysed and compared using paired t-tests. The frequency of behaviours demonstrated more than usual while still working and the attributes or symptoms that impacted the respondent's ability to perform tasks at work, were reported with the corresponding 95% CIs. Two-sample tests for equality of proportions without continuity correction were performed between respondents with and without cognitive dysfunction.

Multivariate regression analyses were performed to analyse whether demographic variables had a significant effect on whether the respondents were diagnosed with depression, and whether they took time off during their depressive episode (absenteeism). All the above mentioned demographic variables were included in the multivariate regression model, i.e. gender, age, marital status, working status, company size, level of education, and level of income. The backwards stepwise elimination method was used to remove variables and obtain a final model, that is, by removing the least significant variable using the p-value as the criterion.

Statistical significance was analysed at the $P < 0.05$ level. All analyses were carried out using RStudio (<https://www.rstudio.com/>), version 0.97.336.

Ethics statement

All survey participants gave written informed consent. The study was submitted to the Human Science Research Council (HSRC) ethics

	Individuals reporting experience of depression (n=278)			Individuals reporting no experience of depression (n=783)		
	%	LB	UB	%	LB	UB
Gender						
Male	30.2%	24.8%	35.6%	49.8%	46.3%	53.3%
Female	69.8%	64.4%	75.2%	50.2%	46.7%	53.7%
Age						
16-24	7.6%	4.4%	10.7%	12.8%	10.4%	15.1%
25-34	36.3%	30.7%	42.0%	38.8%	35.4%	42.2%
35-44	25.5%	20.4%	30.7%	26.6%	23.5%	29.7%
45-54	19.4%	14.8%	24.1%	15.2%	12.7%	17.7%
55-64	11.2%	7.5%	14.9%	6.6%	4.9%	8.4%
Marital Status						
Married	47.8%	42.0%	53.7%	45.5%	42.0%	49.0%
Living together	18.3%	13.8%	22.9%	14.3%	11.9%	16.8%
Single	20.9%	16.1%	25.6%	30.1%	26.9%	33.4%
Widowed	1.1%	0.0%	2.3%	1.4%	0.6%	2.2%
Divorced	10.8%	7.1%	14.4%	6.0%	4.3%	7.7%
Separated	0.7%	0.0%	1.7%	1.9%	1.0%	2.9%
Don't know	0.0%	0.0%	0.0%	0.4%	0.0%	0.8%
Prefer not to say	0.4%	0.0%	1.1%	0.4%	0.0%	0.8%
Working status						
Working full time	69.8%	64.4%	75.2%	77.5%	74.6%	80.4%
Working part time	21.9%	17.1%	26.8%	17.8%	15.1%	20.4%
Previously employed in past 12 months	8.3%	5.0%	11.5%	4.7%	3.2%	6.2%
Company size						
Small	52.2%	46.3%	58.0%	46.6%	43.1%	50.1%
Medium	18.3%	13.8%	22.9%	15.8%	13.3%	18.4%
Large	27.7%	22.4%	33.0%	34.5%	31.2%	37.8%
Don't know	1.8%	0.2%	3.4%	3.1%	1.9%	4.3%

Highest level of education						
No formal education	0.0%	0.0%	0.0%	0.1%	0.0%	0.4%
Some high school	4.3%	1.9%	6.7%	4.5%	3.0%	5.9%
Matriculated	24.1%	19.1%	29.1%	24.9%	21.9%	27.9%
Some university	15.1%	10.9%	19.3%	13.3%	10.9%	15.7%
University completed	28.4%	23.1%	33.7%	25.7%	22.6%	28.7%
Any other post matric qualification	11.5%	7.8%	15.3%	11.7%	9.5%	14.0%
Some college or technical college education	16.5%	12.2%	20.9%	19.8%	17.0%	22.6%
Household income per month						
<R2500	7.2%	4.2%	10.2%	7.7%	5.8%	9.5%
<R9000	12.9%	9.0%	16.9%	18.4%	15.7%	21.1%
<R25000	51.4%	45.6%	57.3%	46.0%	42.5%	49.5%
≥R25000	28.4%	23.1%	33.7%	28.0%	24.8%	31.1%

Note: %, percentages; LB, lower bound of 95% confidence interval; UB, upper bound of 95% confidence interval

Table 1: Descriptive statistics of people with and without depression in the workplace. |

committee and was approved on 5 June 2014 under protocol No REC 26/19/02/14: Impact of depression in the workplace in South Africa. The survey included data for 16-18 year olds to maintain consistency with research conducted in other countries to allow comparison of results at a later stage. A separate email invitation was sent to parents/guardians of participants between the ages of 16 – 18 years, the youth required agreement from a parent or guardian to take part in the survey. If the parent/guardian provided this consent, a consent form to join the panel was sent to the participant to complete. The informed consent process for minors was approved for this study. Data collection was performed independently by Ipsos MORI who follow the International Organization for Standardization (ISO) 27001:2005, which formally specifies a management system that is intended to bring information security under explicit management control. All data for the survey were anonymous.

