Original Article

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Impact of Diabetes Mellitus on Occupational Health Outcomes in Canada

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Abstract

Background: Research suggests that diabetes mellitus (DM) has a negative impact on employment and workplace injury, but there is little data within the Canadian context.

Objective: To determine if DM has an impact on various occupational health outcomes using the Canadian Community Health Survey (CCHS).

Methods: CCHS data between 2001 and 2014 were used to assess the relationships between DM and various occupational health outcomes. The final sample size for the 14-year study period was 505 606, which represented 159 432 239 employed Canadians aged 15–75 years during this period.

Results: We found significant associations between people with diabetes and their type of occupation (business, finance, administration: 2009, p=0.002; 2010, p=0.002; trades, transportation, equipment: 2008, p=0.025; 2011, p=0.002; primary industry, processing, manufacturing, utility: 2013, p=0.018), reasons for missing work (looking for work: 2001, p=0.024; school or education: 2003, p=0.04; family responsibilities: 2014, p=0.015; other reasons: 2001, p<0.001; 2003, p<0.001; 2010, p=0.015), the number of work days missed (2010, 3 days, p=0.033; 4 days, p=0.038; 11 days, p<0.001; 24 days, p<0.001), and work-related injuries (traveling to and from work: 2014, p=0.003; working at a job or business: 2009, p=0.021; 2014, p=0.001).

Conclusion: DM is associated with various occupational health outcomes, including work-related injury, work loss productivity, and occupation type. This allows stakeholders to assess the impact of DM on health outcomes in workplace.

Keywords: Diabetes mellitus; Occupational health; Surveys and questionnaires; Workplace; Canada

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Introduction

Currently, there are three million Canadians living with diabetes mellitus (DM). The number has been more than doubled the 2000 value and directly costs the health care system C$ 3 billion (US$ 2.2 billion) annually.[1] Despite the current, high economic burden of DM in Canada, it is expected to increase by 40% in the next 10 years. However, while the cost of DM on the health care system has been well studied, less is known about the effect the disease has at the workplace.

Studies from the USA and several European countries found that patients with DM had a higher number of sick days owing to their illness than patients without DM.[2-5] Previous research has found that people who left the labor force early due to diabetes had an income five times less than those who did not have a chronic ill-

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ness.[6] Men and women with DM were 7.1% and 4.4%, respectively, less likely to be working compared to their counterparts without the disease.[7] The same study also found that people with diabetes had more work-loss days per year than those without the disease. Furthermore, patients with DM were more likely to have work limitations that affect the kind or amount of work they could do.[7]

In a Canadian study, researchers found that diabetes has a negative impact on employment of women, but no association was observed in men. The author suggests that diabetes affects women more than men and that the severity of their diabetes inhibits them from finding job.[8] Two studies also looked at the risk of workplace injury and diabetes but found opposite results. There was a 17% increased risk of injury in a study of diabetic, blue collar workers in the US, while a British study found no evidence linking diabetes as a contributor to increased workplace injury.[9,10] A recent Swedish study suggested that diabetes and work disability were jointly associated with a high risk of premature death, highlighting the importance of prevention and early detection.[11]

While these studies are useful in gaining a general understanding of the impact that diabetes has on the workplace, the results may vary depending on the country where the study was performed. To the best of our knowledge, there is a dearth of evidence on the impact DM has at the workplace within the Canadian context.

This study used the retrospective Canadian Community Health Survey (CCHS) data from 2001 to 2014 to investigate whether DM had any effects on occupational health outcomes over time, such as the type of occupation, employment status, work productivity, absence due to chronic disease, and injury occurring at the workplace.

Materials and Methods

Survey Data Collection

The CCHS is a cross-sectional survey conducted by Statistics Canada to collect information about health status, health care utilization, and determinants of health from a representative sample of the Canadian general population. The survey population includes Canadians over the age of 12 years living in all 10 provinces and three territories, which make up 136 Health Regions. Excluded from the survey are full-time members of the Canadian Forces, and institutionalized population and people living in the Quebec health regions of Région du Nunavik and Région des Terres-Cries-de-la-Baie-James, all of which account for less than 3% of the Canadian population aged 12 years and older. From 2001 to 2005, the survey was administered every two years with approximately 130 000 respondents during the 2001, 2003, and 2005 reference periods. In 2007, the study was administered every year with a sample size of 65 000 respondents. All analyses were performed using data from the CCHS Public Use Micro-Data File obtained from Statistics Canada.

