



ONTARIO ELECTRICAL LEAGUE



Ontario Electrical League: Supporting Employers in Apprentice Training

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We would also like to thank the apprentices and team of the Ontario Electrical League (OEL). Your willingness and openness in participating in our surveys and focus groups have allowed us to understand the barriers you face. Your participation has contributed to our goal of addressing and devising a solution to the gaps commonly faced in the skilled trades.

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

Executive Summary

The Ontario Electrical League (OEL) is a non-profit organization which was originally established as the Electric Home League on January 11, 1922. The organization has over 12,000 members province-wide including electrical contractors, inspectors, utilities, distributors, manufacturers, agents, engineers, educators and more. The OEL is aimed to promote, strengthen, and represent the electrical industry in Ontario.

This report examines the outcomes of a training and mentorship program that supports electrical and plumbing employers' need to train apprentices. Increasing the engagement in developing and delivering a solution to close these gaps in these trades. Active participation and involvement among employers in apprentice training in electrical and plumbing sectors will increase the capacity to train and certify enough workers in the skilled trades to meet the current and future needs of the labour market.

The study was completed in 12 months and comprised of two sections. First, the preparatory period (3 months) comprised of Research Ethics Board approval from the University of Toronto and partnering research institutions. Agreement of all required documents including study protocol, consent forms, survey questionnaire, focus group protocol, and the email scripts between parties was made.

Research staff from the University of Toronto carried out the consent and work with all stakeholders and participants. A mixed-methods sequential explanatory approach was employed, using a cross-sectional questionnaire design followed by focus groups. During the quantitative phase (Phase I), all participants were invited to complete self-administered questionnaires online. The qualitative data collection (Phase II) was met through qualitative focus groups with participants with lived experience of burnout and occupational stress. 11 participants took part in a focus group held virtually using video conference technology using Microsoft Teams, running approximately 60-75 minutes.

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https://www.restore.rehab/files/ugd/edcbdf_3d5b4c568d7e41969a44a57b8cc5950a.pdf

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Introduction

The following sections comprise this report:

Section 1 provides an overview of this report and an introduction to the framework.

Section 2 outlines the literature relevant to this report and project. This section provides detail to the common demographic visible within this population, the barriers faced in this field, the impact of mental health, and the recent Covid-19 impact.

Section 3 highlights the methodology of this project, how it came to be, the purpose of this project, the research questions, and how the study was conducted, how the qualitative and quantitative phases will be carried out.

Section 4 presents the findings of the qualitative and quantitative results.

Section 5 provides a discussion and overview of the significant results and the importance of this report.

Section 6 addresses and offers recommendations based on the results of the findings.

Terminology

Table 1. Terminology

Apprentice	A qualified trainee who has signed a written agreement with their sponsor and the Ministry to receive the opportunity to learn and work in a designated trade.
Apprenticeship training	A pathway that combines technical learning and supervised workplace training. The two components will aid in the apprentice to gain knowledge, understanding and skills aligned with their designated trade.
Certificate of Completion of Apprenticeship	A certificate issued to the apprentice upon completion of the final level of training for their designed trade.
Certificate of Qualification	This certificate is obtained when the apprentice completes the written exam that examines the individual's knowledge and proficiency in their designated trade.
Compulsory Trades	Requires a registered apprentice or journeyman to work in the trade.
Designated Trade	Trade occupations under The Apprenticeship and Trade Certification Act, 1999.
Journeyman	A recognized and qualified skilled professional who has completed their Apprenticeship certification and has received their certificate of qualification. They can train and mentor other apprentices.
Red Seal Program	An endorsement used to enhance a journeyman's certificate of qualification. Indicates that a tradesperson has achieved the competency required the national standard in their designated trade. They

	are licensed to practice their trade in any Canadian province and territory.
Skilled Trades	Refers to an occupation that requires skilled labour and knowledge of the subject.
Voluntary Trades	An individual is not required to obtain a certificate or license to practice their trade legally.

List of Abbreviations

- CBI Copenhagen Burnout Inventory
- NIOSH National Institute for Occupational Safety and Health
- OEL Ontario Electrical League
- OS&OT Occupational Science and Occupational Therapy
- PTSD Post-Traumatic Stress Disorder
- REB Research Ethics Board
- UofT University of Toronto

About the OEL

The Ontario Electrical League (OEL) is a non-profit members-based organization that represents the electrical industry in Ontario¹. Their goal is to promote, strengthen and represent the electrical industry in Ontario as they bring current issues in the industry (e.g., labour laws) to the attention of various government authorities through chapter meetings, conference's seminars, trade shows, training programs and government relations initiatives. Additionally, the OEL helps with the hiring process for companies seeking apprentices. This includes providing a hiring tool to find qualified apprentices and training to assist employers with the required paperwork and information. The OEL membership includes more than 12,000 individuals that span across Ontario and is supported by a provincial office. As an employer-based organization established 100 years ago, OEL is a staunch supporter of apprenticeship, one of the oldest, most respected forms of education and training.

About the University of Toronto (UofT)

The University of Toronto was founded in 1827 and is Canada's top university. The University of Toronto is one of the world's top research-intensive universities, bringing together top minds from different backgrounds and disciplines to collaborate. Their goal is to prioritize city building, international partnerships and transformative education to strengthen their standing as a globally ranked research powerhouse and leader in research-intensive education.

The Department of Occupational Science and Occupational Therapy (OS&OT)

The Department of Occupational Science and Occupational Therapy at the University of Toronto is a place to learn the knowledge and skills of occupational therapy that will lead to a Master of Science in Occupational Therapy degree. The Department of Occupational Science and Occupational Therapy provides excellence in research and teaching in occupational science and occupational therapy and contributes to the well-being of the population by advancing knowledge regarding engagement in life's occupations. Furthermore, the Department of OS&OT provides graduate and continuing education programs that enable occupational therapists to be leaders in research, clinical practice and the promotion of health and well-being.

Temerty Faculty of Medicine

The Temerty Faculty of Medicine at the University of Toronto overlooks the medical education and rehabilitation sciences departments and programs, including the Department of OS&OT.

About the ReSTORE Lab

The ReSTORE (Rehabilitation Sciences Through Occupational Research and Engagement) Lab was created in 2021 and is led by Dr. Behdin Nowrouzi-Kia. The ReSTORE lab is a

multidisciplinary research group with backgrounds in occupational therapy, occupational health and safety, work disability prevention, work ability and stroke rehabilitation. The mission of the ReSTORE lab is to identify and assess risk and to develop occupation-based interventions to improve mental and physical health in the workplace. Using a biopsychosocial lens, the ReSTORE lab seeks to understand how work disability extends towards personal characteristics (e.g., psychosocial) and environmental (e.g., healthcare system, workplace, workers' compensation system) factors to improve health outcomes.

ReSTORE Lab Members

Dr. Behdin Nowrouzi-Kia Ph.D. is an assistant professor in the Department of Occupational Therapy and Occupational Science, where he also holds the inaugural Emily Geldsaler Grant Early Career Professorship in Workplace Mental Health. Through an occupational lens, his research program is a systematic study of occupations in the areas of work disability prevention, return to work, and disability management. This approach is designed to produce results directly applicable to identifying and assessing risk and developing interventions for preventing or improving high-risk behaviors in the workplace. Dr. Nowrouzi-Kia's work is motivated by efforts in the field of work disability prevention that extends beyond the efforts to prevent or cure diseases from a purely physical perspective, toward more holistic approaches

Dr. Ali Bani-Fatemi is a Postdoctoral Fellow at the Centre for Addiction and Mental Health, Toronto, and the Department of Occupational Science and Occupational Therapy at the UofT. His research focuses on evaluating the influences of genetic and epigenetic alterations as potential risk factors for suicidal behavior. Using a biopsychosocial approach, he investigates the socio-cultural and clinical variables that may be related to suicidality. He has expertise in conducting rigorous research and has strong methodological experience in review studies, quantitative methods, and analyses.

Aaron Howe is a graduate student at Columbia University, where he is completing his studies in Clinical Psychology. He has previously worked at the Centre for Addiction and Mental Health on various projects related to investigating epigenetic and genetic mechanisms of suicidal behavior in adult schizophrenia spectrum patients. Aaron has a passion for studying the intersection between psych neuroendocrinology and evidence-based mental health treatments for children and adolescents. He has joined the ReSTORE Lab in March 2022 to contribute to mental health-related projects.

Dr. Fatin Akeela is highly experienced as a general physician in different countries outside Canada and has a post-graduate diploma in clinical research. She first joined the team as a research assistant in January 2022. She has solid knowledge of clinical research methodology and documentation. She is passionate about helping others, and that is why she works in rural areas to survey living standards, provide counselling, health and sanitation education, vaccinations and various cancer screenings, volunteer for charity and interpretation to help people with their language barriers.

Joyce Lo is a fourth-year co-op student at the University of Toronto Scarborough, specializing in Mental Health Studies. Her research interests include occupational and mental health. Joyce joined the ReSTORE Lab in September 2021 and has been contributing as a Research Assistant. She is currently working on projects that look at workplace well-being in different healthcare provider groups as well as skilled trades workers.

Sharan Jaswal is in her third-year at the University of Toronto Scarborough, where she is in the progress of completing a Specialist Program for Psychological and health sciences (co-op). She has interests in research science and occupational science and therapy. In January 2022, Sharan joined the ReStore lab as a Research Assistant, and is working on different research projects.

Dr. Ajith Krishnan is a Public Health Dentist with more than two decades of teaching and research experience. His key areas of interest are Public Health Research, Epidemiology, and Evidence-Based Dentistry. He has held several chief academic and administrative positions at various levels during his career. Ajith holds a Post Graduate Diploma in Clinical Research and is currently pursuing an Applied Clinical Research Certificate program at McMaster University, Hamilton. He has over 50 publications in various scientific journals including PubMed indexed journals. Ajith joined the team as a volunteer in February 2022.

Background Information: Review of the literature

Demographics

Apprentices

The average apprentice age in Canada is 26 to 27 years old² and the average apprentice age in Ontario is 29 years old³. Canadian apprentices are typically men (86.3%), and Canadian born (91.3%)². Approximately 13.7% of apprentices in 2015 were women, 8.7% were immigrants and 6.3% were aboriginal. The majority (55.7%) of apprentices have a high school diploma as their highest level of education when starting an apprenticeship.

Industry

In 2021, there were approximately 140,000 women employed in Canada's construction industry⁴, which is only 5% of the nearly 1.1 million tradespeople employed in the industry. Additionally, the Canadian construction labourforce is made up of approximately 4.9% Indigenous peoples and 16% new Canadians.

There are five sectors comprising Canada's skilled trades, construction, transportation, manufacturing and industrial, services and information and digital technology⁵. The top 15 largest Red Seal Trades in Canada include automotive service technician, boilermaker, bricklayer, carpenter, construction electrician, cook, hairstylist, heavy duty equipment technician, industrial mechanic, mobile crane operator, plumber, refrigeration and air conditioning mechanic, sheet metal worker, steamfitter/pipefitter, and welder⁶. Trades in demand nationally include a boilermaker, bricklayer, cook, hairstylist, welder, and industrial mechanic.

Challenges in Apprenticeship Training

Skilled trade labour shortage

Ontario faces a serious labour force shortage in the skilled trades⁴. As Ontario's construction market is predicted to resume growth after 2021, the industry will need to hire, train, and retain more than 116,200 additional workers to keep up with the expected demand growth and to replace the 92,500 workers (21% of the current labour force) expected to retire. There are a variety of factors that contribute to Canada's shortages in the skilled trades, including the system's failure to expand beyond the traditional group of the manual-technical trades, underrepresentation of minority groups (e.g., women, visible minorities, indigenous population), and the lack of appeal to youth with academic capability⁷.

The House of Commons Canada (2019)⁸ indicates lack of awareness and economic barriers to labour mobility as the main factors affecting the skilled trades labour supply. For example, there is a lack of awareness about the career options in the skilled trades. There is generally a lack of knowledge about the diversity of jobs within the skilled trades, from the types of professions to salary range. Additionally, many high schools do not have Ontario Youth Apprenticeship Program coordinators to educate students on apprenticeship programs. There is

also a lack of awareness about federal and provincial apprenticeship supports such as the Canada Apprenticeship loan of the Apprenticeship Completion Grant. Labour mobility has a positive impact on skilled trades labour shortages as it allows workers to pursue work opportunities outside their region when facing economic challenges. However, there are economic challenges such as costs to traveling to work given the high cost of living in the Greater Toronto and Hamilton Area. It is also costly for employers to temporarily accommodate workers from other regions. Despite the diversity of occupations in the skilled trades, the appeal has declined with the shift in occupational preferences since the mid-2000s. The five largest sectors of trades account for more than one third of the total labour force in the trades⁹.

The age structure of the skilled trades in Canada can also be associated with the labour shortage. As the experience and knowledge of aged workers retire, the slower the growth in new workers and delayed labour force can be seen. The aging phenomenon is having a negative impact on the ability to maintain the competitive workforce⁹. Although, some occupations in the skilled trades are not affected by this phenomenon. Occupations such as plumbers, electrical trades, carpenters, and other construction trades are dominated by younger workers. However, heavy equipment operators, transportation, equipment mechanics remain susceptible to the aging phenomena⁹.

Apprenticeship system in Canada

Adding to the labour force shortage, there are inadequate training opportunities provided through apprenticeships. According to a Canadian Apprenticeship Forum report, only 1 in 5 employers in the skilled trades hire and train apprentices. Yet, apprentices spend 80-90% of their training time on-the-job. In a Canadian study by Meredith (2011)⁷, the majority of apprentices specify that they do not receive employer support during their training. While a low apprenticeship wage may deter employees from undertaking an apprenticeship, a high wage may deter employers from providing apprenticeships¹⁰. The Canadian apprenticeship system has been under review for the past decade, regarding issues in areas such as the low number of completions relative to total registrations¹¹. Apprenticeship registration growth is highly cyclical and is closely associated with the unemployment rate. As the demands of the labour market continue to develop, the apprenticeship system in Canada fails to adapt to these demands¹¹.

Completion of apprenticeship programs

Some design features of apprenticeships can restrict entry into the trade and deter completions. This includes the lengthy programs, the restrictive scope of practice in the compulsory trades, strict testing with low pass rates on the exams, the requirement of extensive classroom training and/or requiring a high school diploma¹⁰. On average, an electrician apprenticeship program takes 5 years to complete¹². The length of the program can be deterring for individuals with families as they are more likely to experience family changes¹⁰. The length of the program can also deter employers from providing apprenticeship training since they face considerable uncertainty as to whether they can sustain the training and provide journeypersons to provide the training. Classroom training, which is 840 hours in

Ontario, can also deter individuals from completing the apprenticeship program. This requirement affects individuals living in isolated or rural communities, such as Indigenous persons.

Mental Health in Skilled Trades Apprentices

Internationally, suicide rates within the construction industry are disproportionately high as males working in the construction section are one of the highest occupational risk groups for suicide¹³. To add, evidence suggests that rates of suicide in younger and less-skilled male construction workers are double compared to other young males. Statistics Canada found that men between the ages of 45 and 59 are at the greatest risk for suicide among this population. Due to the high segregation of males within the skilled trades, this provides an explanation as to why the rates of suicide are higher among men than females¹⁴.

According to the Construction Industry Rehabilitation Plan, approximately 83% of construction workers have experienced moderate to severe mental health issues¹⁵. It is well-documented that psychosocial stressors (e.g., bullying) related to the work environment can increase the risk of mental illness. Other factors associated with this include substance abuse, relationship issues, job security, financial strain and the contribution of masculine norms in the workplace and culture (e.g., self-reliance and suppressing emotion), and injury rates. Workers in the construction industry are also susceptible to high risks of depression and anxiety across the globe. A study by Stocks et al (2010)¹⁶ found that due to workplace hazards, post-traumatic stress disorder (PTSD) was quite high among construction workers.

There are other demographic factors that have been associated with poor mental health in skilled trades apprentices. A Study by Ross et al (2020)¹⁷ found that age, sexual identity, apprenticeship status, occupation type, and highest level of education were significantly associated with suicidal thoughts in construction apprentices. As mentioned, age is one contributing factor associated with mental health in skilled trades apprentices. Young people face delays in transitions to adulthood that may continue into their 30's, which postpones key priorities such as becoming financially independent, engaging in significant relationships, and transitioning to parenthood¹⁸. To add, entering the labour force is often challenging and stressful, particularly for young people with lower educational attainment. Participants who identified as LGBTI+, were non-active in their apprenticeship status, did not have an employer, and training in civil or outdoor construction were more likely to experience suicidal thoughts than their counterparts.

