HEALTH AND SAFETY FOR CANADIAN YOUTH IN TRADES

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ABSTRACT

This article examines occupational health and safety (OHS), with a particular focus on youth apprentices. It uses quantitative and qualitative data to examine the incidence of injuries among youth apprentices, and their experiences related to health and safety at work in Canada. Analysis of large-scale national surveys suggests a high incidence of work-related injuries among youth and low participation rates of younger workers in formal OHS training. A survey of 173 former Ontario Youth Apprenticeship Program (OYAP) and Registered Apprenticeship Program in Alberta (RAP) participants finds that one-fifth suffered serious occupational injuries, which required time off work. The results from this study have important implications for youth apprenticeship programs, particularly the OHS- and trade-specific knowledge required for youth to work safely during and following their apprenticeship training.

INTRODUCTION

According to Canadian policy-makers, apprenticeship training plays a significant role in "enabling business and industry in Canada to remain competitive" by preparing skilled trades workers demanded in the Canadian labour market (CMEC 2003, 113). To address shortages of trades workers in Canada and to smooth youth transitions to work, provincial governments have developed and promoted apprenticeship programs for high-school students in the past two decades. However, few studies describe the experiences of youth apprentices with occupational health and safety, or their working conditions and health-related outcomes. This article addresses this gap by examining health and safety issues for youth who began their apprenticeship while in high school. Our objectives are to examine work-related injuries and safety concerns among youth apprentices drawing on quantitative and qualitative data to

inform discussion about ways to improve the health and safety of youth apprentices.

This article provides initial responses to the following research question: To what extent does work during and immediately following high school apprenticeship training represent a risk for the health and safety of youth involved in these programs and how do they respond?

In answering this question, we aim to contribute to policy discussions about how educational programs and policy measures can better contribute to the improvement of the health and safety of young apprentices.

Comparisons of Canadian apprenticeship training programs with those in countries like Germany consistently show that Canadian apprenticeship programs have lower completion rates and are less able to attract young people (Franz and Soskice 1995; Lehmann 2000). Additionally, apprentices in Canada tend to be concentrated in a smaller range of traditional occupations, are older, and represent a smaller proportion of the overall labour force (Sharpe 2003).

Our review of data from the Registered Apprenticeship Information System (RAIS) in Canada indicates increasing enrolments between 1991 and 2010. The number of completions also increased slightly in 2010 but the ratio of completions to enrolments was still low compared to college and university (Canadian Council on Learning 2009:35). Other Canadian studies show a substantial gender gap in enrolments in registered apprenticeship training programs (Prasil 2005). In addition, the expectations of apprenticeship training leading to secure well-paying work are not always fulfilled. A study on work and lifelong learning in Canada (Raykov and Livingstone 2005) found significant gaps between apprentice trainees' expectations of finding a job and actual job attainment, which were attributed to their training. While almost half of all apprentices (47.5 per cent) expect to improve their employability, less than half of these (21.2 per cent overall) achieve this goal.

The majority of studies of apprenticeship are concerned with training outcomes and graduation rates of adults who participate in apprenticeship training (e.g., CMEC 2003; HRDC 2002). Comparatively less research on high school apprentices has been done to learn about their experiences in training and the workplace (exceptions are Taylor 2007; Taylor and Watt-Malcolm 2008). The higher risk of injury evident among youth and recently hired workers and the fact that trade, manufacturing, and construction occupations have higher rates of injury than other industries (McClosky 2008), suggests that a focus on the experiences of youth apprentices is long overdue.

YOUTH WORKER HEALTH AND SAFETY

Compared to the majority of OECD countries, Canadian studies demonstrate a higher incidence of workplace-related injuries and fatalities (Osberg and Sharpe 2003; Sharpe and Hardt 2006). After a period of declining

work-related morbidity and disability (Mustard 2003), recent reports indicate that the number of workplace fatalities is increasing, with approximately three to five fatalities occurring at work per day (Logan and Reeder 2007; Sharpe and Hardt 2006). Each year nearly one million occupational injury claims were reported to provincial and territorial Workers' Compensation Boards (WCBs) (Logan and Reeder 2007). Further, Cherry, Sithole, Beach and Burstyn's (2010) analysis of claims to the Workers' Compensation Board found that younger workers, particularly those in machining trades and manufacturing, were at the highest risk for injuries.