Variables

The primary outcome for this study was whether having diabetes is associated with various occupational health outcomes. Respondents aged 15–74 years, who reported to be working at the time of the survey, were included in our analyses for each CCHS cohort. The variables that were included in our analyses were occupation type, full- or part-time employment status, reasons for missing work, the number of work days lost due to a chronic condition in the previous three months, and the activity where the most serious injury occurred. Several covariates were included in this study to account for potential confounding

Table 1: Summary of variables analyzed in each CCHS cohort. A long dash represents where data were not available.

	2001	2003	2005	2007	2008	2009	2010	2011	2012	2013	2014
Type of occupation	✓	✓	—	✓	✓	✓	✓	✓	✓	✓	✓
Full/Part-time status	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reasons for missing work during the last week	✓	✓	—	—	✓	—	✓	✓	✓	✓	✓
Number of work days lost due to chronic condition	—	—	—	—	—	—	✓	✓	✓	✓	✓
Activity where the most serious injury occurred	✓	✓	✓	✓	—	✓	✓	✓	✓	✓	✓

variables including age, gender, and physical activity index. The physical activity index is based on the average daily physical activity of the respondent over the past three months. Individuals were categorized as "inactive" (physical activity index of <1.5 kcal/kg/day), "moderately active" (physical activity index of 1.5–2.9 kcal/kg/day), and physically "active" (physical activity index of >3.0 kcal/kg/day). Also, some variables were not available for certain years of the CCHS. A summary of the variables included in the analysis for each year can be found in Table 1.

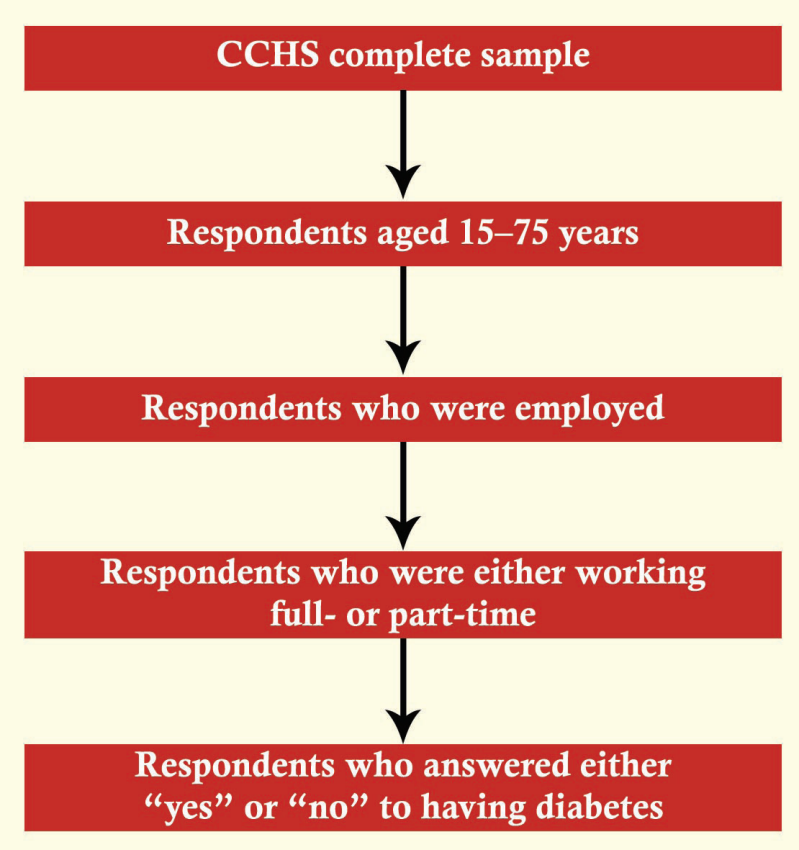

Figure 1: Flow chart of sample selection

Statistical Analysis

Bivariate analysis was used to filter variables—those with $p<0.1$ were retained for model building. The significance level of $p<0.1$ was used to ensure potential useful variables were not excluded from the analysis. Manual backward stepwise logistic regression analysis was then used to develop two models of occupational health factors associated with diabetes in Canada: (1) type of occupation and full/part-time status, and (2) number of work days missed, reasons for missed work, and activity where the most serious injury occurred. A significance level of $p<0.05$ was used in each of the final models; variables were corrected using *post hoc* analysis. The analysis was completed in StataMP 14, with "svyset" commands to apply sampling weights and to adjust for clustering of observations within the health region strati-

Table 2: Study sample characteristics, CCHS 2001 to 2014 survey of employed respondents aged 15–75 years. Figures are percentages. A long dash represents where data were not available.

