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Supervisor and worker perspectives on workplace accommodations for mental health

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Executive Summary

Mental health disorders (MHD) are a major cause of human suffering, lost productivity, workplace disability, and economic loss throughout the industrialized world. One in every three Canadians experience mental or substance use disorders in their lifetime. The economic burden of MHD in Canada is estimated at $51 billion per year. This includes health care costs, lost productivity, and reductions in health-related quality of life. The consequences of MHD directly affect Canadian employers, since between 30% and 60% of the related social costs are associated with a reduction in productivity.

The burden of MHD on workplaces is heavy. Estimates for the prevalence of MHD in the workplace range from 10% to 12%. Productivity losses associated with MHD are estimated to be approximately $17.7 billion annually. Risk factors for mental disorders include family history of mental illness; family, workplace, and life event stresses; chronic diseases; substance abuse; age; and sex. Environmental factors can precipitate the onset or recurrence of a mental illness. Among these factors are a number of workplace variables, and this has led to growing interest in whether workplace interventions might be integrated with clinical treatment to prevent long-term disability due to MHD.

Supervisors of workers with mental health disorders play a key role in the prevention of prolonged work absences. Providing appropriate workplace accommodation is one approach supervisors use to facilitate an employee staying at work or returning to work early. People with mental health disorders function well in the workplace when they are provided with appropriate work accommodations that take into account social, organizational, and interpersonal issues. Yet, we have little understanding of how these factors influence the decision-making of supervisors to develop and provide work accommodation.

The general objective of our study was to understand what factors (organizational/job, supervisor, healthcare provider and worker) determine whether workplace accommodations are supported and received from the perspective of both supervisors and workers.

The study involved distributing surveys to supervisors and workers from 31 randomly selected businesses from across Manitoba and Northwestern Ontario. For inclusion in the study, businesses were required to have a minimum of 50 employees and be from one of ten industrial groups: Agriculture, Forestry, and Fishing; Manufacturing; Mineral Industries; Construction Industries; Wholesale Trade; Retail Trade; Transportation, Communication, and Utilities; Finance, Insurance, and Real Estate; Service Industries; and Public Administration. We invited three randomly selected businesses from each of the 10 industrial groups to participate.

What we did

For each business that agreed to participate, we distributed two separate surveys: one to supervisors and one to workers. For supervisors, the survey included a case vignette of a worker with a mental health disorder and a number of scales assessing factors that may affect their decisions to provide workplace accommodations. Workers were asked to complete a survey indicating whether or not they suffer from a mental health disorder, whether or not they have disclosed their condition, and which accommodations they were offered/preferred/found helpful. We also used the surveys to assess workplace, supervisor, and worker factors that may influence whether a worker with a mental health disorder is offered an accommodation or not.

Results from this study will further our understanding of how supervisors can facilitate a stay at work or return to work for workers with mental health disorders. It will also help us understand factors that may influence which accommodations workers with mental health disorders most often receive and which would be most helpful to them.

Overview of Results

First, the factors associated with supervisors' likelihood to accommodate a worker with a mental health disorder were workplace disability management policies and practices, supervisor stigma, and supervisor education level. These findings are important for all work disability prevention stakeholders as they identify important targets for intervention. For example, simple applications may be to improve disability management policies and practices; or to train supervisors to improve their mental health literacy and decrease stigmatizing attitudes. Second, workplace and supervisor factors do not appear to be strong determinants of whether or not a worker will find an accommodation helpful. Finally, supervisors are providing the types of accommodations that workers find helpful. We have recommended 10 accommodations that were ranked high by workers and also well supported by supervisors as a starting point for accommodation consideration.

Acknowledgements

I'd like to thank the entire research team for their invaluable expertise and advice related to this project. Project members included:

- Dr. Marc Corbière, Université du Québec à Montréal, Centre de recherche de l'Institut universitaire en santé mentale de Montréal
- Dr. William S Shaw, University of Connecticut Health Center
- Dr. Karen Harlos, University of Winnipeg
- Ms. Margaret Cernigoj, Workplace Safety and Prevention Services

The project advisory team was also instrumental to this project. First, they contributed valuable advice prior to the start of the study to ensure we collected the most appropriate information. Second, they participated in our concept mapping exercise to help us develop a new measure of support (supervisor perspective) and preference (worker perspective) for accommodations for workers' with mental health disorders. Third, they assisted in the development of messages to take away from this project. Finally, they continue to contribute through dissemination of the findings contained in this report to their networks. The project advisory team included:

- Ron Ferguson, formerly of Great West Life Insurance; now retired
- Sara MacDonald, KTE Associate at the Institute for Work & Health
- Paula Raposo, Manitoba Government and General Employees' Union
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Introduction

The Problem of Mental Health Disorders

MHD are a major cause of human suffering, lost productivity, workplace disability and, economic loss throughout the industrialized world. One in every three Canadians experience mental or substance use disorders in their lifetime.[1] The economic burden of MHD in Canada is estimated at $51 billion per year. This includes health care costs, lost productivity, and reductions in health-related quality of life.[2] The consequences of MHD directly affect Canadian employers, since between 30% and 60% of the related social costs are associated with a reduction in productivity.[2-4] The Canadian Nurses Association demonstrated that reducing absenteeism levels due to MHD by 50% over three years would put the equivalent of an additional 7,000 full-time registered nurses into the workforce to provide care and service and would save $500 million in salaries.[5] In Québec, MHD account for 40% of all salary insurance claims.[6]

Defining Mental Health Disorders

MHD are characterized by alternations in thinking, mood, or behaviour associated with significant distress and impaired functioning over an extended period of time.[7] Over a lifetime, every individual experiences feelings of isolation, loneliness, emotional distress or disconnection at some point. These are usually normal, short-term reactions to situations, rather than symptoms of MHD. However, sometimes the duration and intensity of painful feelings or disorienting patterns of thought may interfere with everyday life. Dewa and McDaid define mental disorders as including mood disorders, anxiety disorders, psychotic disorders, substance use disorders, and traumatic brain injuries (TBI).[8] Corbière et al. differentiate between common mental disorders and severe mental disorders.[9] Common mental disorders include adjustment disorder, anxiety, and depression disorders and account for about 30% of disability claims.[10] Severe mental disorders include schizophrenia and bipolar disorder.[9] Other psychiatric diagnoses, such as personality disorders and severe concurrent diagnoses (psychiatric diagnosis with substance abuse) are also considered severe mental disorders. Many (70-80%) of these workers continue to be unemployed.

Epidemiology of Mental Health Disorders in Canada

In 2012, the annual prevalence of mental health or addiction problems in the Canadian population was 10%, or 2.8 million people.[1] Mood disorders are most common, with 5.4% of the Canadian population experiencing a mood disorder over a 12-month period. Depression is the most common mood disorder (4.7%), while 1.5% experience bipolar disorder. Alcohol abuse is the most common substance use disorder with a prevalence of 3.2%. A total of 2.6% of Canadians have generalized anxiety disorder. Females tend to have higher rates of depression and anxiety disorders than males, and males have higher rates of substance use disorders.[1] The incidence of mild traumatic brain injury (MTBI) in the general population is not known, but the incidence of hospital-treated

patients with MTBI is about 100-300 per 100,000 population.[11] Given most MTBI is not treated at hospitals, the true population-based rate for MTBI is estimated to be above 600 per 100,000.[11] The annual incidence of hospital admissions for moderate to severe TBI is 85 per 100,000.[12] Young people aged 15 to 24 are more likely to experience MHD and/or substance disorders than any other age group.[1,13]

Workplace burden of Mental Health Disorders

The burden of MHD on workplaces is heavy. Estimates for the prevalence of MHD in the workplace range from 10% to 12%.[14,15] Individuals with MHD are less likely to be employed.[8] Unemployment rates are between 70% to 90% for people with the most severe mental disorders.[16] Productivity losses associated with MHD are estimated to be approximately $17.7 billion annually.[2] Risk factors for mental disorders include family history of mental illness; family, workplace, and life event stresses; chronic diseases; substance abuse; age; and sex – depending on the MHD. Environmental factors can precipitate the onset or recurrence of a mental illness. Among these factors are a number of workplace variables, and this has led to growing interest in whether workplace interventions might be integrated with clinical treatment to prevent long-term disability due to MHD.

Workplace-based Intervention

Given the burden of MHD on workplaces, and the fact that characteristics of work and the work environment frequently emerge as predictors of MHD in various studies, several work-focused interventions for these conditions have been developed. These can be categorized into three categories: individual level (those delivered to the individual employee), organizational level (those delivered company-wide), and combined (those that combine both types).[17,18] Many individual level interventions incorporate cognitive behavioural training strategies with the goal of enhancing the employee's coping skills and awareness of distorted thinking associated with these disorders, and the development of more adaptive behaviour. Organizational interventions tend to use screening or needs assessment, followed by education. Yet, many obstacles exist for intervening in the workplace, including barriers to employer communication, stigma, corporate culture, limited information about job tasks and prospects for modifying work, and employers unwilling or unable to provide modified or transitional work.[19] Additionally, although the mental health of workers has become the focus of many new interventions across the globe, inconsistent outcome measures and study designs have inhibited the ability of employers to see the relevance to their workplace.[18] More data on return to work, absenteeism, or presenteeism needs to be presented to help employers see the relevance. Thus, more research is needed to understand return to work and stay at work processes from the employer perspective and how to best develop and disseminate improved policies, procedures, and training methods in workplace disability management.

Job Modification/Accommodation

Workplace accommodations have been a significant component of work rehabilitation for individuals with mental health disabilities for decades.[20] Job accommodations are recognized in legislation, research, and practice models as one of the most critical strategies for promoting the employment retention of individuals with mental health disabilities.[19] Accommodation and return to work after any kind of absence can be challenging for both employees and employers.

The employer's duty to accommodate is the same whether it is for a physical or a mental issue. With physical issues, the appropriate accommodations are more obvious – including the implementation of ergonomic workstation designs, changing the physical work load, etc.[21] Temporary job modification is key to facilitate early return to work (RTW) among workers with musculoskeletal injuries. Injured workers who are offered modified work are twice as likely to return to the same job with the same employer, and modified work programs cut the number of lost work days in half.[22] Other studies have linked lower workers' compensation costs to employer policies that promote temporary job modification.[23-26] Another review also concluded that temporary job modification reduces work disability duration and employer costs.[27] Thus, there is consistent evidence that job modification is a beneficial and cost-effective strategy for employers to prevent work disability.

Despite the strength of this evidence, many questions remain about which job modifications are most feasible for employers, which are most effective for facilitating a sustainable RTW, and why employers choose to support or not support temporary job modifications for a returning worker.[28] In most cases, job modification is the result of a unilateral "job offer" of modified duty that strives to meet medical restrictions and is usually presented to the employee as the only viable option. While physician restrictions provide a basic medical rationale for restricting activities, employers maintain a very significant role in relating these medical restrictions to specific job tasks and defining feasible job modifications. In fact, much of the final return to work planning involves feedback and support from frontline supervisors.

Dysthymia, major depression, posttraumatic stress disorder, panic disorder, and social phobia are the most common mental health disabilities requiring a need for temporary workplace job modifications.[29] In 2011, the Conference Board of Canada surveyed 1,010 individuals currently employed on either a part-time or full-time basis. Of those who were currently experiencing, or had previously experienced, a mental health issue, 26% required workplace accommodations.[15] More than half of those requiring accommodations received them in a timely manner, but 31% of those in need did not receive any workplace accommodation.[15] Therefore, appropriate accommodations are not consistently being provided to employees experiencing mental health issues.

Few studies of MHD have focused on the process of job modification from the employer perspective, and little is known about the factors surrounding an employer's willingness to accept or recommend temporary job modifications to assist a worker struggling with MHD. Schultz and colleagues examined the relationship between employer attitudes towards workers with mental health disabilities and their knowledge and use of appropriate job accommodations.[30] They found that over 50% of Canadian employers have important concerns about workers with mental health disabilities, including: employee's capacity to remain mentally stable, exhibiting bizarre behaviours, the ability to tolerate work pressure and stress, becoming violent in the workplace, and being able to tolerate working conditions.[30] Their findings confirmed the presence of social stigma, with at least half of all the employers in the study expressing significant concerns. Corbière and colleagues investigated the relationship between accommodations and natural supports available in the workplace, and job tenure for people with severe mental disorders.[31] They found that supervisor and coworker supports were most predictive of job tenure.[31]

The Role of Supervisors

Supervisors are important gatekeepers and facilitators of temporary job modification. Supervisors may be asked to interpret medical restrictions, document job demands, create modified duty positions, or temper production demands. They may also alter workstations, adjust work schedules, monitor adherence to medical restrictions, engage co-workers, communicate with providers and insurers, and monitor the effectiveness of job modifications over time. Our past research has shown that injured workers have extremely high expectations that a supervisor will provide personal guidance and support in the event of a work injury, especially with regard to providing meaningful, ergonomically sound, and non-pejorative job modifications.[32]

Past work by the project team has shown that supervisor training to communicate more effectively with injured workers reduces disability costs,[32-34] and this work has received national attention in the US, winning the 2008 Innovative Research Award for Worker Health and Safety from the National Occupational Research Agenda (NORA) program. At the same time, workers continue to report varying levels of assistance and support from supervisors.[35-37] In the Conference Board of Canada study, 81% of managers said they felt comfortable having a discussion with a staff member about mental health, and the same percentage agreed that they would be able to direct staff to the appropriate supports.[15] However, only 29% of employees believe that their manager is knowledgeable about mental health, and only 26% felt their manager is effective at managing mental health issues.[15]

Although the benefits of temporary job modification are well established, there are only two other studies investigating the factors that explain individual differences in supervisors' efforts to support job modification, both with regards to musculoskeletal disorders. First, research on "informal accommodations" by Florey and Harrison[38]

suggests that disability onset controllability, past performance, and the magnitude of the requested accommodation may affect managerial attitude and intention. Second, our research team determined that disability management policies, supervisor leadership style, supervisor autonomy, and workplace social capital influenced the likelihood of supervisors to support accommodations for low back pain injured workers.[39] The proposed study builds on this research, by exploring other factors that contribute to managerial decision-making around accommodations for workers with MHD. Within this study we will also examine the workers' perspective of the same factors to see if similar factors contribute to the worker receiving helpful accommodations. This information is critical to refine and improve existing workplace intervention strategies to prevent mental health disability in the workplace.

