ORIGINAL ARTICLE

How many employees receive safety training during their first year of a new job?

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Tables 2 and 4 and an appendix can be viewed on our website at <http://ip.bmj.com/supplemental>

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Objective: To describe the provision of safety training to Canadian employees, specifically those in their first year of employment with a new employer.

Design: Three repeated national Canadian cross-sectional surveys.

Subjects: 59 159 respondents from Statistics Canada's Workplace and Employee Surveys (1999, 2001 and 2003), 5671 who were in their first year of employment.

Main outcome: Receiving occupational health and safety training, orientation training or office or non-office equipment training in either a classroom or on-the-job in the previous 12 months.

Results: Only 12% of women and 16% of men reported receiving safety training in the previous 12 months. Employees in their first 12 months of employment were more likely to receive safety training than employees with >5 years of job tenure. However, still only one in five new employees had received any safety training while with their current employer. In a fully adjusted regression model, employees who had access to family and support programs, women in medium-sized workplaces and in manufacturing, and men in large workplaces and in part-time employment all had an increased probability of receiving safety training. No increased likelihood of safety training was found in younger workers or those in jobs with higher physical demands, both of which are associated with increased injury risk.

Conclusions: From our results, it would appear that only one in five Canadian employees in their first year of a new job received safety training. Further, the provision of safety training does not appear to be more prevalent among workers or in occupations with increased risk of injuries.

The first few months of a new job is a time of high risk for work-related injury.^{1–4} For example, in the Canadian province of Ontario, lost-time injury claims among workers in their first month of employment were four times higher than among workers with >12 months of employment. Further, this increased risk persisted after adjustment for sex, age, occupation and industry group differences.⁵ In short, older, more experienced workers have a similar risk of being injured during their first months of employment as do younger, and often less experienced, workers. The provision of health and safety training early in employment may help orientate new workers to the hazards and safety procedures in their new workplace, possibly reducing the time it takes to adapt to their new surroundings, thus reducing their risk of injury.^{6,7}

In addition to the possible injury prevention benefits, providing information to employees on workplace hazards and dangers, as well as instructing them on the proper use of workplace machinery and safety equipment is a mandatory requirement of employers under a system of "internal responsibility" in many Canadian provinces.^{8,9} Yet, despite the legal requirement and possible safety benefits of providing early safety training, there is currently no active surveillance of whether workplaces actively comply with these obligations. Of the available information in Canada, a survey of 600 workers aged between 14 and 17 years reported 44% had received some training before taking on new tasks at work;¹⁰ another sample of over 1000 young workers aged 15–24 years reported that 40% had received health and safety training within their first week of employment;¹¹ another survey of 400 Ontario workers of all ages reported that 61% had received some training while in their current job.¹² Unfortunately, the above survey estimates have methodological issues concerning the convenience sampling and recruitment of respondents, thus reducing the ability to generalize these study results.

Statistics Canada's Workplace and Employee Survey (WES) offers a unique opportunity to describe the prevalence of

occupational health and safety training in representative samples of Canadian employees across three time periods. The objective of this paper is to examine factors at the individual, occupational and organizational level that are associated with increased probability of receiving safety training among Canadian workers, in particular those in their first year of employment with a new employer.

METHODS

Statistics Canada's WES, initiated in 1999, collects information from a representative national sample of over 23 000 individuals from over 6000 workplaces in Canada annually. The WES surveys both employees and employers, creating a linked employer–employee database. A representative sample of workplaces are selected from the Canadian Business Register (CBR), a census of all active businesses in Canada that have a corporate income tax account, are an employer or have a goods and services tax account with an annual gross business income of over \$30 000. The workplace response rate for the 1999 survey was 95.2%. The majority of non-responding workplaces were owner-operators with no employees who were in the CBR because of a payroll deduction account.

Each selected workplace was asked to provide a list of employees, from which a random sample of up to 12 employees was selected. In workplaces with four or fewer employees all employees were surveyed. The employee response rate to the 1999 survey was 82.8%. Further details on the WES sample and design are available elsewhere.¹³

Each workplace is contacted annually for 4 years, with a new group of employees from each workplace surveyed every 2 years. Currently, five cycles of the WES are available for analysis (1999 through 2003) consisting of two workplace samples and three

Abbreviation: WES, Workplace and Employee Survey

employee samples (more details are given in appendix A, table A1). Due to this unique sampling design, in the years 1999, 2001 and 2003 the employee samples consisted of a number of respondents who were in their first 12 months of employment.

