

Disclosure of Type 1 diabetes at work among Finnish workers

Running title: Type 1 diabetes and disclosure at work

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What's new?

- We examined disclosure of Type 1 diabetes to colleagues, line managers and occupational health personnel in a representative national sample.
- Psychosocial factors had the biggest role in workplace disclosure. Social support and psychosocial work ability were associated with disclosure to colleagues, line managers and occupational health personnel. Quality of relationships at work was associated with disclosure to colleagues and to the line manager. Furthermore, opportunity to self-manage diabetes at work was associated with disclosure to colleagues.
- Only half of respondents disclosed their Type 1 diabetes at work and further research is required to examine the reasons for not disclosing Type 1 diabetes.

Abstract

Aims To determine which self-management factors and psychosocial work factors were associated with disclosing diabetes to colleagues, line managers and occupational health personnel among workers with Type 1 diabetes.

Methods A total of 767 working-aged respondents with Type 1 diabetes completed a Finnish cross-sectional survey named 'People with Type 1 Diabetes in Worklife'. Factor analysis was carried out, followed by logistic regressions to estimate the associations between self-management factors, psychosocial work factors and the likelihood of disclosure separately to colleagues, line managers, and occupational health personnel. The models were adjusted for sociodemographic, diabetes-related and work-related variables.

Results A total of 52% of the respondents had disclosed their diabetes to their colleagues, 45% to occupational health personnel, and 28% to their line manager. Receiving social support and having good psychosocial work ability were significantly associated with disclosure to colleagues, line managers and occupational health personnel. Relations at work were associated with disclosure to colleagues and the line manager. Furthermore, opportunity to self-manage diabetes at work was associated with disclosure to colleagues.

Conclusions Line managers and colleagues have a remarkable role to play in providing workplace support to workers with Type 1 diabetes. Disclosure of Type 1 diabetes should be encouraged as line managers can provide workers with the right support, implement work adaptations and facilitate job retention. As only half of respondents disclosed their Type 1 diabetes at work, further research is required into the reasons for and consequences of not disclosing a diagnosis.

Introduction

It is estimated that ~95% of diabetes management is self-management [1]. As workers spend 60% of their waking hours at work [2], self-management of Type 1 diabetes at work is inevitable.

Self-management of Type 1 diabetes can be challenging at work [3]. In order for workers to self-manage their diabetes effectively, support may be required from the workplace [4-6]. Studies show that employers do provide support and work adjustments to those who need to manage their chronic health condition at work [7,8]. In such cases, workers have disclosed their health condition to their employer (i.e. line manager) or to their colleagues [7,9,10]. Compared with other chronic conditions, people with diabetes are less likely to disclose their condition at work [9]. In people with diabetes, workplace disclosure is associated with self-management behaviours at work [6,11,12].

Despite its importance, knowledge of Type 1 diabetes disclosure at work is limited. We examined which self-management and psychosocial work factors were associated with disclosure at work among workers with Type 1 diabetes. In addition, we estimated how those factors were associated with disclosure to colleagues, line manager and occupational health staff.

Materials and methods

For the present study we tracked a sample of workers diagnosed with Type 1 diabetes. The survey, named 'People with Type 1 Diabetes in Worklife', was conducted by the University of Eastern Finland and the Kuopio University Hospital in 2010–2012. A questionnaire was mailed to a randomly selected sample of 2500 working aged (18-65 years) Finns with Type 1 diabetes. The

sample was drawn from The Medication Reimbursement Register of the Social Insurance Institution of Finland and covered 6% of the Finnish population with Type 1 diabetes.

Altogether 2464 people received the questionnaire (four were deceased and 32 were unreachable), and 1214 returned the form. The response rate was 49.3%. We excluded from analysis 201 questionnaires that were filled in incompletely; thus, the final sample of completed questionnaires included 1013 respondents with Type 1 diabetes.

We studied only working Finns with Type 1 diabetes. Those who were retired, unemployed, students and homemakers who had not been working in the last 12 months were excluded. This left a final sample of 767 respondents for analysis (Table 1).

The Research Ethics Committee of the Northern Savo Hospital District reviewed and approved the research protocol (18//2010).

