

## Work Limitation due to Chronic Diseases: A Cross Sectional Survey Conducted in Bankers of Karachi

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### Abstract

**OBJECTIVES:** To determine work limitation and self-reported impact of chronic medical conditions on the work performance of bank employees.

**METHODS:** This was a cross-sectional study conducted amongst 304 bankers of Karachi between the ages of 30-60 years who had the chronic diseases of either Diabetes Mellitus type 2, Hypertension or COPD for more than one year. Data collection tool was made with the aid of the WHO Health performance questionnaire (HPQ) and included sections on demographic variables, disease and its duration and work performance.

**RESULTS:** Out of the 304 participants, 160(52.6%) were diabetics, 111(36.50%) hypertensive's and 33(10.9%) had COPD. Absenteeism was found to be highest in diabetics (n=60, 37.5%), and they also took the maximum number of health related holidays in a single week

(n=37). Total work hours lost because of absenteeism in a 4 week period amount to 2256, 1012 and 368 hours for diabetes, hypertension and COPD

respectively. Maximum decrease in work productivity as compared to their colleagues was reported by COPD participants (n=18, 54.5%). The trend to compensate for the lost hours and decreased productivity was found to be highest in diabetics (n=48, 38%) and lowest in COPD (n=6, 18.2%). Majority of the participants had positive perceptions regarding their working capacity and only few admitted that their health problems limit the type and amount of work they do.

**CONCLUSION:** Diabetes, hypertension and COPD affect not only patients but also employers and society as a whole by contributing to lost work hours and decreased on-job work performance because of health issues. Work laws for these people can help reduce the economic losses

### KEYWORDS:

chronic diseases; work performance; sickness absence; absenteeism

**Introduction:**

The prevalence of chronic non-communicable disease is on the rise worldwide, especially in the developing countries.<sup>[1]</sup> WHO defines chronic disease as a slowly progressing illness spanning a long period of time.<sup>[1]</sup> Few such chronic illnesses which remain the main focus of both patients and health care providers alike are hypertension, diabetes mellitus, chronic obstructive pulmonary disease (COPD) and cancer. Treatment of these chronic illnesses is mostly palliative as none of them is completely curable and death is inevitable if not by the disease itself then by related factors.<sup>[2]</sup> The sedentary life style coupled with the stress of everyday life is major factors contributing to the increased prevalence of chronic diseases. These conditions not only cause a great financial burden in terms of medical treatment rendered but the productivity losses due to decreased work performance, sickness absenteeism and disability are great as well.<sup>[3]</sup> Functional limitation as defined by WHO is 'the inability to complete simple or complex tasks due to any health problem'.<sup>[4]</sup> Work limitation is the lack of capacity to meet the physical, cognitive and psychological demands of a job effectively. People with work limitation require a revised work schedule which includes extra rest periods and a short leave.<sup>[5]</sup> Work limitation may present itself as sickness, absenteeism and presenteeism. Absenteeism is defined as number of work days missed due to sickness while presenteeism is decreased productivity that occurs when sick

employees show up for work but are unable to perform up to the usual standards. In 2003, Karen Davis and colleagues found that 69 million employees were absent on 407 million work days at a cost of 248 billion to the employers.<sup>[6]</sup> A study undertaken by the Milken institute<sup>[2]</sup> reported that Presenteeism accounts for a greater output loss as compared to absenteeism and that chronic disease is one of the most common causes of presenteeism. The report further disclosed that lost productivity due to absenteeism and presenteeism combined was highest for hypertension, at \$280 billion annually. Lost productivity for diabetes and COPD was \$105 billion and \$94 billion respectively.<sup>[2]</sup> Loeppke et al reported that costs incurred due to decreased individual economic productivity were 4 times greater than the direct medical cost of managing the disease.<sup>[7]</sup> Wasay et al. reported a 33% prevalence of hypertension and 25% diabetes prevalence in people aged 45 or above in Pakistan with a rate of 5.4% in people aged over 15 years.<sup>[8]</sup> COPD is less common than diabetes and hypertension, with a total of 64 million cases globally, responsible for over 5% of total deaths in the year 2005.<sup>[9]</sup> Bankers constitute the elite working class of our society. Their sedentary lifestyle, lack of physical activity, high level of stress and smoking habit, predisposes them to hypertension<sup>[10]</sup>, diabetes<sup>[11]</sup> and COPD<sup>[12]</sup>. The purpose of our study was to assess work limitation in bankers who had the chronic diseases of either hypertension, COPD or diabetes mellitus in

terms of Absenteeism and Presenteeism scores and to determine their view point regarding the effects of their disease on their work performance.