Researchers that examine work-related risks (Shultz and Taylor 2006) and injury among youth in Canada (e.g., Chin et al. 2010) report an alarmingly high number of injuries despite measures taken by governments, professional organizations and employers to educate youth and improve their safety at work. Differences between youth and adult worker injury rates are commonly explained by developmental factors (e.g., degree of physical and cognitive maturity). However, Breslin and Smith (2010) suggest that more important factors are unsafe work conditions and unfamiliarity with tasks and equipment. In addition, youth tend to be overrepresented in low paying, physically demanding jobs. They therefore conclude that work-related risks are central.

McClosky (2008) agrees that job and workplace factors are more important than individual factors in determining the risk of injury to young workers. He also notes that adolescent workers (aged 15-19) and young adult workers (aged 20-24) tend to have more limited knowledge about their rights and responsibilities, and are more eager to please, susceptible to peer pressure, and willing to take risks.

If asserting one's rights as a worker (e.g., the right to refuse unsafe work) entails significant risk and happens infrequently (Barnetson 2010), it is likely to be even riskier for apprentices, whose jobs are more tenuous and who often lack knowledge about workplace risks and their rights. Young workers not in school, whose injury rates are much higher than those in school, also report lower levels of social support at work, which may accentuate feelings of vulnerability (McClosky 2008). Differences in legal requirements, enforcement, and prevention programs may also affect youth and adult injury rates across jurisdictions.

Authors tend to agree that more safety training is needed to address the needs of workers most susceptible to injuries (e.g., young and new workers) and occupations with increased risk of injuries (e.g., trades) (Breslin and Smith 2010; McClosky 2008; Smith and Mustard 2007). Breslin (2008) found that out-of-school youth have higher rates of work injuries than younger workers still in school. Considering the fact that a large number of young workers do not receive workplace safety training, he suggests that school-based workplace safety programs be supplemented with other prevention strategies that target workplace training and supervision, or with

community-based programs for the most vulnerable groups of young workers.

Studies that examine injuries and health-related issues among apprentices report a high incidence of injuries related to nail-guns (Lipscomb, Nolan, Patterson and Dement 2010), falls (Kaskutas et al. 2010), allergies (especially among hairdressers) (Krecisz, Kiec-Swierczynska and Chomiczewska 2011; Ling and Coulson 2002), and musculoskeletal disorders (Hunting, Welch, Cuccherini and Seiger 1994; Jensen and Kofoed 2002). Apprentices in several trades (e.g., plumbing, hairdressing) may also be exposed to chemical and biological hazards, which lead to occupational diseases over the longer term (Barnetson 2010). In addition to better timing and more appropriate content of OHS training, studies recommend improved mentorship, eliminating unsafe work practices (Kaskutas et al. 2010), preventative measures including technical solutions (Lipscomb et al. 2006), and increased monitoring and injury reporting (Lipscomb et al. 2010) as preconditions to creating a safe workplace. A study of youth apprentices in carpentry in Ontario (Taylor and Watt-Malcolm 2008) also asserts the need for change in workplace safety cultures since youth often receive conflicting messages in classroom training vis-à-vis the workplace. The focus on employer responsibility in studies resonates with Barnetson's (2010) argument that high injury rates are linked to ineffective regulation and enforcement by governments and employers' failure to provide a safe work environment with proper orientation, training and supervision of young workers rather than worker carelessness.

RESEARCH METHODS

This mixed methods study begins with quantitative analysis of the 2010 Canadian Community Health Survey (CCHS) and 2004 Work and Lifelong Learning (WALL) datasets, to provide contextual information about work-related injuries and learning about OHS among younger workers. CCHS data include participants 15 years or older while WALL data include participants 18 years or older. Our quantitative analysis also includes primary data from Taylor and Lehmann's 2010-11 RAP/OYAP survey.

The RAP/OYAP survey included youth who participated in the Registered Apprenticeship Program (RAP) in Alberta high schools and the Ontario Youth Apprenticeship Program (OYAP) in Ontario high schools. The sample intentionally included youth who became apprentices in high school at least five years earlier (2006 or earlier), so that we could track their experiences and outcomes. This survey gathered information concerning participants' backgrounds, educational and employment experiences, future educational and career goals, and barriers to working in trades, in addition to questions regarding injuries and inability to work due to work-related injuries.