Outcome variables

Employee safety training

Employees were asked to report all types of classroom training they had received in the previous 12 months. Options included occupational health and safety training, orientation training and office and non-office equipment training. They were then asked to report all on-the-job training they had received. Respondents who had received occupational health and safety, orientation or office or non-office equipment training, either in a classroom or on-the-job in the previous 12 months, were defined as having received safety training. Questions from the WES are provided in appendix A.

Independent variables

We examined the prevalence of safety training across the following variables:

1. Individual employee characteristics: age (grouped) and immigrant status (yes/no), and membership in a union or collective bargaining agreement (yes/no);
2. Occupational characteristics: employment status (full time or part time), occupational physical demands (coded into three groups using the Standard Occupational Code 1991, details given in appendix A),^{14 15} working regular hours between Monday and Friday (yes/no), permanent employment (yes/no), access to non-wage benefits (yes/no), access to family-support programs (yes/no), and wages per hour (three groups based on self-reported actual salary); and
3. Employer characteristics: based on responses from one or more persons with the knowledge of workplace characteristics (eg, human resources manager) these included industry of the employer (grouped), workplace size (grouped), non-profit workplace (yes/no), and the location of the head office (grouped by province)

Given that the working conditions and job-related tasks might differ between men and women, even within similar occupations,¹⁶ analyses were stratified by sex.¹⁷

ANALYSIS

In each study year, a small number of respondents reported having taken three or more classroom training courses in the previous 12 months. Unfortunately, the WES only asks respondents the subjects of their two most recent classroom courses. Therefore, these respondents may have taken a classroom course in safety training previous to their two most recent courses. As we could not categorize these employees as having participated in safety training they were removed from the study sample. This group comprised of 8.6% of the total 2003 sample (5.8% of the sample in their first year of employment); 8.1% of the 2001 sample (6% of the sample in their first year of employment); and 9% of the 1999 sample (6.1% of the sample in their first year of employment).

A logistic analysis compared the removed respondents with those remaining. Among all respondents those who were: female, younger, Canadian born (*v* immigrants), in their second year of employment (*v* ≥ 5 years of employment), employed full time, receiving non-work benefits and family-support programs, and higher wages and from workplaces with 50–100 employees (*v* workplaces with ≤ 20 employees), were more likely to have participated in three or more courses in the

previous 12 months. Similar associations were observed in the sample of respondents in their first year of employment.

After excluding these employees, our final study sample consisted of 21 421 respondents to the 1999 survey (2177 who were in their first 12 months of employment), 18 700 respondents to the 2001 survey (1690 in their first 12 months), and 19 038 respondents to the 2003 survey (1804 in their first 12 months). All survey cycles were combined giving a full sample of 59 159 employees, of which 5671 were in their first 12 months of employment. The year of the survey was included in all analyses to examine for changes in sample characteristics between survey cycles.

An initial descriptive analysis examined the percentage of employees who had received safety training by different groups of job tenure and survey cycles. Two logistic analyses (unadjusted and fully adjusted) then modelled the odds of having received safety training with job tenure and survey year as the main independent variables.

To examine the prevalence of training within the first year of employment, the study sample was restricted to those employees who had worked for their current employer for <12 months ($n = 5671$). A descriptive analysis compared the percentage of employees who received safety training versus those who did not across each of the main study variables. Logistic regression modelled the probability of having received safety training in the previous 12 months (than having not received safety training) with all study variables and year of survey included in one model.

To account for the complex sampling design of the WES, variance estimates for each point estimate were calculated using a bootstrap procedure, as specified by Statistics Canada.¹³

RESULTS

Table 1 presents the percentage of respondents receiving safety training, and the odds for receiving safety training across by job tenure and survey year categories, stratified by sex. Relatively few respondents reported receiving either classroom or on-the-job safety training in the previous 12 months ($<19\%$ in all survey cycles). Respondents in their first year of employment were more likely to receive training in both male and female samples. Although there was no change in the percentage of women receiving safety training across survey cycles, in the male sample there was an increase from 14% in 1999 to 19% in 2003.

Table 2 describes the provision of safety training only among respondents in their first year of employment with their current employer. Similar to all employees, safety training increased between 1999 and 2003 among male respondents, although a similar increase was not present in the female sample. In the male sample the groups most likely to receive safety training were those who also had family or support program available to them (32%), those in large workplaces (31%) and those whose employers head office was in Manitoba (34%). Similar trends were observed in the female sample, although women working in medium-sized workplaces (50–100 employees) were more likely to have received safety training (34%) than those in small workplaces. In both samples, those employees whose head office was in Québec were the least likely to have received safety training (6% of men and 12% of women).