Research Objectives

The general objective of this study was to understand what factors (organizational/job, supervisor, health care provider, and worker) determine whether workplace accommodations are supported (from the perspective of supervisors) and whether workplace accommodations are received (from the perspective of workers).

Specific aims included:

1. To determine, from the supervisor perspective, the association between supervisor characteristics, organizational/job factors, health care provider and worker characteristics and supervisors' decisions to support and facilitate workplace accommodations for workers with MHD.

2. To determine, from the perspective of workers with MHD, the association between supervisor characteristics, organizational/job factors, health care provider and worker characteristics and the provision of helpful workplace accommodations.

A secondary objective was to determine the association between accommodations supervisors are willing to support and accommodations that workers with MHD would prefer/find helpful.

MHD in the workplace represents a common and costly problem for working-age adults and their employers, and more efforts are needed to reduce the functional loss and work disability associated with mental health conditions. Depression and anxiety are the most common MHD affecting working-age adults, and a significant number of workers will experience productivity loss or time lost from work. Workplace-based interventions for MHD have shown promise by improving performance in the workplace and curtailing long-term sickness absence, but little is known about the process by which job modifications are developed and supported by employers.

In most employment settings, supervisors act as a gatekeeper for job modifications, ensuring that modifications are feasible in light of production demands and other

organizational constraints. The decisions of supervisors to allow or refuse temporary job modifications for a worker with a mental health disorder may involve numerous factors, including worker characteristics, health care provider directions, supervisor attitudes and beliefs, and other organizational influences. Workers may have different perspectives on the influence of organizational, supervisor, health care provider and worker factors on the provision of workplace accommodations. It is important to capture both perspectives to target intervention development towards factors that may have the greatest impact on all stakeholders. There is a need for research of workplace factors and processes that can be used to improve worksite policies, practices, and training that improve job accommodation efforts for MHD in the workplace.

Methods and Data

Research Design and Methodology

We conducted a quantitative study including cross-sectional surveys of supervisors and workers. Supervisors were asked to answer a questionnaire that is based on a representative case (case vignette) of a worker with a mental health disorder. Workers were asked about their 6-month prevalence of various MHD. Workers with prevalent mental health conditions were asked to indicate which accommodations they received and answer a questionnaire similar to the supervisor survey. Workers without prevalent mental health conditions were asked to answer the same questionnaire without the accommodations section.

Case Vignettes to Study Decision-making

The use of case vignettes is a well-established research method for studying the decision-making practices surrounding health and functional problems. In back pain research, case vignettes have been used to assess adherence of physicians to evidence-based treatment guidelines[40] and to assess differences in treatment recommendations by specialty group or practice experience.[41] Such studies have shown relatively poor adherence to evidence-based guidelines for the treatment of acute low back pain among physicians, especially among general practitioners with more years of clinical experience. In mental health research, case vignettes have been used to examine the presence of social stigma and clinical care.[42] Other case vignette studies in medical research have focused on the professional judgments of social workers regarding the need for institutional care,[43] the opioid prescribing practices of emergency room physicians,[44] and the effect of racial bias in medical decision-making.[45] Case vignettes can test a number of hypothesized variables thought to influence decision-making, and predictive variables can include both experimental factors (randomized factors systematically altered in different versions of the vignette), and respondent factors (variables reflecting attitudes and characteristics of the decision-maker). Strengths of the case vignette approach are ease of administration, standardization of the decision-making scenario across respondents, and avoidance of the practical and ethical considerations associated with collecting information about actual decisions from real cases. As very little is known about the decision-making practices of supervisors to support or facilitate workplace job modifications for MHD, the case vignette approach is a feasible and appropriate method for assessing the effects of multiple factors. Only the supervisor survey involved the use of the case vignette.

Study Design

Design and data collection

We randomly selected 31 Manitoba and Northwestern Ontario businesses using a stratified selection procedure. Three businesses, individually employing at least 50

employees, were randomly selected from each of the ten industrial groups of the National Occupational Classification System (Agriculture, Forestry, and Fishing; Mining; Construction Industries; Manufacturing; Transportation; Wholesale/Distributors; Retail Trade; Finance, Insurance, and Real Estate; Services (including health care); and Public Administration).

The sampling frame of employers was generated from InfoCan, a commercially available database of more than a million businesses across Canada. This sample source has previously been used for recruiting employers to study accommodations for mental health disability.[28] The ten industrial groups listed have been selected to correspond to the major industry group categories in InfoCan. All randomly selected businesses were informed of the study by email or postal letter and then contacted by phone for further description and to answer any questions.

Upon employer consent for the workplace to participate in the study, all supervisors and workers were invited to participate in the appropriate survey. Invitation to participate in the study was sent by e-mail through the employer. If e-mail was unavailable, the employer was provided with paper-based surveys and postage-paid envelopes to distribute to their employees and supervisors. The e-mail invitation included a web-based Universal Resource Locator link that participants could click on to take them to the appropriate web-based study questionnaire (supervisor or worker).

Supervisors were provided with the supervisor survey link and workers were provided with the worker survey link. Participants would then log on and complete the 30-minute survey online. The supervisor survey allowed participating supervisors to: (1) provide informed consent; (2) input demographic data; (3) describe a type of job position they routinely supervise; (4) read a hypothetical case scenario involving a worker (in that job position) with a mental health condition; and (5) respond to accommodation outcome and workplace/supervisor/healthcare provider/worker factor instruments. Similarly, the worker survey allowed participating workers to: (1) provide informed consent; (2) input demographic data; (3) describe their job position; (4) identify any MHD (and information around disclosure) and comorbidities experienced in the past 6 months; (5) respond to the accommodation outcome (if mental health disorder experienced); and (6) workplace/supervisor/healthcare provider/worker factor instruments.

The study design was based on a conceptual framework hypothesizing supervisor efforts to support, recommend, or coordinate specific job accommodations influenced by management policies, worker characteristics, information from medical providers, and the leadership style and attitudes of the supervisor.[21,46] (Figure 1 below)

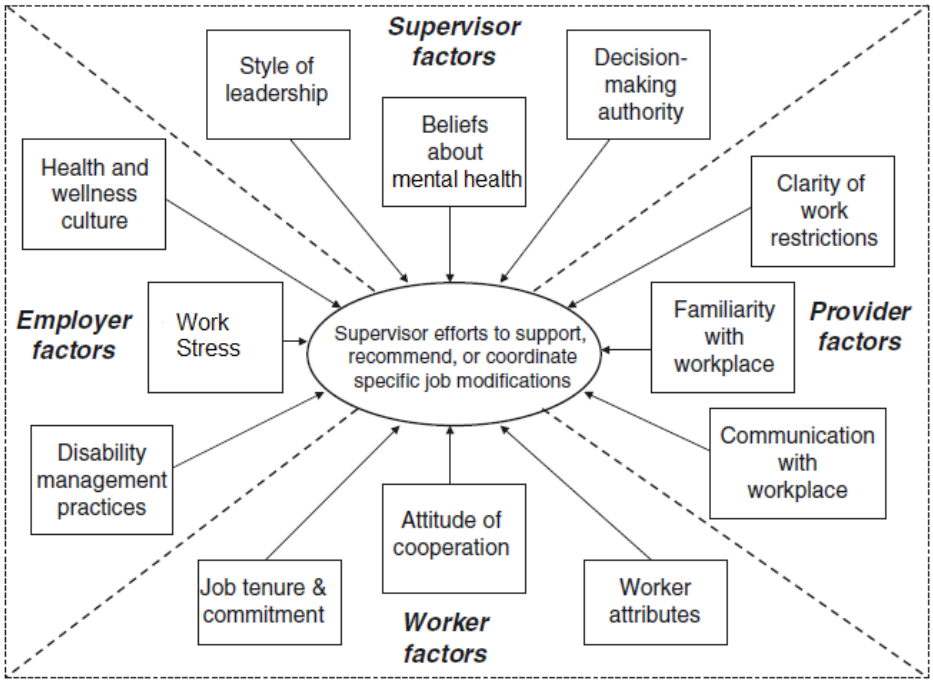

Figure 1. Our conceptual framework showing potential factors influencing supervisor support for job modifications.

Consent to participate in the study was completed online when potential participants log in and confirm agreement to complete the survey. Those who wished not to participate indicated so by checking a box on the on-line consent form. Non-responders received up to five reminder e-mails, sent weekly. The study was submitted to and approved by the Lakehead University Research Ethics Review Board for approval.

Inclusion and exclusion criteria

We invited all supervisors and workers from the randomly selected employers who agreed to participate and were willing to provide their employees with paid time to complete the survey. Participants had to be at least 18 years of age or older and employed full-time or part-time by the selected employer. A supervisor was defined as someone who supervises at least one employee and was identified by the employers. Higher level supervisors who supervise lower-level supervisors were eligible for participation. Individuals who do not speak English were invited to participate, but were likely excluded from the study since we did not have valid, culturally-adapted versions of the survey instruments to be used in this study.

Web-based Survey and Measures

We previously completed a CIHR-funded study examining factors influencing supervisors support of workplace accommodations for low back injured workers.[21,39,47,48] Prior to that study, we reviewed the organizational and disability management literature

to identify appropriate measures for workplace factors to be used in the study. Most of the measures described here were used in our previous work. Based on a similar conceptual design, all were found to be valid and reliable for the supervisor population. Most have previously been used in worker populations. The following instruments were adapted for web-based electronic administration. The supervisor survey instrument and the worker survey can be found in the appendices. Both surveys include the following instruments:

Job accommodation outcome measures

We combined all the items from three accommodation scales, the Job Accommodation Scale (JAS),[21] the Work Accommodation and Natural Support Scale (WANSS),[31] and the Workplace Mental Health Accommodation Questions into one scale using the JAS template. The Job Accommodation Scale (JAS) was specifically developed for use in the supervisor population to assess the likelihood of provision of specific accommodations for low back pain.[22] It has been shown to be applicable, reliable, and valid when administered to supervisors considering accommodations for low back pain. We have modified the template for the JAS to use in the worker population. This scale determines how helpful each accommodation would be for a worker with a MHD, if the accommodation is available in his or her work setting, and if it is available, determines if the worker received the accommodation or not. The Work Accommodation and Natural Support Scale (WANSS) was designed to determine accommodations for severe mental disorders.[31] It has a version for both workers and for supervisors. It has been shown to be a valid and useful tool to assess work accommodations and natural supports available in the workplace. Finally, the Workplace Mental Health Accommodation Questions were used in a longitudinal cohort study of employees with a prior or current mental disorder.[49] We included these items in the development of our outcome measure for job accommodations for mental health.

Predictors

Disability management was measured using 13 questions from the Organizational Policies and Practices (OPP) Scale.[50] The OPP was developed to measure four scales: people-oriented culture, safety climate, disability management policies and practices, and ergonomic practices.[50] We have selected 13 questions, all relevant to claim management and return to work, which comprise the disability management scale. The total score is computed by averaging the scores on the 13 items.

Work Stress was measured with a 12-item index of items from Karasek and Theorell[51,52] that reflect participant's perceptions of various dimensions of work, including job security, social support, monotony, physical effort required, and extent of participation in decision-making. Higher scores indicate greater work stress. This scale has been used in the Canadian Community Health Survey, conducted by Statistics Canada, since its inception and has been shown to be valid and reliable in the Canadian population.