Results

Participant characteristics

Questionnaires were collected from 1,061 respondents in the South African workplace, of which 278 reported that they were diagnosed as having depression by a doctor or medical professional. Table 1 presents the respondents' descriptive statistics. Most respondents with depression were female (70%), in contrast to an equal gender distribution among those without a diagnosis of depression. The majority of respondents with or without an experience of depression was aged 25 to 44 years, married, educated to at least matriculation, working full-time, and employed in small companies (1-50 employees). The majority (> 70%) of respondents earned less than R25,000 per month (i.e. in all income groups up to and including < R25,000), with no significant differences between the depression and no depression groups.

Prevalence of depression

Table 2 shows the comparison of demographic characteristics between respondents with depression and those without a depression diagnosis. In line with the results above, women were significantly more likely than men to have experienced depression (OR: 2.29, 95% CI 1.71-3.07, $p < 0.001$) and multivariate analysis confirmed this association. Older age was linked to a greater likelihood of depression (i.e. those 45-54 years [OR: 2.16, 95% CI 1.22-3.82, $p = 0.007$], and 55-64 years [OR:

	OR*	LB	UB	P-value
Gender				
Male	Reference			
Female	2.29	1.71	3.07	<0.001
Age				
16-24	Reference			
25-34	1.58	0.94	2.67	0.083
35-44	1.63	0.95	2.80	0.078
45-54	2.16	1.22	3.82	0.007
55-64	2.84	1.49	5.42	0.001
Marital Status				
Married	Reference			
Living together	1.22	0.83	1.79	0.315
Single	0.66	0.46	0.93	0.018
Widowed	0.73	0.20	2.66	0.632
Divorced	1.71	1.04	2.82	0.034
Separated	0.36	0.08	1.58	0.158
Don't know + prefer not to say	0.45	0.05	3.74	0.445
Working status				
Working full time	Reference			
Working part time	1.37	0.98	1.93	0.068
Previously employed in past 12 months	1.94	1.13	3.35	0.015
Company size				
Small	Reference			
Medium	1.04	0.71	1.51	0.857
Large	0.72	0.52	0.99	0.041
Don't know	0.52	0.20	1.40	0.191
Highest level of education				
No formal education + some high school	Reference			
Matriculated	1.03	0.51	2.10	0.933
Some university	1.21	0.58	2.55	0.614
University completed	1.18	0.58	2.38	0.646
Any other post matric qualification	1.04	0.48	2.25	0.914
Some college or technical college education	0.89	0.43	1.85	0.756
Household income per month				
<R2500	Reference			
<R9000	0.75	0.40	1.40	0.366
<R25000	1.19	0.69	2.05	0.526
≥R25000	1.08	0.61	1.91	0.785

Note: * crude odds ratios; LB, lower bound of 95% confidence interval; UB, upper bound of 95% confidence interval

Table 2: Odds ratios of demographic characteristics of respondents.

2.84, 95% CI 1.49-5.42, p = 0.001] versus those aged 16-24 years), and again multivariate analysis confirmed this association. Furthermore, respondents who had experienced depression were less likely to be single (OR: 0.66, 95% CI 0.46-0.93, p = 0.018), and more likely to be divorced (OR: 1.71, 95% CI 1.04-2.82, p = 0.034), compared to married respondents. Respondents reporting depression were significantly less likely to be employed at a large company (i.e. with more than 250 employees versus 1-50 employees; OR: 0.72, 95% CI 0.52-0.99, p = 0.041). Finally, multivariate analysis found a higher likelihood of depression when working part time or being previously employed in the past 12 months compared to working full time. No significant differences were found between depressed and non-depressed respondents for education level and household income.

Multivariate analysis found no significant demographic variables predicting a higher likelihood of being absent from work (absenteeism) or predicting a higher likelihood of continuing work during an episode of depression.