Participants from Ontario were recruited with the assistance of the Ministry of Training, Colleges and Universities. On the researchers' behalf,

the Ministry mailed an invitation to participate in the online survey to a random sample of former high-school apprentices. In Alberta, CAREERS the Next Generation (a foundation that helps match high school apprentices to employers) helped to recruit participants. The online survey was completed by 173 former apprentices (68 former OYAP participants in Ontario and 105 former RAP participants in Alberta). The average age of participants was 22.4 years.

To complement these quantitative data, this article draws on qualitative data from 40 interviews with former RAP apprentices from a range of trades in Alberta conducted during 2011/2012. The semi-structured interviews focused on apprentices' experiences in training and employment since enrolling in RAP, including health and safety issues. Our purposeful sample focused on achieving saturation of responses and obtaining representative experiences (Lasch et al. 2010; Sandelowski 1995). Interviews lasting an average of an hour were conducted in person by the research team members. Thematic analysis was used for identification, coding and analysis of interviews (Braun and Clarke 2006) using NVivo 10 for computer-assisted qualitative data analysis.

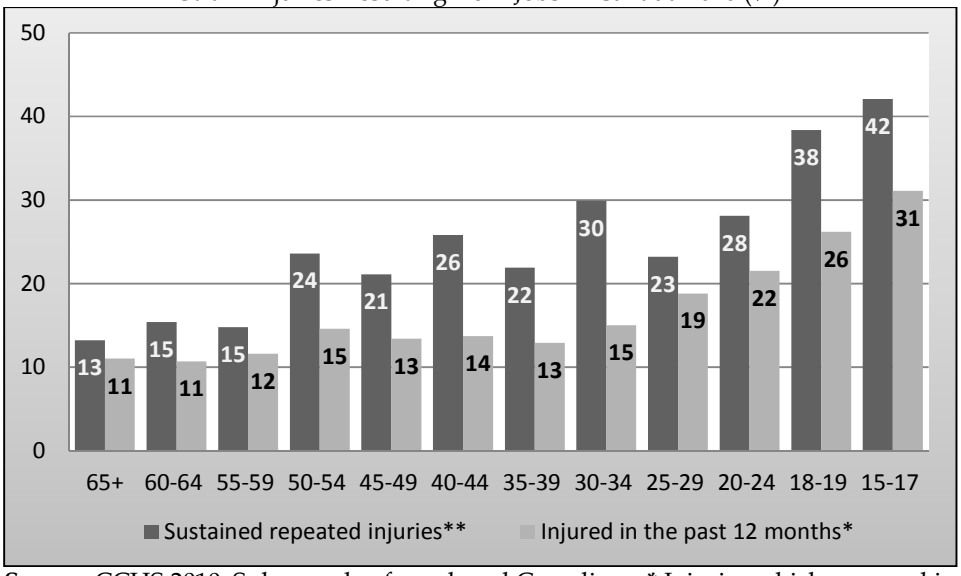
RESEARCH FINDINGS AND DISCUSSION

As the literature review shows, younger workers are more frequently injured on the job (e.g., Loughlin and Frone 2004; Salminen 2004). Our analysis of the 2010 Canadian Community Health Survey (CCHS) shows that 16 per cent of those aged 20 to 24 have sustained serious injury at work (Figure 1).

The CCHS survey contains an extensive set of questions regarding different forms and causes of work-related injuries. Serious injuries are defined as "injuries which occurred in the past 12 months, and were serious enough to limit your normal activities the day after the injury occurred," for example, a broken bone, a bad cut, a burn or a sprain (CCHS 2010). Further analysis of the 2010 CCHS based on a subsample of employed Canadians also shows that 18 to 24 year-old employees are more prone to be hurt, both on and off the job, than any other group of workers. The study demonstrates that the incidence of injuries among young employees is almost twice as high as that of older employees in Canada (31.1 per cent vs. 15.8 per cent).