### **Methods:**

**Study design and Setting:** A cross-sectional study was conducted over a period of 3 months from June 2012 to August 2012 in different banks of Karachi, Pakistan. The data was collected from the participants by convenient sampling in form of an oral interview.

**Sample size:** Sample size was calculated using proportion of work impairment among chronic ill employees measured as 17.8% to 36.4% (Average 27.1%).<sup>[13]</sup> Using 95% CI and 5% margin of error, the sample size was 304.

**Participants:** The study included working males and females between the ages of 30-60 years who had any one of the chronic illness of either hypertension, or diabetes mellitus type 2 or chronic obstructive pulmonary disease (COPD). The participants needed to have had the disease diagnosed for duration of more than one (1) year and would still be working in their current job as a banker despite of their illness.

All those who fell outside the age range or those who were not currently working because of early retirement, vacation/leave or suspension were not included. Those participants with more than one chronic illness and those with any other existing co-morbid condition were also excluded.

**Tool:** Data collection tool was formulated using the help of the modified WHO Health performance questionnaire (HPQ).

**Rationale for the HPQ approach to work limitation:** WHO health performance questionnaire (HPQ) is a self-reporting questionnaire designed in 2002. It is an elaborated form of work role module of WHO Disability assessment schedule (WHO-DAS).<sup>[14]</sup> HPQ was developed after a systematic review of existing work performance related questionnaires and pilot interviews, followed by development of a preliminary questionnaire which was further improvised through pilot testing and surveys.<sup>[14]</sup> Three outcomes are measured in HPQ: Absenteeism, work performance and job related accidents

**Variables:** The tool included two sections. The first section comprised of basic socio-demographics such as age, education, income, the disease, its duration and work input in terms of hours per week. The second section included open ended questions regarding their performance in the past week as compared to their colleagues. In the end, they were asked to rate their performance during the past 7 days and their usual job performance over the past year and also their performance in comparison to their colleagues. It was assessed by a simple, self-reporting 0-10 scale in which 0 was defined as the worst job performance and 10 was defined as top work performance on their current job.

**Calculating Absenteeism:** Absenteeism is the difference between required working hours and given input hours for total time period of 4 weeks. Negative absenteeism showed that participants worked more hours

than required and a high score indicated a higher amount of absenteeism.<sup>[15]</sup>

Absolute absenteeism:  $4(A - B)$

Where, A= total hours required to work in a week

B= total hours worked by the participant in the past week

**Calculating Absenteeism rate:**

Ratio of number of hours lost in four weeks and the total hours that could have been worked in four weeks.

**Calculating Presenteeism:**

Presenteeism is the percentage of productivity/ work performance of the participant rated out of ten with ten being the maximum.<sup>[15]</sup>

**Calculating Relative presenteeism/ work productivity:**

Relative presenteeism is a ratio of participants' actual performance (C) to the performance of most workers at the same job (D).<sup>[15]</sup>

All values below 1 were taken as lesser performance than peers, all values above 1 were taken as performance greater than peers.

**Combined score:** To determine whether the respondents were compensating the lost work hours with increased productivity, a combined score was calculated by obtaining the product of relative absenteeism with relative presenteeism. A score  $>1$  meant that they were compensating.

**Statistical methods:** All collected data were entered and analyzed in SPSS v18. Categorical data were presented in form of frequencies and percentages. As the data were found to be skewed by normality test, most continuous variables were presented as median with inter quartile range. Participants were divided on the basis of their disease into three groups for most of the statistical analyses.

Associations between diseases and socio-demographic variables were found by Chi-square tests. Difference between diseases and variables of work Limitation were found by Kruskal-Wallis test. Effect of socio-demographic factors and work Limitation on Absenteeism and Presenteeism were found by Kruskal-Wallis test. Spearman's Correlation was applied to see the effect of continuous variables on Absenteeism and Presenteeism. P value less than 0.05 was taken as significant.