The impact of cognitive dysfunction on absenteeism

Table 3 presents the impact of cognitive dysfunction on absenteeism among respondents with an experience of depression (n = 278). Respondents with cognitive dysfunction were more likely to be absent from work compared to respondents without cognitive dysfunction, but the result was not statistically significant (OR: 1.47, p = 0.183). Among respondents that were absent from work during the last time they had depression, respondents without cognitive dysfunction were absent from work for an average of 13.2 days compared to 21.5 days for respondents with cognitive dysfunction but the difference was not significant (p = 0.255). Among respondents who indicated the number of days absent from work (excluding the "don't know" category, n = 25), the difference in average number of days off work between those with and without cognitive dysfunction was not significant among men, women or different age and income categories.

	Individuals without cognitive dysfunction (n=70)				Individuals with cognitive dysfunction (n=208)				P-value
	n	% or MND*	LB	UB	n	% or MND*	LB	UB	
Absent from work	70				208				
Yes	29	41.4%	29.9%	53.0%	114	54.8%	48.0%	61.6%	0.053
No	34	48.6%	36.9%	60.3%	91	43.8%	37.0%	50.5%	0.483
Prefer not to say	3	4.3%	0.0%	9.0%	1	0.5%	0.0%	1.4%	
Not applicable	4	5.7%	0.3%	11.2%	2	1.0%	0.0%	2.3%	
Number of days off work	29		n=29		114		n=114		
1-5 days	12	41.4%	23.5%	59.3%	43	37.7%	28.8%	46.6%	0.718
6-10 days	5	17.2%	3.5%	31.0%	22	19.3%	12.1%	26.5%	0.801
11-15 days	2	6.9%	0.0%	16.1%	18	15.8%	9.1%	22.5%	0.218
21+ days	6	20.7%	5.9%	35.4%	14	12.3%	6.3%	18.3%	0.244
Don't know	4	13.8%	1.2%	26.3%	17	14.9%	8.4%	21.5%	0.879
Gender	25				97				
Male	11	12.4	1.2	23.5	27	8.7	5.5	11.9	0.499
Female	14	13.9	4.3	23.4	70	26.4	8.7	44.2	0.210
P-value		0.825				0.054			
Age	25				97				
16-24	3	5.0	5.0	5.0	4	5.5	0.0	15.8	0.887
25-34	3	6.7	0.0	17.9	42	10.7	3.7	17.8	0.368
35-44	9	22.8	5.2	40.4	21	6.5	4.8	8.3	0.067
45-54	6	7.8	0.0	19.3	20	52.2	1.9	102.5	0.085
55-64	4	10.8	0.0	22.1	10	43.1	0.0	124.1	0.391
Household income per month	25				97				
<R2500	4	6.8	2.2	11.3	6	6.2	2.2	10.1	0.789
<R9000	1	5.0	NE	NE	18	47.4	0.0	105.0	NE
<R25000	17	16.4	6.7	26.1	44	21.3	3.7	38.8	0.623
≥R25000	3	6.3	0.0	22.9	29	8.9	5.5	12.3	0.587

Note: *% or MND, percentage of employees given for 'Absent from work' and 'Number of days of work', and mean number of days for all other variables; LB, lower bound of 95% confidence interval; UB, upper bound of 95% confidence interval; NE, not enough observations

Table 3: The impact of cognitive dysfunction on absenteeism.

The impact of cognitive dysfunction on presenteeism

Table 4 presents the impact of cognitive dysfunction among respondents with an experience of depression (n = 278), who continued work during their last episode of depression. The proportion of respondents who continued working during their last experience of depression was significantly higher among those with cognitive dysfunction compared to respondents without cognitive dysfunction (89.4% vs. 78.6%, p = 0.021). Among respondents who continued to work during their last experience of depression and without cognitive dysfunction, the mean rating of job performance during an experience of depression was significantly lower than during a depression-free period (5.60 vs. 7.62, p < 0.001 where a score of 10 = top performance).

Similarly, among respondents with cognitive dysfunction who continued to work during their last experience of depression, the mean rating of job performance during an experience of depression was significantly lower than during a depression-free period (4.96 vs. 8.06, p < 0.001). Furthermore, during an experience of depression, mean ratings of job performance were significantly lower among respondents with cognitive dysfunction compared to those without cognitive dysfunction (4.96 vs 5.6; P < 0.001). Conversely, no significant differences in mean ratings of job performance were found during depression-free periods between respondents with or without cognitive dysfunction (8.1 vs 7.6; P = 0.642).