Covid-19 Impact

Coronavirus first emerged in 2019, has left and continues to create severe consequences worldwide. Covid-19 has had a direct impact on the economy, with many countries have faced detriments to their economic growth¹⁹. Implications of business have been a considerable factor in the effects of the pandemic. The Work-From-Home notion has been implemented by

companies and businesses around the world to accommodate services¹⁹. However, many occupations deemed essential were permitted to perform work responsibilities onsite. Covid-19 has seriously impacted the skilled trades. In Canada, approximately 3 million skilled trade jobs were lost in 2020. Among the Red Seal trades, employment decreased by 30%¹⁹. Statistics Canada collected data of the impact of Covid-19 on skilled trades, and found that from the 28 weeks [Canada Emergency Response Benefit \(CERB\)](#) was available, 38% of journeypersons in Canada at least once received the benefit²⁰. Whereas, one-third of the general working population received the benefit. Women in the skilled trades were more likely to receive the benefit, 56% of female journeypersons collected the benefit, compared to the 36% of their male counterparts²⁰. Apprenticeship programs, training, in-person learning, placements experienced interruptions since the beginning of the pandemic²¹. Real gross domestic product (GDP) in the construction industry is estimated to deteriorate until 2028. Projects, labour shortages, job loss, and financial impact have been significant impacts on the construction industry stemming from Covid-19²¹.

Diversity, Inclusion, Equity

Male-dominated industries have undervalued women's work and participation. The skilled trades are a distinct male-dominated workforce which has presented barriers resulting in the underrepresentation of women within this field²². Gender isolation and segregation are apparent across occupations in the skilled trades, especially in many Western nation. In Australia, women make up 1-3% of trades, 2% in Canada, and less than 3% in the United States²³. Registration and entry of women into the apprenticeship program is quite low. Only 9.3% of all national apprenticeship registrations in 2002 were comprised of women applicants²². Entry in apprenticeships presents a variety of barriers to women surrounding discriminatory hiring practices such as stereotyped perceptions of women's abilities and capacity of work, unequal pay and sexual harassment^{22,23}. Women account for 4.4% of all registered apprentices with the Ontario College of Trades²⁴.

Women's involvement in male-dominated sectors is to a minimum and are focused on traditionally perceived women trades or "pink trades" such as cooking and hairdressing, and cosmetology²⁵. Women in apprenticeships are 1.5 times more likely to abandon and/or prolong their apprenticeships than the average apprentice. This is likely due to the barriers and challenges women and other underrepresented groups face²⁶. Furthermore, in 2017 the Registered Apprenticeship Information System (RAIS) found that only 9% of Red Seal of continuing apprentices in Canada accounted for women. However, this percentage decreases to 4% when "pink trades" were excluded²⁴. Underrepresentation of women in skilled trades is widespread across Canada. In Ontario, women represent 13% of the construction industry, 69% working within this sector responsible for administrative and management positions, and 31% working directly on projects revealed by Build Force Canada²⁴. Most common trades such as construction, automotive and industry trades include less than 3% of women.

Canadian women apprentices are about 12% less likely to be employed than men in male-dominated trades (e.g., mechanical, electrical, metal, vehicle and related, architectural,

construction²⁷. On average, compared to men, Canadian women work 3.8 fewer hours than their male counterparts in male-dominated fields, are less likely to be in a union (43% versus 35%) and are less likely to have extended benefits (70% versus 60%)²⁷.

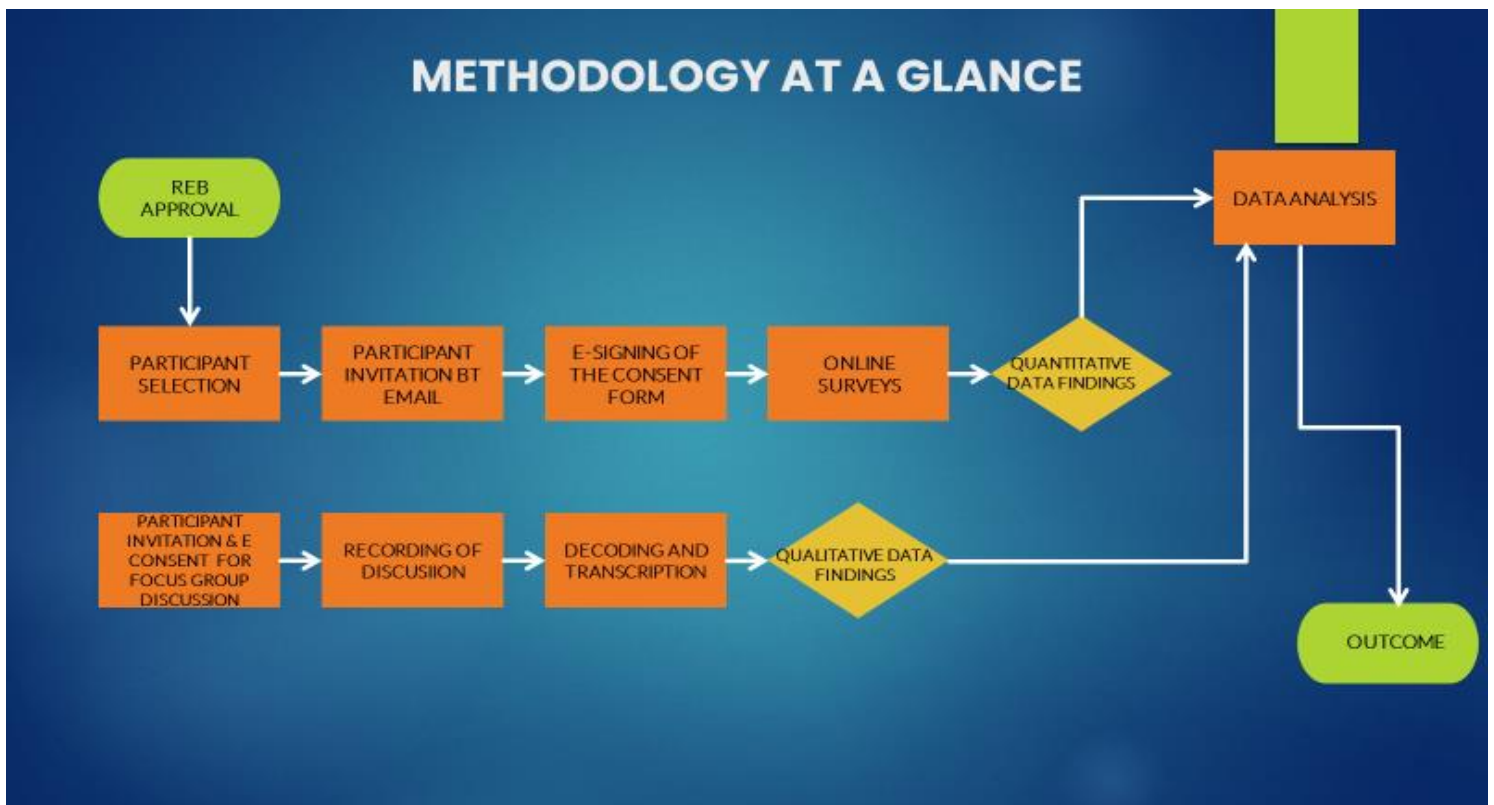
In addition to the aging population, the lack of diversity is one challenge contributing to the skilled trades labour shortage. This includes the lack of visible and non-visible minorities, women, Indigenous groups, and individuals with disabilities. Breaking the stigma and identifying barriers in underrepresented groups can encourage participation in apprenticeship training in addition to making apprenticeship training more accessible as these groups can be used to meet future demand²⁸. The Ministry of Labour, Training and Skills Development (2021)²⁹ recommends establishing multiple subcommittees with members of historically underrepresented groups to aid in planning, feedback and promoting skilled trades to these groups.

Methodology

Preparatory period and participant selection

The study was conducted to (1) examine the mental health outcomes among electricians and plumbers in Ontario and (2) to evaluate the impact of a mentorship program conducted by the OEL to increase the number of employers involved in apprenticeship training to have the capacity to train and certify enough workers in the skilled trades to meet the current and future trades in the labour market. This 12-month study commenced on April 1st, 2021. The first three months were considered the preparatory period wherein the Research Ethics Board (REB) approval was obtained from the UofT and partnering research institutions. During the remaining nine-month, online surveys and focus group discussions were conducted. Forty participants were included in this study (33 employers, five newly recruited apprentices, and two mentors). These participants were selected by using a sample of convenience. Convenience sampling (also known as availability sampling) is a specific type of non-probability sampling method that relies on data collection from population members who are conveniently available to participate in the study. The resources provided include employer outreach, mentoring, training, and hiring tools. Employer outreach was achieved by contacting employers who were not currently participating in apprentice training and by educating the employer on the advantages of training apprentices.

Figure 1. Overview of methods



Subsequently, a qualitative method can be applied to find subjective nuances from participants as persons and describe the phenomenon behind the numbers that cannot be explained simply by quantitative data. This approach can be used in both social and behavioral sciences research³²⁻³⁴.

Figure 2. Overview of explanatory sequential mixed methods

EXPLANATORY SEQUENTIAL MIXED METHODS RESEARCH



Data Collection

Quantitative Data Collection

The OEL invited participants to take part in an online survey using an email script created by the researchers from the University of Toronto. Prior to accessing the online survey, the study participants had to complete a consent form. The survey measures were developed by the principal investigator using validated questionnaires and was administered by trained research staff. The survey questionnaire (See Appendix A) was a 38-item questionnaire which helped in collecting demographic data including gender and sex, age, ethnicity, marital status, educational attainment, years of experience working as an electrician or a plumber, the number of years working, area of clinical practice, hours of work per day and in a week, overtime hours worked, income, and travel time required for work.

The questionnaire also included an inventory of factors experienced as occupational stressors and burnout based on the Copenhagen Burnout Inventory (CBI)³⁵, and the National Institute for Occupational Safety and Health Generic Job Stress Questionnaire (NIOH Generic Job Stress Questionnaire)³⁶. The CBI is a questionnaire with three subdivisions: Personal burnout, work-related burnout, and client-related burnout. Personal burnout is the degree of physical and psychological tiredness and exhaustion suffered by a person. Work-related burnout is the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to their work, and the client-related burnout is the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to their work with clients (colleagues in this study). The PSS was originally developed in 1983 and, remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. NIOSH Generic Job Stress Questionnaire, which measures the most accepted contributors of occupational stress: physical environment, role ambiguity/conflict, level of control, administrative and co-worker support, workload, and skill demand. The NIOSH Generic Job Stress Questionnaire was created by the NIOSH and is utilized worldwide for the collection of data and assessment of occupational stress research. The NIOSH Generic Job Stress Questionnaire was designed to provide a generic questionnaire and scale that could be used across occupations as well as allow collapsing and expansion of scales. The NIOSH Generic Job Stress Questionnaire comprises concepts related to stressors that would be anticipated to take the lead to some form of occupational strain in the worker as well as factors that may affect the way the worker responds to those stressors. The NIOSH Generic Job Stress Questionnaire was used to determine overall job stress through the following concepts: (1) job satisfaction, (2) nonwork activities, (3) social support, (4) work hazards, (5) self-esteem, and (6) your job³⁶. These items will be measured on an index scale from 1 to 5.

Qualitative Data Collection

Similar to quantitative data collection, the OEL invited participants to take part in the focus groups using an email script created by the researchers from the University of Toronto. The study participants had to complete a consent form prior to participation in the focus groups. A focus group operates with the help of a skilled moderator who accelerates a discussion with a small, chosen group of participants for a certain amount of time. Qualitative data was collected from the focus group discussion. This method emerged as a qualitative data collection approach and a bridging method for the scientific research³⁷. Eleven participants took part in two focus group discussions (six in focus group session one, and five in focus group session two), held virtually using video conference technology by Microsoft teams. The session began by making the participant comfortable through information conversation that included confirmation of their name and brief work history. Confidentiality issues were discussed, including informing participants that only the research team would have knowledge of what the participant discussed, and that the discussion content would be combined with other focus group data for analysis. The focus group moderator requested permission to record the focus group and explained the importance of recording for the accuracy of data collection. Participants were also invited to provide their contact information if they wished to receive a one-page summary of the study findings upon completion of the project. Although it was stated and participants were informed in the consent form, they were reminded that at any point in time they were

free to leave if they were not comfortable with the focus group discussions. Furthermore, they were informed that their information might be used in the designing and/or preparing the report which would be submitted to OEL and/or any regulatory agencies from time to time, including the Government of Ontario. However, it was assured that their personally identifying information would not be released, unless asked by the law. Each focus group was conducted for 60-75 minutes. The focus groups had discussions on various aspects of apprenticeship like long-term apprentice retention, diversified, well-rounded apprentice recruitment, etc. (the focus group protocol has been appended at the end of this report). The focus groups in this study were participatory and empowering and generated excellent data on group views, beliefs and reasons, and collective action.

Data Analysis

Quantitative Data Analysis

The quantitative data were analyzed in SPSS Statistics version 25 to determine the demographic, work-related predictors of stress, and burnout using descriptive and inferential statistics. Appropriate checks were made to ensure that assumptions of normality were followed without any violations, apart from the application of quality assurance checks by re-entering 25% of the randomly selected sample. Weighted Cohen's Kappa statistics were used to find out the inter and intra-examiner variability. The collected data was presented, summarized, and analyzed by using the various statistical methods like various graphs, and/or diagrams, and tables measures of central tendency (mean, median and mode) and dispersion (range, standard deviation), etc.

Qualitative Data Analysis

Qualitative data analysis used a thematic approach to discern themes. Even though there are many ways to approach thematic analysis, Braun and Clarke's six-stage inductive thematic analysis was used in this study to analyze the qualitative data. This is a 6 step or stage framework and is the most influential approach because it offers such a clear and usable framework for doing thematic analysis. The goal of thematic analysis is to identify the themes, i.e., patterns in the data that are important or interesting, and use these themes to address the research or say something about an issue. The use of the thematic analysis approach discerns themes and one level of subthemes per theme^{38,39}. The focus groups were moderated by one of the authors (BNK). The groups were audio and video recorded using Microsoft Teams (version 1.5.0) and transcribed verbatim by a professional transcription company. The transcription was validated by one of the authors (ASH) by independent review of the audio-visual recording.

The research staff and the principal investigator reviewed all transcripts and created and defined descriptive codes from the text of each focus group. Coding was descriptive and led to a representation of key concepts and ideas in the focus group transcripts. Three coders independently coded the focus group transcripts, after which they met to compare their respective applied codes to ensure consistency in the interpretation of their findings. NVivo is a software program used for qualitative research. Specifically, it is used for the analysis of

unstructured text, audio, video, and image data, including (but not limited to) interviews, focus groups, surveys, social media, and journal articles. Code node feature in NVivo was used to identify the topics. Analytic coding helped in creating categories as well as themes and subthemes through active questioning of the data. Data collection and analysis were reflexive and iterative by using a reflexive research journal. Member checking was used to ensure factual accuracy and authenticity of the participants' responses about job stress. Qualitative data was analyzed using an evidence-based, generic qualitative framework as described by Bradbury-Jones et al. 2017⁴⁰ and through a data-driven thematic analysis approach. There was no reliance on a theoretical or pre-existing coding schedule developed by the researchers or the OEL. Three researchers identified codes in the focus group transcription independently using NVivo 12 (version 12.7.0). Key themes were generated by the researchers co-operatively and were subsequently reviewed by the principal investigator to ensure standardization and relevance to the research question. Supporting quotes reviewed in the transcription were collated based on relevance to each theme and associated sub-theme. Impactful quotes were annotated in NVivo to be incorporated in the research findings. Data visualization was conducted using Microsoft Visio.

Results

Quantitative findings

Overview

Using SPSS Statistics, version 25, descriptive statistical analysis was performed to examine participants' demographic characteristics, smoking, employment status, and importance and availability of the work-related factors that keep employers and apprentices working as their current position in their current workplace. We achieved the target sample (n=40) by using a mixed sample of employers, mentors, and apprentices/employees.

Ninety five percent of the participants were male with an average age of 48 years. The findings showed that over 87% of the study participants were born and/or raised in Ontario and more than 97% of them got their training in this province. Non-smokers were most of the study participants with 27 individuals (67.5%).