Health and wellness culture was measured with the organizational culture profile instrument (OCP). The OCP is one of the most widely cited survey instruments in the

organizational culture literature.[53] The 26-item scale includes values descriptive of organizational culture (e.g., fairness, risk taking). Participants were prompted to indicate to what extent each of the values listed in the scale describes their organization on a unipolar rating scale ranging from “not at all” to “a great extent”. The OCP has been shown to be a valid and reliable indicator for measuring organizational culture in population-based occupational health research.[54] The four subdomains of the scale come from the Completing Values Framework:

- Group Culture (internal – flexibility/change),
- Hierarchy (internal – stability/order/control),
- Developmental (external – flexibility/change), and
- Rational (external – stability/order/control).

Score ranges differ per group with higher scores indicating stronger membership to the culture types.

Attitude of cooperation was measured with the workplace social capital scale.[55] Social capital at the individual-level is an individual’s perception of the shared attitudes and values among members of an organization, reciprocity, mutual respect and trust between workmates, collective action and participation in the networks at work, and trust in and trustworthiness of a supervisor. Low workplace social capital has been shown to be a predictor of depression[56] and low self-rated health.[57] An 8-item scale is used to measure the key components of social capital at the workplace. The 8-item scale has been shown to be a reliable and valid measure of social capital.[55] The responses are on a 5-point scale with higher scores indicating higher individual-level social capital.

Leadership style was measured using the Leader Behavior Description Questionnaire (LBDQ).[58] The LBDQ provides measures of two important dimensions of leadership: Initiating Structure and Consideration. Initiating Structure refers to the degree to which a supervisor defines and organizes his or her role and the roles of subordinates, is oriented toward goal attainment, and establishes well-defined patterns and channels of communication.[59] Consideration refers to the degree to which a leader shows concern and respect for subordinates, looks out for their welfare, and expresses appreciation and support.[60] Originally identified in the Ohio State University leadership studies, these two constructs have been shown to be meaningful in a wide variety of supervisor-subordinate situations. A meta-analysis found that of the four existing measures of Consideration and Initiating Structure, the LBDQ had the highest validity.[61] The LBDQ is a 40-item questionnaire that results in a range of scores from 0 to 60 on each dimension. Higher scores indicate greater Structure and greater Consideration. There is a weak correlation (r=0.36) between Consideration and Initiating Structure on the LBDQ, and theoretically we would expect about a 0.30 correlation between the two dimensions.[61] The LBDQ has been used for research purposes in industrial, military, educational settings, and we used it previously in supervisors.[39] Fleishman[62,63] and Fleishman, Harris and Burtt[64] have used the LBDQ for use in studies of factory foreman

and have found the two leader behaviour dimensions useful in evaluating the results of a supervisory training program. We made small modifications to the introduction and to the instrument for the worker survey to express the view of the subordinate answering questions about their leader instead of the internal reflections of a supervisor.

Mental health disorders were determined by a battery of assessment questions used in the 2011 Canadian Community Health Survey – Mental Health supplement.[65] We assessed the 6-month period prevalence and lifetime prevalence of mood disorders, anxiety disorders, psychotic disorders, and substance use disorders. The CCHS found approximately 7% of respondents clinically diagnosed with depression, and 6% with an anxiety disorder.[65]

Demographic variables such as age, gender, income, education, unionization, experience and seniority were measured using standard demographic questions.

Additional predictors used only in the supervisor survey included:

Beliefs about mental disorders in the workplace A 22-item measure, the Opening Minds Scale for Workplace Attitudes,[66] was used to assess general attitudes towards mental disorders in the workplace. Lower scores indicate more positive attitudes towards mental health disorders in the workplace. Higher scores represented more stigmatizing attitudes. Scores range between 1 and 5.

Supervisor autonomy In previous qualitative work with supervisors, all supervisors cited accommodation as part of their job and an issue of concern.[33,34,67] However, we wanted to include a measure of supervisor autonomy as a check on this assumption. We developed three questions for this purpose. Wording of the three questions is modeled after the construct of decision latitude, a factor included in the Job Content Questionnaire.[68] The three questions ask supervisors to rate their autonomy with regard to making decisions about modified duty, having freedom to recommend specific job modifications, and “having a say” in company decisions about modified duty. We have previously used this scale with supervisors.[39]

Medical restrictions and communication with healthcare providers was measured with a short 5-item questionnaire developed specifically for this project. The five questions were selected from existing publications[69,70] as we could not find an existing scale appropriate for our needs through the literature review. Three constructs were measured from these questions including healthcare communication (i.e., do you communicate with providers?), healthcare beliefs (i.e., does the supervisor believe the provider understands the nature of the job?), and healthcare information (i.e., how often does a provider help you return a worker to work?).

Additional predictors used only in the worker survey included:

Comorbidities were determined using the Saskatchewan Comorbidity Scale. The Comorbidity scale is a patient-centered, self-report measure of health problems (e.g., arthritis, diabetes).[71] It is a 12-item measure asking the participant to indicate whether he or she experiences a particular health problem, and if so, what effect that problem has on his or her health (none, mild, moderate or severe). The instrument has acceptable test-retest reliability during a 10 to 14 day-period with item-specific weighted kappa coefficients above 0.56.[71] Self-reported health problems corresponded moderately with physician-reported health problems, and patient-reported co-morbidity scores were found to be correlated with health-related quality of life as measured by the SF-36.[71]

Disclosure and Job Performance for workers who indicated a prevalent mental health condition in the past 6 months, we asked 1) for information around disclosure of their mental health condition; and 2) if their mental health condition has negatively impacted their job performance.

Worker's perception of supervisor's attitude towards mental illness We used one question to assess workers' perceptions of their supervisor's attitude towards mental illness: "In your opinion, how well does your supervisor support workers with a mental illness?"

Medical restrictions and communication with healthcare providers was measured with a short 4-item questionnaire developed by modifying the questions used for the supervisors. Three constructs were measured from these questions including healthcare communication (i.e., do you communicate with providers?), healthcare beliefs (i.e., does the worker believe the provider understands the nature of the job?), and healthcare information/support (i.e., how important is it that your healthcare provider gives you work restrictions and how well does he or she support you?).

Data Analysis

Primary objectives: Multivariable mixed regression models

To analyze the correlated (nested by employer) data, we used multilevel models (mixed linear regression) to determine the contribution of factors (organizational/job factors, physician recommendations, and supervisor characteristics) and covariates (demographic variables) in 1) a supervisor's decision to support workplace accommodations for MHD; and in 2) the provision of helpful workplace accommodation for workers with MHD. The continuous accommodation outcome scores provided the dependent outcome, with higher scores indicating greater likelihood of accommodation (supervisor) and greater helpfulness of provided accommodations (worker), respectively. The bivariate associations between the independent variables and the outcome will be evaluated first. All variables that are associated with the outcomes with a p-value of less than or equal to 0.2 will be included in a final model.

Secondary objectives: Comparing Supervisor and Worker Responses to Accommodation Questions

To enhance our understanding of differences in opinion of the different types of accommodation, we examined scores on accommodation questions between supervisors and the workers. Rank sum (or Wilcoxon-Mann-Whitney) tests were used to compare mean scores between the two groups.

Results

Study data

Data from 366 supervisors and 1062 workers was collected between May 2017 and May 2018 from 31 different companies (18 were from Manitoba and 13 were from North Western Ontario). Of the 381 companies invited, 144 couldn't be reached and 153 declined. After accounting for "no follow-up" due to sector/study completion (n=53), the response rate at the company level was 9.5% (n=31/328). For the supervisors, 366 responses were collected from 828 surveys that were distributed, giving a response rate of 44%. For workers, 3942 surveys were distributed with 1062 responses (response rate of 27%). Table 1 shows the number of participating supervisors and workers by sector.

Table 1. Breakdown of participants by Supervisor/Worker across the 10 sectors.

Sector	Number of Supervisors (%)	Number of Workers (%)
Mining	67 (18.3)	275 (25.9)
Finance	50 (13.7)	112 (10.6)
Wholesale	19 (5.2)	29 (2.7)
Public Administration	65 (17.8)	236 (22.2)
Construction	27 (7.4)	38 (3.6)
Agriculture	52 (14.2)	94 (8.9)
Transportation	16 (4.4)	62 (5.8)
Service	42 (11.5)	79 (7.4)
Retail	11 (3.0)	51 (4.8)
Manufacturing	17 (4.6)	86 (8.1)
TOTALS	366	1062

Table 2 contains the demographic information from both the supervisor sample and the worker sample. Supervisors had a higher proportion of males than workers, were higher educated, and older on average.

Table 2. Supervisor and worker demographics.

Variable	Number of Supervisors (%)	Number of Workers (%)
Gender		
Female	93 (25.4)	387 (36.4)
Male	228 (62.3)	579 (54.5)
Intersex	0	1 (0.09)
Choose not to answer	3 (0.8)	9 (0.8)
Missing	42 (11.5)	86 (8.1)
Education Level		
High School or less	42 (11.5)	173 (16.3)
Some Secondary	51 (13.9)	234 (22.0)
Completed Secondary	226 (61.7)	570 (58.3)
Missing	47 (12.8)	88 (8.2)
Mean age, years, (SD, range)	45.6 (10.5, 19-68)	40.7 (12.5, 16.9-71.6)
Mean years in position (SD, range)	11.6 (9.1, 0-40)	10.6 (10.2, 0-51)
Mean years with company (SD, range)	11.9 (10.3, 0-42)	7.5 (8.1, 0-43)
Unionized Workforce		
All workers	64 (17.4)	386 (36.3)
Some workers	87 (23.7)	164 (15.4)
No workers	159 (43.4)	368 (34.7)
Missing	56 (15.3)	144 (13.6)

Table 3 highlights a few of the questions related to mental health and mental health accommodations. Of the supervisors who participated in the survey, 13.6% reported having a mental health disorder. Seven out of ten supervisors reported having

supervised a worker with a mental health disorder. However, in terms of providing accommodations to workers for mental health disorders, only 35.6% of supervisors reported having done so.

Table 3. Questions related to supervisor experience with mental health and accommodations (n=348).

	Supervisors	
	Yes	**No**
Do you have any mental health disorders?	13.6%	82.5%
Do you think you have ever supervised a worker with a mental health disorder?	69.3%	30.7%
Have you provided accommodations to a worker who you thought might have a mental health disorder?	35.6%	64.4%

The percentage of workers who reported having at least one mental health issue was 31.8% (See Table 4). Of the workers reporting a mental health issue, 35.5% indicated that the mental health condition impacted their job performance.

Table 4. Percentage of workers reporting mental health issues or diagnoses.

	Workers
Workers reporting at least one mental health issue (n=1062)	31.8%
Of workers reporting mental health issue, percentage indicating it impacts their job performance. (n=341)	35.5%

Within the Workers' survey, employees were asked, "In your opinion, how well does your supervisor support workers with a mental illness?". Table 5 shows the responses of the workers from across all 31 employers.

Table 5. Immediate supervisor's attitude toward mental health illness as reported by the workers in the study (n=973).

Survey Question: "In your opinion, how well does your supervisor support workers with a mental illness?"	**Workers (%)**
Very well	20.4%
Well	23.4%
Somewhat	12.0%
Not at all	5.2%
Don't Know	37.9%
Prefer not to answer	1.0%

The Opening Minds Scale for Workplace Attitudes (OMS-WA) was used to assess general attitudes towards mental disorders in the workplace. Lower scores indicate more positive attitudes towards mental health disorders in the workplace and higher scores represent more stigmatizing attitudes. Scores range between 1 and 5. In Table 6 the average scores for the OMS-WA across the 10 sectors are displayed. These results demonstrate the variability in stigma across the different sectors and companies.

Table 6. Average scores for supervisors on the Opening Minds Scale for Workplace Attitudes (OMS-WA) scale across the 10 industrial sectors. Scores range between 1 and 5, with lower scores indicating more positive attitudes towards people with mental health disorders in the workplace. Higher scores indicate more stigmatizing attitudes.

Sector	Number of Supervisors	Average OMS-WA Score (SD)
Mining	67	1.91 (0.48)
Finance	43	2.35 (1.19)
Wholesale	17	3.04 (1.27)
Public Administration	52	2.36 (1.07)
Construction	23	2.14 (0.42)
Agriculture	50	2.15 (0.65)
Transportation	16	2.92 (1.21)
Service	35	1.82 (0.56)
Retail	11	1.76 (0.43)
Manufacturing	16	2.12 (0.44)

The supervisor survey contained a series of questions about communication with healthcare providers in relation to their input regarding medical restrictions for workers. These questions include the clarity and helpfulness of the work restrictions provided, satisfaction with the support from human resources and healthcare providers, and conditions regarding accommodations at the supervisor's workplace. The breakdown of the responses for each of these 6 questions can be found in the following tables (Tables 7-12).

Table 7. Supervisor responses to the question on the clarity of work restrictions provided by healthcare providers (n=321).

Survey Question: "How clear are the work restrictions you receive from healthcare providers for workers who need accommodations for mental health issues (either directly or through your health and safety office)?"	**Supervisors (%)**
I don't receive any restriction information from healthcare providers	53.9%
Very clear	17.1%
Somewhat clear	19.6%
Somewhat unclear	7.5%
Very unclear	1.9%

Table 8. Supervisor responses to the question on the helpfulness of work restrictions provided by healthcare providers (n=214).