Measurements

The questionnaire contained the following themes: socio-demographics, diabetes background, diabetes and work, health and disclosure of diabetes. The questionnaire included 108 questions and based on previous studies on disclosure at work [9] of those 52 questions were selected for principal axis factor analysis. Seven factors were identified: (1) the opportunity to self-manage diabetes at work (Cronbach's $\alpha = 0.841$); (2) mental stress attributable to managing diabetes at work (Cronbach's $\alpha = 0.832$); (3) taking medical time off from work (Cronbach's $\alpha = 0.896$); (4) adhering to self-management at work (Cronbach's $\alpha = 0.735$); (5) social support (Cronbach's $\alpha = 0.843$); (6) relations at work (Cronbach's $\alpha = 0.629$); and (7) psychosocial work ability (Cronbach's

$\alpha = 0.751$) (Table S1). The items that fall under each factor are described in the Supporting Information (Appendix S1).

Disclosure of diabetes

The previously used 'Disclosure of illness' measurement [13] was used as a means of measuring disclosure of diabetes. On a scale of 1–5 (not at all to full extent) participants were asked: 'To what extent have you shared the following information about your diabetes with your colleagues: a) type of diabetes and its symptoms; b) ways in which you manage your diabetes at work (e.g. insulin, diet); c) the effect of your diabetes on your work (e.g. on your ability to perform tasks); and d) any time off work needed, related to your diabetes?'. For each item, respondents were asked to report to what extent they had shared information about their diabetes with their colleagues (.881), line manager (.929) and occupational health personnel (.947). For the analyses, we first calculated an overall mean score across the items for disclosure made to colleagues. The single mean score was then dichotomized, 0–1 (0 = not at all; to a small extent; to some extent; and 1 = to a large extent; to a full extent). These steps were repeated for disclosure to line manager and disclosure to occupational health personnel.

Covariates

Other measures included gender (1 = women; 2 = men), age (years), education (1 = no education or only high school; 5 = university), length of employment (years), HbA_{1c}-level [1 = ≤ 60 mmol/mol ($\leq 7.5\%$); 2 = 61–70 mmol/mol (7.6–8.5%); 3 = 71–80 mmol/mol (8.6–9.5%); 4 = ≥ 81 mmol/mol ($\geq 9.6\%$)], duration of diabetes (years), comorbidities (0 = no; 1 = yes), serious hypoglycaemic episodes (0 = no; 1 = yes), number of workers at current work place, working hours, work pattern

(0 = regular, 1 = irregular) and type of work (0 = mentally demanding or equally mentally and physically demanding work; 1 = physically demanding work).

Statistical analysis

Three sets multiple logistic regression analyses were conducted to estimate the associations between the seven factors and the disclosure separately to (a) colleagues, (b) line manager, and (c) occupational health personnel as expressed by odds ratio and 95% CI. The models were adjusted for sociodemographic covariates (gender, age, education and length of employment), for diabetes-related covariates (HbA_{1c}, duration of diabetes, comorbidities and serious hypoglycaemic episodes), and for work-related covariates (number of workers at current work place, working hours, work pattern and type of work; Table 2). All analyses were carried out in SPSS for Windows, Rel. 21.0.0.0, 2012 (SPSS Inc., Chicago, IL, USA). Missing data were excluded from the analysis.

Results

The characteristics of the 767 participants are summarized in Table 1. Most (68%) of the participants had good or moderate HbA_{1c} levels. More than 40% of the participants had a Type 1 diabetes duration of >10 years. A total of 52% of the participants had disclosed their diabetes to their colleagues, 45% to occupational health personnel and 28% to their line manager.

In the logistic regression analysis the sociodemographic covariates older age and longer employment were associated with disclosure of Type 1 diabetes to the line manager (Table 2).

Workers with longer employment were also more likely to disclose the condition to their colleagues. In addition, older workers disclosed their diabetes to occupational health personnel.

Of the diabetes-related covariates, higher HbA_{1c} level, longer duration of diabetes and serious hypoglycaemic episodes were more likely to be associated with disclosure to the line manager. In the case of serious hypoglycaemic episodes, workers also disclosed their diabetes to their colleagues.