Among respondents who continued to work during their last

	Individuals without cognitive dysfunction (n=70)				Individuals with cognitive dysfunction (n=208)				P-value
	n	%	LB	HB	n	%	LB	HB	
Did the respondent continue working during the last experience of depression	70				208				
Yes	55	78.6%	69.0%	88.2%	186	89.4%	85.2%	93.6%	0.021
No	12	17.1%	8.3%	26.0%	18	8.7%	4.8%	12.5%	0.048
Don't know	3	4.3%	0.0%	9.0%	4	1.9%	0.1%	3.8%	0.275
Rating of usual job performance over the past year or two when not depressed	55				186				
0 - Worst Performance	1	1.8%	0.0%	5.3%	3	1.6%	0.0%	3.4%	
1	0	0.0%	0.0%	0.0%	1	0.5%	0.0%	1.6%	
2	1	1.8%	0.0%	5.3%	0	0.0%	0.0%	0.0%	
3	2	3.6%	0.0%	8.6%	2	1.1%	0.0%	2.6%	
4	1	1.8%	0.0%	5.3%	4	2.2%	0.1%	4.2%	
5	5	9.1%	1.5%	16.7%	7	3.8%	1.0%	6.5%	
6	2	3.6%	0.0%	8.6%	7	3.8%	1.0%	6.5%	
7	6	10.9%	2.7%	19.1%	18	9.7%	5.4%	13.9%	
8	14	25.5%	13.9%	37.0%	54	29.0%	22.5%	35.6%	
9	14	25.5%	13.9%	37.0%	58	31.2%	24.5%	37.8%	
10 - Top Performance	9	16.4%	6.6%	26.1%	32	17.2%	11.8%	22.6%	
Rating of usual job performance the last time the respondent had depression	55				186				
0 - Worst Performance	0	0.0%	0.0%	0.0%	5	2.7%	0.4%	5.0%	
1	0	0.0%	0.0%	0.0%	4	2.2%	0.1%	4.2%	
2	3	5.5%	0.0%	11.5%	7	3.8%	1.0%	6.5%	
3	5	9.1%	1.5%	16.7%	26	14.0%	9.0%	19.0%	
4	9	16.4%	6.6%	26.1%	31	16.7%	11.3%	22.0%	
5	10	18.2%	8.0%	28.4%	44	23.7%	17.5%	29.8%	
6	7	12.7%	3.9%	21.5%	32	17.2%	11.8%	22.6%	
7	12	21.8%	10.9%	32.7%	16	8.6%	4.6%	12.6%	
8	6	10.9%	2.7%	19.1%	14	7.5%	3.7%	11.3%	
9	3	5.5%	0.0%	11.5%	3	1.6%	0.0%	3.4%	
10 - Top Performance	0	0.0%	0.0%	0.0%	4	2.2%	0.1%	4.2%	
Which of the following behaviours did you demonstrate more than usual while still working	55				186				
Regularly coming in late	9	16.4%	7.7%	28.8%	43	23.1%	17.3%	29.8%	0.285
Making more mistakes than usual	20	36.4%	23.8%	50.4%	99	53.2%	45.8%	60.6%	0.028
Missing deadlines	8	14.5%	6.5%	26.7%	45	24.2%	18.2%	31.0%	0.129
Taking more time to complete simple jobs	20	36.4%	23.8%	50.4%	106	57.0%	49.5%	64.2%	0.007
Withdrawing from colleagues	34	61.8%	47.7%	74.6%	142	76.3%	69.6%	82.3%	0.033
Crying at work	13	23.6%	13.2%	37.0%	74	39.8%	32.7%	47.2%	0.028
Falling asleep at work	12	21.8%	11.8%	35.0%	19	10.2%	6.3%	15.5%	0.024
Difficulty making decisions	19	34.5%	22.2%	48.6%	98	52.7%	45.3%	60.0%	0.018
Other	1	1.8%	0.5%	9.7%	10	5.4%	2.6%	9.7%	0.267
Which attributes/symptoms do you think most impacted your ability to perform tasks at work as normal	55				186				
Low mood or sadness	29	52.7%	38.8%	66.3%	110	59.1%	51.7%	66.3%	0.398
Trouble concentrating	17	30.9%	19.1%	44.8%	98	52.7%	45.3%	60.0%	0.004