Survey Question: "How helpful are the work restrictions you receive from healthcare providers for workers who need accommodations for mental health issues (either directly or through your health and safety office)?"	**Supervisors (%)**
Very helpful	25.2%
Somewhat helpful	54.7%
Somewhat unhelpful	15.0%
Very unhelpful	5.1%

Table 9. Supervisor responses to the question about their satisfaction for the support received from human resources (n=287).

Survey Question: "How satisfied are you with the support you receive from human resources?"	**Supervisors (%)**
Very satisfied	45.0%
Somewhat satisfied	45.0%
Somewhat unsatisfied	7.0%
Very unsatisfied	3.0%

Table 10. Supervisor responses to the question on satisfaction with the quality of information from healthcare providers (n=267).

Survey Question: "How satisfied are you with the quality of information from health care providers?"	**Supervisors (%)**
Very satisfied	19.5%
Somewhat satisfied	59.9%
Somewhat unsatisfied	17.6%
Very unsatisfied	3.0%

Table 11. Supervisor responses regarding the frequency of communication with employer regarding accommodations (n=296).

Survey Question: "How often do you speak to your employer about accommodation issues when facing an accommodation?"	**Supervisors (%)**
Never (0% of the time)	10.1%
Seldom (less than 50% of the time)	21.3%
Sometime (50% of the time or more)	16.6%
Always (100% of the time)	29.4%
Don't know	22.6%

Table 12. Supervisor responses to the question on the requirement of medical confirmation of functional limitations in relation to providing accommodations (n=296).

Survey Question: "How often you require medical confirmation of functional limitations in order to provide an accommodation?"	**Supervisors (%)**
Never (0% of the time)	13.5%
Seldom (less than 50% of the time)	13.9%
Sometime (50% of the time or more)	15..2%
Always (100% of the time)	29.4%
Don't know	28.0%

Both supervisor and worker surveys also contained a wide variety of scales. Results and brief descriptions of the instruments can be found in Tables 13-16 for supervisors and Tables 17-19 for workers. Each of the tables contain the range of possible scores for each scale, the number of individuals with scores on the scale, the average score, and the standard deviation (a measure of how spread the numbers are). A description of each of the scales and interpretations for the scores can be found accompanying each of the tables.

Table 13. Supervisor scale scores from a variety of workplace scales. See footnotes for more details on each of the scales.

Measure	Possible range of scores	N	Mean (SD)
Organizational Policies and Practices Scale	1-5	326	4.12 (0.82)
Work Stress Scale	0-52	335	18.6 (4.97)
Workplace Social Capital Scale	8-40	332	32.6 (6.04)
Leadership Behavior Description Questionnaire – Consideration	0-100	327	74.80 (11.20)
Leadership Behavior Description Questionnaire – Initiating Structure	0-100	327	67.26 (11.88)
Supervisor Autonomy	1-5	349	3.54 (1.10)

Organizational Policies and Practices Scale (OPP): Disability management was measured with 13 items from the Organizational Policies and Practices (OPP) scale. The total OPP score is computed by averaging the scores on the 13 items. A higher OPP score represents better disability management.

Work Stress: To measure work stress, we used a brief version of the Job Content Questionnaire with 13 items scored from 0-4. Higher scores indicate a higher level of work stress.

Workplace Social Capital Scale: Workplace social capital was assessed with an 8-item self-assessment scale designed to measure social capital in the workplace. Scores can range between 8 and 40. A high score in the scale indicates high social capital.

Leadership Behavior Description Questionnaire – Consideration: Consideration refers to behavior indicative of friendship, mutual trust, respect, and warmth in relationship between the leader and members of the group. Higher scores indicate greater use of this leadership style.

Leadership Behavior Description Questionnaire – Initiating Structure: Initiating Structure refers to the leader's behavior in delineating the relationship between himself and the members of his group, and in endeavoring to establish well-defined patterns of organization, channels of communication, and ways of getting the job done. Higher scores indicate greater use of this leadership style.

Supervisor Autonomy Scale: Three questions that cover the authority the supervisor has to offer job modifications. Higher scores indicate greater perceived autonomy. Scores can range between 1 and 5.

Table 14. Supervisor scores across the Opening Minds Scale for Workplace Attitudes (OMS-WA) scale. Lower scores indicate more positive attitudes towards mental health disorders in the workplace. Higher scores represented more stigmatizing attitudes.

Measure	Possible range of scores	N	Mean (SD)
OMS-WA Full scale	1-5	330	2.19 (0.88)
Subscales			
Avoidance	1-5	330	1.96 (1.04)
Danger	1-5	330	2.22 (0.96)
Competency	1-5	330	2.20 (0.92)
Helping	1-5	330	2.02 (0.87)
Responsibility	1-5	330	1.18 (0.68)

Table 15. Job Accommodation Scale for Mental Health (JAS-MH): Average scores taken from across 29 accommodation items. Higher scores indicate greater likelihood to provide accommodations to workers with MHD. Subscales cover different types of accommodations (described in more detail in the next section of the report).

Measure	Possible range of scores	N	Mean (SD)
JAS-MH Full Scale	1-4	320	2.74 (0.62)
Subscales			
Work Schedule	1-4	341	2.82 (0.79)
Physical Environment	1-4	330	2.70 (0.74)
On-job Duties	1-4	344	2.83 (0.62)
Psycho-social Adjustments	1-4	334	3.22 (0.74)

Table 16. Organizational Culture Profile (OCP) Instrument: Supervisors completed the 26-items related to four subdomains from the competing values framework. Score ranges differ per group with higher scores indicating stronger membership to the culture types.

OCP Subdomains	Possible range of scores	N	Mean (SD)
Group	7-28	332	10.74 (3.50)
Hierarchy	6-24	330	9.67 (3.03)
Developmental	5-20	329	9.18 (2.80)
Rational	5-20	330	7.43 (2.33)

Group culture favours employee participation, cooperation, mutual trust, team spirit, learning, fulfilling work through human resource development, trust in human potential, cohesiveness, and synergy.

Hierarchical organizational culture is characterized by stability and continuity, information management, division of labour, efficiency, formal procedures, order, control, and rules and regulations.

Developmental culture relies upon environmental scanning, experimenting, innovating, organizational transformation through organic growth or market acquisitions, learning, creativity, adaptability, and growth.

Rational culture emphasizes decision rules, performance indicators, individual and collective accountabilities, reinforcement contingencies, production, and achieving goals and objectives.

Table 17. Worker scores from a variety of workplace scales. See footnotes for more details on each of the scales.

Measure	Possible range of scores	N	Mean (SD)
Organizational Policies and Practices Scale	1-5	837	3.8 (1.12)
Work Stress	0-52	987	20.6 (5.58)
Workplace Social Capital Scale	8-40	982	30.1 (7.63)
Leadership Behavior Description Questionnaire – Workers' Assessment	0-100	976	57.6 (22.05)
Saskatchewan Comorbidity Score	0-100	883	7.8 (6.96)

Organizational Policies and Practices Scale (OPP): Disability management was measured with 13 items from the Organizational Policies and Practices (OPP). The total OPP score is computed by averaging the scores on the 13 items. Scores range from 1 to 5. A higher OPP score represents better disability management.

Work Stress: To measure work stress, we used a brief version of the Job Content Questionnaire. Higher scores indicate a higher level of work stress. Scores can range between 0 and 52.

Workplace Social Capital Scale (WSCS): Workplace social capital was assessed with an 8-item self-assessment scale designed to measure social capital (i.e. quality of workplace relationships) in the workplace. A high score in the scale indicates high social capital. Scores can range between 8 and 40.

Leadership Behavior Description Questionnaire – Workers' Assessment: Workers answered a series of 24 questions on their supervisors' general leadership abilities. Scores range from 0-100, with higher scores indicating superior rating of leadership behaviours.

Saskatchewan Comorbidity Scale (SCS): The SCS is a 15-item self-report scale that assesses the presence and impact of health conditions. The conditions considered are the same as the above list. The SCS also incorporates the impact of the condition on the individual's overall health. The SCS scores can range from 0 to 100, with low scores indicating less impact on the individual's health from their health condition(s).

Table 18. Job Accommodation Scale for Mental Health (JAS-MH): Average scores taken from across 29 accommodation items. Higher scores indicate greater likelihood to provide accommodations to workers with MHD. Subscales cover different types of accommodations (described in more detail in the next section of the report).

Measure	Possible range of scores	N	Mean (SD)
JAS-MH Full Scale	1-4	247	2.57 (0.67)
Subscales			
Work Schedule	1-4	275	2.69 (0.80)
Physical Environment	1-4	267	2.58 (0.90)
On-job Duties	1-4	305	2.61 (0.78)
Psycho-social Adjustments	1-4	268	2.72 (0.75)

Table 19. Organizational Culture Profile (OCP) Instrument: Supervisors completed the 26-items related to four subdomains from the competing values framework. Score ranges differ per group with higher scores indicating stronger membership to the culture types.

OCP Subdomains	Possible range of scores	N	Mean (SD)
Group	7-28	954	12.19 (4.09)
Hierarchy	6-24	961	10.36 (3.21)
Developmental	5-20	971	10.09 (2.97)
Rational	5-20	957	8.15 (2.59)

Group culture favours employee participation, cooperation, mutual trust, team spirit, learning, fulfilling work through human resource development, trust in human potential, cohesiveness, and synergy.

Hierarchical organizational culture is characterized by stability and continuity, information management, division of labour, efficiency, formal procedures, order, control, and rules and regulations.

Developmental culture relies upon environmental scanning, experimenting, innovating, organizational transformation through organic growth or market acquisitions, learning, creativity, adaptability, and growth.

Rational culture emphasizes decision rules, performance indicators, individual and collective accountabilities, reinforcement contingencies, production, and achieving goals and objectives.

The Development of the Job Accommodation Scale for Mental Health (JAS-MH) Concept Mapping Procedure

One of the main goals of this study was to develop a measure that could be used to assess the likelihood of an employer to provide accommodations to workers with mental health issues from the perspectives of both supervisors and workers. Here, we outline the use of concept mapping in the development of this measure.

Concept mapping mixes qualitative and quantitative methods and can be used to develop a consensus-based conceptual framework about a problem or issue.[72,73] This approach has been widely used in the development of measures and in evaluation work.[74] The Concept Mapping process involves six steps: (1) Preparation; (2) Generation of Statements; (3) Structuring of Statements; (4) Representation of Statements; (5) Interpretation; and (6) Use of the results. These steps for the development of the JAS-MH measure are outlined below.

Step 1. Preparation: Participants for the concept mapping process in this current study came from the advisory panel for the overall project titled "Supervisor and worker perspectives on workplace accommodations for mental health". This project has been funded by the Worker's Compensation Board of Manitoba and its general goal is to understand what factors (organizational/job, supervisor, healthcare provider and worker) determine whether workplace accommodations for mental health are supported. In total, 11 advisory board members participated in the concept mapping process and included researchers and stakeholders. The goal of the process was to develop a measure that can be used to assess the likelihood of an employer to provide accommodations to workers with mental health issues.

Step 2. Generation of statements: The second step of the concept mapping process involved generating statements to be considered as potential items to be included in the measurement tool. This step was conducted at the first advisory board meeting in Winnipeg, MB in July 2016. The advisory board consisted of the research team and additional stakeholders from the Manitoba WCB, unions, and public agencies.

Step 3. Structuring of statements: In order to develop the structure of how the individual items work together, the Concept Mapping process has the participants organize the statements into groupings of similar statements. This was completed by eleven participants using the items generated in Step 2 printed out onto small pieces of paper. Each participant then manually sorted the cards into separate piles of related themes with the following restrictions: each statement could be put into only one grouping; all statements could not be put into a single pile; all statements could not be put into their own pile; and no 'miscellaneous' grouping – unique statements were placed on their own. This sorting data generated by the advisory panel was then collected and entered using Qualtrics (online survey software). Participants were also asked to name each of the groupings that they came up with.

In addition to organizing the statements into groups, the 11 participants were also instructed to rate each item on their importance from both the worker's perspective and the supervisor's perspective using a Likert Scale of 1-5.

Step 4. Representation of Statements: Using the groupings provided by each of the participants, the grouping data was transformed into similarity matrices and analyzed using Multidimensional Scaling (MDS) Analysis with Euclidean approach used as the distance measure. MDS transformed the data in the similarity matrices into two dimensions which indicates the relationships between the items that were generated by the participants. The 2-dimensional output from the MDS analyses is in the form of X-Y co-ordinates and can be used to generate a map or figure that illustrates the relationship between the items. The X-Y co-ordinates can then be examined using cluster analysis to identify a consensus organization of the items or consensus groupings. For this analyses, we used hierarchical cluster analysis with Ward's algorithm. The Duda/Hart Criteria was used to assist in the determination of the number of clusters.

Step 5. Interpretation: This step involves examining the results of the cluster analysis and refining the groupings so that they are conceptually coherent.