Variables	2001	2003	2005	2007	2008	2009	2010	2011	2012	2013	2014
Age											
15–19	10.03	10.58	7.36	6.43	—	6.88	6.68	6.43	6.36	6.11	5.98
20–29	17.6	16.82	18.26	16.33	—	17.36	18.09	17.24	16.93	16.22	16.03
30–39	24.30	23.09	23.28	22.33	—	20.69	20.14	19.59	19.31	19.13	18.69
40–49	25.78	22.70	23.20	22.78	18.65	20.31	20.06	19.53	19.32	17.96	17.50
50–59	16.66	20.63	20.14	22.64	49.95	23.22	23.18	23.75	23.77	24.79	25.21
60–69	5.04	5.72	6.95	8.56	28.44	10.44	10.66	12.11	12.85	14.03	14.64
70–74	0.59	0.46	0.83	0.93	2.95	1.10	1.20	1.36	1.46	1.77	1.95
Male sex	51.25	50.15	50.71	49.87	51.03	49.18	49.03	48.58	48.46	48.38	48.40
With diabetes	2.53	2.96	3.24	3.95	8.87	4.27	4.37	4.53	4.54	4.99	5.14
Physical activity index											
Active	24.15	23.86	26.2	25.36	—	27.4	28.15	29.2	29.24	29.4	29.08
Moderate active	24.8	25.7	25.92	25.73	—	26.1	25.94	26.22	26.06	26.2	26.28
Inactive	51.05	50.44	47.88	48.91	—	46.3	45.91	44.58	44.7	44.4	44.63
Type of occupation											
Management, sciences, health, education, arts, culture	32.07	—*	—	34.5	33.6	24.52	34.53	34.95	35.43	35.28	35.33
Business, finance, administration	11.34	—*	—	17.9	21.55	18.34	18.27	17.83	17.13	16.92	17.07
Sales and service	24.11	—*	—	23.5	22.26	24.04	24.45	24.11	23.96	24.31	24.26
Trades, transportation, equipment	14.97	—*	—	15.3	14.19	14.6	14.45	14.8	15.02	14.56	14.49
Primary industry, processing, manufacturing, utilities	10.56	—*	—	8.83	8.39	8.51	8.30	8.31	8.45	8.94	8.84
Employment status											
Full-time	81.64	82.15	82.88	82.71	81.12	80.9	80.58	80.44	80.48	80.14	80.14
Part-time	18.36	17.85	17.12	17.29	18.88	19.1	19.42	19.56	19.52	19.86	19.86

Continued

Table 2: Study sample characteristics, CCHS 2001 to 2014 survey of employed respondents aged 15–75 years. Figures are percentages. A long dash represents where data were not available.

Variables	2001	2003	2005	2007	2008	2009	2010	2011	2012	2013	2014
Reasons for missing work during the last week											
Illness/disability/permanently unable	12.26	11.2	—	—	31.64	—	23.36	32.72	33.07	25.97	35.66
Family responsibility	7.75	7.92	—	—	—	—	33.04	37.58	40.24	18.18	37.53
School or education	17.28	13.5	—	—	—	—	6.97	3.84	0.8	—	1.25
Labor dispute	6.23	6.98	—	—	—	—	—	—	—	—	10.1
Retired	6.25	7.14	—	—	—	—	4.36	2.22	1.99	1.3	2.24
Looking for work	22.71	23.9	—	—	—	—	—	—	—	—	—
Other	27.52	29.44	—	—	68.36	—	32.26	23.63	23.9	54.55	13.22
Number of work days lost due to chronic condition											
1–10	—	—	—	—	—	—	81.66	73.33	72.32	74.50	78.96
11–20	—	—	—	—	—	—	8.18	8.16	9.13	8.82	8.53
21–30	—	—	—	—	—	—	4.41	6.67	8.15	9.80	4.74
31+	—	—	—	—	—	—	5.76	11.85	10.42	6.86	7.77
Activity where the most serious injury occurred											
Sports or physical activity	40.20	25.08	27.24	30.2	—	30.04	30.05	29.81	28.83	28.56	28.11
Leisure activity or hobby		12.69	10.61	13.57	—	6.59	6.55	7.26	6.83	6.75	6.62
Working at a job or business	32.82	31.73	26.51	25.44	—	20.61	20.86	23.34	23.33	20.07	20.05
Travelling to and from work	—	6.48	4.96	5.48	—	5.44	5.59	6.91	5.33	5.57	5.85
Household chores	17.53	15.65	13.16	14.48	—	15.12	16.08	13.72	16	15.92	16.26
Other	9.46	8.37	17.52	10.83	—	22.2	20.87	18.97	19.66	23.14	23.13