Those with irregular working times were more likely to disclose their condition to their line manager. Workers were more likely to disclose their condition to occupational health personnel if they had physically demanding work and worked for a larger organization.

After adjusting for covariates, the final models showed that receiving social support and having good psychosocial work ability were significantly associated with disclosure to colleagues, line manager and occupational health personnel. Good relations at work were associated with disclosure to colleagues and the line manager. Furthermore, the opportunity to self-manage diabetes at work was associated with disclosure to colleagues.

Discussion

The present study showed that about half of the participants had disclosed their diabetes to their colleagues and occupational health personnel, and only 28% to their line manager. Different factors were associated with disclosure to colleagues, line manager and occupational health personnel.

Psychosocial factors had the biggest role in disclosure at work. Workers who had disclosed their condition to colleagues, line manager and occupational health were more likely to report receiving social support from these groups of people and were also more likely to report good psychosocial

work ability. These results are consistent with other studies that found social support to be important for good self-management of Type 1 diabetes and other chronic conditions at work [6,14,15]. In addition, good relations between colleagues and line managers may also encourage disclosure.

Serious hypoglycaemic episodes were associated with disclosure to colleagues and line managers. Higher HbA_{1c} level, and longer duration of diabetes were associated with disclosure to line managers only. These results support previous studies reporting that people with Type 1 or Type 2 diabetes choose to disclose depending on how serious their condition is and which self-management activities are required [14,16]. In the present study, individuals who had irregular working times, including shift work, were more likely to disclose their diabetes to their line manager. This may emphasize the line manager's role in implementing work adaptations and facilitating job retention among workers with chronic conditions [17].

The opportunity to self-manage diabetes at work was associated with disclosure to colleagues only. This finding is not surprising as Type 1 diabetes is mainly a self-managed condition where individuals are required to carry out multiple daily self-care activities whilst at work [4,14,18]. It may be difficult for a worker with Type 1 diabetes to hide certain self-management activities from their colleagues.

Older workers, those with physically demanding work and those working in larger organizations were more likely to disclose their condition to occupational health personnel. This was to be expected, as these workers have more need for support, and availability of occupational health care is better in large organizations [19].

A key strength of the present study is that it included a large representative national sample of 767 working respondents with Type 1 diabetes. The sample represented workers from a wide range of organizations and types of work. The study was cross-sectional, however, and the measurements used were self-reported.

Further longitudinal research should focus on disclosure rates, reasons for choosing not to disclose or deliberately concealing Type 1 diabetes, and the impact of working relationships on disclosure.

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Completing interests

None declared.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Appendix S1. Factor Analysis and supplementary references.

Table S1. Factor structure of disclosure using a principal axis factor analysis and Varimax rotation.

Table 1. Characteristics of the participants

Gender (<i>n</i> = 763)	
Women	337 (44.2)
Men	426 (55.8)
Mean ± SD age, years (<i>n</i> = 760)	36.2 ± 12,4
Education (<i>n</i> = 767)	
No education or only high school	151 (19.7)
Vocational course	31 (4.0)
Vocational school	264 (34.4)
Technical or vocational college, or university of applied sciences	217 (28.3)
University	104 (13.6)
Last HbA _{1c} level* (<i>n</i> = 757)	
≤60 mmol/mol (≤7.5%)	255 (33.7)
61–70 mmol/mol (7.6–8.5%)	261 (34.5)
71–80 mmol/mol (8.6–9.5%)	176 (23.2)
≥81 mmol/mol (≥9.6%)	65 (8.6)
Duration of diabetes (<i>n</i> = 764)	
0–5 years	186 (24.3)

6–10 years	249 (32.6)
11–15 years	291(38.1)
≥16 years	38 (5.0)
Number of workers at current work place (<i>n</i> = 714)	
1	38 (5.3)
2–9	184 (25.8)
10–49	244 (34.2)
50–249	143 (20.0)
≥250	105 (14.7)
Mean ± SD length of employment, years (<i>n</i> = 727)	9.1±9.9
Disclosed	
To colleagues (<i>n</i> = 684)	354 (51.8)
To line manager (<i>n</i> = 649)	179 (27.6)
To occupational health personnel (<i>n</i> = 615)**	275 (44.7)

Data are *n* (%) except where indicated. Missing data were excluded.