Demographic characteristics of study participants

Table 2 shows the socio-demographic characteristics of the study participants. The participants' ages ranged from 18 to 77 years with an average of 48 years. The sample included only two females and 38 of the study participants identified themselves as males. Fifty five percent of the study participants had a college certificate or diploma (n=22), while 27% had completed high school and 10% were university undergraduates and graduate (n=4). Nearly seven percent of the participants (n=3) described their education level as master electrician or trade certification via apprenticeship. All but one of the participants received their training in Ontario (n=39). The vast majority of participants were employed in the electrical sector (n=37), while two individuals were employed in the plumbing sector, and one was employed in the non-electrical or plumbing sector. Out of 40 individuals who participated in this study, only three persons were union members. The results of the survey showed that only two participants did not intend to stay in their current position for the next five years and 31 participants showed their willingness to stay in their current position for the next five years. One participant was retired in 2019, and five participants will be retired within the next 5 years. Among the survey respondents, 47.5% of the participants (n=19) have gross annual income more than \$80,000, while 32.5% (n=13) have gross annual income less than \$80,000.

Importance of Work-related factors

To find out the importance of the factors that keep the employers and apprentices/employees working as their current position in their current workplace, we conducted a survey with 19 work-related factors we adopted from a previous questionnaire created by the primary investigator of the study (Dr. Nowrouzi-Kia)⁴¹.

Workplace Safety (54%), family commitments (51.3%), income and benefits (48.6%), and full-time employment opportunities (45.9%) were found to be the most crucial factors to keep study participants working as their current position in their current workplace. On the other

hand, leave of absence for external training (51.3%), Financial support for external training (43.2%), and Career advancement possibility (40.5%) were described as the least important factors by the study participants (Table 3 and Figure 3).

Availability and satisfaction with the work-related factors in current workplace

Similar to the previous questionnaire, the survey participants were assessed by an 18-factors self-reported questionnaire adopted from another questionnaire that was created by Dr. Nowrouzi-Kia in a previous study⁴¹, to identify the availability and their satisfaction with those factors in their current workplace. Full-time employment opportunity (86.1%), opportunity for apprentices to become a fully licensed electrician (80.6%), flexible scheduling for family commitments (75%), flexible scheduling for external training (72.2%), and involvement in organization decision-making (72.2%) were the most common factors that participants believed are available to their satisfaction in their current workplace. However, 21.6% of the participants believed that “career advancement possibility” was not available in their workplace (Table 4 and Figure 4).

Burnout

Table 5 shows the level of burnout in the study participants that were analyzed using the CBI³⁵. Our findings showed that only a few participants experienced a moderate burnout (average score of 50 to 74) including personal burnout (n=7), work-related burnout (n=2), and colleague-related burnout (n=2). However, none of the participants indicated a high or severe burnout.

Table 2. Demographic characteristics of study participants (N = 40).

Demographic variables		Frequency (n)	Percent (%)
Born and/or raised in Ontario	Yes	35	87.5
	No	5	12.5
Marital Status	Married/Common-law	32	80
	Single	6	15
	Divorced	1	2.5
	Widowed	1	2.5
Education Level	Completed high school	11	27.5
	College certificate/diploma	22	55
	University Undergraduate and graduate	4	10
	Other	3	7.5
Training obtained in Ontario	Yes	39	97.5
	No	1	2.5
Primary language	English	36	90
	French	1	2.5
	Spanish	1	2.5
	Ukrainian	1	2.5
	Romanian	1	2.5
Ethnicity	White North American	29	74.3
	White European	6	15.4
	Other	2	5.1
	Asian East	1	2.6
	Aboriginal	1	2.6
Smoking	Non-smoker	27	67.5
	smoker	13	32.5
Current employment	Employed in electrical sector	37	92.5
	Employed in plumbing sector	2	5
	Employed in non-electrical/plumbing sector	1	2.5
Belong to a Union	No	37	92.5
	Yes	3	7.5
Average overtime hours per week	None	21	60
	5 hours or less	5	14.3
	6 – 10 hours	7	20
	More than 10 hours	2	5.7
	Yes	31	94

Intend to stay in current position for the next 5 years*	No	2	6
Gross annual income	Less than \$80,000	13	32.5
	More than \$80,000	19	47.5
	Prefer not to answer	8	20

*One participant was retired in 2019, and 5 participants will be retired within the next 5 years.

Table 3. Importance of the factors that participants believe keep them working as their current position in their current workplace (N=40).

Factors	Not important		Important		Extremely important	
	Frequency (n)	Percent %	Frequency (n)	Percent %	Frequency (n)	Percent %
Career advancement possibility	15	40.5	10	27	12	32.4
Cost of Living	6	16.2	16	43.2	15	40.5
Existing leadership	10	27	17	45.9	10	27
Facility and workplace equipment/resources	11	29.7	18	48.6	8	21.6
Family commitments	3	8.1	15	40.5	19	51.3
Financial support for external training	16	43.2	12	32.4	9	24.3
Flexible scheduling for external training	10	27.8	14	38.9	9	25
Full-time employment opportunity	9	24.3	11	29.7	17	45.9
Income and benefits	2	5.4	17	45.9	18	48.6
Internal staff development opportunity	12	32.4	18	48.6	7	18.9
Involvement in organization decision-making	6	16.7	17	47.2	12	33.3
Leave of absence for external training	19	51.3	14	37.8	4	10.8
Orientation program for new staff	12	32.4	18	48.6	7	18.9
Peer support	10	27	20	54	7	18.9
Stable staffing/minimal turnover	5	13.5	17	45.9	15	40.5
Workload allocation	7	18.9	19	51.3	11	29.7
Workplace Safety	5	13.5	12	32.4	20	54
Opportunity to become a fully licensed Electrician (For apprentices)	11	35.5	7	22.6	13	41.9
Opportunity/support to qualify as Master Electrician	12	38.7	9	29	10	32.25

Table 4. Availability and satisfaction with the following factors in current workplace (N=40).

Factors	Not available		Available but needs improvement		Available to my satisfaction	
	Frequency (n)	Percent %	Frequency (n)	Percent %	Frequency (n)	Percent %
Career advancement possibility	8	21.6	4	10.8	25	67.6
Effective management	4	11.1	7	19.4	25	69.4
Facility and workplace equipment/resources	4	10.8	10	27	23	62.2
Financial support for external training	7	20	10	28.6	18	51.4
Flexible scheduling for external training	5	13.9	5	13.9	26	72.2
Flexible scheduling for family commitments	3	8.3	6	16.7	27	75
Full-time employment opportunity	3	8.3	2	5.5	31	86.1
Internal staff development opportunity	5	13.9	10	27.8	21	58.3
Involvement in organization decision-making	4	11.1	6	16.7	26	72.2
Leave of absence for external training	3	8.3	10	27.8	23	63.9
Orientation program for new staff	6	16.7	11	30.5	19	52.8
Peer support	5	13.9	11	30.5	20	55.5
Salary and benefits	3	8.3	11	30.5	21	58.3
Stable staffing/minimal turnover	3	8.3	12	33.3	21	58.3
Workload allocation	3	8.3	11	30.5	22	61.1
Workplace safety	1	2.8	9	25.7	25	71.4
Opportunity to become a fully licensed electrician (For apprentices)	6	19.3	0	0	25	80.6
Opportunity/support to qualify as Master Electrician	7	21.9	3	9.4	22	68.7

Table 5. Copenhagen Burnout Inventory

Type of Burnout	Mean [SD]	Moderate burnout* (n)	High burnout* (n)	Severe burnout* (n)
Personal burnout	33.48 [16.60]	7	0	0
Work-related burnout	25.63 [13.21]	2	0	0
Colleague-related burnout	17.56 [16.32]	2	0	0

**In the Copenhagen Burnout Inventory, scores of 50 to 74 are deemed to be 'moderate burnout', 75-99 is deemed to be high burnout, and a score of 100 is deemed to be severe burnout (Creedy et al., 2017).*

Figure 3. Importance of the factors that participants believe keep them working as their current position in their current workplace

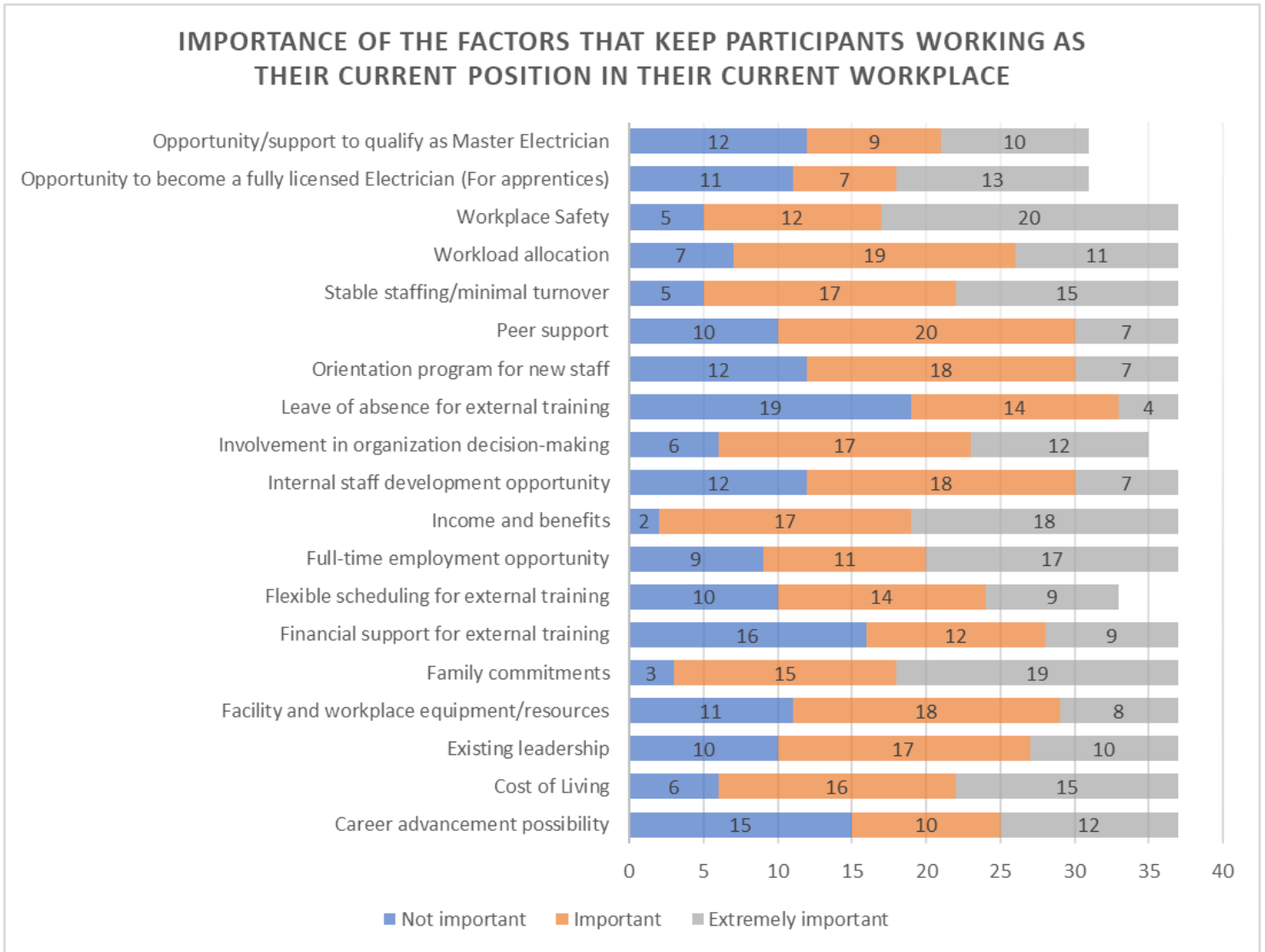
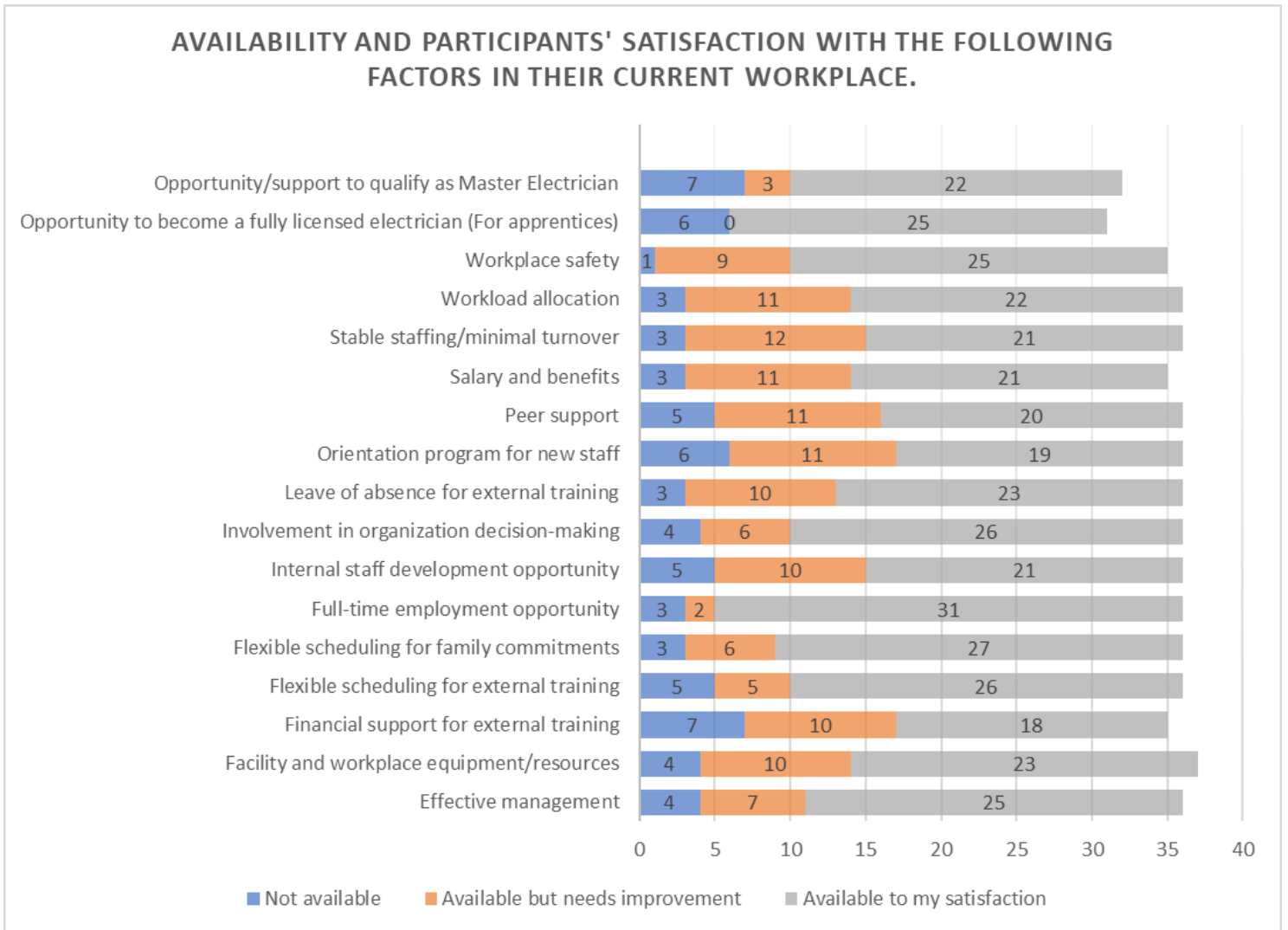


Figure 4. Availability and satisfaction with the following factors in current workplace