Younger workers are also much more likely to sustain repeated injuries. Injuries decrease youth apprentices' quality of life, cause them to miss work, and make them consider leaving a trade. Research also shows that youth injuries contribute to higher healthcare use among injured workers, leading to significant costs over the life course (Koehoorn, Breslin and Xu 2008).

Figure 1
Incidence of Injuries, Repeated Injuries and Repetitive Strain Injuries Resulting from Jobs in Canada 2010 (%)



Source: CCHS 2010; Sub-sample of employed Canadians. * Injuries which occurred in the past 12 months, and were serious enough to limit *your* normal activities the day after the injury occurred. For example, a broken bone, a bad cut, a burn or a sprain. [CCHS 2010]. ** How many times were you injured? [CCHS 2010]

Further analysis (Figure 1) shows that more than half (56 per cent) of Canadians who experience repetitive strain injuries attribute these injuries to their job. Our analysis shows that almost one third (31.9 per cent) of the 18 to 19 year-old workers who experience repetitive strain injuries, and more than half (52.7 per cent) of the 20 to 24 year-old workers attribute repetitive strain injury to their job. In addition to the descriptive analysis, logistic regression indicates that younger workers are 2.2 to 3.6 times more likely to sustain injuries (Table 1). Particularly at risk are young male employees, who are much more likely to be injured than female and older workers.

Table 1
Likelihood of Injuries and Gender

	All Respondents	**Male**	**Female**
Age	**Odds Ratios** (Lower-Upper 95% CI)	**Odds Ratios** (Lower-Upper 95% CI)	**Odds Ratios** (Lower-Upper 95% CI)
15-17	**3.643** (3.608-3.678)	**5.216** (5.151-5.282)	**2.304** (2.270-2.338)
18-19	**2.860** (2.832-2.888)	**4.229** (4.175-4.282)	**1.717** (1.691-1.744)
20-24	**2.213** (2.194-2.232)	**2.739** (2.708-2.770)	**1.624** (1.602-1.646)

Source: CCHS 2010; Sub-sample of employed Canadians

Logistic regression (Table 2) also shows that different age groups of younger workers are 4.8 (15-17), 3.2 (18-19), and 2.6 (20-24) times more susceptible to repeated injuries. Repeat injury rates for female workers are even higher.

Table 2
Likelihood of Repeated Injuries and Gender

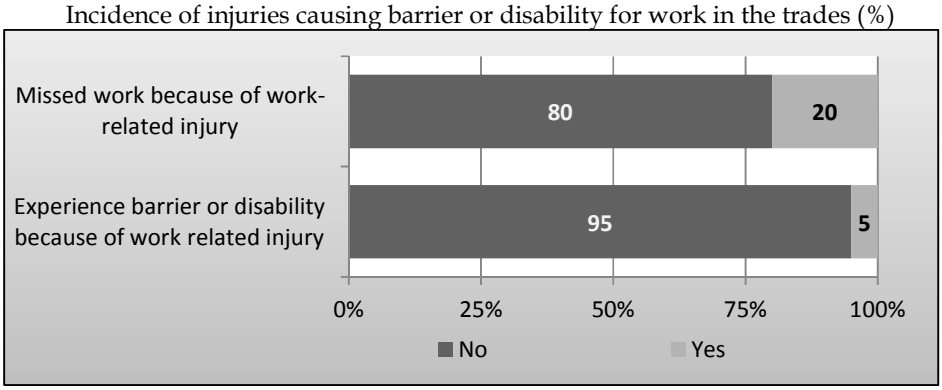
	All Respondents	**Male**	**Female**
Age	**Odds Ratios** (Lower-Upper 95% CI)	**Odds Ratios** (Lower-Upper 95% CI)	**Odds Ratios** (Lower-Upper 95% CI)
15-17	**4.772** (4.659-4.889)	**4.230** (4.112-4.351)	**6.950** (6.616-7.301)
18-19	**4.098** (3.999-4.199)	**3.215** (3.124-3.308)	**7.189** (6.840-7.555)
20-24	**2.569** (2.510-2.630)	**2.116** (2.059-2.174)	**4.210** (4.011-4.419)

Source: CCHS 2010; Sub-sample of employed Canadians

Our analysis of injuries sustained at work demonstrates that the rates for younger employees exceed the overall incidence of such injuries and indicates a higher level of injuries among males. Thus, there is an urgent need for policy measures to protect this vulnerable group as is suggested in several Canadian studies (e.g., Barnetson 2011; Eakin, Champoux and MacEachen 2010; Koehoorn, Breslin and Xu 2008; Shultz and Taylor 2006).