*Occupation type collected in 2003 was classified differently than other years.

Table 3: Survey sample size and representative population size for each CCHS dataset

Year	Total survey sample size	Total representative population size	Study sample size	Representative study population size
2001	130 880	25 787 334.1	76 789	16 066 998
2003	134 072	26 555 429.5	5085	988 707
2005	132 221	27 104 036.7	70 505	16 144 453
2007	131 061	28 017 371.9	67 701	16 476 623
2008	30 865	13 635 505.7	10 430	7 106 159
2009	124 188	28 725 105.5	62 245	16 711 537
2010	62 908	28 878 418.4	31 317	16 718 723
2011	124 929	29 335 211	61 158	16 991 617
2012	61 707	29 491 030	30 196	17 202 001
2013	127 462	30 002 817	60 364	17 465 257
2014	63 552	30 154 391.7	29 816	17 560 164
Total	1 123 845	297 686 651.5	505 606	159 432 239

fication. A representative set of Stata command codes for the statistical analysis of the 2001 CCHS dataset is included in the Appendix. *Post hoc* pairwise comparisons on significant variables were performed using the Bonferroni multiple comparison test.

Results

Study Sample and Population

Figure 1 presents the flow chart on how the final analysis sample was obtained. In total, there were 1 123 845 respondents for the CCHS between 2001 and 2014. Respondents were excluded from the study based on the age criteria and employment status. A summary of the study sample characteristics in each CCHS is provided in Table 2. The final sample size was 505 606 for the 2001 to 2014 CCHS, and this represented a total of 159 432 239 employed Canadians aged 15 to 75 years during this period (Table 3).

Bivariate Analysis

In bivariate analysis, diabetes was associated with the following: type of occupation in 2001, 2007–2012, 2013, and 2014; full- or part-time employment in 2005, 2013, and 2014; reasons for missing work in 2001, 2003, 2008, 2010, 2012, 2014; number of work days lost due to chronic condition in 2010; activity where the most serious injury occurred in 2001, 2003, 2005, 2007, 2009, 2010, 2013, and 2014; age in 2001, 2003, 2005, 2007–2014; sex in 2001, 2003, 2005, 2007–2014; and physical activity index in 2001, 2003, 2005, 2007, 2009–2014. Only these variables were subsequently used in the manual backwards stepwise logistic regression models. Several factors were associated with diabetes in each year of the CCHS as determined by the regression models. The variables that remained significant after Bonferroni correction are summarized in Table 4.

Table 4: Summary of the significant associations between occupational health factors and diabetes based on backwards, stepwise logistic regression model. Figures are OR (95% CI). A long dash represents where data were not available. Non-significant ORs are not presented.

	2001	2003	2005	2007	2008	2009	2010	2011	2012	2013	2014
Type of occupation											
Management, sciences, health, education, arts, culture	1.0	—	—	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Business, finance, administration		—	—			1.39 (1.12 to 1.71)	1.64 (1.20 to 2.23)				
Sales and service		—	—								
Trades, transportation, equipment		—	—		1.60 (1.06 to 2.43)			1.43 (1.14 to 1.79)			
Primary industry, processing, manufacturing, utilities		—	—							1.24 (1.04 to 1.47)	
Full/Part-time status											
Reasons for missing work											
Illness/disability/permanently unable	1.0	1.0	—	—	1.0	—	1.0	1.0	1.0	1.0	1.0
Family responsibility			—	—	—	—					0.09 (0.01 to 0.61)
School or education		0.19 (0.04 to 0.92)	—	—	—	—				—	
Labor dispute			—	—	—	—	—	—	—	—	
Retired			—	—	—	—					
Looking for work	0.67 (0.47 to 0.95)		—	—	—	—	—	—	—	—	—
Other	0.50 (0.50 to 0.72)	0.37 (0.22 to 0.64)	—	—		—	4.31 (1.33 to 13.95)				