Crying frequently or for no reason	11	20.0%	10.4%	33.0%	46	24.7%	18.7%	31.6%	0.468
Indecisiveness	4	7.3%	2.0%	17.6%	42	22.6%	16.8%	29.3%	0.011
Forgetfulness	9	16.4%	7.8%	28.8%	56	30.1%	23.6%	37.2%	0.044
Difficulty planning	15	27.3%	16.1%	41.0%	60	32.3%	25.6%	39.5%	0.483
Changes in weight and appetite	11	20.0%	10.4%	33.0%	24	12.9%	8.4%	18.6%	0.189
Trouble sleeping	21	38.2%	25.4%	52.3%	96	51.6%	44.2%	59.0%	0.080
Loss of interest in daily activities	32	58.2%	44.1%	71.4%	106	57.0%	49.5%	64.2%	0.875
Mean work performance ratings comparing respondents with and without cognitive dysfunction	Mean Rating								P-value
Comparison of work performance between patients without cognitive dysfunction before and after depression									<0.001
Mean rating depression-free period	7.6								
Mean rating during depression	5.6								
Comparison of work performance between patients with cognitive dysfunction before and after depression									<0.001
Mean rating depression-free period	8.1								
Mean rating during depression	5.0								
Comparison of work performance between patients without and with cognitive dysfunction before depression									0.641
Mean rating depression-free period	7.6								
Mean rating during depression	8.1								
Comparison of work performance between patients without and with cognitive dysfunction after depression									<0.001
Mean rating during depression	5.6								
Mean rating during depression	5.0								

Table 4: The impact of cognitive dysfunction on presenteeism.

experience of depression, respondents with cognitive dysfunction experienced a significantly higher frequency of poor working behaviours, which is associated with presenteeism, compared to those without cognitive dysfunction, such as making more mistakes than usual (53.2% vs. 36.4%, $p = 0.028$), taking more time to complete simple tasks (57% vs. 36.4%, $p = 0.007$), withdrawing from colleagues (76.3% vs. 61.8%, $p = 0.033$), crying at work (39.8% vs. 23.6%, $p = 0.028$), and difficulty making decisions (52.7% vs. 34.5%, $p = 0.018$). However, these respondents experienced a significant lower frequency of falling asleep at work when compared to those without cognitive dysfunction (10.2% vs. 21.8%, $p = 0.024$). One of the symptoms of major depression is insomnia (at night), and one would expect that if a person does not sleep at night, he/she would be so tired at work, and fall asleep at work.

When considering the symptoms that were most likely to impact the ability of depressed workers to perform tasks as normal, respondents with cognitive dysfunction were significantly more likely than those without such dysfunction to report trouble concentrating (52.7% vs. 30.9%, $p = 0.004$), indecisiveness (22.6% vs. 7.3%, $p = 0.011$), and forgetfulness (30.1% vs. 16.4%, $p = 0.044$) depicting presenteeism.

Discussion

This study aimed to address a gap in the literature in terms of baseline data for assessing the burden and impact of depression in the South African workplace. From our survey sample of 1,061 respondents, 278 or 26.2% reported an experience of diagnosed depression. This is more than two and a half times the national prevalence rates previously reported in South Africa [4,6] but consistent with an earlier study showing a depression prevalence of 25.2% in an urban setting [28]. In that study's urban setting, both being older and being female were dominant contributors to the frequency of depression [28-30].

Similarly, in the present study, both these factors are associated with and significantly increase the prevalence of depression, and support the WHO finding that the global burden of depression is 50% higher for females [2]. In fact, the WHO report observes that depression is the leading cause of disease burden for women worldwide irrespective of country income level [2]. This is supported by the present study showing that education and income levels had no bearing on the prevalence of depression. Furthermore, since depression is one of the most debilitating diseases with a significant impact on not only those affected but also on family members, friends and colleagues [11], it is not surprising that this survey found a higher rate of divorce among respondents who experienced depression.