Step 6. Use of Results: In this final step, the items are finalized and the subscales are examined. Reduction of the number of items was achieved by examining item-rest correlations within each of the groupings identified in Step 5 as outlined by Nunnally and Bernstein.[75] Any items with item-rest correlations less than 0.50 were dropped from the scale.

After scale refinement, Structural equation modeling (Stata 14.0) was used to assess the validity of combining factor scores into a single latent construct reflecting support for mental health accommodations. Goodness-of-fit parameters were calculated for when the parceled factored scores from the concept mapping procedure were fit into a measurement model. Goodness of fit for the measurement model was estimated with the following metrics: the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). For CFI and TLI, .95 or greater is interpreted as evidence of an appropriate model fit,[77] while CFI and TLI between .90 and .95 is regarded as acceptable.[77,78] For the RMSEA, the guidelines for interpreting results is < .05 indicates good model fit, RMSEA between .05 and .08 indicates a reasonable model fit, and RMSEA >.10 indicates a poor model fit.[78,79]

Reliability for the individual factors and total score were assessed using Cronbach's alpha. Correlation coefficients between each factor and the overall score were also generated. In total, 41 items were collected from three previously developed measures: Job Accommodation Scale (JAS)[21], Work Accommodations and Natural Supports Scale (WANSS)[31], and the Workplace Mental Health Accommodation Questionnaire.[49]

Multidimensional Scaling Analysis

After receiving the groupings from each of the participants, similarity matrices were produced for each participants and combined to create one overall similarity matrix. Multidimensional scaling (MDS) was then used to convert the similarity matrix into the 2-dimensional map found below. Each item is organized relative to other items based upon the average of how the participants formed their groupings. For each item, their x and y co-ordinates from the MDS map can be recorded and used in the next step of the process.

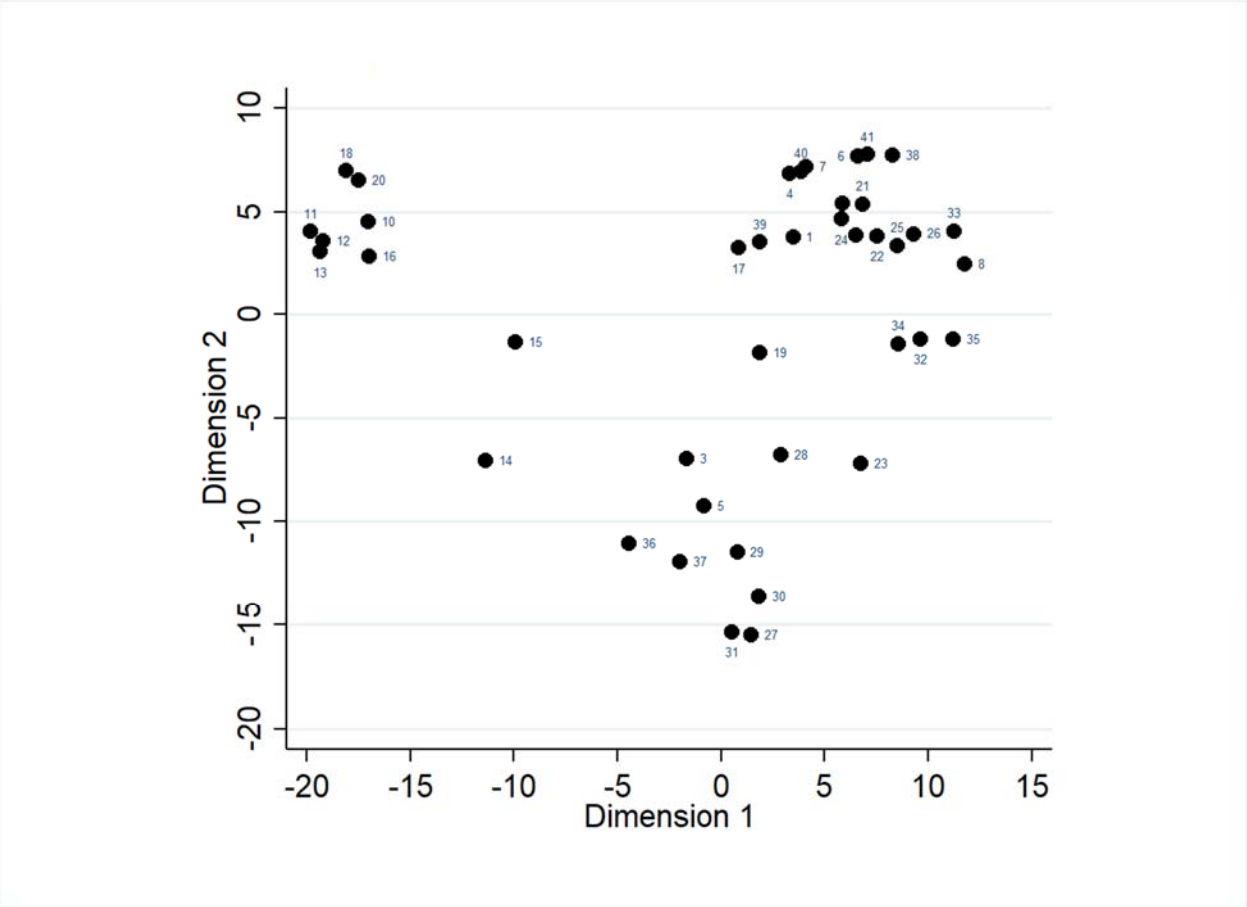

Figure 2. Results of the Multidimensional Scaling Analyses with each dot representing an item.

Cluster Analysis

The output of the MDS analyses (X/Y co-ordinates for each of the items; Figure 2) was then examined using hierarchical cluster analysis (Ward's method). This analysis provides output that can be used to identify the initial groupings of items. In order to determine the ideal number of clusters, the Duda/Hard statistical criteria can be examined. Here, we found that a six cluster solution was identified to be ideal (Figure 3 and Table 20).

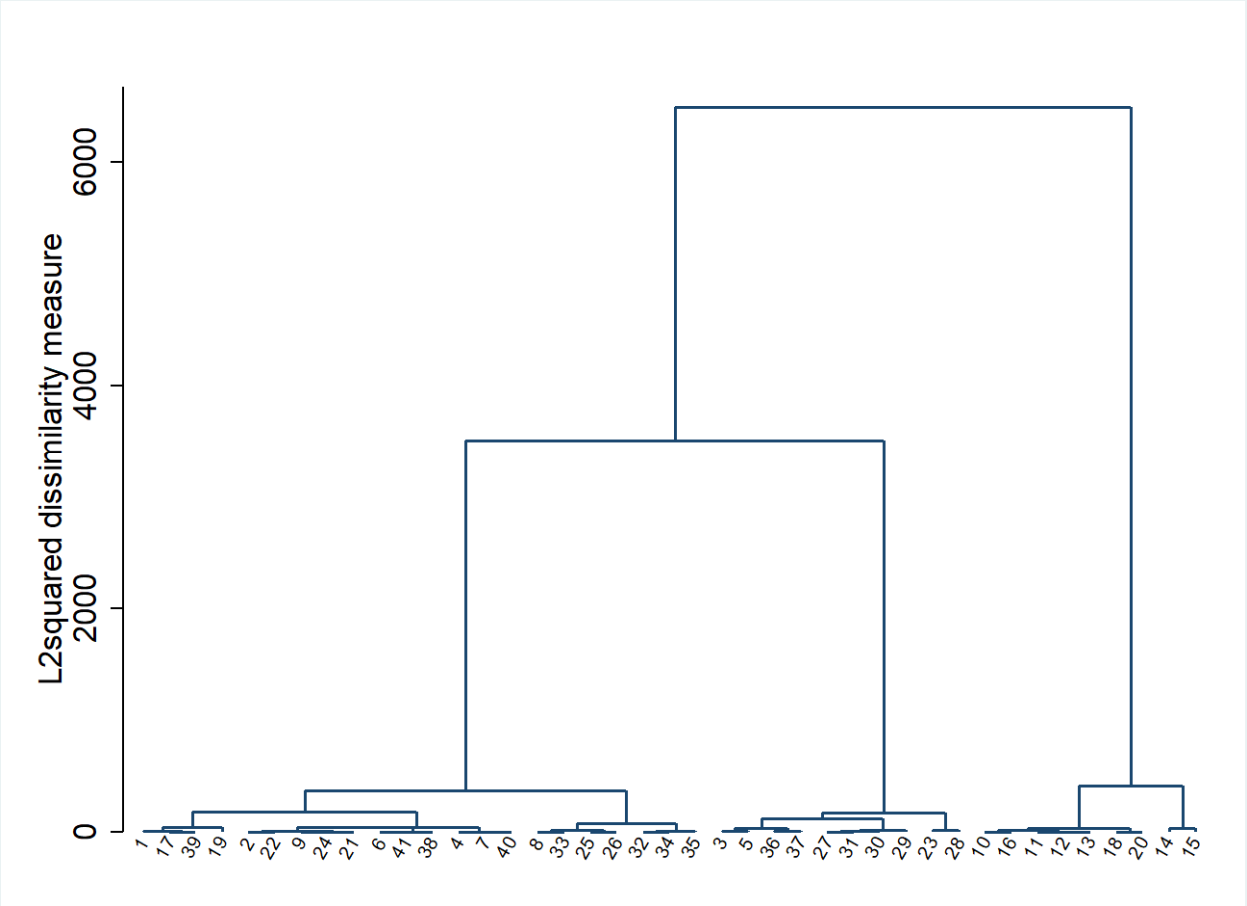

Figure 3. Tree diagram from cluster analysis examining the output from the MDS analysis.

Table 20. Statistical criteria for deciding on number of clusters (Duda/Hart Criteria). The Je(2)/Je(1) index indicates cluster solution when highest (6 in this case) and the Pseudo T-squared indicates the best cluster solution when lowest (6 in this case, highlighted in green).

Number of Clusters	Duda/Hart Criteria	
	Je (2)/Je(1)	Pseudo T-squared
3	0.1671	34.89
4	0.5367	17.26
5	0.4481	16.01
6	0.5389	6.85
7	0.3664	10.37
8	0.2428	15.59
9	0.5225	8.23
10	0.1456	11.73

Optimizing the clusters

Using the 6-cluster solution suggested by the Duda/Hart criteria and the same paper-based setup that was originally used by the team (each accommodation cut-out onto separate small papers that could be easily organized into groups), Drs. Kristman and Armstrong revised the 6 clusters so that they were conceptually coherent by shifting the items from small clusters into clusters that were conceptually similar (see Figure 4). For example, items 14 (“Allow the worker to work from home”) and 15 (“Provide paid time off for the worker’s healthcare provider appointments “) formed their own cluster in the analysis. Item 14 was shifted into the Physical Environment cluster and item 15 was shifted into the Work Schedule cluster.

These revisions created four groupings of potential workplace accommodations for mental health disorders. Names for each of the groupings were then developed based on names suggested by the participants in Step 3 of the Concept Mapping process.

Grouping names: (1) Work Schedule; (2) Physical Environment; (3) On-job Duties; (4) Psycho-social Adjustments.

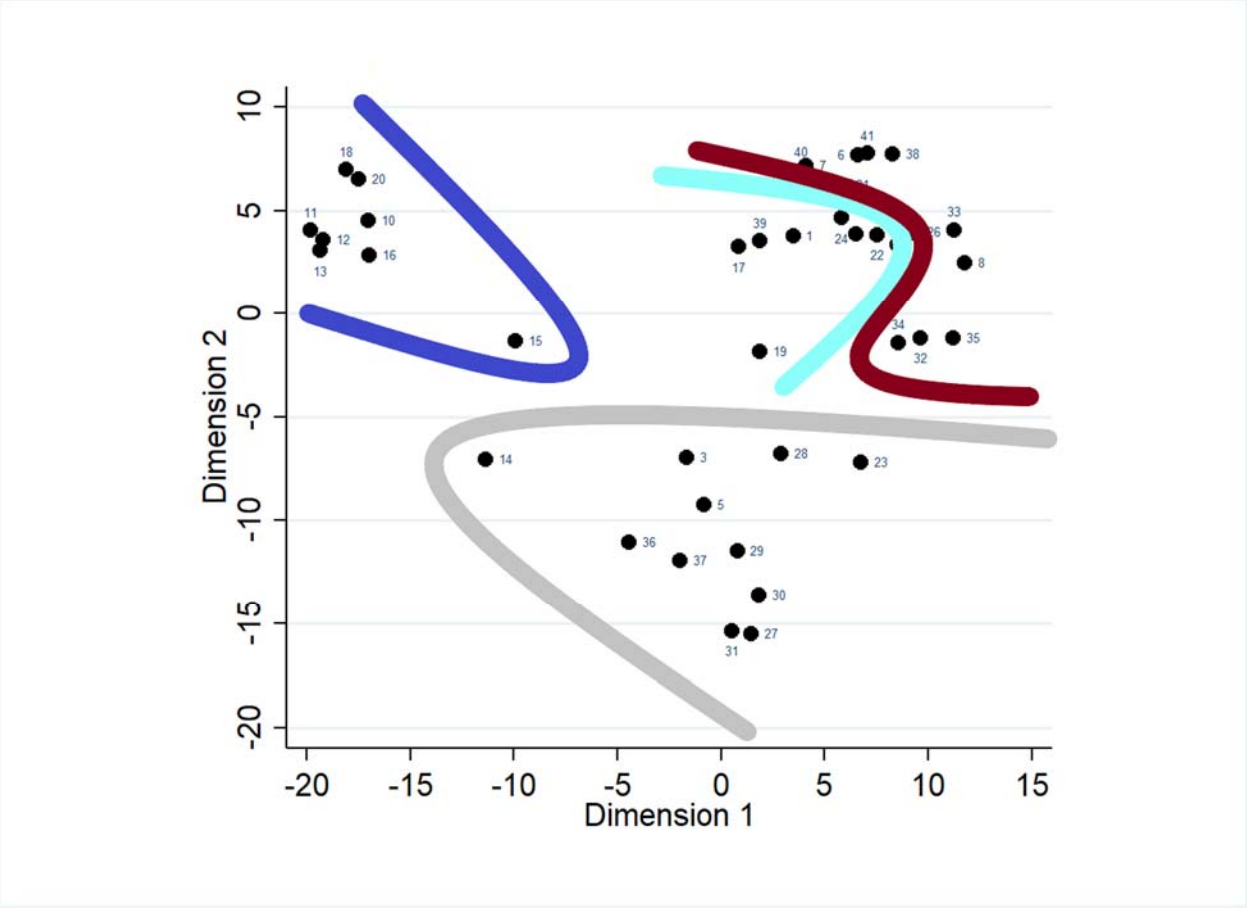

Figure 4. The finalized four groupings on the MDS map.