Continued

Table 4: Summary of the significant associations between occupational health factors and diabetes based on backwards, stepwise logistic regression model. Figures are OR (95% CI). A long dash represents where data were not available. Non-significant ORs are not presented.

	2001	2003	2005	2007	2008	2009	2010	2011	2012	2013	2014
Number of work days lost due to chronic condition											
1	—	—	—	—	—	—	1.0	1.0	1.0	1.0	1.0
3	—	—	—	—	—	—	3.11 (1.10 to 8.79)				
4	—	—	—	—	—	—	3.92 (1.08 to 14.23)				
11	—	—	—	—	—	—	77.01 (9.52 to 622.91)				
24	—	—	—	—	—	—	35.06 (4.36 to 281.63)				
Activity where the most serious injury occurred											
Sports or physical activity	1.0	1.0	1.0	1.0	—	1.0	1.0	1.0	1.0	1.0	1.0
Leisure activity or hobby			1.94 (1.05 to 3.59)		—						
Working at a job or business					—	1.97 (1.11 to 3.50)					4.41 (1.91 to 10.17)
Travelling to and from work	—				—						5.25 (1.75 to 15.77)
Household chores					—						
Going up and down stairs or walking	—	—	—	—	—	3.69 (2.14 to 6.34)	2.98 (1.03 to 8.63)				4.81 (2.12 to 10.91)
Other					—	2.77 (1.16 to 6.60)	4.31 (1.33 to 13.95)				2.67 (1.17 to 6.10)

Type of Occupation

In the final multivariate regression model, five of the 10 CCHS (2008–2011, 2013) where the type of occupation data was collected, a significant positive association with diabetes was observed ($p<0.05$). Respondents with occupations in the business, finance, and administration; trades, transportation, and equipment; and primary industry, processing, manufacturing, and utilities sectors, were more likely to have diabetes compared to people with occupations in management, sciences, health, education, arts, and culture. A positive association between sales and service occupations and diabetes was observed in five CCHS cohorts (2009–2013); however, none were significant after *post hoc* analysis (Table 4).

Full/Part-time Employment

No significant association was found between full- or part-time employment and diabetes in any of the CCHS cohorts between 2001 and 2014.

Reasons for Missing Work

In the final multivariate regression model, a negative association between the reasons for missing work and diabetes was observed in four out of the eight CCHS that collected this data (2001, 2003, 2010, and 2014). People with diabetes were less likely to miss work due to reasons such as looking for work, school or education, family responsibilities, or other reasons compared to missing work due to an illness/disability or being permanently unable to work (Table 4).

Number of Work Days Lost due to a Chronic Condition

Of the five CCHS where data on the number of work days missed due to a chronic disease were collected, a positive association to diabetes was observed in the 2010 cohort. Compared to one work day missed, those with diabetes were more likely to miss 3, 4, 11, and 24 days of work (Table 4).

Activity where the Most Serious Injury Occurred

In four of the 10 CCHS (2005, 2009, 2010, and 2014) that collected data on the activity where an individual sustained the most serious injury, a positive association was found between the variable and diabetes. Compared to sports and physical activity, people with diabetes were more likely to sustain a serious injury performing a leisure activity or hobby, travelling to and from work, working at a job or business, going up and down the stairs or walking, or performing other activities including sleeping, eating, and personal care (Table 4).

TAKE-HOME MESSAGE

- Diabetes mellitus has a negative impact on employment and workplace.
- Various factors might be associated with diabetes within the Canadian context.
- Diabetes may be more common in “blue collar” occupations where manual labor comprises much of the work they do.
- Diabetes is associated with various occupational health outcomes including work-related injury, loss of work productivity due to absenteeism, and the types of occupations.