In addition, as Figure 2 illustrates, almost five per cent (4.8 per cent) of youth apprentices in our RAP/OYAP survey sustained serious work-related injuries making it impossible for them to work in the trades. Findings from the 2006 U.S. General Social Survey and the 2005 European Working Conditions Survey are similar to our finding that one in five participants in our RAP/OYAP survey missed work because of work-related injuries during their apprenticeship training.

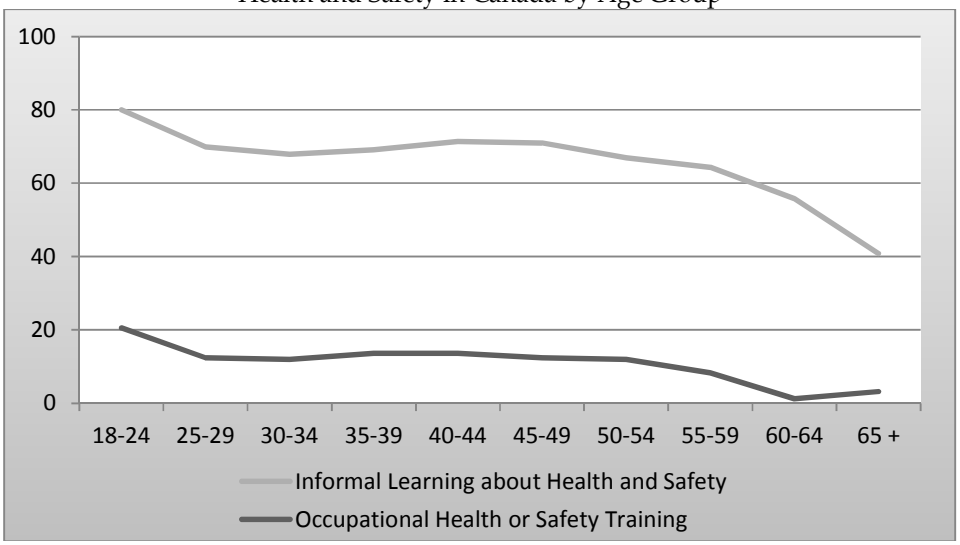
Figure 2
Incidence of missed work days because of work-related injury and
Incidence of injuries causing barrier or disability for work in the trades (%)



Source: RAP/OYAP Survey 2011/2012, N=173

Although health and safety training and awareness of risks at work are widely advertised by government agencies, our analysis of the Work and Lifelong Learning (WALL) survey shows that, on average, only 13 per cent of Canadians participated in formal training in 2004 (declining with age), although a much higher percentage learned about OHS informally (Livingstone and Raykov 2011) (Figure 3).

Figure 3
Participation in Informal and Formal Learning about Health and Safety in Canada by Age Group



Source: Work and Lifelong Learning survey, 2004

Our interviews with former RAP participants confirm the importance of safety training as well as broader health concerns for young workers. RAP was perceived to provide useful orientation to safety in the workplace, first aid, and Workplace Hazardous Materials Information System (WHMIS) training. This was important since workplace training was variable, as this sheet metal apprentice responds when asked if he had participated in safety training, "Besides the RAP stuff, not really. They [employer] just said, watch where your hands are." (Interview #3).

While most employers were perceived to take safety standards seriously, apprentices observed significant differences across companies. For example, a millwright recounts:

> [A]t the sawmill, there was no safety. … You look back on the stuff that I did there and it's just unreal. You remember thinking, if something slips here, you're going to fall.
> *Q: So no harnessing?*
> No, they'd say, "oh, you don't need that." It's a very archaic mentality. … I was actually the safety rep for a crew… We were going in and out of a small vessel continually throughout the year. … I wanted confined space training

> to make us better aware. I was told that there's no such thing as confined space training. On my second day at [a new employer] I spent the whole day in the city in confined space training. (Interview #8)