**Ethical considerations:** The study was reviewed and approved by Dow University of Health Sciences research department. Informed consent was obtained from all the participants.

**Results:**

**Demographics:** A total of 304 participants were included in the study. Of these, 160(52.6%) were diabetics, 111(36.50%) hypertensive and 33(10.9%) had COPD. Mean age of the participants was  $49.06 \pm 7.42$  years and the mean duration of their illness since diagnosis was  $7.49 \pm 5.31$  years. Two hundred and twelve (69.7%) participants were males with a male to female ratio of 1.43:1. Two hundred and eighty six (94.1%) were married. Most respondents were well educated with post-graduation was the most common qualification. Most participants (n=84, 27.6%) were earning between Pakistani Rupee (PKR) 50,000-80,000 monthly. **Table 1** shows the demographic distribution of the three groups of participants.

**Absenteeism:** Median absolute absenteeism of the participants was 0 (28) with minimum of -80

and maximum of 144. P value for association for absolute absenteeism between the three diseases was 0.719. **Table 2** shows the characteristics of absenteeism amongst the participants of the three diseases. Amongst diabetics, the median absolute absenteeism was 0 (40) with minimum -80 and maximum 144. Amongst hypertensives, the median absolute absenteeism was 0 (16) with minimum -60 and maximum 100. Amongst COPD, the median absolute absenteeism was 4 (30) with minimum -60 and maximum 40.

**Presenteeism:** For diabetes and hypertensives, the median absolute presenteeism was 80 (20). For participants with COPD, the median absolute presenteeism was 80 (10). P value for association between the three diseases was 0.850.

#### **Association of Absenteeism and Presenteeism with demographics:**

The absenteeism and presenteeism of diabetic and COPD patients were not affected by the variable age. However, absenteeism of hypertensive patients significantly increased with age. Gender, education and income levels had significantly different effect on absenteeism and presenteeism of diabetic bankers. For hypertensive bankers, education and income levels affected their absenteeism while presenteeism was affected by income levels. Such effect of education and income was found conversely on absenteeism and presenteeism of COPD patients. Marital status had no effect on absenteeism of different disease participants. However, presenteeism of hypertensive and COPD patients varied between

married and single bankers. **Table 3** shows these findings in detail.

**Relative presenteeism/ Work productivity:** P-value for association between the three diseases for Relative Presenteeism was 0.294. Relative Productivity of the participants compared to their peers, was predicted by relative Presenteeism. Eighteen (54.5%) COPD, Fifty two (46.8%) hypertensive and sixty three (39.4%) diabetic participants` exhibited lesser productivity than fellow peers. Three (1.9%) diabetics and 7 (6.8%) hypertensives reported greater productivity than their co-workers. Hence, it is safe to say that COPD participants exhibited maximum decrement in work productivity

**Combined Score:** Amongst Diabetics, 48 (30%) showed greater productivity to compensate for the lost hours. For Hypertensives, 29 (26.1%) showed greater productivity to compensate for the lost hours. For COPD, 6(18.2%) showed greater productivity to compensate for the lost hours. The compensation profile was best amongst the diabetics and worst amongst the COPD.

**Participants' perception about their work performance:** When asked about performance of work in comparison with other peers at work, 69 (43.1%) diabetics thought it to be somewhat better and 50 (31.2%) thought it to be a little better. About 44 (40%) hypertensives thought it to be somewhat better and 29 (26.1%) thought it to be average. 13 (40%) of participants with COPD thought it to average while 7 (21.2%) thought it to be somewhat better (p-value=0.049).

When asked about health problems limiting their work performance, 73 (45.6%) diabetics reported little of the time and 37 (23.1%) reported some of the time, 49 (44.1%) hypertensives reported little of the time and 31 (27.9%) reported some of the time, 13 (39.4%) COPD reported little of the time and 11 (33.3%) reported none of the time ( $p$ -value=0.132).