Discussion

In this secondary analysis of the 2001 to 2014 CCHS data, we found various factors that might be associated with diabetes within the Canadian context. Previous research has suggested that diabetes may be more common in “blue collar” occupations where manual labor comprises much of the work that they do. A 34-year longitudinal US study found that people with blue-

collar occupations have a 42% and 55% higher risk of having diabetes than white-collar occupations for men and women, respectively.[12] Another study found that men in a low occupational class, characterized by unskilled or semi-skilled manual occupations, have a significantly higher risk of having diabetes than men in higher occupational classes.[13] However, the results of this study suggest that this may not always be the case. We found that "white-collar" occupations in business, finance, and administration were significantly associated with diabetes, and had similar risks as "blue-collar" occupations in the primary industry, processing, manufacturing, and utility sector.

A Japanese study of the incidence of diabetes amongst male white-collar workers found that sales workers aged 40–49 and 50–59 had 1.55 and 2.01 times the risk for DM compared to other white-collar workers, respectively.[14] The authors of the same study suggested that sales workers may have some occupational risk factors for DM, independent from traditional risk factors. An alternative reason would be that working in a sales or service occupation may exacerbate any pre-existing traditional risk factors for DM.[14] Interestingly, an association between DM and sales and service occupations was observed in five of the 10 CCHS cohorts (2009–2013) after running the logistic regression model. While these associations were not significant after *post hoc* analysis, more research should be done to better understand this relationship. This is especially important in Canada as workers in the sales and service sector make up a large percentage of the labor force. In 2011, 27.1% and 18.7% of women and men aged 15 years and over, respectively, were most likely to be employed in sales and service occupations.[15] A possible cause for these results may be the level of strain experienced by people in sales and service occupations. A recent study found that passive occupations, characterized by low demand and control, are associated with a significantly increased risk of diabetes.[16] Studies on the effect of job strain on various outcomes utilize a questionnaire to determine where an individual lies on the four quadrants of the job strain model.[16–18] As a result, there may be variations in the level of strain experienced by different individuals within the same occupation. An area of potential future research is to discern whether an association between sales and service occupations and diabetes truly exists and if so, whether it is due to the level of strain experienced.

An association between diabetes and experiencing a serious injury working at a job or business, and traveling to and from work, was observed in this study in four CCHS cohorts. There is limited literature on work-related injury due to diabetes, and the results of each study are variable. Canadian studies on the risk of a crash in truck-permit and commercial drivers were higher in individuals with diabetes than healthy drivers.[19,20] Other medical conditions, including coronary disease, hypertension, and visual impairment, did not have a significant effect on the risk of accidents.[20] A British population-based, case-controlled study found no evidence that diabetes contributes to workplace injury.[10] However, due to the CCHS design, the nature of the injury experienced by the respondents was not included, making it difficult to make any further meaningful conclusions from these results.

In four CCHS cohorts, people with diabetes were more likely to miss work due to an illness/disability or being permanently unable to work compared to other reasons such as looking for work, school or education, labor dispute, family responsibilities, and other reasons. These results suggested that an individual's diabetes might have a higher negative impact on the labor force,

as demonstrated by the higher likelihood for workplace absenteeism, than any other reason. For this study, only individuals who reported that they were currently employed at the time of the survey were included in the analysis, and those not in the labor force due to their disability were excluded. As a result, the loss of productivity was even higher if individuals not currently in the work force would have been included in the analysis. This finding was consistent with other studies that have also documented higher workplace absenteeism in people with diabetes than those without.[4,21-24] Cawley and colleagues found that obese and morbidly obese men missed 2.64 and 5.69 extra days of work per year compared to healthy weight non-diabetic people.[21] The economic impact that absenteeism due to diabetes has on the labor force has been analyzed in the same study. Obese and morbidly obese diabetics cost an extra US$ 429 and US$ 924, respectively, in absenteeism costs compared to the control group.[21] While presenteeism was not investigated in this study, several studies have also found higher rates amongst people with diabetes than those without.[4,22,23]

The data from this study will be useful in highlighting the importance of interventions and methods to reduce risk factors for diabetes in the workplace. A recent study on educational seminars tailored for transport workers demonstrated a positive impact on their health behaviors and may lower risk factors associated with obesity-related disorders such as diabetes.[25] The loss of work productivity in patients with diabetes has been well studied in other countries, but our results provided data on the Canadian context.