Table 3 presents the fully adjusted regression model examining the probability of receiving safety training. Table 2 shows that adjusting for individual, occupational and workplace factors reduced many of the univariate associations. In the male sample, the increasing prevalence of safety training was still observed between 1999 and 2003, although it was attenuated through adjustment for differential occupational and industry participation across survey cycles (eg, in the 1999 survey 34% of male respondents worked in manual occupations, in the 2003 survey this increased to 48%). Increased

Table 1 Percentage of sample having received safety training and having received no training, in the past 12 months, by job tenure. 1999, 2001 and 2003 Workplace and Employee Survey samples

1999, 2001 and 2003 WES Samples (n = 59 159*)					
Tenure with employer		n*	Safety training†	Probability of having received safety training in the past 12 months	
				Unadjusted OR (95% CI)	Adjusted‡ OR (95% CI)
Men					
Tenure (years)					
>5	15422	15.7	Ref	Ref	
4–5	1596	15.6	0.98 (0.74 to 1.29)	1.00 (0.72 to 1.35)	
3–4	2412	13.5	0.82 (0.61 to 1.09)	0.90 (0.68 to 1.19)	
2–3	2953	14.3	0.87 (0.69 to 1.10)	0.93 (0.73 to 1.18)	
1–2	3606	16.9	1.10 (0.90 to 1.34)	1.19 (0.96 to 1.47)	
≤1	2650	21.4	1.48 (1.19 to 1.84)	1.66 (1.29 to 2.12)	
Year					
1999	10318	13.6	Ref	Ref	
2001	9347	16.4	1.26 (1.07 to 1.48)	1.22 (1.04 to 1.44)	
2003	8975	18.5	1.47 (1.24 to 1.74)	1.44 (1.21 to 1.71)	
Women					
Tenure (years)					
>5	15150	11.0	Ref	Ref	
4–5	2041	11.3	1.01 (0.71 to 1.44)	1.06 (0.73 to 1.53)	
3–4	2514	9.6	0.86 (0.63 to 1.17)	0.83 (0.59 to 1.18)	
2–3	3345	10.3	0.93 (0.74 to 1.18)	0.97 (0.75 to 1.26)	
1–2	4448	14.6	1.37 (1.07 to 1.75)	1.44 (1.09 to 1.91)	
≤1	3022	21.2	2.16 (1.76 to 2.65)	2.36 (1.83 to 3.05)	
Year					
1999	11103	12.4	Ref	Ref	
2001	9353	11.8	0.97 (0.76 to 1.22)	0.91 (0.72 to 1.15)	
2003	10063	12.8	1.05 (0.84 to 1.32)	1.04 (0.83 to 1.30)	

Ref, reference; WES, Workplace and Employee Survey.

*All frequency counts are weighted estimates, representing the Canadian working population.

†Sum of OH&S, equipment and orientation training.

‡Adjusted for age, sex, immigrant status, membership in union or CBA, occupation, employment status, wage, receiving benefits, receiving family-support programs, workplace size, non-profit workplace, industry and province of head office.

probability of safety training was present among those employees who had family and support programs available to them, women working in workplaces with 50–100 employees, women employed in the manufacturing industry and men in workplaces with >500 workers, and those with part-time employment. Decreasing probability of receiving safety training was present among men and women whose employer's head office was located in Québec. Trends towards decreasing likelihood of having received training were also present among women working in jobs with low wages and those working for employers with a head office in Ontario.

DISCUSSION

This study provides a comprehensive overview of participation in safety training within Canadian workplaces, and specifically among employees in their first 12 months of employment. This study adds two findings to the current research literature on the provision of safety training in Canada. Firstly, <13% of women and <19% of men reported receiving any safety training in the previous 12 months in any cycle of the WES. Among employees in their first 12 months of employment approximately one in five reported having received safety training since starting their employment. Even if we assume that all the respondents we removed from our analyses had received safety training this number would still only increase to one in four new workers (between 24% and 28% across survey cycles).