While the majority of the youth interviewed expressed confidence in their safety training (despite employer variability) and took it seriously, most appeared to be unaware of the long-term health dangers associated with their work. For example, when asked about the effects of the chemicals used in the hairdressing trade, a former RAP apprentice replied:

> I can't even imagine what it's doing to us. I try and wear gloves as much as I can but I don't even smell it [hair products] any more.
> *Q: What do they say about the chemicals in school [in-class apprenticeship training]?*
> Nothing. I don't know how dangerous it is. The bleach, the lightener, there's four different levels of strength. … The second, third or fourth burns when it touches.
> *Q: Do most stylists wear gloves?*
> I know some girls that don't like gloves and they're elbow deep in it. (Interview #39)

Similarly, an apprentice electrician acknowledges that working in the oil sands developments in northern Alberta has health effects:

> *Q: What are the potential dangers in the job?*
> They say if you're brand new in Fort Mac [Fort McMurray] and start working at the plants, they call it the "[name of company] flu". You start getting a really sore throat and your energy is kind of drained, and that's because the pollution up there is so terrible. …You get used to it. When you're done working, you hop in the shower and you've got black coming off you. Just, the air is so thick up there. You've got so many trucks. In the winter time it gets so cold they don't turn anything off. (Interview #1)

Trades workers in this context work shifts (often 12-hour days) plus overtime in remote work camps at higher than average rates of pay, but the long-term health effects are unclear.

In many cases, employees are well aware of factors that influence their health but continue to do their jobs in spite of their awareness of the harm such exposure might cause. Our interviews with young workers suggest a couple of reasons for this. First, power relations at work mean that young, less experienced and precarious workers are less likely to voice their concerns since the most serious obstacle to the completion of apprenticeship is the limited opportunity to find employment (Taylor, Hamm and Raykov 2011). In addition, the fact that most youth apprentices were working with older co-workers may contribute to their silence—their "eagerness to please" (cf. McLosky 2008) is often related to a desire to keep their job. In some cases, youth apprentices were actively discouraged from reporting work-related

injuries because of the consequences for their employer. For example, when asked about his most challenging job, a pipefitter recalls:

> I actually dropped a pipe on my arm before Christmas. It didn't break my arm but it swelled up and I had a big gash on my arm. The only thing that saved me is it was kind of cold out so I had coveralls and two sweaters on.
> *Q: Did you file a report?*
> They [employer] said they didn't want me to, because then it looks bad. If it gets written down and then … it was just a big thing. I couldn't believe it. ...
> *Q: Are people reluctant to report anything?*
> Yeah, it gets that way sometimes. (Interview #42)

In other cases, apprentices did not report accidents because they were afraid of being perceived as incompetent or negligent. Instead, most apprentices comply with employer requests, patiently wait for better conditions, or in extreme cases, leave unsafe workplace; they rarely voice concerns or struggle to improve working conditions and the organizational safety climate (Tucker and Turner 2011).

A second reason for under-reporting relates to the culture in workplaces. Interviews suggest that apprentices are fatalistic about risks in workplaces where particular kinds of injuries are common (cf. Houser 2010). For example, a male chef comments:

> There are added safety issues in a kitchen. I literally play with knives and fire all day. … Mistakes happen, but on average you're gonna slice yourself once a year. You're gonna get a good burn three or four times a year. It happens. If you can't cope with that, better get out of the kitchen. The integrity of a good chef comes from, I cut myself, I'm bleeding like hell, someone hand me a glove so I can keep working. (Interview #30)

In such a context, preventative measures and the development of a safety leadership style are very important (cf. Zohar and Luria 2003).

While apprentices' lack of knowledge of long-term health issues was evident (cf. Koehoorn, Breslin and Xu 2008), as new employees, they were more likely to discuss immediate concerns. For example, this former RAP apprentice, now a Red Seal instrument technician, recounted the stress she felt in her first placement working for a transnational company in an oil upgrader:

> You're unsure of yourself and you want to be safe. I used to be so anxious. When I'd go to work, I sometimes had anxiety during the day. I was just like, 'oh my gosh', because I wasn't completely sure of my surroundings. I didn't know the dangers unless someone told me. (Interview #13)