There are a few limitations to this study. One is the self-reported nature of the questionnaires and the reliance on recall for some questions. Self-reported data may affect the accuracy of the responses to some of the questions, including the number of days missed from work due to a chronic condition in the past three months. However, a study found that self-reported recall of missed work days in the past three months is better than the recall for the past year.[26] Another limitation was that the CCHS questionnaires do not distinguish between type 1 and type 2 DM. Previous studies have found an association between low socioeconomic status and occupational class, and increased risk of type 2 DM. However, less is known about the relationship between type 1 DM and occupational outcomes.[12,13] As a result, not being able to account for type 1 and type 2 DM may lead to an over- or under-estimation of the associations between occupational health outcomes and DM. Future research is needed to compare occupational health outcomes with type 1 and type 2 DM, separately.

Collectively, our results suggest that diabetes is associated with various occupational health outcomes, including work-related injury, loss of work productivity due to absenteeism, and the types of occupations. These results will allow Canadian policy makers, employers, and other stakeholders to assess and examine the impact diabetes have at the workplace.

Conflicts of Interest: None declared.

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Appendix

Stata command codes for the statistical analysis of the 2001 CCHS dataset. This is a representative set of codes for all CCHS datasets. Italicized words were not part of the command code, but indicate the action that was taken following the command.

1. svyset GEOADPMF [pweight=WTSAM], vce(linearized) singleunit(missing)
2. keep LBFA_31A LBFADPFT LBFAGRNW INJAG09 CCC_101 DHHGAGE DHH_SEX PACADPAI WTSAM GEOADPMF LBFAG31
3. drop if DHHGAGE < 2
4. drop if DHHGAGE > 13
5. drop if LBFAG31 >2
6. drop if LBFADPFT >2
7. drop if LBFA_31A >9
8. drop if CCC_101 >5
9. rename CCC_101 Diabetic
10. recode Diabetic (2=0)(1=1)
11. svy: tab Diabetic LBFA_31A *(variable kept)*
12. svy: tab Diabetic LBFADPFT *(variable dropped)*
13. svy: tab Diabetic LBFAGRNW *(variable kept)*
14. svy: tab Diabetic INJAG09 *(variable kept)*
15. svy: tab Diabetic DHHGAGE *(variable kept)*
16. svy: tab Diabetic DHH_SEX *(variable kept)*
17. svy: tab Diabetic PACADPAI *(variable kept)*
18. keep LBFA_31A LBFAGRNW INJAG09 Diabetic DHHGAGE DHH_SEX PACADPAI WTSAM GEOADPMF
    A. xi: svy: logistic Diabetic i.DHHGAGE i.DHH_SEX i.PACADPAI i.LBFA_31A
    B. test _ILBFA_31A_2 _ILBFA_31A_3 _ILBFA_31A_4 _ILBFA_31A_5 _ILBFA_31A_6 _ILBFA_31A_7 _ILBFA_31A_8 _ILBFA_31A_9 *(variable kept)*
    C. test _IPACADPAI_2 _IPACADPAI_3 *(variable kept)*
    D. test _IDHH_SEX_2 *(variable kept)*
    E. test _IDHHGAGE_3 _IDHHGAGE_4 _IDHHGAGE_5 _IDHHGAGE_6 _IDHHGAGE_7 _IDHHGAGE_8 _IDHHGAGE_9 _IDHHGAGE_10 _IDHHGAGE_11 _IDHHGAGE_12 _IDHHGAGE_13 *(variable kept)*
    F. xi: svy: logistic Diabetic i.DHHGAGE i.DHH_SEX i.PACADPAI i.LBFA_31A

    A. xi: svy: logistic Diabetic i.DHHGAGE i.DHH_SEX i.PACADPAI i.LBFAGRNW i.INJAG09
    B. test _IINJAG09_2 _IINJAG09_3 _IINJAG09_4 *(variable dropped)*
    C. xi: svy: logistic Diabetic i.DHHGAGE i.DHH_SEX i.PACADPAI i.LBFAGRNW
    D. test _ILBFAGRNW_2 _ILBFAGRNW_3 _ILBFAGRNW_4 _ILBFAGRNW_5 _ILBFAGRNW_6 _ILBFAGRNW_7 *(variable kept)*
    E. xi: svy: logistic Diabetic i.DHHGAGE i.DHH_SEX i.PACADPAI i.LBFAGRNW