Secondly, there does not appear to be any targeting of which groups of workers receive safety training. For example, research in Canada has shown that younger workers,^{18–19} and those in occupations with high physical demands²⁰ are at increased risk

of work injury. However, we found no increased provision of safety training in either of these groups compared with other age and occupational groups (tables 2, 3). Similarly, the provision of safety training across industry sectors is also constant (with the exception of women employed in manufacturing who receive more training). Taken together our findings suggest a lax application of segments of the internal responsibility system regarding workplace safety in Canadian workplaces; with employees who are taken care of (eg, those who have access to family-support programs or non-wage benefits) also being the most likely to receive safety training.

We observed an increasing trend in the provision of safety training across study years among our male sample, but not among our female sample. Because of the attenuation in odds ratio (OR) from tables 2, 3 (OR = 2.01 v = 1.56), we feel some of this increasing trend in the male sample is due to compositional differences across study years. Examination of whether this trend represents a real increase or an artefact, and the possible reasons for this increase, warrants further investigation.

We also observed differences in the provision of safety training across Canadian provinces, in particular the low provision of safety training in Quebec. Tucker⁹ has previously suggested, comparing the Canadian provinces of Ontario, Alberta, British Columbia and Nova Scotia, that worker participation and protection is weakest in Alberta and strongest in Ontario. Based on our results, differences in the provision of health and safety training does not appear to be strongly related to worker protection and participation in occupational health and safety (eg, laws around health and safety committees and fines issued by provincial inspectors). We offer three alternative hypotheses for the lower reports of safety training in Quebec: a

Table 3 Fully adjusted odds of having received safety training in the past 12 months among short-tenure employees stratified by sex. 1999, 2001 and 2003 Workplace and Employee Survey samples (n = 5671*)

	Men	Women
	OR (95% CI)	OR (95% CI)
Survey year		
1999	Ref	Ref
2001	1.15 (0.70 to 1.89)	0.89 (0.59 to 1.37)
2003	1.59 (1.00 to 2.55)	0.78 (0.48 to 1.28)
Age group (years)		
>45	Ref	Ref
35-44	0.88 (0.46 to 1.70)	1.22 (0.67 to 2.24)
25-34	0.78 (0.49 to 1.26)	1.45 (0.87 to 2.43)
15-24	0.87 (0.52 to 1.43)	1.23 (0.74 to 2.03)
Immigrant		
No	Ref	Ref
Yes	1.17 (0.68 to 2.01)	0.89 (0.69 to 1.72)
Member of union/CBA		
No	Ref	Ref
Yes	1.17 (0.69 to 1.99)	1.12 (0.64 to 1.99)
Employment status		
Full time	Ref	Ref
Part time	2.06 (1.11 to 3.80)	0.86 (0.54 to 1.35)
Occupation		
Non-manual	Ref	Ref
Mixed	1.43 (0.88 to 2.33)	1.67 (1.07 to 2.59)
Manual	1.40 (0.82 to 2.39)	1.39 (0.85 to 2.27)
Permanent employee		
No	Ref	Ref
Yes	0.98 (0.59 to 1.63)	0.84 (0.50 to 1.41)
Receives non-wage benefits		
No	Ref	Ref
Yes	1.49 (0.92 to 2.43)	1.43 (0.84 to 2.44)
Receives family-support programs		
No	Ref	Ref
Yes	1.81 (1.09 to 3.00)	1.76 (1.18 to 2.63)
Works regular hours (Mon to Fri)		
No	Ref	Ref
Yes	0.82 (0.54 to 1.25)	0.49 (0.30 to 0.80)
Wages/h (\$)		
>20	Ref	Ref
10-20	1.05 (0.65 to 1.67)	0.87 (0.48 to 1.55)
<10	1.22 (0.67 to 2.22)	0.62 (0.34 to 1.14)
Workplace size (number of employees)		
<20	Ref	Ref
20-50	1.93 (1.11 to 3.37)	0.95 (0.55 to 1.65)
50-100	1.46 (0.89 to 2.37)	1.92 (0.98 to 3.76)
100-500	1.50 (0.76 to 2.95)	1.22 (0.71 to 2.12)
>500	2.34 (1.08 to 5.06)	1.00 (0.56 to 1.78)
Non-profit		
No	Ref	Ref
Yes	0.56 (0.29 to 1.10)	1.08 (0.58 to 2.01)
Industry		
Other service industries	Ref	Ref
Accommodation and food services	1.08 (0.45 to 2.60)	1.25 (0.56 to 2.79)
Trade -(wholesale and retail)	0.95 (0.50 to 1.79)	1.37 (0.71 to 2.65)
Manufacturing	1.55 (0.83 to 2.87)	1.93 (1.07 to 3.50)
Other goods industries	1.56 (0.84 to 2.92)	1.56 (0.70 to 3.46)
Location of head office		
Atlantic provinces	Ref	Ref
Quebec	0.14 (0.06 to 0.37)	0.33 (0.16 to 0.70)
Ontario	0.96 (0.54 to 1.69)	0.65 (0.39 to 1.08)
Manitoba	1.40 (0.82 to 2.39)	1.39 (0.85 to 2.27)
Saskatchewan	0.70 (0.30 to 1.64)	0.41 (0.14 to 1.24)
Alberta	0.98 (0.50 to 1.95)	0.73 (0.38 to 1.39)
British Columbia	1.09 (0.58 to 2.03)	0.74 (0.42 to 1.29)