A further aim of this study was to quantify the links between depression, cognitive dysfunction, absenteeism and presenteeism. Our main finding was that cognitive dysfunction while depressed had a highly significant association with presenteeism, as shown by a substantial drop in subjective ratings of job performance ($p < 0.001$). Employees who worked while depressed and had impaired cognitive function, showed significantly poorer working behaviours. These ranged from difficulties in completing simple tasks, completing tasks in a timely manner and not making superfluous mistakes, to more complex cognitive decision making. Employees attributed this poor performance to significant problems in concentrating, as well as forgetfulness and indecisiveness. Furthermore, these depressed employees had significantly poorer interactions with colleagues, such as withdrawal and crying, underlying the serious emotional impact of depression on functionality [7]. Thus, the clear relationship between depression and presenteeism observed in this survey supports the vital need to improve employees' access to quality treatment (which will be discussed in more detail below). There were no associations found linking demographic variables to absenteeism or presenteeism, suggesting that our findings

could be generalized across the working population irrespective of gender, age, marital status, working status, company size, level of education, and level of income. Nevertheless, it has been suggested that certain occupations can significantly increase employee vulnerability to productivity loss, such as those requiring proficiency in decision making and communication and/or frequent customer contact [31,32]. Therefore, by providing guidance to employees on how to effectively manage work demands and minimize work stress, may be one practical way of employers reducing presenteeism; increasing productivity amongst their workforce and thereby reducing the costs of productivity loss.

When considering the impact of depression than absenteeism, may be more crucial to manage.

In order to reduce the negative impact that depression has on individual sufferers and the working environment, and to minimize the financial cost to organisations, it is imperative to find effective treatment interventions. Integrated care models are one potential solution that focus on 3 aspects of care that are essential for the treatment of depression [11]. The first step is to run an inexpensive screening program via primary care physicians or trained nurses to identify patients who may have depression. Secondly, nurses assess disease severity, educate patients about treatment options and monitor progress over time. Thirdly, a pharmacist supervises and provides patient education and monitoring and crucially provides alternatives for intolerable or ineffective drugs. By limiting visits to speciality care givers or psychiatrists, these integrated care models have been shown to be cost-effective [33-35]. Furthermore, these models have been shown to significantly increase the number of patients diagnosed, and by promoting patient understanding of the necessity for treatment and ensuring frequent contact with care managers, have the potential to raise compliance in the long-term. Previous studies have indicated positive results with such integrated care models [33-35]. For example, improved primary care depression management over two years in 326 patients in the USA resulted in a 6.1% increased productivity and 22.8% less absenteeism, which rose to an 8.2% productivity increase and 28.4% reduced absenteeism for those employed full-time [33]. Further integration to improve effectiveness has been suggested by managing disease and disability together, as well as all other data and services, so that organizations can quickly and accurately quantify medical cost offsets, decrease hospitalizations, and improve work performance [9]. The success of this 'health and productivity management' depends on an organisation's understanding that employees are their greatest asset [9], and that integrated care is the way to identify and treat health problems early on before they become cost-prohibitive.

Limitations

The results from this study all rely on subjective responses to an online questionnaire. Anonymity supports the reliability of the data, however, the design of this study does not allow for diagnosis of depression to be verified. Many further contributing factors such as the extent of clinical severity, time since diagnosis, comorbidities, ethnicity and work roles are outside the scope of the survey. There is a limit to the information that can be gleaned from one survey while keeping within reasonable time constraints, but these additional factors in future surveys could provide more understanding as to what the prevailing social and work practices are in response to colleagues/employees with depression, e.g. those with more severe illness or a lower position on a company's hierarchy. It may be that investing in more health care for those who have a high risk of becoming heavy utilizers of

sick leave (absenteeism), disability payments and poor productivity (presenteeism) would be more cost-effective in the long-term i.e. by providing a prevention program to keep the workforce healthy rather than simply controlling medical costs [9]. Another limitation is the sample size, which although it is in line with a previous study using the IDEA instrument [27], may still have not been large enough to give clearer results on the impact of absenteeism in the work place in South Africa. Also a limitation of the study was Recall bias by study participants regarding events or experiences from the past.

Conclusion

The results of this survey suggest that more than a quarter of the South African workforce have suffered from one or more episodes of clinically diagnosed depression. Such depressive episodes can have profound negative effects on the sufferers' cognitive function, manifested by substantially poorer work performance and professional behaviour. This survey highlights presenteeism as a pressing concern for productivity management, rather than the more easily measurable absenteeism, in the South African workplace. There is a vital need to improve employees' access to quality treatment for depression, preferably through programs based on integrated care models. We suggest that this will not only benefit the mental health and quality of life for the individual employee, but will significantly strengthen work output and improve quality at both company and national levels.

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