*Self-reported. **Disclosure to Occupational health personnel has been reported only for those who stated their organization had occupational health services.

Table 2. Adjusted logistic regression model with disclosure, as dependent variable

	<u>Model 1</u>			<u>Model 2</u>			<u>Model 3</u>		
	<u>Colleagues (n = 545)</u>			<u>Line manager (n = 512)</u>			<u>Occupational health personnel (n = 490)*</u>		
	R ² **	OR (95% CI)	P-value	R ² **	OR (95% CI)	P-value	R ² **	OR (95% CI)	P-value
Covariates									
Gender		1.07(0.69–1.65)	0.760		1.39 (0.88–2.21)	0.158		1.20 (0.77–1.89)	0.420
Age		0.98 (0.96–1.01)	0.153		0.97 (0.94–1.00)	0.026		1.04 (1.01–1.06)	0.009
Education		1.01 (0.85–1.21)	0.918		1.08 (0.90–1.31)	0.417		1.20 (0.97–1.45)	0.069
Length of employment	0.029	1.05 (1.01–1.08)	0.004	0.018	1.05 (1.02–1.09)	0.005	0.079	1.00 (0.97–1.03)	0.828
HbA _{1c}		1.06 (0.85–1.34)	0.603		1.36 (1.07–1.73)	0.013		0.97 (0.77–1.21)	0.765
Duration of diabetes		0.84 (0.67–1.05)	0.121		0.75 (0.58–0.95)	0.018		0.94 (0.75–1.18)	0.591
Comorbidities		1.41 (0.93–2.14)	0.106		1.42 (0.91–2.20)	0.121		1.02 (0.67–1.56)	0.921
Serious hypoglycaemic episodes	0.063	1.69 (1.05–2.73)	0.032	0.092	1.82 (1.11–3.00)	0.018	0.089	1.17 (0.73–1.88)	0.506

Number of workers at current work place		0.92 (0.76–1.12)	0.392		0.85 (0.69–1.04)	0.120		1.23(1.01–1.49)	0.045
Working hours		1.00 (0.98–1.02)	0.877		1.01 (0.99–1.03)	0.469		1.01 (1.00–1.03)	0.148
Work pattern		0.75 (0.49–1.16)	0.197		0.57 (0.36–0.91)	0.018		1.10 (0.70–1.72)	0.692
Type of work	0.071	1.01 (0.65–1.58)	0.956	0.116	0.81 (0.51–1.29)	0.377	0.117	1.63 (1.02–2.61)	0.040
Factors									
Opportunity to self-manage diabetes at work		1.27 (1.04–1.56)	0.018		1.14 (0.92–1.42)	0.222		1.06 (0.85–1.31)	0.603
Mental stress due to managing diabetes at work		0.85 (0.70–1.04)	0.123		0.82 (0.66–1.02)	0.077		0.89 (0.72–1.10)	0.295
Taking medical time from work		1.06 (0.87–1.28)	0.582		1.23 (0.99–1.51)	0.061		1.15 (0.93–1.41)	0.190
Adhering to self-management at work		1.16 (0.94–1.44)	0.168		1.09 (0.86–1.37)	0.483		1.14 (0.91–1.42)	0.258
Social support		2.35 (1.87–2.94)	0.000		2.17 (1.75–2.70)	0.000		1.49(1.22–1.83)	0.000
Relations at work		1.23 (1.02–1.50)	0.034		1.40 (1.14–1.71)	0.001		0.94 (0.77–1.14)	0.520

Psychosocial work ability	0.268	1.37 (1.14–1.66)	0.001	0.298	1.25 (1.02–1.53)	0.035	0.185	1.27(1.04–1.55)	0.018
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OR, odds ratio.

Missing data were excluded. The models were adjusted for sociodemographic covariates (gender, age, education, and length of employment), for diabetes-related covariates (HbA1c, duration of diabetes, comorbidities, and serious hypoglycaemic episodes), and for work-related covariates (number of workers at current work place, working hours, work pattern, and type of work).

*Disclosure to Occupational health personnel has been reported only for those who stated their organization had Occupational health services.

** Cumulative Nagelkerke coefficient of determination