This interview and others suggest that gender may complicate safety issues. Women working in non-traditional trades, are often less familiar with work in industrial contexts and feel a need to prove their credibility in the

workplace, may be more concerned about asking questions about health and safety and asking for help. For example, when asked if she saw any barriers to achieving her work goals a female welder replied:

> Being sick and being female. … I would take on way too much work and responsibilities. … I kept saying 'yes' and I worked to the point that I made myself physically sick. I went on sick leave on two jobs and that's when I said "I need to get it looked at."
> *Q: Was it mostly stress related?*
> I found out it was stress related.
> *Q: You said being female too – in what sense?*
> Being female in a male trade is very hard. (Interview #28)

This young person faced the added challenge of a learning disability, which is not uncommon among apprentices. Often such disabilities are invisible because youth do not disclose them to employers.

The quotations above point to a larger problem, which is that health and safety decisions are often left up to the employee, for example, the right to refuse work, as noted earlier, presents a greater risk to more precarious workers. For example, a female plumbing apprentice talked about the dangers of drilling holes overhead. She noted that the drill often catches if the drill bits are dull (as they are reported to be in her company), and if the worker is small and cannot hold the tool steady, it can easily slip and cause serious injury. When asked if anyone in her company advised her not to do it, she responded that it was something that she decided not to do, because of advice from her mother, who had also worked in plumbing. When asked if her employer was supportive of her decision, she commented: "Well, the guys [co-workers] complain about it definitely." (Interview #9)

In another case, a male bricklaying apprentice (who later left the trade) recounts being asked by a co-worker to work below him while he was using hydrochloric acid to wash a wall. The apprentice reluctantly complied but then refused to work after feeling drops fall on his arm, and walked off the job. But he reported feeling "devastated" partly because he felt that his co-worker had placed him in an unsafe situation and partly because he was afraid of what his employer would say:

> I had never felt like that before at work and I didn't know if I was in the right or the wrong, if I should've done that or I shouldn't have done that. (Interview #32)

Still in high school, this youth called his RAP teacher, who advised him to tell his employer. This example suggests that teachers as well as students may need more information about workers' rights on the job as well as about health and safety risks in different occupations so that employers are held accountable. It should not just be up to youth to refuse work, which is often a risky activity (Gray 2002). Thus, although safety instruction should be an

employer obligation, schools can play an important role in ensuring that this obligation is met.

Our interviews suggest that organizational factors significantly determine the use of protective equipment and the overall safety climate (cf. Barnetson 2010). For example, when asked if she worried about her health and safety on the job, an apprentice electrician replied:

> We use a … coolant to keep the parts from overheating and burning. When it hits the hot metal from the friction it aerosols, so you're breathing it in. A regular particulate mask won't stop it, you need one of those chemical ones with the fine particles.
> *Q: Do you wear one?*
> No.
> *Q: Are they available?*
> No. It's not required, nor are they available. (Interview #38)

Two of forty former apprentices had already left their RAP trade at the time of our interviews because of health and safety reasons. One young man started in RAP as a heavy-duty mechanic but found that his asthma test results became worse after he started working at an oil sands plant. This youth's mother became concerned and urged him to try other work. A second youth switched from his carpentry apprenticeship to a career as an engineering technologist, describing his decision as follows:

> *Q: How did you end up leaving?*
> Injury, I dislocated my knee. I was installing cabinets and my doctor said it was just prolonged usage of being on my knees. ... Just all of a sudden it popped... So then I had to make a decision whether I wanted to stay there or move on.
> *Q: Did the knee injury influence that decision?*
> A little. That definitely impacted the way I was thinking. Being 22 or 23 and to already have a blown out knee is not a good factor for staying in the career for another 20 years, so that was definitely another factor to it. My body was getting tired. (Interview #51)

A third apprentice had to leave her hairdressing trade for several months because she developed carpal tunnel syndrome. The financial and psychological implications were devastating, as she describes:

> WCB was very difficult because you have to prove how terrible it really is. … I left work crying one day because I couldn't push the button on the brake to put it down in my car. Anyway, [the doctor] wouldn't give me a letter and wouldn't help me at work, so I actually just quit my job. I had no source of income to pay rent or support myself at all. … I didn't even get $500 [from WCB] because I had quit. (Interview #39)

At the time of our interview, five years after the onset of carpal tunnel syndrome, she was about to have an operation for a cyst on her wrist, the

latest in a series of work-related injuries. Not surprisingly, when asked if she saw hairdressing as a long term occupation, she replied, "Yeah, as long as my health holds up."