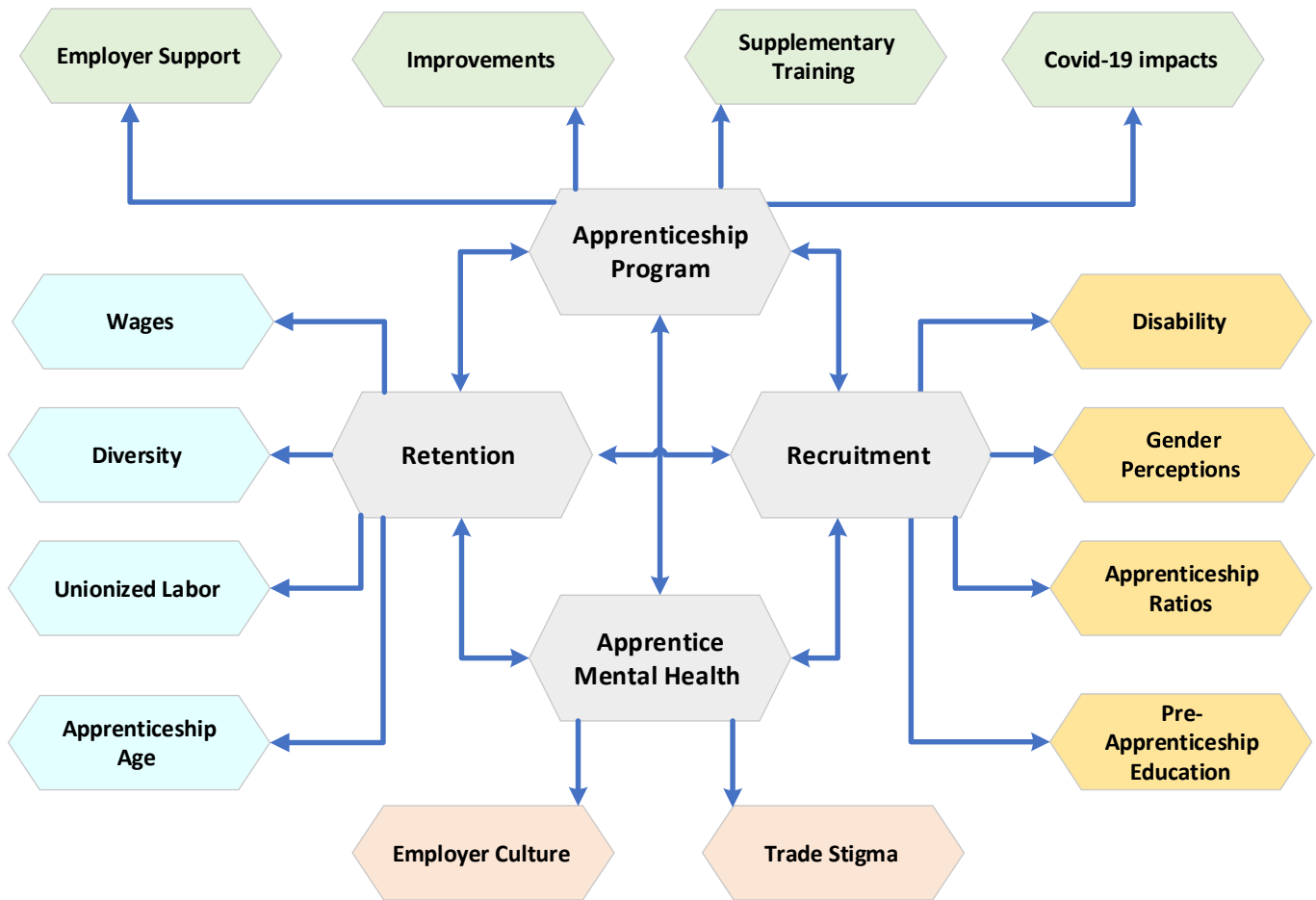
Qualitative Findings Section

Overview

Analytic review of the focus group data resulted in four overarching and inter-related themes related to this investigation of the efficacy of the apprenticeship training and mentorship program implemented by small-to-medium sized electrical employers. These themes were identified as (a) *long-term apprentice retention*; (b) *diversified, well-rounded apprentice recruitment*; (c) *sustainable apprentice mental health trajectories*; and (d) *review of apprenticeship program outcomes*. Within these themes, sub-themes were formulated to organize influential factors involved in the participation and engagement rates of apprentices with small-to-medium sized electrical employers. These themes and associated sub-themes will be discussed in detail in the sections below. Figure 1 displays a concept map that illustrates the relationship of the core four themes as well as the connected sub-themes.

There were 11 small-to-medium sized electrical employers across Ontario that participated in the two focus group sessions (six in focus group session one and five in focus group session two).

Figure 5. Focus group themes



A concept map of the themes and sub-themes generated from both focus group sessions. The bi-directional arrows represent an interrelationship between themes and the bi-directional influence each of the core themes has on all sub-themes.

Long-term Apprentice Retention

There was consistent agreement among the employers that participated in the focus group that long-term apprentice retention was a primary concern for non-union employers engaged in the mentorship program. Given the costs associated with mentorship and training of an apprentice, the employers expressed discontent with the ability to retain apprentices due to external pressures from society, unionized employers, economic instability (e.g., wages), and apprentice age-related nuances. These concerns are not necessarily critical of the mentorship program per se, but rather reflective of years prior to the most recent legislative changes that have resulted in mentorship inflexibility, lack of standardization in training, and lack of government support for the trade industry.

FGP7: "In the old day[s] before they had to get registered, there's a bunch that would have a helper; and then eventually the helper would come on and hire onto me to get his license. And they'd be grandfathered in for a couple of years, or three years because of experience – work experience, and get his ticket in two years and then go out and be his own self-employed in a van."

FGP11: "It hurts when they leave because it takes – everybody talks about apprenticeship, but for us to have a top gun, that we can use in the industry, it takes me 10 years."

FGP8: "I think another – another thing that's missing is back in the day, when we used to hire apprentices, we used to have a Ministry of College rep actually come to our place of employment and meet with the apprentices, sign them up, here's your program, here's what you need to do. That's all gone away. There's no more social interaction with those ministries, right?"

Anecdotally, there was mention of a 50% retention rate from one employer in the focus group that was attributed to the comprehensive nature of their individual training and mentorship, however even this employer noted more difficulties recently:

FGP8: "What I can tell you is that the training and aspects for our apprentices, they never leave. Because we provide them [with] full training through their whole term of apprenticeship. But in the last ten years, retention is becoming far more difficult."

Unionized Labour and Wages

Historically, poaching has made retaining apprentices difficult in many trades and apprenticeship programs globally (e.g., United States, Australia, Ireland) and in other provinces in Canada (e.g., British Columbia). This sample of electrical employers has also affirmed these difficulties in Ontario. The main contrast between unionized employers and non-unionized employers appears to be greater financial support for union employers; more diverse employee growth opportunities; and career guidance from trades educational instructors to join union employers. The focus group employers highlighted the lower return on investment considering the lack of financial support for non-unionized employers in training an apprentice compared with the time and resources required to train them. Some excerpts from the focus group describe this further and mention the limitations of competing against unionized employers:

FGP7: "Well, why would a private contractor invest \$30,000 in training an apprentice for the union to poach them?"

FGP6: "We're just a training center for the union half the time. I cut back and get five on payroll now, but what happened was the union was dictating to the non-union contractor what we could do and what we couldn't do."

FGP3: "You've got to teach them everything and then you risk losing them whether you lose them to a union, another company or just going into another field."

Another consideration is that currently the cost of training apprentices significantly outweighs the benefits. Many of the employers mentioned that it would take a couple years for the apprentice to become sufficiently trained to be productive for the employer. Larger, unionized employers have utilized poaching as a strategy to acquire well-trained apprentices by paying them higher wages rather than absorbing the initial training costs of a 1st or 2nd year apprentice.

FGP11: "How many in industry don't bother training? They go to the market; they go to our people that we have trained to hire them away. That's happening, uh, all the time to us.... They said, uh, the people from hydro come along after they've – we've done the training, offer them more money and so, they say we're not going to train anymore."

FGP11: "Do I really want to train somebody? Do you think half the contractors don't train any apprentices, they just say, "I'll wait until somebody's trained, and I'll offer more money?" "Of 9,000 electrical contractors, we know how many are not training any apprentices, maybe half."

FGP6: "The other unfortunate part is the, what I find as a non-union contractor is I find it very hard now as they jack minimum wage up, we work under percentages of what your rate of your, what your shop is."

A secondary pressure on wages is economic volatility through inflation and cyclic supply and demand constraints that can result in work shortages or layoffs. This is also influenced by increases in minimum wage in non-urban areas of Ontario despite stable or slowly rising service costs.

FGP6: "So, there's a training aspect here that every time they jacked the minimum wage, everybody's wages have got to go up and it's becoming harder and harder."

FGP6: "...we should be getting subsidized as the minimum wage was up because it's not, the farther they drive the minimum wage up it's just going to be, it's more ridiculous for the people that you already have on senior people on staff because an area will only take what an area can be charged out at. You can't start charging where I am in a rural Kingston area."

FGP1: "I think it's next to impossible to hire anybody right now, it's a very, very difficult market and wages are increasing exponentially, faster than we can definitely put up our rate."

Diversity

There was widespread openness amongst the focus group employers to willingly hire those from underrepresented groups (e.g., indigenous, non-white ethnic backgrounds, newcomers to Canada) in the electrical trades. Retention of these diverse groups was mentioned to be difficult given that many of the non-financial supports are not readily accessible (e.g., where to access) or accommodating (e.g., language barriers) to these populations. For example, one employer mentioned that many newcomers to Ontario have been trained differently with different materials and tools in their country of origin. This presents a barrier for them to get started with securing a mentor in the apprenticeship program as they are unfamiliar with licensing requirements and standard wiring procedures. Current small-to-medium sized employers may have to personalize individual support and be patient with ethnic assimilation to ensure an adequate fit for diverse employees.

FGP8: "I think another component of that is you know we try to promote anybody that comes into the trades. However, a lot of them are constricted by language and unfortunately, a lot of the codebooks and a lot of the training manuals, uh, that you do go through your apprenticeship with, they're either written in either English or French I believe. But mostly English. You know you have to start converting some of your manuals to accommodate you know the new people coming into the trades."

FGP9: "If you're not exposed to it, it's not something you're ever going to think about. So, if you don't see anyone that looks like you in the trades it's not something you're going to want to do. If everything that's written or everything that's public about that trade is in a language that you don't understand you're not going to be interested in it."

Apprentice Age

Throughout the focus group, there was a stark difference in retention and engagement rates amongst the employers and mentors with apprentices aged 18-24 compared to those that were 25-29. Most of the employers reported that there was difficulty retaining apprentices ages 18-24 due to generational gaps in work ethic (e.g., punctuality, interpersonal communication) and information access (e.g., social media, cellphone usage). Employers had some concerns with the responsibility of younger apprentices stating that they are not prepared for success in the trades industry with respect to tools and materials and employee work etiquette. This lack of preparedness was largely attributed to the educational system not promoting students to consider the trades and lack of exposure to preparatory workshops/courses during high school.

FGP3: "There's not too many guys that will hire first term apprentices especially 18, 19-year-old kids coming out of high school."

FGP7: "But when you're talking to a person who is 21 or 22 years old, they don't have the ability to perceive the value of working with the company for 20 plus years, having the same people to work with, a stable secure environment. Um, because, once again, it goes right back to when I talked about starting to expose people in grades seven and eight to these ideas."

To support this further, one employer mentioned that they had higher retention rates with the 18-24 age demographic based on their strong relationship with a co-operative education program in their work catchment area. It may then be beneficial for OEL to generate an outreach registry that matches small-to-medium sized employers with local high schools to engage students in the community and generate further interest in the trades at the municipal level. The consensus among the group was that older apprentices (>25 years old) had more life responsibility and therefore, more desirable given their higher retention rates during the trades apprenticeship program.

FGP1: "...it has to start Grade 9, Grade 10. When someone's now working toward what potentially they're going to do for their life. If it starts after that it's definitely not too late. You're not too old to get into a trade at 25. I mean most of the apprentices I'm hiring are 25 years old. But I think if we want to fix this program, if we want to fix how the trades work, it's got to start at 14, 15."

Diversified, Well-Rounded Apprentice Recruitment

As discussed in this report, there is ongoing concern of tradesperson shortages in Ontario due to reduction in apprenticeship registration and increasing electrician attrition due to generational retirement. The downward trend of apprenticeship registration and completion over the past decade has put significant pressure on the future supply of construction electricians available to meet the needs of the increasing population. The re-occurring sentiment across both focus groups was difficulties with the beginning and end of the apprenticeship program for these employers, which we have defined as recruitment and retention. Both themes can be used interchangeably given that the intrinsic (e.g., apprentice ratios, unionized labour, wages, disability) and extrinsic (e.g., apprentice age, gender perceptions, pre-apprentice education and diversity) factors that influence the outcome of increasing engagement are interrelated. All the employers agreed that increasing non-financial and financial support from the education system and the government is critical to the long-term success of the OEL mentorship program and trades apprenticeships. Some examples mentioned by the employers of non-financial support(s) include increasing awareness of trades as a viable career opportunity throughout elementary (Grade 6 – 8) and secondary school (Grade 9 –12), collaboration of schools with local employers for co-op programs/student placements and increasing accessibility of resources to consider the apprenticeship program after secondary school.

FGP1: "Now on occasion we get someone who's 17, 18 years old trying to get into the trade. But they don't even know, coming out of high school trades are not even really an option, not even promoted as something to do. Or at least that's what it feels like because we do not get many people that are coming right out of high school."

FGP1: "And the biggest shortfall is that people are not getting out of high school or even going into high school with a trade even on the horizon. It's not even in anybody's mind. It's I'm going to get out. You know most of the apprentices I'm hiring have gone to two years of college."

Some employers had mentioned that they thought the OEL promoted subsidies were helpful in offsetting some costs of the apprenticeship training, however they also believe there is a lack of financial support from the government to promote, sustain and encourage pre-apprenticeship training at high schools.

Apprentice Ratios

Apprenticeship ratios have been a long-standing issue for the trades industry in Ontario due to the implications of injuries, delays in licensure, and apprentice capacity for small-to-medium sized employers. In 2019, Bill 47 shifted the ratios from 3:1 to 1:1 (journey person to apprentice) which has been beneficial for increasing capacity for apprenticeship opportunities, but also has reduced the quality of the apprentices available. The dynamic between the employer and the apprentice is predicated on high initial investment costs and therefore, the employers in the focus group sessions have emphasized the opportunity to introduce a probationary screening period. During this period, apprentices would be considered as “helpers” and therefore they would not count towards their apprentice ratio until the employer determined the mentorship candidate was ready for the apprenticeship program. This would also be beneficial to the helper to determine if the employer was the right fit, in terms of workplace culture and mentorship style, and to confirm that the apprenticeship program aligns with their vocational interest. Some examples of this are illustrated below:

FGP3: “I get all kinds of requests for people that want to be first term apprentices so my idea would be that along with the ratio is to have someone that is basically designated as a helper and you create 2,500[-hour] window or a 3,000-hour window and that person then becomes just the helper, he’s not registered as an apprentice. He becomes a helper which then helps you [to be] competitive as a contractor. It also helps you basically weed out whether that helper is, you’re willing to include him as part of your ratio, as part of your apprentices, right?”

FGP1: “But that’s why I have the theory that if you had some one that you could take on for about 3,000 hours right, not count towards your ratio and then if gives you the ability to screen that person for that long whether you want to take him on or not and also gives him the ability to say yeah, this is what I want to do for the rest of my life or no I’m out of here right?”

Another limitation of the 1:1 ratio for small-to-medium sized employers is that all apprentices despite their years of training in the program are counted equally towards the apprentice ratio. The employers in this focus group argued that there are fundamental differences in the apprentice acumen and workplace productivity for first- or second-year apprentices compared to fourth- and fifth-year apprentices. It was general consensus amongst the group that first- and second-year apprentices require full supervision during their apprenticeship activities, whereas fourth- and fifth-year apprentices are able to perform most work activities independently. The group was in full agreement that flexibility should be introduced for upper year apprentices with respect to the ratio requirement, but they also acknowledged that may deter employers from recruiting early year apprentices.

FGP3: “And you know if you have six guys on a job, say even if you have four guys on a job site, like he could probably handle once licensed guy and then maybe like another fourth- or fifth-year apprentice and then two newer guys, right? But with the ratios it completely restricts you from doing anything like that.”

FGP7: “I have one gentleman that’s been a fifth term for two and a half years now.”

Lastly, a recent factor influencing the apprenticeship program from 2020-2022 is the COVID-19 pandemic. Employers are noticing the impact of COVID-19 on the examination backlog of journeyman candidates to complete their licensing requirements. These delays are creating additional pressure for employers who are unable to onboard or recruit new apprentices due to constraints of the 1:1 apprenticeship ratio guideline in Ontario. One employer also stated that COVID-19 has also influenced the ability of small-to-medium employers to be competitive given supply chain difficulties resulting in many business owners exiting the electrical industry.