Item Reduction

In order to reduce the number of items used in the measure and to refine the scale for parsimony, item-rest correlation values were used to identify items for removal as outlined by Nunnally and Bernstein.[75] In the following four tables (Tables 21 – 24), each of the items with item-rest correlations less than 0.5 are highlighted in orange and were then considered dropped from the scale.

Table 21. Work Schedule items for the JAS-MH. Rows highlighted in orange have an item-rest correlation less than 0.5 and were dropped from further analyses.

#	Item	Item-rest correlation	Cronbach's Alpha if item removed
10	Allow the worker time off without pay	0.31	0.84
11	Shorten the worker's work days	0.71	0.79
12	Change the time the worker came and left work	0.53	0.82
13	Allow the worker to take longer or more frequent breaks	0.62	0.80
15	Provide paid time off for the worker's healthcare provider appointments	0.44	0.83
16	Allow the worker to make up time	0.58	0.81
18	Arrange a part-time work schedule for the worker	0.63	0.80
20	Provide a flexible work schedule	0.62	0.80
	Overall Cronbach's Alpha for all items--->		0.83
	Cronbach's Alpha for 6 included items--->		0.84

Table 22. Physical Environment items for the JAS-MH. Rows highlighted in orange have an item-rest correlation less than 0.5 and were dropped from further analyses.

#	Item	Item-rest correlation	Cronbach's Alpha if item removed
3	Allow the worker to make telephone calls to healthcare providers and others for support	0.18	0.82
5	Allow the worker to bring his/her support animal to work	0.31	0.80
14	Allow the worker to work from home	0.33	0.80
23	Use special equipment or tools to make the job easier	0.49	0.79
27	Rearrange the workplace to be more comfortable	0.61	0.77
28	Move the worker to a different site or location	0.51	0.79
29	Reduce distractions in the worker's work area	0.57	0.78
30	Allow the worker to change noise levels or wear headphones to play music or white noise	0.50	0.79
31	Allow worker to change the lighting	0.56	0.78
36	Provide accommodations relating to transportation such as provisions for taxi, bus, etc.	0.34	0.80
37	Provide medication related accommodations such as access to water in the workspace or private space to take medication	0.48	0.79
	Overall Cronbach's Alpha for items--->		0.79
	Cronbach's Alpha for 5 included items--->		0.80

Table 23. On-job Duties items for the JAS-MH. Rows highlighted in orange have an item-rest correlation less than 0.5 and were dropped from further analyses.

#	Item	Item-rest correlation	Cronbach's Alpha if item removed
1	Do not mandate worker to attend social functions	0.34	0.87
2	Allow the worker to exchange work tasks with others	0.47	0.86
4	Modify your expectations of the worker	0.55	0.86
6	Provide extra training to the worker to learn particular skills	0.49	0.86
9	Provide additional time for the worker to learn new responsibilities	0.55	0.86
17	Allow the worker to self-pace his/her workload	0.52	0.86
19	Plan for uninterrupted work time for the worker	0.57	0.86
21	Replace the worker's normal job tasks with things that are easier to do	0.58	0.85
22	Rotate the worker between job tasks	0.62	0.85
24	Get the worker assigned to another job temporarily	0.50	0.86
25	Divide the worker's assignments into smaller tasks	0.65	0.85
26	Gradually introduce tasks to the worker	0.66	0.85
	Overall Cronbach's Alpha for items--->		0.87
	Cronbach's Alpha for 9 included items--->		0.86

Table 24. Psycho-Social Adjustments items for the JAS-MH. Rows highlighted in orange have an item-rest correlation less than 0.5 and were dropped from further analyses.

#	Item	Item-rest correlation	Cronbach's Alpha if item removed
7	Provide training for coworkers about mental health problems	0.63	0.89
8	Provide the worker with written instructions and checklists	0.44	0.91
32	Provide the worker with day planners or electronic/software organizers to help organize tasks	0.59	0.90
33	Remind the worker of important deadlines	0.64	0.89
34	Allow the worker to tape record meetings	0.58	0.90
35	Provide the worker with typewritten meeting minutes	0.61	0.89
38	Provide the worker with feedback from yourself	0.74	0.90
39	Provide the worker with emotional support (such as offering time to talk or interaction with colleagues)	0.78	0.88
40	Encourage interaction between coworkers	0.80	0.88
41	Provide the worker with rewards or recognition from you	0.70	0.89
	Overall Cronbach's Alpha for items--->		0.90
	Cronbach's Alpha for 9 included items--->		0.91

Measurement Model

After the items with poor fit were dropped, four subscale scores were generated by calculating the average score across the items within each grouping. These subscales scores were then used in a measurement model with a latent measure representing the overall JAS-MH score. The measurement model was computed for survey participants without any missing values for the four subscale scores (n=586) (Figure 5 and Table 25). The results from the fit statistics indicate that the four factors fit sufficiently within a single latent construct. The predicted JASMH score that was obtained from the measurement model was highly correlated with a simple arithmetic mean of all endorsed items from the scale (r = 0.94).

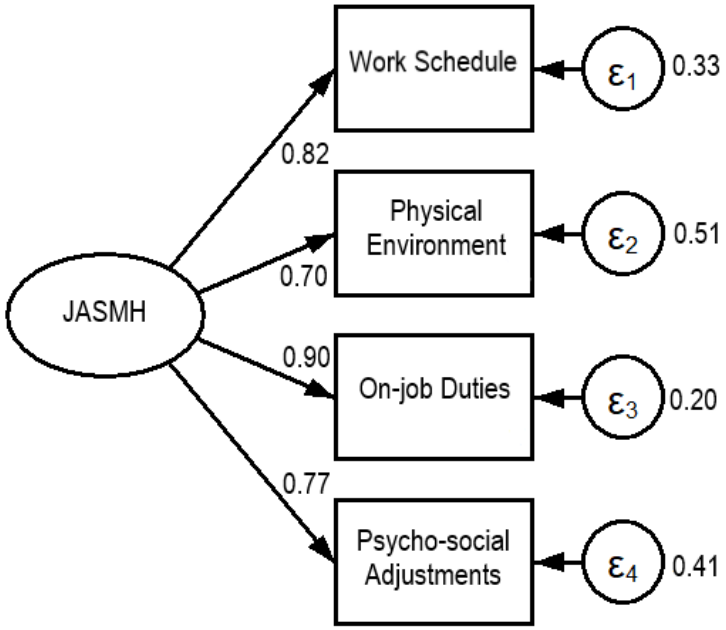

Figure 5. Measurement model for JASMH.

Table 25. Fit statistics for measurement model.

Fit Statistic	Value
Likelihood Ratio (Model vs. Saturated)	7.422 (p=0.024)
Likelihood Ratio (Baseline vs. Saturated)	1207.575 (p<0.001)
Root Mean Squared Error of Approximation	0.068 (0.021-0.123)
Akaike's information criterion	4263.205
Bayesian information criterion	4315.685
Comparative fit index	0.995
Tucker-Lewis index	0.986
Standardized root mean squared residual	0.013
Coefficient of determination	0.895

Primary Objective #1: Factors associate with Supervisors' decisions to support workplace accommodations for MHD

The following analyses examine, from the supervisor perspective, the association between supervisor characteristics, organizational/job factors, health care provider and worker characteristics and supervisors' decisions to support and facilitate workplace accommodations for workers with MHD. Supervisors' decisions to support and facilitate workplace accommodations for workers with MHD was measured using the newly developed JAS-MH measure. The measurements associated with supervisor characteristics, and organizational/job factors were previously discussed.

Data for these analyses came from the supervisors that participated in the study. To determine the most highly associated factors related to JAS-MH scores, we used a series of multilevel regression models. The first model included only company which indicates the amount of variation in JAS-MH that could be accounted for by the clustered nature of the data (i.e., supervisors within companies) as measured by the intraclass correlation. For the supervisor data, this initial model indicated that 46.1% of the variation in JAS-MH could be accounted for by company membership.

The second stage of models looked at bivariate relationships between the various factors and the JAS-MH scores (see Table 26 on the next page). Every factor that had a statistically significant relationship at the $p<0.2$ level was included in the third stage of models. The third stage is considered the preliminary full model. It contains all the significant factors from stage 2. The final model resulted from the removal of non-significant factors that did not significantly improve model fit. This cleaning provides the clearest idea of the factors that are significantly associated with the JAS-MH score in this data.

Below are the results of the bivariate analyses (Table 26). Each factor of interest was entered into multilevel models that had the JAS-MH scores of the supervisors as the dependent variable. Using a p-value cutoff of 0.2 allowed us to screen out variables that were not closely associated with the JAS-MH measures. Any factors below the threshold were then entered into a preliminary full model (Table 27) containing all potentially relevant items in a multivariable model.

Table 26. Stage two models - Bivariate Analyses with JAS-MH scores.

Variable	Coefficient	95% CI	P-value	Include in Final Model
Organizational Policies and Practices Scale	0.19	0.12,0.26	0.000	Yes
Work Stress	-0.03	-0.04, -0.01	0.000	Yes
Workplace Social Capital Scale	0.02	0.01, 0.03	0.000	Yes
LBDQ – Consideration	0.01	0.01, 0.02	0.000	Yes
LBDQ – Initiating Structure	0.004	-0.0008, 0.009	0.106	Yes
Opening Minds Scale for Workplace Attitudes	-0.25	-0.33, -0.16	0.000	Yes
Supervisor Autonomy	0.09	0.04, 0.14	0.000	Yes
Sex	0.03	-0.10, 0.17	0.652	No
Age	-0.002	-0.01, 0.003	0.436	No
Years as supervisor	-0.003	-0.01, 0.002	0.228	No
Years with company	-0.005	-0.01, 0.0008	0.094	Yes
Education				
• High School or less	REF	REF	REF	Yes
• Some Secondary School	0.21	0.003, 0.42	0.046	
• Completed secondary school	0.30	0.12, 0.47	0.001	
Unionized Workforce	-0.10	-0.25, 0.05	0.185	Yes
Organizational Culture Profile Scales				
Group	-0.03	-0.05, -0.02	0.000	Yes
Hierarchy	-0.014	-0.03, 0.005	0.150	Yes
Developmental	-0.017	-0.038, 0.003	0.101	Yes
Rational	-0.014	-0.040, 0.010	0.243	No

Table 27. Stage 3 - Preliminary Full Model (n=274, 31 groups). All significant predictors (p≤ 0.2) from bivariate models were included in the analyses.