It was apparent that despite their short tenure in trades, young trades workers' awareness of working and safety conditions was starting to influence their career plans. For example, we had this exchange with a welder:

> *Q: Are you satisfied with the work conditions?*
> Yeah, … you have to work outside in my trade…
> *Q: Does the job get more difficult physically as you get older?*
> Yeah, but I don't plan on being in it for 30 years. (Interview #14)

A few apprentices planned to move to different kinds of work or to own their own business in the future to avoid the long-term physical toll of trades work.

CONCLUSIONS

This study has analyzed a variety of quantitative and qualitative data related to safety and youth in trades. Similar to other Canadian and international studies about workplace safety and apprenticeship generally, we found a high incidence of injuries among youth who had participated in high school apprenticeship programs in Alberta and Ontario. Injuries were often cumulative rather than the result of a single event, and some were serious enough to cause youth to leave the trade. Examples from in-depth interviews with youth apprentices suggest that numerous factors contribute to injuries at work, most of which are related to work conditions and practices rather than the carelessness of individuals (Barnetson and Foster 2012). Our interviews confirm that youth apprentices have limited knowledge of their rights and responsibilities related to safety and are eager to please, as suggested by McLosky (2008). They often lacked information about short-term and long term health risks, and were being socialized into work cultures that discourage voicing concerns about safety. Young women in non-traditional trades appeared to face additional challenges.

The findings that many young apprentices experience a lack of regulated safety practices are in agreement with an extensive analysis of the "upstream" factors (regulations, policies, services and professional practices) that affect health and safety in small workplaces (Eakin, Champoux and MacEachen 2010). Easkin et al. show that misalignment of the occupational health and safety system with the conditions and social relations at work puts workers at significant risk of injury; authors propose a better system for data collection, and an "audit" of OHS-related legislation, policy and interventions. Research also shows that younger workers require special attention regarding knowledge, attitudes and beliefs about safety and the risks of injury at work (e.g., Titchener, Haworth and Lennon 2011). However,

a brief overview of the OHS campaigns in Alberta shows that policy makers focus mainly on individual workers' education and behaviour while paying little attention to "upstream" factors (e.g., WorkSmart and Young Worker Awareness Safety in Ontario, Work Safe Alberta and Heads Up in Alberta, Passport to Safety and JobSafe Canada).

Our study suggests that youth do take occupational health and safety seriously and would be receptive to learning more about it through various forms of formal and informal learning. There are also indications that the combination of information lack and working under pressure prompts some apprentices to take risks that jeopardize their health and cause injuries. Most youth admitted to having concerns about health risks on the job. The low participation in formal learning about OHS documented through our study demonstrates a need to improve this area of training using the most effective methods to encourage youth and other employees to engage in formal education and training. However, it is also important for employers to take a more active role in promoting a culture of safety and to prioritize health as well as safety. As well, government agencies can contribute to the health and safety of youth in trades through more regular inspection of employers, especially those employing higher proportions of youth apprentices (Government of Alberta 2010, 2011). These recommendations stem from our observation that it is usually up to employees to determine what it safe and that longer-term health issues are given less attention than acute injuries at work. In addition to comprehensive preparation of youth apprentices for work in trades, further development of policies, regulations and safe organizational practices is necessary to change workplace cultures where OHS is currently not a priority.

While OHS training is important for all workers, the precarious positions of youth apprentices, and the challenges faced by subgroups within this category (young women and youth with learning disabilities), warrant particular attention. Some partners involved in high school apprenticeship programs have addressed issues of health and safety through mandatory school-based training for youth. However, it appears that more could be done by employers, unions, trainers, and schools to provide more occupation-specific information concerning both short-term and long-term health and safety concerns. At present, apprenticeship programs emphasize the wonderful opportunities for learning and earning provided by trades in Alberta, Ontario and other provinces. While this is important, youth also need to be aware of how they can make trades a more sustainable and fulfilling career. Hopefully, the insights from this study will initiate debate and further study that will contribute to policy interventions and organizational practices that will ultimately increase the well-being of all employees.

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