FGP5: “We’ve really been noticing this through COVID with the online schooling that some of our apprentices have gone through. They’ve become journey person candidates and then there’s a backlog of testing so they were waiting potentially months to get an exam and if they were unsuccessful then it was an additional month before they could write again.”

FGP5: “They’ve become journey person candidates and then there’s a backlog of testing so they were waiting potentially months to get an exam and if they were unsuccessful then it was an additional month before they could write again. And regardless of the fact that they have completed their apprenticeship, in the eyes of the apprenticeship program they’ve gone and completed all of the schooling, they have all of their logged hours, they’re still considered part of the ratio and our hands were tied to bring on additional apprentices and that just creates a bit of a backlog for new apprentices who are wanting to come on to the program as well.”

FGP8: “...over the last year I can tell you, there’s 5,000 less people in the electrical trade, either they’ve closed their business or whatever, other circumstances have happened. But we’re going to have a shortfall.”

Pre-Apprentice Education

Over the last decade there have been generational shifts in educational pursuits that have evolved from advancements in technology. These technologies have generated new avenues of study in post-secondary educational programs that have created greater demand for web-based careers. This evolution has resulted in post-secondary institutions focusing their course offerings and funding on programs to develop candidates working in technology driven settings (e.g., information technology, healthcare, financial technology). This pivot in the educational system has impacted the trade industry through recruitment, retention, and student perception of the viability of a vocational pursuit in the trades industry. This student perception is further reinforced by parental and societal attitudes of “blue collar” vs “white collar” jobs as seen below:

FGP10: “We haven’t had a single person, um, go through that program that’s decided to become an electrician.”

FGP7: “...I have been to all the high schools, I have been to the OEL nights, I’ve been to the Georgian College meet the kid’s night, we’ve set up trade fare booths all in the light of promoting. But we never get the key to talk to the teachers, or to talk to the principals, to talk to the directors in the boards of education to make decisions of the curriculum for the schools. And I think that’s where some core – um – I don’t know what the right word is – training – but that’s not the right word, put aside the second-class nature that this is all interpreted as starting at grade nine or grade eight or grade seven.”

FGP8: “But, you know, the teachers in the school system still don’t really promote it. And the parents think of it as second class. And you know, the kid’s uncle that’s a professional something or other, you know, you don’t want to go be an electrician.”

Students within the secondary education system also have difficulty in making post-secondary education or career decisions given the breadth of program offerings for which they do not have prior hands-on experience. This is especially noteworthy in the construction trades where many of the electrical employers stated that most of the apprentices, they receive are not prepared for the apprenticeship program as they have minimal workplace etiquette or have no general knowledge of the tools (or materials) used in the industry.

FGP10: “Um, through high school, we probably get, oh, I would say probably two or three students a year that are interested in the electrical trade. The biggest problem with that, we have about – with all those, we’ve probably been doing it for probably ten years with the high school, I think we’ve only hired one person in that whole ten years that was going to be somebody that would make it as an electrician.”

FGP9: “[I] teach at a college level too, and I can tell you based on what you said earlier, I literally have you know 23-year-old students coming in who do not know what end of a hammer to hold. They’re so excited when you actually teach them how to operate a drill, uh, when you actually you know start explaining wire sizes to them.”

Therefore, increasing awareness and exposure for students early in their secondary school studies would allow future students to consider a career in the electrical trade. The Support Ontario Youth has designed boot camps that are designed to go across to all high schools in the province to get more students aware and involved in the trades, however further study is required to determine its efficacy.

Gender Perceptions

The electrical trades continue to be a workplace environment dominated by hegemonic masculinity despite recent traction to promote female participation in this vocational pursuit. This group of electrical employers have reported mixed findings with recruiting female apprentice candidates. Some employers have reported success recruiting females through co-operative programs at their local secondary school while others reported that they have seen

very few females at their workplace or worksite, and if they do hire a woman there are significant dropout rates.

FGP6: "...girls in high school are coming forward because I'm finding that now with myself with the co-op students."

FGP2: "It's nothing against saying that women cannot go into the field, it's just not common for me in my case because I have only seen one person, one female in a job say in 15 years."

It was consensus amongst the group that there is openness to recruit women to the electrical trades, however there are concerns about capacity to endure the physical nature of the job and potential frequent exposures to physical hazards. Some employers within the group have re-structured their business to re-evaluate their workplace culture and create positions within the industry to allow for gender-neutral positions.

FGP5: "We do not have very many female electricians apply when we have job openings which is unfortunate. I would love to see more women in the industry."

FGP5: "It's a massive industry and I think that there's room for many more unique individuals to enter the industry. So, there may be some areas that women would love to be in the electrical industry and have that conversation and say you know, I'm not interested in these types of jobs."

FGP5: "So, we've done a lot of restructuring in our business to really promote and to be really intentional about the clients that we will work with to protect the mental health of our employees. And I think that maybe that is part of the gap [because] there are not as many women involved..."

FGP10: "It wasn't because they were female that we hired them, it was solely because of their abilities."

Despite this, there are some additional industry-wide ongoing barriers identified that are preventing an inclusive environment such as lack of gender inclusive safety protocols and women designed personal protective equipment (e.g., boots and overalls), employee promotion of a masculine, self-reliant environment (e.g., disapproval for asking for help), and workplace accessibility issues (e.g., having sanitary, gender-neutral washrooms). These considerations need to be applied industry-wide and not just at the employer-level to observe the intended effect of these changes. These barriers create an atmosphere of an unaccepting environment and can be a deterrent for women to consider a career in the electrical industry as there can be a lack of belongingness.

FGP4: "I think the toughest part about being a woman in any construction industry is the mental aspect and how they're viewed and how they're treated and treated by other trades people, right?"

FGP1: "...we just hired two women recently. Both of them in the interview when asked them what are your expectations or what are you looking for in this job, their first, both of them their first answer was just an accepting environment."

Disability

Given the physicality of being a trades apprentice, physical disability can be challenging to accommodate especially with the diversity of worksite conditions where electricians perform their work. However, similar to the above discussed gender perceptions, there needs to be open conversations and roles created to accommodate and integrate disabled persons into the electrical workplace environment. Equitable outcomes for persons with disabilities can be achieved by creating an inclusive, accountable system that improves the learning environment for those with diverse learning capacities. As for psychological disability, there was a positive experience reported by one of the employers in the focus group:

FGP6: "I had a lad, unfortunately he died of heart attack at an early age, but I did have an impaired employee work for me, I think it was almost seven years. He went to university, a very brilliant man and he had two or three nervous breakdowns. He's coming to work for us and he worked there, like I said, for six, seven years with an impairment. Let's face it, I knew all about his background, but he lasted with us and he enjoyed the camaraderie because he worked in the office and he enjoyed the camaraderie with the guys out in the field."

Small-to-medium electrical employers should focus on creating an accessible and gender-neutral environment to allow increased diversity to drive innovation within the apprenticeship program.

Sustainable Apprentice Mental Health Trajectories

Increased awareness of mental health impacts on employer productivity has become increasingly important against the backdrop of the COVID-19 pandemic. In the construction industry, there are many traditional masculine beliefs such as stoicism and authoritarianism that can perpetuate instances of workplace bullying. First and second-year apprentices that are not accustomed to working in these male-dominated, high-pressure environments can experience poor mental health outcomes associated with avoidant coping strategies (e.g., substance use, apprenticeship dissatisfaction, physical stress) and social isolation (e.g., fear of asking for help, co-dependence). Therefore, having the necessary support(s) in place to help apprentices manage their anxieties about their performance and learning process, and workplace integration with their co-workers will allow for a better apprenticeship experience. Some electrical employers had mentioned that the worksite conditions have improved over the past couple of decades, but there remains further considerations to achieve sustainable participation of diverse individuals in the electrical trades.

FGP5: "One of my areas of focus right now is around mental health in the work place and it pains me to hear some of the stories and see some of the situations on construction sites on how individuals are spoken to. Having electricians, having apprentices move

over from other companies and just the amount of pressure that has been put on some of these individuals from a mental health perspective.”

Trade Stigma

In the trades industry, there has been increased societal stigma that has prevented long-term growth in recruitment and retention. Teachers and parents motivate young people into “professional careers” based on financial viability and into careers with exponential long-term growth opportunities. Careers within the trades have been largely considered as an alternative when you are considered not successful within the traditional, hierarchical education system. The general exception to this, as illustrated by the focus group participants, were those who had a family history of trade workers. This juxtaposition has created a gradient effect in the education system where that is high competition and accumulated debt for “white collar jobs” and low competition and lower accumulated debt for “blue collar jobs”. This is further reinforced by ongoing technological use in our day-to-day lives and less exposure to hands-on, physical learning experiences, therefore devaluing a career that utilizes physicality.

FGP1: “Yeah, I just wanted to continue one with the OAP and high school. I think I definitely agree with you, there’s always been a stigma. I talked to my dad who, previous generation of our company, [is an] electrician, our previous master electrician. Trades is for the dummies, that’s the comment that he says when he was going to high school and I don’t know that it’s changed drastically.”

FGP8: “So, I think there’s a stigma with – you know between blue collar and white-collar workers. And you know when you’re considered a blue-collar worker everybody kind of like downgrading you all the time. And for us as a company we’ve been here in business now for over 30 years.”

FGP1: “And you know, basically there is that aspect, the hard part of the job and you can’t have somebody that’s 80 or 90 pounds carrying two rolls of wire on their shoulders especially when they’re not built for it. So, there is that stigma too I guess that women can’t do this.”

This devaluation of the electrical trades is discussed thoughtfully amongst the group and to counterbalance this, these employers have been working to re-frame the positive contributions being an electrician can provide for society to younger apprentices.

FGP4: “And they actually feel like they’re less than what they really are as people right? And what I tried to explain to them is that they just have a different skill set as compared to those other children, with those other kids and that they do and will provide something positive to society, becoming a skill[ed] tradesperson.”

Employer Culture

It was consensus amongst this group of employers that there needs to be a shift in employer culture to make the construction electrical industry more inclusive. There is agreement that the current employer culture is based on long-standing traditional principles passed down from generations-to-generations of male electricians. This can result in difficulty in recruiting new

groups to the electrical trades as they may not thrive in an outdated workplace environment. The upside to this is that new groups and diverse role models in the electrical trade can help innovate the culture to support new entrants into the industry.

FGP1: "Going to a job site makes it a little more difficult because you're dealing with other sub trades and contractors and other people that might have a different mandate, but I don't, I mean I don't think you're going to change the 50-, 60-year-old tradesman, or trades person, tradesman we should say because most of them are men. You're not going to change that mindset. You have to start with the new people coming in and change the culture there."

Many of the employers in this group have mentioned they have implemented increased accountability with their apprentices and journeypersons for how they present themselves on the worksite. If more employers focus on improving their internal culture, ultimately it will promote a more inviting apprenticeship program and allow apprentices to find value within the program.

FGP3: "Well going back to the mental health issue, I think it is our job to create good cultures in our companies and change that it is on the construction field. Again, in my case, how I said I didn't let anybody yell at me, it's not like I walk away from a job site and say you know, I'm not taking this. I have situations when someone tried to be disrespectful to me, but I let them know that I'm not OK with that and I'm not going to be willing to take it from that point on."

FGP5: "And it's not OK that they talk to you like that. You're a human being as well. If they can't talk to our office staff in a certain manner, there's no way they can talk to you as a foreman in that manner as well. And I think that that is a huge gap in the industry as far as employability goes because the reality is that people who are coming in to the industry, they don't have the same tolerance and leniency to be treated the way that historically some of these constructions trades have just gotten away with, to be quite frank."

Summary of Mentorship Program Outcomes

Despite the influential factors influencing participation and engagement of small-to-medium sized electrical employers, this group of employers is optimistic for the future and have provided recommendations on how to improve some of the challenges in the industry. Many of the members of the group are long-standing mentors in the OEL and continue to promote the apprenticeship program, as well as utilize the employer support available through the OEL.

FGP8: "Our company is a fourth-generation electrical contractor, and we've continually had apprentices the whole time, including myself. So, um, I believe it's a very valuable training tool. I think probably 98 percent of electricians in Ontario have all gone through the apprenticeship program."

Supplementary Training and Improvements

Small-to-medium electrical employers have significant supplementary costs when providing mentorship to an apprentice. These costs include materials, tools, supervisory costs and basic standardized training costs (e.g., safety training, circuit training, alarms). Many of the employers within this group agreed that they need further support to streamline basic training while providing mentorship.

FGP11: “We got to teach safety, for example, to all our people before they start. We don’t get any assistance in that, that’s a big cost, uh, to do the safety and then somebody leaves.”

FGP4: “Some technical background and it would be like a Saturday morning style class similar to what the union does for some of these apprentices, just to give additional training whether it be fire alarms, circuits. You know, simple things. It’ll just grow, it’ll help them grow as electricians down the road.”

The OEL and its members have been working on lobbying the government to create training centers to allow for collaborative learning of safety and basic electrical training based on feedback from OEL member employers. Further governmental support is required to execute this vision and provide further support to be able to effectively provide a training environment that promotes retention. Currently, many of the members of the OEL operate on a volunteer basis and may not be able to dedicate the time and resources to contribute to establishing the training centers. By allowing these employers to focus on creating a quality mentorship and inclusive environment, they can avoid the external pressures of poaching from the larger employers in the electrical industry. These training centers would also allow these employers to focus on training that would add value and productivity to their individual businesses and stimulate further contractor participation in the apprenticeship program.

FGP4: “I would think that it would be nice if they had additional training even if it’s once a month specific training for some of these apprentices.”

When discussing improvements to the apprenticeship program, many of the employers were reflective of prior years when there was more involvement with the provincial government. They appreciated in-person contact and bi-weekly check-ins from the government ministries to ensure that they felt supported throughout the mentorship. COVID-19 has certainly impacted recruitment and retention for many of these small-to-medium employers as many communications are now electronic with many candidates arriving on the worksite without having met the employer in person. There is a shared sentiment that the journey person camaraderie of these smaller businesses lends to a preference of in-person, social interactions over electronic communications. Their general perception is that they would be able to select higher quality candidates if they were able to meet them in-person and engage with them.

FGP8: “We used to have a Ministry of College rep actually come to our place of employment and meet with the apprentices, sign them up, here’s your program, here’s what you need to do. That’s all gone away. There’s no more social interaction with those ministries, right.” That makes a difference that you matter you’re valued.”

Employer Support

The focus group participants provided positive feedback on the OEL's support of employers participating in the mentorship program. Many of them praised the onboarding process and hiring tools have provided positive experiences for these employers when they are recruiting apprentices to the electrical trades. The accessibility and resourcefulness of the OEL representatives have allowed these employers to not only be supported at the beginning but also through the entire 5-year apprenticeship.

FGP5: "I have had really great experience with their job boards and hiring through the OEL talent sorter. 'I believer' is who they are partner[ed] with so I found that to be a really great resource because hiring in the electrical field can be difficult as well. We have a fantastic representative that's been very supportive with any questions that I've had onboarding new apprentices."

FGP9: "The boot camps are designed to go across to all the high schools, or I believe it's high schools; not just high schools. But it gives them a taste of what the electrical trade is like. And if that interest is there, then that's when those apprentices get funneled over to the OEL. And that's when we take over as mentorship and trying to help them further get them involved with a potential employer that want to hire them."

There was one critical feedback about the apprenticeship program regarding sponsorships. The transferring of sponsorship can be an anxiety provoking experience especially if the apprentice was leaving a non-supportive working environment. In the future, the OEL may want to find ways to support the transferring of sponsorships for the apprentice and the new on-boarding employer as stated in the quote below:

FGP5: "One piece of the process that I've always found extremely awkward is transferring of sponsorships. So essentially if we hire on a third or a fourth or a second whatever apprentice, we require a letter from their previous employer confirming their hours, which is great in a perfect world, but if they're unable for whatever reason to provide that or they're estranged from their previous employer for whatever reason, we haven't run into it but I've always kind of thought in the back of my head, it puts people in a really awkward situation to ask for this."

Discussion

A mixed-methods sequential explanatory design was performed to achieve the objectives of this study. Mixed methods design in general employs the power of both quantitative and qualitative methods to allow for a broader and more creative approach to overcome the limitations of using a common single methodological design. Therefore, a mixed-methods design is a suitable method for responding to research questions that neither quantitative nor qualitative methods could answer independently⁴². The synergy of these two methods allows the researcher to shape the research question in both a planned and systematic manner to maximize the findings of a study³⁰.