#### **Discussion:**

The numbers of hours lost daily and the number of work days lost collectively effects the economy of the country. However, the greatest effect is on the patients and their families, especially if the patient is the sole bread winner. This is true for all the working classes irrespective of the socio-economic status.

In our study the population taken was bank workers. Diabetes (52.6%) was the most common of the three afflictions seen, followed by hypertension (36.5%) The least percentage was of COPD (10.9%) but with the increasing prevalence in both the developed and the developing countries, there is a marked increase in its socio economic burden.<sup>[16]</sup>

#### **Absenteeism:**

Absenteeism is defined as missed work days either full or partial due to any reason. One of the main reasons of which is sickness. According to National Health Interview Survey of 1994 by National Academy of Aging, the proportion of workers with chronic conditions who report missing a day or more of work was higher in workers with chronic conditions.<sup>[17]</sup> 8% of hypertensive participants missed a day or more as compared to 6% without any chronic ailment.<sup>[17]</sup> The proportion of limitation of

a hypertensives' ability in the amount and type of work they can do is almost double the proportion of those without hypertension.<sup>[17]</sup>

In our study, absenteeism was observed by 51.5% of COPD, much greater than the hypertensives and diabetic participants. This could be explained by the fact that COPD patients experience acute exacerbations in which the patient is more likely to become house bound. Meanwhile in another study, 19.9% of patients suffering from respiratory conditions were found unable to work where as those who were working averaged an annual income loss of \$3,143.<sup>[18]</sup>

Absenteeism rate was found to be highest for diabetes in our study population. Diabetes imposes a great economic burden not only on the patient but also on the country as a whole. Vijan et al reported that diabetes had a great negative effect on the economic output of a patient due to lost work days, early retirement, disability and mortality.<sup>[19]</sup> The medical costs alone can be a huge burden in itself but the productivity losses due to diminished working capacity coupled with sick leaves/absent work days are even more staggering.

In our study, more females reported absenteeism as compared to males. This female excess in sickness absence might be explained by the fact that they are better than men in recognizing their symptoms and seeking medical care. The association between female gender and absenteeism was significant in case of diabetes ( $p$ -value = 0.035) and was also consistent with a study conducted by Julius who

showed a higher absenteeism rate for diabetic women.<sup>[20]</sup>

### **Presenteeism:**

Presenteeism is defined as attending work while being sick. This can create a lot of problems for the both employee and employer because even though, the employee remains physically present in the work place, his performance is not up to the required standard. The most common cause of presenteeism is chronic diseases.<sup>[21]</sup>

Subjects showing presenteeism were more likely to feel that they were not concentrating enough on their work and their quality of work was poor. They were more likely to believe that their health problems were responsible for their performance being not what was expected by them. These findings can be attributed to stress due to work load, issues with people and personal problems, which itself can be a triggering factor for presenteeism.<sup>[22]</sup>

### **Work Performance:**

Lesser work productivity was reported by participants in our study as compared to their colleagues irrespective of the disease they were suffering from. A study by Karen Davis revealed the difference between sicker and healthier workers reporting one or more days of reduced productivity to be 56% vs 48%.<sup>[6]</sup> In our study this was found highest for COPD in which 54.5% respondents admitted to having a lower performance level as compared to their colleagues. This perceived limitation of work capacity amongst employees with COPD was also reported by Mark D et al.<sup>[23]</sup> But on a positive side, participants in our study also

demonstrated an inclination to compensate for lost working hours both due to lost work days and decreased work productivity while on the job. Forty eight diabetics, 29 hypertensive's and 6 people suffering from COPD showed an increase in work performance to cover up for lost work. The compensation profile was best amongst the diabetics and worst amongst people with COPD. A study has reported that diabetics tend to compensate for their decreased productivity by working extra hours.<sup>[24]</sup> Participants' in our study believed that their health conditions were causing minimal limitations in the type and amount of work they could do. They were dissatisfied with their quality of work in only a few occasions. Diabetics and hypertensives thought that they were somewhat better at what they do while COPD participants rated their performance similar to their colleagues.