Variable	Coefficient	95% CI		P-value
Organizational Policies and Practices Scale	0.11	0.02	0.19	0.02
Work Stress	-0.01	-0.02	0.01	0.29
Workplace Social Capital Scale	0.00	-0.01	0.02	0.66
LBDQ – Consideration	0.00	0.00	0.01	0.23
LBDQ – Initiating Structure	0.00	-0.01	0.00	0.20
Opening Minds Scale for Workplace Attitudes	-0.17	-0.26	-0.09	0.00
Supervisor Autonomy	0.03	-0.02	0.08	0.26
Unionized	-0.06	-0.20	0.08	0.40
Years with Company	0.00	-0.01	0.00	0.78
OCP Group	-0.01	-0.04	0.01	0.29
OCP Hierarchy	0.03	0.00	0.06	0.03
OCP Developmental	-0.01	-0.03	0.02	0.58
Education				
• High School or less	REF	REF	REF	REF
• Some Secondary School	0.15	-0.07	0.36	0.19
• Completed secondary school	0.19	0.00	0.38	0.05

After the preliminary model was run, a series of nested models were run by removing one factor at a time. Using the Log Likelihood Ratio test, we were able to determine if the factors produced significantly better model fit. Factors were dropped if they did not reach the cutoff of $p < 0.05$. This was performed recursively until only the most meaningful factors remained in the model. The results of this model reduction can be found in Table 28. In the reduced final model, the factors that remained significantly associated with the JAS-MH for supervisors was Organizational Policies and Practices Scale (a measure of disability management at the workplace), the Opening Minds Scale for Workplace Attitudes (a measure of stigma towards people with mental health disorders), and education level. Better disability management, less, stigma, and higher education of the supervisors were association with a greater likelihood of accommodating workers with mental health issues.

Table 28. Stage 4 -Results of final regression model for factors associated with JAS-MH from the supervisor perspective (N=292).

Variable	Coefficient	95% CI		P-value
Organizational Policies and Practices Scale	0.18	0.11	0.25	0.00
Opening Minds Scale for Workplace Attitudes	-0.18	-0.27	-0.09	0.00
Education				
• High School or less	REF	REF	REF	REF
• Some Secondary School	0.14	-0.06	0.34	0.164
• Completed secondary school	0.21	0.04	0.38	0.017

Primary Objective #2: Factors associated with workers' preference for workplace accommodations for MHD

The following analyses examine, from the worker perspective, the association between organizational/job factors, worker characteristics, and worker preference for workplace accommodations for MHD. The outcome measure for these regression analyses was determined from the newly developed JAS-MH measure. The measurements associated with worker characteristics, and organizational/job factors were previously discussed.

Data for these analyses came from all of the workers reporting MHD that participated in the study. To determine the most highly associated factors related to JAS-MH scores, we used a series multilevel regression models. The first model included only company which indicates the amount of variation in JAS-MH that could be accounted for by the clustered nature of the data (i.e., workers within companies) as measured by the intraclass correlation. For the supervisor data, this initial model indicated that 5.2% of the variation of JAS-MH could be accounted for by company membership. While much lower than the rate found in the supervisors, this amount still indicates that there is a clustering effect within the data and that multilevel models will provide more accurate estimates.

The second stage of models looked at bivariate relationships between the various factors and the JAS-MH scores (see Table 29 on the next page). Every factor that had a statistically significant relationship at the $p<0.2$ level was included in the third stage of models. The third stage is considered the preliminary full model. It contains all the significant factors from stage two. The final model is the result of removing non-significant factors that don't significantly improve model fit. This model reduction provides the clearest idea of the factors that are significantly associated with the JAS-MH score in this data.

The following page contains the results of the bivariate analyses (Table 29). Each factor of interest was entered into multilevel models that had the JAS-MH scores of the workers as the dependent variable. Using a p-value cutoff of 0.2 allowed us to screen out variables that were not closely associated with the JAS-MH measure. Any factors below the threshold were then entered into a preliminary full model (Table 30) containing all potentially relevant items in a multivariable model.

Table 29. Bivariate Analyses with JAS-MH worker preference scores

Variable	Coefficient	95% CI	P-value	Include in Final Model
OPP	0.09	0.02, 0.16	0.010	Yes
Work Stress	-0.013	-0.027, 0.001	0.076	Yes
Workplace Social Capital Scale	0.0096	-0.00052, 0.020	0.063	Yes
LBDQ – Worker Assessment of Supervisor	0.0004	-0.004, 0.005	0.846	No
Saskatchewan Comorbidity Score	0.002	-0.008, 0.012	0.737	No
Worker Female Sex	0.26	0.08, 0.44	0.004	Yes
Worker Age	-0.008	-0.015, -0.001	0.028	Yes
Mean years in position	-0.006	-0.016, 0.003	0.198	No
Mean years with company	-0.004	-0.015, 0.008	0.514	No
Worker Education				
• High School or less	REF	REF	REF	No
• Some Secondary School	0.18	-0.076, 0.43	0.169	
• Completed secondary school	0.07	-0.16, 0.30	0.545	
Unionized Workforce	-0.04	-0.24, 0.16	0.697	
Worker Income				
0=$0 - $20,000	REF	REF	REF	No
1=$20,001 - $40,000	0.28	-0.52, 1.07	0.496	
2=$40,001 - $60,000	0.49	-0.27, 1.26	0.208	
3=$60,001 - $80,000	0.50	-0.27, 1.28	0.201	
4=$80,001 - $100,000	0.47	-0.30, 1.2	0.231	
5=Above $100000	0.33	-0.43, 1.08	0.400	
Organizational Culture Profile Scales				
Group	-0.018	-0.04, 0.002	0.071	Yes
Hierarchy	-0.03	-0.06, -0.008	0.009	Yes
Developmental	-0.037	-0.064, -0.009	0.009	Yes
Rational	-0.043	-0.074, -0.013	0.006	Yes

Table 30. Preliminary Full Model (n=191, 29 groups) All significant predictors from bivariate models were included in the analysis.

Variable	Coefficient	95% CI		P-value
OPP	0.071	-0.022	0.164	0.134
Work Stress	-0.004	-0.026	0.019	0.730
Workplace Social Capital Scale	-0.004	-0.024	0.017	0.722
Sex	0.270	0.073	0.468	0.007
Age	-0.003	-0.011	0.004	0.393
OCP Group	0.007	-0.032	0.046	0.716
OCP Hierarchy	-0.018	-0.056	0.020	0.357
OCP Developmental	-0.005	-0.047	0.037	0.802
OCP Rational	-0.027	-0.069	0.015	0.205

After the preliminary model was run, a series of nested models were run by removing one factor at a time. Using the Log Likelihood Ratio test, we were able to determine if the factors produced significantly better model fit. Factors were dropped if they did not reach the cutoff of $p < 0.05$. This was performed recursively until only the most meaningful factors remained in the model. The results of this model reduction can be found in Table 31. In the reduced final model, the only factors that remained significantly associated with the JAS-MH score for workers was sex. On average, women were more likely to rate the accommodations for mental health disorders as helpful.

Table 31. Results of regression model for accommodation helpfulness after model reduction (N=238).

Variable	Coefficient	95% CI		P-value
Female Sex	0.26	0.08	0.44	0.004

After discussing this finding with our advisory committee, i.e., sex being the only statistically significant predictor of JAS-MH scores for workers, it was suggested that we also needed to account for the nature of the job. This was deemed important as sex can play a role in the type of jobs that people take on. Without accounting for job type, it is not clear if it is the sex of the worker or the type of job that account for variation in the JAS-MH. To examine this further, we ran the final model with sex as the exposure of interest, controlling for age, education, income, and job characteristics. Job characteristics were added to the multilevel regression model using the Occupational Information Network (O*NET) occupational taxonomy that we derived from the worker's reported job description. After running this model, we found that sex was no longer a significant predictor of the JAS-MH (Coef = 0.23; 95% CI: -0.02, 0.48; p = 0.07).

Secondary Objective: Association between Supervisor and Worker Ratings of Accommodations

A secondary objective was to determine the association between accommodations supervisors are willing to support and accommodations that workers with MHD would prefer/find helpful. The data for the analyses comes from both the workers (n=1062) and the supervisors (n=366).

To address the objective, we used the Wilcoxon rank-sum test or Wilcoxon-Mann-Whitney test to examine differences between supervisors and workers. Table 32 contains the results of these comparisons as well as a difference between means (supervisor minus worker). All negative results in the difference between means indicate larger worker means on the JAS-MH compared to supervisor JAS-MH scores.

In addition, the accommodations were ranked for both workers and supervisors by the proportion that rated the accommodations "Very helpful" and "Somewhat helpful" for workers (Table 33), and "Very likely" and "Somewhat likely" for supervisors (Table 34).

Table 32. All accommodation items from the surveys compared with the Wilcoxon rank-sum test.

#	Item	P-value of Rank Sum Test	Difference between means*
1	Do not mandate you to attend social functions	0.025	0.164
2	Allow you exchange work tasks with others	0.028	-0.155
3	Allow you make telephone calls to healthcare providers and others for support	0.026	0.079
4	Modify their expectations of you	0.078	0.139
5	Allow you to bring your support animal to work	0.000	0.455
6	Provide extra training for you to learn particular skills	0.000	-0.419
7	Provide training for coworkers about mental health problems	0.001	0.256
8	Provide you with written instructions and checklists (i.e. to-do lists)	0.011	0.203
9	Provide additional time for you to learn new responsibilities	0.415	-0.087
10	Allow you time off without pay	0.330	0.075
11	Shorten your work days	0.000	0.414
12	Change the time you came and left work	0.062	0.202
13	Allow you to take longer or more frequent breaks	0.113	0.160
14	Allow you to work from home	0.833	-0.057
15	Provide paid time off for your healthcare provider appointments	0.000	-0.494

16	Allow you to make up time	0.288	-0.068
17	Allow you to self-pace your workload	0.032	-0.112
18	Arrange a part-time work schedule for you	0.000	0.570
19	Plan for uninterrupted work time for you	0.215	0.147
20	Provide a flexible work schedule	0.006	-0.171
21	Replace your normal job tasks with things that are easier to do	0.000	0.510
22	Rotate you between job tasks	0.001	0.321
23	Use special equipment or tools to make your job easier	0.063	0.221
24	Get you assigned to another job temporarily	0.000	0.409
25	Divide your assignments into smaller tasks	0.000	0.579
26	Gradually introduce tasks to you	0.000	0.605
27	Rearrange your workspace to be more comfortable	0.696	0.077
28	Move you to a different site or location	0.000	0.403
29	Reduce distractions in your work area	0.213	0.162
30	Allow you to change noise levels or wear headphones to play music or white noise	0.917	0.045
31	Allow you to change the lighting	0.038	0.221
32	Provide you with day planners or electronic/software organizers to help organize tasks	0.000	0.649
33	Remind you of important deadlines	0.000	0.547
34	Allow you to tape record meetings	0.000	0.947
35	Provide you with typewritten meeting minutes	0.000	0.882
36	Provide you with accommodations relating to transportation such as provisions for taxi, bus, etc.	0.001	0.312
37	Provide you with medication related accommodations such as access to water in the workspace or private space to take medication	0.000	0.751
38	Provide you with feedback about yourself	0.000	0.433
39	Provide you with emotional support (such as offering time to talk or interact with colleagues)	0.000	0.493
40	Encourage interaction between yourself and coworkers	0.000	0.445
41	Provide you with rewards or recognition from your supervisor	0.016	0.200

* A positive value indicates supervisors supported the accommodation more than the workers preferred it; a negative value indicates workers found this more helpful than the supervisors were willing to provide it

Table 33. Top 20 most helpful accommodations as reported by workers.

#	Item	% workers finding somewhat or very helpful	% supervisors likely or very likely to provide accommodation
6	Provide extra training for you to learn particular skills	81.6%	66.1%
15	Provide paid time off for your healthcare provider appointments	80.4%	62.3%
3	Allow you make telephone calls to healthcare providers and others for support	77.7%	74.5%
9	Provide additional time for you to learn new responsibilities	77.7%	70.4%
17	Allow you to self-pace your workload	75.5%	67.1%
38	Provide you with feedback about yourself	75.0%	87.0%
16	Allow you to make up time	74.2%	70.9%
20	Provide a flexible work schedule	74.0%	67.2%
40	Encourage interaction between yourself and coworkers	73.8%	86.8%
7	Provide training for coworkers about mental health problems	73.5%	80.8%
41	Provide you with rewards or recognition from your supervisor	70.7%	78.7%
39	Provide you with emotional support (such as offering time to talk or interact with colleagues)	69.4%	86.7%
2	Allow you exchange work tasks with others	68.9%	60.1%
33	Remind you of important deadlines	67.3%	85.5%
10	Allow you time off without pay	66.7%	68.1%
4	Modify their expectations of you	65.6%	69.1%
27	Rearrange your workspace to be more comfortable	65.5%	66.3%
1	Do not mandate you to attend social functions	65.1%	63.5%
12	Change the time you came and left work	64.3%	70.0%
23	Use special equipment or tools to make your job easier	64.3%	71.2%

Table 34. Top 20 accommodations most likely to be provided by supervisors.