In the mixed-methods sequential explanatory approach, which was performed in this study, the sequence of the quantitative and qualitative data collection was determined by the study purpose and research questions. A quantitative phase came first in the sequence because the aim of the study was to investigate an in-depth explanation of the findings from the quantitative outcomes. This method can be especially beneficial when the researchers face unexpected results from their quantitative data analysis⁴³. Mixing in the sequential explanatory approach can be done in two ways: (1) connecting quantitative and qualitative phases of the study through selecting the participants for the second phase and developing qualitative data collection protocols grounded in the results of the statistical tests and (2) integrating quantitative and qualitative results while discussing the outcomes of the whole study and drawing implications.

The findings of the study have been discussed sequentially (quantitative data and then qualitative data) according to the methodology used in this project.

To understand mental health outcomes among the study participants and examine recruitment and retention factors associated with the apprenticeship training program offered by OEL, we conducted an online survey. The collected data from 40 participants through this survey was analysed quantitatively. The importance and availability of work-related factors as well as the level of burnout in the study participants were the most targeted outcomes examined by the survey to evaluate the mental health of the participants.

Although few studies have described the impact of the work-related factors on mental health and well-being of individuals working in skilled trades such as electricians and plumbers, the literature on the mental health in this population is scant. This study aimed to examine the mental health outcomes among electricians and plumbers in Ontario. Moreover, the study aimed to evaluate the impact of the OEL mentorship program on increasing the number of employers involved in apprenticeship training to have the capacity to train and certify enough workers in the skilled trades to meet the current and future needs in the labour market.

Thirty-eight males and two females, 35 were employers and five were apprentices, were recruited for this study. The participants' average age was 48 years and nearly half of them had a college diploma or certificate. The vast majority of the study participants were in the electrical

sector, non-union members, born and raised in Ontario, and also got their training in Ontario. The collected data from the survey showed that Workplace Safety was the most important work-related factor that keeps participants in their job position at their current workplace. Furthermore, the participants found “full-time employment opportunity” as the most available factor to satisfaction in their workplace. According to the survey data, only a few individuals in our sample experienced moderate burnout that was characterized primarily as personal burnout.

Studies^{44–55} have investigated the factors that can compromise electrical workers' mental health. Living in danger (such as lethal electrical shock, danger of electrical smolders, exposure to lead, and fire and explosions), meeting the formal prescriptions, achieving required productivity, and being responsible for proper functioning of electrical system are common factors that can affect electrical workers' mental health⁵¹. A study by Sauter and colleagues (1998)⁵⁰ on the effect of privatization on electrical workers' mental health found insomnia and nervousness in the electrical workers caused by tension at work and concluded that workers illnesses were associated with the way the work was organized and performed. In addition, the physical consequences of electrical accidents can have long-term effects on health and work ability including long-term emotional and cognitive consequences⁵².

Reduced psychiatric illnesses and mental health symptoms such as depression, anxiety, phobias and PTSD, and memory and concentration difficulties have also been reported^{44,49,52}. Life-threatening events are an unequivocal explanation for such psychological reactions; however, it has been hypothesized that direct damage of the brain from the electrical current may also occur⁴⁴. Another important factor for adaptation after an electrical accident is dealing with individual guilt, blame, and responsibility⁵⁵. Lack of knowledge about the consequences of electrical accidents may lead to negligence of the emotional issues by health care providers, electricians themselves, and their employers as they focus on the physical injuries⁵⁵.

The construction industry including electrical and plumbing sectors had the second-highest rate of heavy alcohol and drug use among employees from 2008 to 2012 and had the fifth-highest rate of illicit drug use, according to a 2015 analysis of a national survey⁴⁵. Studies have found the contribution of psychosocial factors and alcohol use in reducing of electrical workers' performance⁵⁶ in addition to their being predictive of depressive symptoms⁴⁸. A study by de Souza et al. (2010)⁵⁴ identified that the prevalence of common mental disorders was associated with psychosocial aspects of the electricians' workplace, especially in those with high-strain jobs as well as electrical workers with high psychological demand and low social support⁵⁴. Similar to electricians, individuals working in plumbing industry may also be at a higher risk of mental health problems. The reasons why plumbers are at a higher risk of poor mental health included but not limited to long hours of working, fewer holidays and/or breaks because of the nature of this job, isolation in work environment, and stresses related to higher rates of self-employment in this job and stresses that are caused by high-pressure projects⁵³.

Burnout is a response to chronic interpersonal stressors that specified by emotional exhaustion, depersonalization, and reduced personal performance⁵⁷. The Copenhagen Burnout Inventory was used to determine the burnout scores in the participants. The core of burnout in this tool is physical and psychological fatigue and exhaustion. Schaufeli and Greenglass defined burnout as

a state of physical, emotional, and mental exhaustion that is an outcome of long-term involvement in work situations that are emotionally demanding⁵⁸. However, burnout is not only fatigue or exhaustion, and attributed to other domains in the person's life including work and colleagues³⁵. By collecting the personal burnout in the survey, we could compare participants' burnout scores regardless of their occupational status. This scale is sensitive at the negative end and includes simple questions, for instance "How often do you feel tired?". On the other hand, the focus of the work-related burnout questions was on the participant's own attribution of symptoms to their work. Therefore, we did not assess causality in the scientific sense of the term as an individual can ascribe their symptoms to their work without good scientific reason and vice versa⁵⁹. By comparing personal burnout and work-related burnout, we could recognize the reason of burnout in the study participants if it was related to non-work factors such as health problems or family demands or work factors. Finally, using colleague-related burnout questionnaire, we assessed the degree of physical and psychological fatigue and exhaustion in the participants related to their colleague at work.

Few studies investigated burnout in electricians and plumbers. A study by Bakare and colleagues⁶⁰ investigated the level of burnout among electrical and building technology undergraduate students in Nigeria. Their findings showed that the levels of burnout were high in this population. In the contrary of the findings of this study, the results of our study on the employers and employees showed that only a few participants had a moderate burnout, and no participants were identified with high or severe burnout. The lower number of apprentices/employees (n=6) compared to the number of employers and mentors (n=34) participated in this study may explain this contradiction. There is strong evidence of mediation effects of the emotional exhaustion dimension of burnout on the relationship between job stress and workers' intentions to quit⁶¹. The results in this study confirm the findings in the literature as 94% of the participants in this study with a low average score of burnout had a high intend to stay in their current position in their current workplace in the next five years.

According to Statistics Canada, approximately 60% of employment opportunities in 2017 were gained by immigrants⁶². The report also shows that almost 80% of Canada's indigenous population are under 55 years of age. Moreover, nearly 48% of the Canadian workforce was made up by women in 2018. Since diversity is growing and becoming increasingly prevalent in workplaces across Canada, employers are required to adapt with this diversity quickly. To meet this need, Electricity Human Resources Canada has developed resources to support the inclusion of underrepresented groups such as women, indigenous, immigrants, and individuals with disability in the electricity sector. The majority of participants in this study were from white European/American ancestry (89.7%) and male (95%), and mostly born and raised in Ontario (87%)⁶². The male and Caucasian dominance of the employers in our sample may explain the low diversity in this study. Future studies may consider a larger sample size with a more diverse group of participants and perform an intersectional analysis using gender-based analysis plus to incorporate minority identities in the analyses.

Further to our quantitative findings, our qualitative findings emphasized the continued leverage of engagement and support of employers in the construction trades as an important avenue for growth to address the ongoing shortage of skilled trades workers in Ontario, Canada. In this

study, a subset of employers engaged in a non-for-profit industry led mentorship program provided by the OEL participants in organized focus groups. In these focus groups, the employers appreciated the value of the mentorship program through praise of the continued educational support, employer management expertise, hiring resources and onboarding tools. Some barriers to growth in the electrical and plumbing industry were identified, however the groups had a positive outlook for continuing to foster equitable apprenticeship training opportunities for those interested in the trades industry. Some key areas of concern will be discussed below based on the employer's concerns regarding apprentice retention, recruitment and mental health outcomes related to workplace culture and trade stigma.

Apprentice retention continues to be difficult given the impacts of the COVID-19 pandemic, economic changes, and changes in societal interests. In this study, these employers had mentioned anecdotally that many businesses have had to close or transition out of the industry due to the pandemic. The full impact of the pandemic on the Construction trades industry for electrician and plumbing contractors is yet to be fully known, however some research groups have projected an increase in severity of psychosocial stressors and burnout due to social and professional isolation⁶³ as well as disruption of work-life balance^{64,65}. The pandemic has also compounded the influence of changes in economic activity and financial resilience that has presented an additional challenge to small-to-medium sized employers engaging in creating mentorship opportunities. Many of these employers continue to advocate for these opportunities but do not have the financial resiliency of larger unionized employers to lose apprentices to inter-industry attrition or intra-industry poaching. In addition, the pressures of journeyman wage increase in non-urban areas have caused a reduction in business productivity (e.g., revenues, asset-to-debt ratios) on their ability to focus on training and retaining high-quality apprentices. This is problematic in that many of the employers that participated in the focus groups agreed that it takes upwards of 10 years to recruit and train a highly productive, well-trained apprentice to contribute to net business productivity (as defined as profit after training expenses). This perception remains reinforced by the fact that pre-apprenticeship training is critical to the value proposition of the employer-apprentice relationship for small-to-medium sized employers. Employers in apprenticeship programs of other countries have supported this proposition and observed it to be associated with increased registration and completion rates in the construction trades⁶⁶. Therefore, to increase apprentice retention, employers must be supported with comprehensive pre-apprenticeship programs at the government level and through its community constituents (e.g., schools, community centers, non-for-profit industry advocates)^{67,68}.

Given the correlation between the factors that influence both recruitment and retention, employers also have a social responsibility to foster relationships through ongoing vocational outreach with school-aged students to encourage further engagement with the construction trades industry. This social responsibility can be illustrated through efforts to reduce generational disparities between employers and apprentices by improving interpersonal communication, transference of industry knowledge, and perspective sharing regarding their vocational experience as prior apprentices and journeymen. A more supportive approach will allow younger apprentices (< 25 years of age) to be able to evaluate the many intrinsic (e.g., personality style, temperament, attitudes/perceptions of career choice) and extrinsic (e.g.,

finances, future career growth and longevity, health) factors that influence their vocational decision-making as they transition from societal to individual responsibility after high school⁶⁹. Recent studies have also suggested this with greater rates of dropout and dropout consideration in the construction industry for males and females aged 18-24 compared with their 25–64-year-old counterparts⁶⁸. On the other hand, employers in this study and other studies on the construction trades⁶⁸ believe that individual motivation, work ethic and general construction knowledge are desirable apprentice attributes for employers looking to recruit an apprentice. These attributes have also been subjectively reported with greater retention and positive vocational outcomes. For a successful and equitable relationship between apprentice and employer, employers must look to reduce information and hands-on learning barriers through stronger, interactive partnerships with younger apprentices and the institutions that support them.

Recruitment of underrepresented persons (e.g., women, newcomers to Canada, persons with disabilities) have also been presented as a key consideration to encourage further acquisition of vocational talent outside of the prototypical hegemonic masculine applicant. Diversity and inclusion policies have been proposed for this industry to engage young under-represented persons previously, however it is currently unknown which mechanisms would promote sustainable engagement of underrepresented persons. For example, it was observed in a survey study conducted by Morello et al., 2018⁷⁰ that companies with 21-50% of female employees had dedicated recruiting and retention practices for women. The authors mention that the direction of this relationship was unclear and therefore, it is unknown whether this is an application of critical mass theory or organizational-driven policy and procedures²³. Employers may also have to be cognizant of the effects of workplace interest and anxiety when recruiting underrepresented individuals^{66,71}. Workplace environments in the electrical and plumbing industries can be reflective of a hegemonic masculine stereotype (e.g., characteristics of physically strong, competitive risk-taking behaviors, white Caucasian, and heterosexual)⁷², which may reverse the effects of initial high workplace interest with greater workplace anxiety in underrepresented persons. In this study, the employers expressed an openness to recruit underrepresented persons but also cautioned about workplace (and worksite) culture, health and safety hazards, and the physicality or “self-reliance” of being an electrician or plumber, which is consistent with the construction trades literature^{66,73}. A study by Powers and Watt⁶⁶ indicated that higher levels of dropout were associated with apprentices reporting feelings of verbal abuse, harassment, or workplace exploitation. Further research is required to determine the influence of mental health training or workplace culture interventions on recruitment and retention outcomes. Nonetheless, further integration of under-represented persons may allow for re-evaluation of current organizational policies to create adaptations in health and safety policies, revision of current job descriptions, or creation of new jobs to accommodate diverse apprentice strengths that are unrelated to physicality and self-reliance.

There are few studies investigating the roles of workplace culture and construction trade stigma as it relates to employer or apprentice mental health symptoms and psychosocial outcomes. There was some commentary among the focus group participants that workplace culture has improved over the years, but there were identified barriers preventing integration for underrepresented persons previously discussed in the literature related to workplace facility

accessibility (e.g. gender neutral washrooms, open and inclusive environment)¹⁸, access to personal protective equipment designed for different body types and genders⁷⁴, and specific task assignments to females as compared to males^{70,75}. In the literature, increased incidence of mental health symptoms (e.g., sleep problems, anxiety, and depression)⁷⁶ and negative coping mechanisms (e.g., workplace verbal abuse, aggression, social isolation, substance abuse and dependency) in construction trade workers may be indirectly related to their workplace culture and the physical demands of their day-to-day work resulting in musculoskeletal and psychological strain^{77,78}. Studies have also shown that men experience higher employment-related stress but are less likely to engage external mental health supports due to mental health stigma^{76,78} and therefore, are vulnerable to negative mental health outcomes associated with workplace accident(s), injuries, and fatalities⁷². Given these negative outcomes, a few studies have explored passive and active interventions to develop awareness, reduce stigma, and build psychological resiliency^{71,79,80}. A suicide prevention training program implemented by Ross et al.⁸⁰ reported longitudinal improvements in help-seeking behavior and reduced mental health stigma in a sample of Australian construction contractors. No significant differences in the administration of the training (e.g., formal and informal) and high attrition rates observed may limit the findings of this intervention study. Further research is required to understand the effectiveness of the training, disentangle the effects of the components of the training, and determine whether this could be applied to other mental health interventions across different construction-related industries.

There are several limitations identified in our mixed-method research. This sample may not be representative of all employers and employees working in electrical and plumbing sectors in Ontario. However, the questionnaire was filled out by diverse sectors of the skilled trades to meet the current and future needs of the labour market. Follow-up studies might examine the impact of mentorship program on increasing employer engagement in apprenticeship project using a larger sample size and include other skilled trade across the country to evaluate their insight about the project, training apprentices, supports required, the apprenticeship system, and other related topics. Participants' recruitment was another limitation of this study. To reach the target sample of the study, we had to invite the participants who were not part of the OEL's Increasing Employer Engagement in Apprentice Training project. Future studies may include more participants involved in this training project as the suggestions from those staff can contribute important information to improvement of the OEL's Increasing Employer Engagement in Apprentice Training project. Lastly, the virtual aspect of the focus groups may have affected the group dynamics of this sample since many employers within the groups mentioned the preference for in-person meetings.

In conclusion, these qualitative and quantitative findings are representative of the lack of diversity at the employer level in the electrical and plumbing trades. This disparity may be reinforcing the difficulty in recruitment and retention through themes identified in our qualitative analysis but also the lack of high burnout observed given the homogenous sample in this study. Future studies should look to clarify the role of diversity in improving mental health awareness and trades stigma.

Recommendations

Enhancing pre-apprenticeship development programs and improving relations with local educational institutions. The OEL can develop and foster "helper" programs where local adolescents can gain hands on-experience working with OEL members as a "helper" for pre-apprenticeship development. Also, a student-employer matching program to match students at local secondary schools with local employers to expose them to the electrical and plumbing industry (e.g., "bring a high school student to work" for one student/1 day per semester or during summer internships). This should increase access to experiential learning and increase OEL representation in local Ontario communities.

Showcase diversity and increase representation of underrepresented persons (e.g., females, newcomers to Canada, persons with disability) in electrical and plumbing construction trades through marketing resources for employers to consider the value of hiring diverse persons. Increased exposure of female and ethnic role models presented in marketing material, webinars, and training videos to promote inclusion. Provide testimonials from diverse parties about their experience working with OEL members, if possible. This should promote greater awareness and equitable opportunity in the mentorship program.