### **Solution:**

Studies have highlighted the need to develop strategies to empower employees with chronic diseases who experience work related problems so that they can manage them effectively without losing their job.<sup>[25]</sup> Some employers have begun to offer flexible work schedules and other programs that address the needs of employees. If more employers were pliant, their employees with chronic conditions might work more and their productivity would also improve. It is high time that such initiatives be taken in Pakistan which will not only save labor force but also strengthen the country's economy.

**Conclusion:**

Our study shows that not one single chronic disease could be highlighted as having the worst effect on work performance. It is, however, safe to say that COPD is the disease with having maximum impact on work performance and causing the maximum work limitation. Alternatively, Diabetes mellitus was the most commonly found chronic disease amongst bankers and was causing the greatest work hours lost. Hypertensives showed the best Presenteeism values with a greater percentage of hypertensives demonstrating performance that was rated better than their peers.

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**TABLES:Table 1: Demographics**

	<b>Diabetes N=160</b>	<b>Hypertension N=111</b>	<b>COPD N=33</b>	<b>p-value</b>
<b>Age:</b>	50 years (10.7 IQR)	51 years (11 IQR)	47 years (14 IQR)	0.024*
<b>Duration of Illness</b>	8.22±5.31 years	7.77±5.42 years	3.03±1.70 years	<0.001
<b>Male Gender</b>	112, 70 %	79, 71.2 %	21, 63.6 %	0.708
<b>Married</b>	155, 96.8 %	105, 94.5 %	26, 78.8 %	<0.001
<b>Education</b>				
Intermediate .1				0.04
Graduation .2	38, 23.8 %	16, 14.4 %	7, 21.3 %	
Post- .3	58, 36.2 %	35, 31.5 %	11, 33.3 %	
Graduation	64, 40 %	60, 54.1 %	15, 45.5 %	
<b>Income</b>				
15,001-20,000 .1				0.557*
20,001-30,000 .2				
30,001-50,000 .3				
50,001-80,000 .4	32, 20 %	6, 5.4 %	9, 27.3 %	
>80,000 .5	19, 11.9 %	18, 16.2 %	20, 6.1 %	
	16, 10 %	28, 25.2%	5, 15.2 %	
	43, 26.9 %	31, 27.9 %	10, 30.3 %	
	50, 31.2 %	28, 25.2 %	7, 21.2 %	
<b>Required hours per week</b>	40(10) IQR	40(10) IQR	40 (13) IQR	0.01*
<b>Worked hours per week</b>	40 (13) IQR	38(15) IQR	38(15) IQR	0.087*

\*Kruskal-Wallis test for skewed variables

**Table 2: Absenteeism characteristics for the 3 diseases:**

	<b>DM</b>	<b>HTN</b>	<b>COPD</b>
Number of participants demonstrating absenteeism (N, %)	60, 37.5%	48, 43.2%	17, 51.5%
Median absolute absenteeism (Median, IQR)	0, 40	0, 16	4, 30
Total Health related holidays in a single week (days)	37	15	5
Total hours lost in four weeks (hours)	2256	1012	368
Estimated absenteeism rate	0.0812	0.0569	0.0697

**Table 3: Effect of Demographic Characteristics on Absenteeism and Presenteeism (p-values):**

<b>Variable</b>	<b>Absenteeism</b>			<b>Presenteeism</b>		
	<b>DM</b>	<b>HTN</b>	<b>COPD</b>	<b>DM</b>	<b>HTN</b>	<b>COPD</b>
Age*	-0.046 (0.563)	<b>0.323</b> <b>(0.001)</b>	-0.144 (0.425)	-0.058 (0.468)	<b>-0.331</b> <b>(&lt;0.005)</b>	-0.326 (0.064)
Gender	<b>0.035</b>	0.162	0.201	<b>0.045</b>	0.120	0.778
Marital Status	0.580	0.565	0.935	0.123	<b>0.037</b>	<b>&lt;0.001</b>
Education	<b>&lt;0.001</b>	<b>0.042</b>	<b>0.018</b>	<b>&lt;0.001</b>	0.153	<b>0.007</b>
Income	<b>&lt;0.001</b>	<b>0.001</b>	0.337	<b>&lt;0.001</b>	<b>0.005</b>	<b>&lt;0.001</b>

\*Spearman's Correlation was applied to see the effect of age on Absenteeism and Presenteeism