Ref, reference.

*Frequency count is a weighted estimate.

workplace-based training model is not used to disseminate safety information; the provision of safety training is performed in a more adhoc manner; or there is a different perception of what constitutes safety training among employees in Quebec versus the rest of Canada. Unfortunately, we have no information available to us in the current data to investigate any of these explanations further.

These results, however, should be interpreted given the following limitations. Although the WES is collected from a representative sample of Canadian workplaces, the sample frame from which employees are selected is provided by the employer, and may not be representative of all employees in the workplace; resulting in a non-representative sample of employees. To examine this possibility we compared our sample of employees

in their first 12 months of employment to employees of the same job tenure from the 1999, 2001 and 2003 cycles of the Canadian Labour Force Survey.²¹ As one might expect, the WES samples consisted of more full-time employees, permanent employees and employees with higher hourly wages, and fewer younger workers (15–24 years; table 4). However, given the inconsistent provision of safety training, among these groups, we are not able to suggest how these differences might affect our results.

We removed 6% of our study sample (those who completed three or more courses, but did not list safety training in their two most recent classroom courses). To examine the effect of this exclusion on our results we re-ran our regression models assuming that all these respondents had all received safety training. In general, the estimates of all significant results reported in tables 2 and 3 were stronger. The odds ratio for part-time male employees reduced (OR 1.56, 95% confidence interval (CI) 0.86 to 2.83), given that full-time workers were more likely to have completed three or more courses. The odds ratio for employees receiving non-wage benefits and women in low-wage occupations also strengthened to reach traditional limits of statistical significance (ie, 95% CIs no longer crossed 1 in these groups). Results are not shown, but are available on request.

Finally, differential employee recall of having received safety training may affect our results. To examine this possibility we reran our models with months of employment included, hypothesizing that if recall played a significant part in our findings then reports of safety training may be more likely among respondents with the lowest job tenure. We found no association between months of job tenure and increased probability of safety training (results not shown, but available on request).

Limitations aside, the current study also has a number of strengths. The most obvious being our study sample is drawn from a large, random selection of all Canadian workplaces across three different years. Access to a large variety of workplaces, many of which may not readily participate in other occupational safety research, may help explain why our estimates of safety training are approximately half of other estimates from Canadian employees.^{10–12}

Implications for prevention

The results of this study pose a series of questions relevant to occupational health and safety policy makers, both in Canada, and elsewhere. On the basis of our results, we suggest the provision of safety training to new employees does not correspond to groups of known higher injury risk (eg, those in manual occupations) and is generally insufficient, with at least 75% of new employees not receiving either classroom or on-the-job safety training. Further, given the mandated requirement to provide safety information to new employees across Canadian provinces, our results suggest this mandate alone does not guarantee that safety training will be provided. Further investigation is required to determine if the low prevalence of safety training is due to a perception of the lack of value of training by employees or employers, or a general lack of investment by employers in employee safety.

While more research is needed to examine which types of safety training are the most effective in preventing workplace injury, based on our results, we suggest a first step is to increase the number of workplaces that adhere to the legislative obligation to provide safety training to new employees. With up to four in every five new workers receiving no safety training, a greater commitment from employees, employers and policy makers is needed to ensure workers are adequately informed about and protected from workplace hazards.

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Key points

1. Although the provision of safety training is mandatory in many provinces in Canada, only 1 in 5 employees in their first year with an employer reported receiving any safety training in the previous 12 months.
2. Younger workers and employees in manual occupations, each of which have higher injury risks, were no more likely to have received safety training than other employees
3. Employers who provide family and support programs (and to an extent non-wage benefits) were more likely to provide safety training for their employees.

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