Provide employers and mentors engaged in the OEL mentorship program with workshops and training on how to create an inclusive, workplace culture. Engage external partners to provide mental health webinars and local community resources to support with burnout, health and wellness, and work-life balance. Furthermore, engaging employers in supporting apprentice mental health by helping them develop workplace policies and procedures. This should create a supportive, co-operative environment geared towards valuing employer-employee relations rather than promoting transactional interactions (e.g., productivity metrics, self-reliance/independence, and revenue/wage focus).

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List of Appendices

Appendix A: *Questionnaire*

Appendix B: *Focus Group Guide*

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Ontario Electrical League

Appendix A

Questionnaire

Understanding the health and well-being of electricians and plumbers in Ontario

Questionnaire Instructions

The questionnaire will take approximately 20-25 minutes to complete and available online redcap.utoronto.ca

Your participation is completely voluntary. You may withdraw at any time without penalty. You may skip any question that you are uncomfortable answering.

If you do not wish to participate, please return the blank questionnaire.
Thank you for your time.

1. What is your gender?

- Female Male
 Transgender Female Transgender Male
 Gender Variant/Non-Conforming
 Not listed, *Please specify* _____
 Prefer Not to Answer

2. Were you born and/or raised in Ontario?

- Yes
 No

3. How long have you been living in Ontario?

_____ years

4. Was your spouse/significant other born and/or raised in Ontario?

- Yes
 No
 Not applicable

5. Were you born in Canada?

- Yes
 No

6. What is your marital status?

- Single Divorced
 Married/Common-Law Widowed
 Separated

7. Please indicate the highest education you have obtained.

- Incomplete high school
 Completed high school
 College certificate
 College diploma
 University undergraduate degree
 University graduate degree
 Other, *please specify* _____

8. Was your training obtained in Ontario?

- Yes, ***please specify the community*** _____
 No

9. What is your primary language? _____

10. What is your age as of your last birthday (in years)? _____

11. What is your ethnicity? (Check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Aboriginal | <input type="checkbox"/> Indian Caribbean |
| <input type="checkbox"/> Asian East | <input type="checkbox"/> Mixed Background |
| <input type="checkbox"/> Asian South | <input type="checkbox"/> Middle Eastern |
| <input type="checkbox"/> Asian South East | <input type="checkbox"/> Other |
| <input type="checkbox"/> Black Caribbean | <input type="checkbox"/> Prefer Not to Answer |
| <input type="checkbox"/> Black African | <input type="checkbox"/> White European |
| <input type="checkbox"/> Black North American | <input type="checkbox"/> White North American |

12. Do you identify as Aboriginal, Métis or Inuit?

- Yes
 No

13. What is your height?

_____ Feet (0-9) _____ Inches (Please round to the nearest inch)

14. What is your weight (in pounds)? _____ lbs

15. Within the past twelve months, has a doctor ever treated you for, or told you that you had, any of the following? Please check all that apply if "Yes".

- | | |
|---|--|
| <input type="checkbox"/> Asbestosis | <input type="checkbox"/> Back problems/injuries |
| <input type="checkbox"/> Cancer (lung, mesothelioma, gastrointestinal, liver, nasal, or skin) | <input type="checkbox"/> Eye injuries |
| <input type="checkbox"/> Hand-arm vibration syndrome | <input type="checkbox"/> Hypersensitivity pneumonitis |
| <input type="checkbox"/> Acute solvent poisoning | <input type="checkbox"/> Polymer fume fever |
| <input type="checkbox"/> Toxic Neuropathy | <input type="checkbox"/> Pulmonary edema |
| <input type="checkbox"/> Bronchitis | <input type="checkbox"/> Metal fume fever |
| <input type="checkbox"/> Asthma | <input type="checkbox"/> Insomnia |
| <input type="checkbox"/> Noise-induced hearing loss | <input type="checkbox"/> Chloracne and rashes |
| <input type="checkbox"/> Lung or breathing problems | <input type="checkbox"/> Contact urticaria |
| <input type="checkbox"/> Electric shock | <input type="checkbox"/> Contact dermatitis |
| <input type="checkbox"/> Electrical burn | <input type="checkbox"/> Other, please specify _____ |
| <input type="checkbox"/> Knee problems/injury | <input type="checkbox"/> No, I have not been treated for, or told that I have any of the above |

16. Which of the following would you use to describe yourself?

- A daily smoker
- An occasional smoker
- A former daily or occasional smoker
- Non-smoker

17. If you are a current or former cigarette smoker, how many total years have you smoked?

_____ years N/A

18. Please indicate your work experience in years.

_____ total years
 _____ years in Ontario

19. What is your current employment? **Please check only one.**

- Employed in electrical sector
- Employed in plumbing sector
- Employed in non-electrical/plumbing sector

20. What is your current employment status? **Please check one.**

- Full-time, permanent
- Full-time, contract
- Part-time, permanent
- Part-time, contract

- Full-time, permanent Owner
- Other, please specify _____

21. If you are **not** employed full-time, please indicate why. **Please check all that apply.**

- Need more flexible hours
- Health restrictions
- Travel restrictions
- Family commitments
- Lack of full-time job positions
- Workload is too heavy
- Other, **please specify** _____

22. In which position are you working? **Please check all that apply.**

Electrical sector

- Licensed Electrician
- Electrical Apprentices
- Electrical Technician
- Electrical Foreperson
- Maintenance Technician
- Electrician Journeyman
- Electrical power supply system technician
- Other, **Please specify** _____

Plumbing sector

- Licensed Plumber
- Plumbing Apprentice
- Licensed Journeyman Plumber
- Service Technician
- Other, **Please specify** _____

23. Do you belong to a union?

- Yes
- No

24. Do you have people that directly report to you?

- Yes
- No

25. Does your schedule often change unexpectedly?

- Yes, often
- Yes, sometimes
- Yes, rarely

26. Please indicate the average number of hours you work per week.

_____ hours per week

27. Please indicate the average overtime hours you work per week.

_____ hours per week

28. How long have you worked as electrician/plumber? _____ years and/or _____ months

29. How long have you worked at your current workplace? _____ years and/or _____ months

30. If you worked any overtime in the past year, please indicate how you were compensated. **Please check all that apply.**

- Banked hours
- Overtime payment
- No compensation
- Other, **please specify** _____

31. Please indicate the usual duration of shift worked in your current position.

- 4 hours
- 8 hours
- Other, **please specify** _____

32. Do you intend to stay in your current position for the next 5 years?

- Yes
- No
If No, **please specify why** _____

33. Please indicate how important the factors listed below are to keep you working as your current position in your current workplace? **Please check one box in each row.**

		Not important	Important	Extremely important
A	Career advancement possibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	Cost of living	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	Existing leadership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D	Facility and workplace equipment/resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E	Family commitments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F	Financial support for external training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G	Flexible scheduling for external training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	Full-time employment opportunity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I	Income and benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J	Internal staff development opportunity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	Involvement in organization decision-making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L	Leave of absence for external training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	Orientation program for new staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N	Peer support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O	Stable staffing/minimal turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P	Workload allocation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q	Workplace Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
R	Opportunity to become a fully licensed Electrician (For apprentices)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S	Opportunity/support to qualify as Master Electrician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T	Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U	Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

34. Please indicate availability and your satisfaction with the following factors in your current workplace. **Please check one box in each row.**

		Not available	Available but needs improvement	Available to my satisfaction
A	Career advancement possibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	Effective management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C	Facility equipment and workplace resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D	Financial support for external training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E	Flexible scheduling for external training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F	Flexible scheduling for family commitments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G	Full-time employment opportunity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H	Internal staff development opportunity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I	Involvement in organization decision-making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J	Leave of absence for external training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K	Orientation program for new staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L	Peer support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
M	Salary and benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N	Stable staffing turnover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O	Workload allocation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P	Workplace Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q	Opportunity to become a fully licensed Electrician (For apprentices)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
R	Opportunity/support to qualify as Master Electrician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S	Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T	Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

35. Does your organization have policies targeting **recruitment** of registered electricians/plumbers?

- Yes
- No
- Not aware /Don't know

If Yes, ***please specify***

36. Does your organization have policies targeting **retention** of registered electricians/plumbers?

- Yes
- No
- Not aware/Don't know

If Yes, ***please specify***

37. Which of the following best describes your **gross** annual income?

- | | |
|---|--|
| <input type="checkbox"/> Less than \$20,000 | <input type="checkbox"/> \$50,000-\$59,999 |
| <input type="checkbox"/> \$20,000-\$29,999 | <input type="checkbox"/> \$60,000-\$69,999 |
| <input type="checkbox"/> \$30,000-\$39,999 | <input type="checkbox"/> \$70,000-\$79,999 |
| <input type="checkbox"/> \$40,000-\$49,999 | <input type="checkbox"/> \$80,000 or more |
| <input type="checkbox"/> Prefer Not to Answer | |

38. Please indicate the community where your workplace is located. (It would be helpful if you provide both the community name and postal code).

_____ AND _____
Name of the community Postal code

39. You are welcome to comment on or make suggestions for the strategies needed to improve the retention and recruitment of electricians/plumbers in Ontario.

THANK YOU!

BURNOUT

	Never/almost never or to a very low degree	Seldom or to a low degree	Sometimes or somewhat	Often or to a high degree	Always or to a very high degree
Personal Burnout					
How often do you feel tired?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often are you physically exhausted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often are you emotionally exhausted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you think: "I can't take anymore"?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you feel worn out?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How often do you feel weak and susceptible to illness?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work related burnout					
Do you feel worn out at the end of the working day?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are you exhausted in the morning at the thought of another day at work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you feel that every working hour is tiring for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have enough energy for family and friends during leisure time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is your work emotionally exhausting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does your work frustrate you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you feel burnt out because of your work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colleague-related burnout					
Do you find it hard to work with colleagues?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does it drain your energy to work with colleagues?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you find it frustrating to work with colleagues?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you feel that you give more than you get back when you work with colleagues?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are you tired of working with colleagues?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you sometimes wonder how long you will be able to continue working with colleagues?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

JOB SATISFACTION

We would like you to think about the *type of work you do in your job*.

1. Knowing what you know now, if you had to decide all over again whether to take the type of job you now have, what would you decide?

- I would decide without hesitation to take the same job
- I would have some second thoughts
- I would decide definitely NOT to take this type of job

2. If you were free right now to go into any type of job you wanted, what would your choice be?

- I would take the same job.
- I would take a different job.
- I would not want to work.

3. If a friend of yours told you they were interested in working in a job like yours, what would you tell them?

- I would strongly recommend it.
- I would have doubts about recommending it.
- I would advise against it.

4. All in all, how satisfied would you say you are with your job?

- I am very satisfied.
- I am somewhat satisfied.
- I am not too satisfied.
- I am not at all satisfied.

MENTAL DEMANDS

Please indicate the degree to which you agree or disagree with the following statements about your job. Please enter the number in the space provided at the end of each statement.

	Strongly Agree	Slightly Agree	Slightly Disagree	Strongly Disagree
1. My job requires a great deal of concentration.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. My job requires me to remember many different things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I must keep my mind on my work at all times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I can take it easy and still get my work done.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I can let my mind wander and still do the work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PHYSICAL ENVIRONMENT

Please indicate whether the following statements about your job are TRUE or FALSE.

	TRUE	FALSE
1. The level of NOISE in the area(s) in which I work is usually high.	<input type="checkbox"/>	<input type="checkbox"/>
2. The level of LIGHTING in the area(s) in which I work is usually poor.	<input type="checkbox"/>	<input type="checkbox"/>
3. The TEMPERATURE of my work area(s) during the SUMMER is usually comfortable.	<input type="checkbox"/>	<input type="checkbox"/>
4. The TEMPERATURE of my work area(s) during the WINTER is usually comfortable.	<input type="checkbox"/>	<input type="checkbox"/>

5. The HUMIDITY in my work area(s) is usually either too high or too low.	<input type="checkbox"/>	<input type="checkbox"/>
6. The level of AIR CIRCULATION in my work area(s) is good.	<input type="checkbox"/>	<input type="checkbox"/>
7. The AIR in my work area(s) is clean and free of pollution.	<input type="checkbox"/>	<input type="checkbox"/>
8. In my job, I am well protected from exposure to DANGEROUS SUBSTANCES.	<input type="checkbox"/>	<input type="checkbox"/>
9. The overall quality of the PHYSICAL ENVIRONMENT where I work is poor.	<input type="checkbox"/>	<input type="checkbox"/>
10. My WORK AREA(S) is/are awfully crowded.	<input type="checkbox"/>	<input type="checkbox"/>

WORK HAZARDS

Please answer each of the following questions as they apply to you.

1. Does your job primarily involve providing direct service to specific groups of people or client populations?

- YES
- NO

	Never	Occasionally	Sometimes	Fairly Often	Very Often
2. How often does your job expose you to verbal abuse and/or confrontations with clients or the general public?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. How often does your job expose you to the threat of physical harm or injury?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. How often have you been physically assaulted within the past 12 months while performing your job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. How often does your job personally subject you to potential legal liability?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SOCIAL SUPPORT

	Very Much	Somewhat	A little	Not at All	Don't Have Any Such Person
1. How much do each of these people go out of their way to do things to <i>make your work life easier</i> for you?					
a) Your immediate supervisor (boss)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Other people at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Your spouse, friends and relatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. How easy is it for you to talk with each of the following people?					
a) Your immediate supervisor (boss)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Other people at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Your spouse, friends and relatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. How much can each of these people be <i>relied</i> on when things get tough at work?					
a) Your immediate supervisor (boss)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Other people at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Your spouse, friends and relatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. How much is each of the following <i>willing to listen</i> to your personal problems?					
d) Your immediate supervisor (boss)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Other people at work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Your spouse, friends and relatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ontario Electrical League

Appendix B

Focus Group Guide

Focus Group Protocol and Questions

Before the interview with the participant

The session begins by making the participant comfortable through information conversation that includes confirmation of their name and brief work history. Confidentiality issues are discussed, including informing participants that only the research team will have knowledge of what the participant discusses and that the discussion content will be combined with other focus group data for analysis. The focus group moderator will request permission to record the focus group and will explain the importance of recording for accuracy of data collection. Participants will also be invited to provide their contact information if they wish to receive a one-page summary of the study findings upon completion of the project.

- Share your work experience that's brought you here today.
- What do you think about the apprenticeship program?
- How would you describe OEL's support in apprentice training?
- How likely are you to recommend apprenticeship program to a colleague?
- What do you like about OEL mentoring/training program? What are aspects of the OEL mentoring /training program that you would like to see changed?
- What is the biggest challenge you face at work when it comes to hiring an apprentice?
- Was the program successfully encouraging you to hire apprentices from underrepresented groups in the labour market or those disproportionately impacted by COVID-19, including women, youth, persons with disabilities, racialized groups, and Indigenous peoples?
- Tell me the strengths and weaknesses of OEL's mentoring program?
- Tell me about some of the challenges facing employers in training an apprentice.
- What type of supports do you need to provide apprenticeship training opportunities and ensure Ontarians have the skilled trades workforce they need?
- How can the OEL support your needs to train apprentices in order to provide a solution for skills gap in electrical or plumbing trades in Ontario?
- If you could change something to improve OEL/OML project, what would it be?
- OEL/OML provided the resources in the form of employer outreach, mentoring, training and hiring tools to increase employer involvement in the project. Do you think they provided sufficient resources? If not, what other resources you recommend?
- What are other strategies do you think OEL/OML should consider to improve employer engagement?
- Is there anything we haven't touched on today that you'd like us to know?

Thank you for your participation.

Ontario Electrical League

Appendix C

Email Scripts to invite participants to partake in the study

Email Script to invite participants to partake in the survey

Email script to be sent by the Ontario Electrical League

Dear OEL member,

We are inviting you to participate in the study entitled “Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers.” The study is being conducted as part of the OEL Increasing Employer Engagement in Apprenticeship Training project. To learn more about the study and participate, please [click here](#)

Study title: *Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers*

Principal Investigator: Dr. Behdin Nowrouzi-Kia is an occupational therapist and assistant professor in the Department of Occupational Science and Occupational Therapy in the Faculty of Medicine at the University of Toronto.

Sincerely,

The OEL

Email reminder script to be sent by the Ontario Electrical League

Dear OEL member,

Two weeks ago we invited you to participate in a study. If you have already participated in the study, thank you for your contribution. As a reminder, the study is entitled *Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers*. The study is being conducted as part of the OEL Increasing Employer Engagement in Apprenticeship Training project. To learn more about the study and participate, please [click here](#)

Study title: *Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers*

Principal Investigator: Dr. Behdin Nowrouzi-Kia is an occupational therapist and assistant professor in the Department of Occupational Science and Occupational Therapy in the Faculty of Medicine at the University of Toronto.

Sincerely,
The OEL

Email Script to invite participants to partake in the focus group

Email script to be sent by the Ontario Electrical League

Dear OEL member,

We are inviting you to participate in a focus group for the study entitled “Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers.” evaluating the outcomes of a training and mentoring program that supports electrical and plumbing employers’ need to train apprentices. The study is being conducted as part of the OEL Increasing Employer Engagement in Apprenticeship Training project in order to meet the current and future needs of the labour market. To learn more about the study and participate, please [click here](#)

Study title: *Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers*

Principal Investigator: Dr. Behdin Nowrouzi-Kia is an occupational therapist and assistant professor in the Department of Occupational Science and Occupational Therapy in the Faculty of Medicine at the University of Toronto.

Sincerely,

The OEL

Email reminder script to be sent by the Ontario Electrical League

Dear OEL member,

Two weeks ago we invited you to participate in a focus group related to a study entitled Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers. If you have already participated in the study, thank you for your contribution. The study is being conducted as part of the OEL Increasing Employer Engagement in Apprenticeship Training project. To learn more about the study and participate, please [click here](#)

Study title: *Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers*

Principal Investigator: Dr. Behdin Nowrouzi-Kia is an occupational therapist and assistant professor in the Department of Occupational Science and Occupational Therapy in the Faculty of Medicine at the University of Toronto.

Sincerely,

The OEL

Ontario Electrical League

Appendix D

Survey Consent Form



Occupational Science
& Occupational Therapy
UNIVERSITY OF TORONTO

Letter of Information and Consent to Participate in a Research Study – Survey Consent

Study Title: Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers
Behdin Nowrouzi-Kia, Ph.D., OT Reg. (Ont.)
Assistant professor,
Department of Occupational Therapy and Occupational Science, Temerty Faculty of Medicine, U of T

Principal Investigator: *E-mail: behdin.nowrouzi.kia@utoronto.ca*
Telephone: 416-946-3249

Study Sponsor: *The Ontario Electrical League (OEL)*

CONFLICT OF INTEREST STATEMENT

The principal investigator, co-investigators, and research staff do not have any conflicts of interest, financial or otherwise, related to this study or its outcome.

Principal Investigator

Dr. Behdin Nowrouzi-Kia is an occupational therapist and assistant professor in the Department of Occupational Science and Occupational Therapy in the Faculty of Medicine at the University of Toronto.

Study Sponsor:

The study is funded by the Ontario Electrical League (OEL).

Invitation to Participate

We are inviting you to participate in the study with the above title, evaluating the outcomes of a training and mentoring program that supports electrical and plumbing employers' need to train apprentices and thereby be more effectively engaged in developing and delivering a solution to close the skills gap in these trades.

Before agreeing to take part in this research study, it is important that you read the information in this research consent form. It includes details we think you need to know in order to decide if you wish to take part in the study. If you have any questions, you may ask the investigator (BNK) or research team members (ABF and JL).

Study Purpose

The purpose of this study is to have more employers in electrical and plumbing sectors involved in apprenticeship training to increase the capacity to train and certify enough workers in the skilled trades in order to meet the current and future needs of the labour market.

Eligibility

You are being asked to participate in this study because you are small to medium electrical and/or plumbing contractors (with 0-50 employees) in Ontario.

Voluntary nature of the study

You will be asked to complete a questionnaire. The questionnaire will take approximately 20-25 minutes to complete and available online at redcap.utoronto.ca

Your experiences as an electrical/plumbing employer are valuable and important to this study. Your participation is completely voluntary. You may withdraw at any time without penalty. You may skip any question that you are uncomfortable answering. Master lists and any identifying information are securely kept only in Dr. Behdin Nowrouzi-Kia's lab and are electronically encrypted. All information will be securely kept for five years after study completion and will be properly cleared/purged following this time period.

Based on your responses, the data will be analyzed quantitatively using statistical software such as R and SPSS. The results of this study will be used to inform various stakeholders, and will be presented in academic conferences, and published in peer-reviewed journals.

Risks

There is a minimal risk that emotional distress may be created when answering some of the questions related to your mental health and working in the midst of COVID-19. Please feel free to discuss your reactions to the questionnaires with the research staff. Should you experience distress or discomfort when answering the questions, you can skip the questions or terminate your participation without providing a reason. You may also wish to contact the Employee & Family Assistance Program at your respective workplace location, or your mental health provider should you have one.

Benefits

There is no intended direct benefit to you for participation in this study. Information learned from this study will allow the researchers to understand and evaluate the demographic and work-related predictors of occupational stress and burnout of electricians and plumbers. The results of this study may be useful for identifying health, social, and economic impacts of electricians and plumbers psychosocial work environment due to the COVID-19 pandemic in Canada. If you are interested in the study's findings and would like to receive a copy of the study report, you must email the study investigators and request for that. A summary of the findings will be used to generate a report available to the public, where one can be sent to you. Only group information obtained from this study will be reported. Once completed, the findings will also be submitted for publication.

Participation and Withdrawal

Your participation in this research study is voluntary. If you decide to participate, you do not have to answer any questions that you don't want to. You may refuse to participate in or withdraw from the study at any time and this will have no effect on your employment. Your work within your company will not be altered or affected in any way by your decision to participate, abstain or withdraw from this study. If you would like to request the withdrawal of your data, please contact Dr. Behdin Nowrouzi-Kia. Information that was collected before you withdrew will be still used by the researchers for the purposes of the study, but no information will be collected or shared after you withdraw your permission.

Potential Costs and Reimbursement

In recognition of your time, you will have a chance to receive a \$50 Amazon gift card (draws from a prize bowl for participants who complete the focus group and study questionnaire).

Obligation

This study is not mandatory. There are no consequences if you choose not to participate. To reiterate the above-mentioned text, you may stop answering the questions and withdraw at any time.

Confidentiality

All information about you will be kept confidential to the extent of the law. Signing consent does not waive subject’s legal rights nor relieve investigator/sponsor/ institution from legal responsibility. You will be identified only by a unique study ID number, not by identifiers. The investigator responsible for this study or the University of Toronto is not conducting this study to receive commercial benefit. The information that we collect will be kept secure. The data will be summarized along with information obtained from other participants. If the results of the study are published or presented at a scientific meeting, you will not be identified. All individual information will be kept confidential in Dr. Nowrouzi-kia’s lab and will not be made available to the public. The data will be kept on encrypted, password-protected devices in Dr. Nowrouzi-kia’s lab at 500 University Ave, Toronto, Ontario, Canada. The data will be kept for a period of five years to permit for analyses, preparation of manuscripts for publication and to determine the feasibility of the project.

Questions

For any questions about this study, please contact
Behdin Nowrouzi-Kia, Ph.D., OT Reg. (Ont.)
Assistant professor,
Department of Occupational Science and Occupational Therapy, Temerty Faculty of Medicine, U
of T
E-mail: behdin.nowrouzi.kia@utoronto.ca
Telephone: 416-946-3249

I have read the information presented in the Information Consent regarding the research projected conducted by Dr. Nowrouzi-Kia. I voluntarily consent to participate in this study. I am also aware that I can choose to withdraw my information within one week upon receipt of the de-identified transcript or for a longer period upon my request.

Participant Name: _____ Participant signature _____

Date: _____

You may email this consent form. Please read the information in this research consent form carefully and if you agree, please sign the form, scan it, and email to ABF or JL (see below for contact information).

Contact Information:

Behdin Nowrouzi-Kia, Ph.D., OT Reg. (Ont.)
Assistant professor,
Department of Occupational Science and Occupational Therapy, Temerty Faculty of Medicine, U
of T

E-mail: behdin.nowrouzi.kia@utoronto.ca
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of T

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Telephone: 416-946-3249

Ontario Electrical League

Appendix E

Focus Group Consent Form

Letter of Information and Consent to Participate in a Research Study – Focus groups

Study Title: Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers
Behdin Nowrouzi-Kia, Ph.D., OT Reg. (Ont.)
Assistant professor,
Department of Occupational Therapy and Occupational Science, Temerty Faculty of Medicine, U of T

Principal Investigator: *E-mail: behdin.nowrouzi.kia@utoronto.ca*
Telephone: 416-946-3249

Study Sponsor: *The Ontario Electrical League (OEL)*

CONFLICT OF INTEREST STATEMENT

The principal investigator, co-investigators, and research staff do not have any conflicts of interest, financial or otherwise, related to this study or its outcome.

Principal Investigator

Dr. Behdin Nowrouzi-Kia is an occupational therapist and assistant professor in the Department of Occupational Science and Occupational Therapy in the Faculty of Medicine at the University of Toronto.

Study Sponsor:

The study is funded by the Ontario Electrical League (OEL).

Invitation to Participate

We are inviting you to participate in the study with the above title, evaluating the outcomes of a training and mentoring program that supports electrical and plumbing employers' need to train apprentices and thereby be more effectively engaged in developing and delivering a solution to close the skills gap in these trades.

Before agreeing to take part in this research study, it is important that you read the information in this research consent form. It includes details we think you need to know in order to decide if you wish to take part in the study. If you have any questions, you may ask the investigator (BNK) or research team members (ABF and JL).

Study Purpose

The purpose of this study is to have more employers in electrical and plumbing sectors involved in apprenticeship training to increase the capacity to train and certify enough workers in the skilled trades in order to meet the current and future needs of the labour market.

Eligibility

You are being asked to participate in this study because you are small to medium electrical and/or plumbing contractors (with 0-50 employees) in Ontario.

Voluntary nature of the study

You will take part in a focus group held virtually by the research staff (ABF and JL) at the University of Toronto using video conference technology using Microsoft Teams or by phone (if you are not able to attend the focus group sessions), and the focus group will run for approximately 60-75 minutes. Prior to your participation, we are available to assist you in setting up the application, Microsoft Teams (if you choose to use this method of communication in lieu of a phone call), which is a video chat platform with audio capabilities. Your experiences as an electrical/plumbing employer are valuable and important to this study and will be audio-recorded and later transcribed. You will be asked to share your thoughts about what you consider to be important issues in the workplace. Moreover, you will be asked what aspects foster the workplace environment for apprentices and employees at your company. It is also your right as a participant in the study to refuse answering particular questions or to withdraw from the study at any time.

Please also note that while each transcript will be de-identified, it will be coded in such way that can be re-identified. Master lists and any identifying information are securely kept only in Dr. Behdin Nowrouzi-Kia's lab and are electronically encrypted. All information will be securely kept for five years after study completion and will be properly cleared/purged following this time period.

Based on your responses and the responses in the form of transcripts, a procedure called thematic analysis will be performed, which is a qualitative method used to help identify key themes and subthemes related to the study. The results of this study will be used to inform various stakeholders, and will be presented in academic conferences, and published in peer-reviewed journals.

Risks

There is a minimal risk that emotional distress may be created when discussing the current stressors related to working in the midst of COVID-19. Should you experience distress or discomfort during the focus group, you can terminate your participation without providing a reason. You may also wish to contact the Employee & Family Assistance Program at your respective workplace location, or your mental health provider should you have one.

Benefits

There is no intended direct benefit to you for participation in this study. Information learned from this study will allow the researchers to understand and evaluate the effectiveness of the project and make recommendations for future supports that will lead to more completions of apprenticeship pathways. The results of this study may be useful for identifying health, social, and economic impacts of electricians and plumbers psychosocial work environment due to the COVID-19 pandemic in Canada. If you are interested in the study's findings and would like to receive a copy of the study report, you must email the study investigators and request for that. A summary of the findings will be used to generate a report available to the public, where one can be sent to you. Only group information obtained from this study will be reported. Once completed, the findings will also be submitted for publication.

Participation and Withdrawal

Your participation in this research study is voluntary. If you decide to participate, you do not have to answer any questions that you don't want to. You may refuse to participate in or withdraw from the study at any time and this will have no effect on your employment. You may use an alias during the focus group to protect your privacy and to avoid using directly

identifiable information. The focus group will be conducted using Microsoft Teams. Your work within your company will not be altered or affected in any way by your decision to participate, abstain or withdraw from this study. If you would like to request the withdrawal of your data, please contact Dr. Behdin Nowrouzi-Kia. Information that was collected before you withdrew will be still used by the researchers for the purposes of the study, but no information will be collected or shared after you withdraw your permission.

Potential Costs and Reimbursement

In recognition of your time, you will have a chance to receive a \$50 Amazon gift card (draws from a prize bowl for participants who complete the focus group and study questionnaire).

Obligation

This study is not mandatory. There are no consequences if you choose not to participate. To reiterate the above-mentioned text, you may withdraw at any time during the focus group, and can request to remove your data one week after the de-identified transcript has been shared with you (or longer as per your request).

Confidentiality

All information about you will be kept confidential to the extent of the law. Signing consent does not waive subject’s legal rights nor relieve investigator/sponsor/ institution from legal responsibility. You will be identified only by a unique study ID number, not by identifiers. The investigator responsible for this study or the University of Toronto is not conducting this study to receive commercial benefit. The information that we collect will be kept secure. The data will be summarized along with information obtained from other participants. If the results of the study are published or presented at a scientific meeting, you will not be identified. All individual information will be kept confidential in Dr. Nowrouzi-kia’s lab and will not be made available to the public. The de-identified data will be kept on encrypted, password-protected devices in Dr. Behdin Nowrouzi-Kia’s lab at 500 University Ave, Toronto, Ontario, Canada. The data will be kept for a period of five years to permit for analyses, preparation of manuscripts for publication and to determine the feasibility of the project. The de-identified data will be kept for five years and then destroyed.

Questions

For any questions about this study, please contact
Behdin Nowrouzi-Kia, Ph.D., OT Reg. (Ont.)
Assistant professor,
Department of Occupational Science and Occupational Therapy, Temerty Faculty of Medicine, U
of T
E-mail: behdin.nowrouzi.kia@utoronto.ca
Telephone: 416-946-3249

I have read the information presented in the Information Consent regarding the research projected conducted by Dr. Nowrouzi-Kia. I voluntarily consent to participate in this study. I am also aware that I can choose to withdraw my information within one week upon receipt of the de-identified transcript or for a longer period upon my request.

Participant Name: _____

Participant signature _____

Date: _____

You may email this consent form. Please read the information in this research consent form carefully and if you agree, please sign the form, scan it, and email to ABF or JL (see below for contact information).

Contact Information

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Ontario Electrical League

Appendix D

REB Approval Letter



UNIVERSITY OF
TORONTO

OFFICE OF THE VICE-PRESIDENT,
RESEARCH AND INNOVATION

RIS Protocol
Number: 41519

Approval Date: 5-Oct-21

PI Name: Dr Behdin Nowrouzi-
Kia

Division Name:

Dear Dr Behdin Nowrouzi-Kia:

Re: Your research protocol application entitled, "Supporting Employers in Apprentice Training: Outcomes of a Training and Mentoring Program for Electrical and Plumbing Employers"

The Health Sciences REB has conducted a Delegated review of your application and has granted approval to the attached protocol for the period 2021-10-05 to 2022-10-04.

This approval covers the ethical acceptability of the human research activity; please ensure that all other approvals required to conduct your research are obtained prior to commencing the activity.

Please be reminded of the following points:

- An **Amendment** must be submitted to the REB for any proposed changes to the approved protocol. The amended protocol must be reviewed and approved by the REB prior to implementation of the changes.
- An annual **Renewal** must be submitted for ongoing research. Renewals should be submitted between 15 and 30 days prior to the current expiry date.
- A **Protocol Deviation Report (PDR)** should be submitted when there is any departure from the REB-approved ethics review application form that has occurred without prior approval from the REB (e.g., changes to the study procedures, consent process, data protection measures). The submission of this form does not necessarily indicate wrong-doing; however follow-up procedures may be required.
- An **Adverse Events Report (AER)** must be submitted when adverse or unanticipated events occur to participants in the course of the research process.
- A **Protocol Completion Report (PCR)** is required when research using the protocol has been completed.
- If your research is funded by a third party, please contact the assigned Research Funding Officer in Research Services to ensure that your funds are released.

Best wishes for the successful completion of your research.