#	Item	% supervisors likely or very likely to provide accommodation	% workers finding somewhat or very helpful
38	Provide you with feedback about yourself	87.0%	75.0%
40	Encourage interaction between yourself and coworkers	86.8%	73.8%
39	Provide you with emotional support (such as offering time to talk or interact with colleagues)	86.7%	69.4%
37	Provide you with medication related accommodations such as access to water in the workspace or private space to take medication	85.9%	60.2%
33	Remind you of important deadlines	85.5%	67.3%
35	Provide you with typewritten meeting minutes	80.8%	49.8%
7	Provide training for coworkers about mental health problems	80.8%	73.5%
26	Gradually introduce tasks to you	79.4%	54.2%
41	Provide you with rewards or recognition from your supervisor	78.7%	70.7%
32	Provide you with day planners or electronic/software organizers to help organize tasks	77.2%	54.8%
3	Allow you make telephone calls to healthcare providers and others for support	74.5%	77.7%
25	Divide your assignments into smaller tasks	73.8%	49.2%
11	Shorten your work days	73.5%	54.8%
23	Use special equipment or tools to make your job easier	71.2%	64.3%
16	Allow you to make up time	70.9%	74.2%
22	Rotate you between job tasks	70.7%	53.6%
9	Provide additional time for you to learn new responsibilities	70.4%	77.7%
12	Change the time you came and left work	70.0%	64.3%
34	Allow you to tape record meetings	69.4%	32.9%
4	Modify their expectations of you	69.1%	65.6%

In addition to examining the individual accommodations, the averages across the four subscales of the JAS-MH for workers and supervisors were compared using the Wilcoxon rank-sum test. Differences between supervisors and worker means across Work Schedule, Physical Environment, On-job Duties, and Psycho-Social Adjustments can be found in Table 35. Three of the four scales had statistically significant differences with supervisors having higher scores across all subscales. It is also interesting to note that the highest mean subscale for both groups is the Psycho-Social Adjustments subscale.

Table 35. Comparisons between worker averages and supervisor averages across the four subscales within the JAS-MH measure.

JASMH Subscale	Worker Mean (SD)	Supervisor Mean (SD)	Rank Sum Test P-Value
Work Schedule	2.69 (0.80)	2.82 (0.79)	0.04
Physical Environment	2.58 (0.90)	2.70 (0.74)	0.20
On-job Duties	2.61 (0.78)	2.83 (0.62)	0.0003
Psycho-Social Adjustments	2.72 (0.75)	3.22 (0.74)	<0.0001

Discussion

Overall, the sample that we recruited included 1428 individuals with just over one quarter of the respondents being supervisors at the 31 different companies. These participants came from 18 Manitoban employers and 13 Ontarian employers, all of which had over 50 employees working for them. While the response rate at the company level was low (9.5%), the sample was stratified and included at least 3 companies from across 10 different industry sectors.

The data collected from these individuals forms the core of our study. We found that approximately 13.6% of supervisors reported having a mental health disorder. A large proportion of supervisors (69%) reported having supervised a worker with a mental health disorder, but only 36% of these supervisors indicated that they have provided accommodations to a worker with a mental health disorder. From the workers' survey, 32% of the workers reported having at least one mental health issue (i.e., anxiety disorders, depression, and others). Considering these facts in combination, it is clear that mental health issues are present in employees across the companies surveyed.

When workers were asked, "In your opinion, how well does your supervisor support workers with a mental illness?", 44% indicated that their supervisors supported them either "Very well" or "Well". Only a small proportion of workers (5%) felt that their supervisors did not support mental health at all. Further, 38% of workers didn't know how well supervisors support workers with mental illness. While this last finding can be looked as a positive, as many individuals haven't had to consider their supervisors support of mental illness. However, this finding also indicates that many supervisors could be doing a better job of communicating their potential support as well as their company's support of mental health issues for their employees.

The supervisor survey also asked a series of questions about medical restrictions and communication with health care providers (i.e., physicians, chiropractors, etc.). These questions found that the vast majority of supervisors were happy with the work restrictions they received from healthcare providers (80%), the support they received from human resources (90%), and the quality of information provided by health care providers (79%).

Both surveys also contained a wide range of scales that measured a variety of different workplace factors including disability management, work stress, workplace social capital, leadership, stigma towards people with mental health, supervisor autonomy, and organizational culture. On their own, no one scale stood out for the whole population. Each scale was found to vary across both the companies and the sectors.

For supervisors, the average score on the Organizational Policies and Practices Scale (OPP) was 4.12. This indicates that the average disability management across companies was fairly high (maximum score of 5 would be a perfect score). For the Work Stress, companies scored on average 19 out a possible maximum score of 52. This indicates that the average supervisor experiences a relatively low level of work stress as

measured in our survey. Workplace Social Capital Scale scores illustrated a high degree of social capital on average across workplaces. For leadership, supervisors in our study were more likely to take a consideration approach (friendship, mutual trust, respect, and warmth) than an initiating structure approach (establishing well-defined patterns of organization, channels of communication, and ways of getting the job done). However, supervisors' scores on the two leadership scales were not to different which illustrates that supervisors tend to use both styles of leadership in their work.

For workers, OPP scores were slightly lower than supervisors (poorer opinion of disability management at their company) but the average work stress scores were slightly higher (more stress reported by workers). Workplace social capital was also reported to be lower by the workers. The workers also reported on their health state through the Saskatchewan Comorbidity Scale. Here, the average worker score was just under 8 which is indicative of many of the workers being in good health and reporting lower scores on the scale. More detailed analyses of these scales will be developed using this dataset.

After the completion of the data collection, each company received a detailed report that contrasted their results across the scales with the other companies within their sector. Certain companies did score significantly higher on scales such as the Opening Minds Scale for Workplace Attitudes (OMS-WA). This indicates that stigmatic attitudes towards mental health conditions exists in certain workplaces and differences in the extent of stigma occur across companies and sectors. To keep participating company names confidential, we have only reported average scores by sector in this report. The sector with the highest level of stigma towards people with mental health disorders was the wholesale sector. On the flip side, the retail sector had the best scores on the OMS-WA scale.

In order to more closely examine job accommodations for workers with mental health issues, this project aimed to develop a measure that could be used to assess the likelihood of accommodation provision in relation to mental health issues. Due to the small number of respondents for the accommodation questions in the surveys, we chose to employ the Concept Mapping approach to develop the new measure (JAS-MH). Concept mapping allowed us to involve the entire advisory board in the development process of this new measure. The concept mapping procedure resulted in a 29-item scale that can be used to examine overall accommodations for mental health from both the supervisor and worker perspectives. These 29-items are a reduced list of 41 potential accommodations for people with mental health issues included in both the supervisor and worker surveys.

The concept mapping process also used input from the advisory committee and the survey data to discover four subscales or accommodation types within the overall JAS-MH measure. These subtypes included accommodation questions within the following groups: (1) Work Schedule; (2) Physical environment; (3) On-job Duties; (4) Psycho-social Adjustments. Further analyses of these subscales may lead to insights into

preferences of accommodations by workers/supervisors for assisting with mental health issues at the workplace. Furthermore, these subscales may also provide a structure that could lead to support discussions around the varying types of workplace accommodations and supports that can be provided to people with mental health issues.

Objective #1: Factors associated with the likelihood of supervisors to support accommodations for mental health disorders in the workplace

This study examined supervisor and organizational factors associated with supervisors' support for temporary job accommodations for workers with common mental disorders. Almost half of the variation in support for job accommodations can be accounted for by the company. This is an important finding as it suggests the workplace is a prime target for influencing supervisors' likelihood to provide accommodations. The factors with the largest effect on accommodation support for workers with mental health disorders were workplace disability management policies and practices, supervisor stigma, and supervisor education level. The identification of these factors is important for guiding employer policies and practices that can facilitate the accommodation and return to work process of a worker with a mental health disorder.

Similar to our previous finding that workplace disability management policies and practices are associated with supervisors' support for temporary job accommodations for low back injured workers,[39] we also found workplace disability management policies and practices to be associated with supervisors' support for temporary job accommodations for workers with mental health disorders. Workplace disability management policies and practices are associated with the prevention and resolution of work disability.[26] Having a company policy on hiring persons with disabilities and having prior experience with disability has been shown to be more predictive of attitudes toward providing job accommodations than company size.[30]

Expectedly, supervisor stigma levels were equally as important as workplace disability management policies and practices when assessing association with supervisors' support for job accommodations for workers with mental health disorders. The more stigmatizing attitudes held by supervisors, the less likely they were to support job accommodations for workers with mental health disorders. These findings corroborate results of a recent study that showed that managers holding non-stigmatizing attitudes towards mental illness were more likely to contact staff members off work due to mental health problems.[80]

Finally, overall education level of the supervisor was associated with supervisors' likelihood to support job accommodations for workers with mental health disorders. This finding is independent of stigma levels held by supervisors. Increasing education is correlated with knowledge and confidence and supervisors with greater knowledge and confidence in addressing mental health issues are associated with greater mental health literacy.[81] In fact, manager confidence was recently shown to be the greatest

predictor of a supervisor making contact with an employee suffering from a mental illness or on sick leave for mental health reasons.[80]

Objective #2: Factors associated with workers' preference for workplace accommodations for MHD

This study also examined the workers' perspective. Worker, supervisor and organizational factors were examined for their association with workers' preference, in terms of helpfulness, for temporary job accommodations for common mental disorders. Only 5% of the variation in the workers' perspective JAS-MH was accounted for by the company within which a worker worked. This is not surprising – we would not expect workers needs or desires for accommodation to be highly related to the company within which they work. The only factor associated with helpfulness of job accommodations for workers with a mental health disorder was female sex. A study comparing men and women of comparable age, education, work, job function, and health disorders found that women used a few more work accommodations than men.[82] However, as shown with arthritis, health disorders may marginalize women and men in different ways.[83] Therefore, we ran the final model with sex as the exposure of interest, controlling for age, education, income, and job characteristics. We found that sex was no longer a significant predictor of the JAS-MH after the addition of job characteristics into the final model. This demonstrates that predicting helpfulness ratings of workplace accommodations does not depend solely on any individual factor and accommodations may work best depending mostly on the individual's own personal circumstances and preferences.

Secondary Objective

Finally, this study sought to determine the association between accommodations supervisors are willing to support and accommodations that workers with MHD would find helpful. Our first analysis using the Wilcoxon rank-sum test of all 41 accommodations found that there were no significant differences between the JAS-MH scores on 12 of the accommodations. Of the remaining 29 accommodations, for only 5 of them (allow you to exchange work tasks with others, provide extra training for you to learn particular skills, provide paid time off for your healthcare provider appointments, allow you to self-pace your workload, and provide a flexible work schedule) did the workers find the accommodation more helpful than the supervisors were willing to provide. However, it is important to note in this analysis that we are not comparing the exact same measure, as supervisors are rating the likelihood that they would provide the accommodation and workers are rating how helpful they would find it.

A more useful analysis is to compare the percentages of workers' findings the accommodations somewhat or very helpful to the percentages of supervisors who are likely or very likely to provide the accommodation. When we examined the top 20 most helpful accommodations as reported by workers, for half of them there was a greater proportion of supervisors likely or very likely to provide the accommodation than there

were workers finding the accommodation somewhat or very helpful. Since supervisors are already very willing to provide these accommodations, these may be a useful starting set of accommodations to consider when discussing a possible accommodation plan for a worker with a MHD. These accommodations include:

- Provide you with feedback about yourself
- Encourage interaction between yourself and coworkers
- Provide training for coworkers about mental health problems
- Provide you with rewards or recognition from your supervisor
- Provide you with emotional support (such as offering time to talk or interact with colleagues)
- Remind you of important deadlines
- Allow you time off without pay
- Modify their expectations of you
- Rearrange your workspace to be more comfortable
- Change the time you came and left work

These suggestions for supervisors dealing with employees with depression are supported by a recent study by Negrini and colleagues in the Journal of Occupational Rehabilitation.[84]

When we compared the accommodations according to the four subscales of the JAS-MH, the supervisors had higher JAS-MH scores on all subscales than the workers except the physical environment accommodations, where there was no significant difference between the supervisors and the workers. A fairly recent scoping review of accommodations for people with mental illness, including severe mental disorders, found that the most commonly reported work-related accommodations were flexible scheduling/reduced hours, modified training and supervision, and modified job duties/descriptions.[85] The least common type of accommodation was physical modification to the workplace.[85] Similarly, we found that supervisors were most likely to provide psycho-social adjustments, and then flexible scheduling and modified job duties, followed by physical environment changes. Hence, it appears that overall supervisors are providing the types of accommodations that workers would find helpful.

Study strengths and limitations

As far as we are aware, this is the first study to examine a range of organizational and supervisor factors for their association with supervisors' support of job accommodations and workers' perception of helpfulness of job accommodations for workers with mental health disorders. The study included supervisors and workers from a range of industrial sectors, a conceptual framework to guide the identification of important factors, and validated measurement instruments. The use of the case vignette with the supervisors is a well-established research method for studying the decision-making practices surrounding health and functional problems.[39,41,43,44] Strengths of the case vignette approach are ease of administration, standardization of the decision-making scenario

across respondents, and avoidance of the practical and ethical considerations associated with collecting information about actual decisions from real cases. On the other hand, having workers with mental health disorders respond to our survey from their own personal experiences is a tremendous strength of this study.

There are also important limitations to consider. First, the main limitation is the low response rate from the employers (9.5%). It is highly likely that the employers who were willing to participate had already been considering the topic of mental health in their workplaces and were more open to participating in such a study. Given the high amount of variation in the JAS-MH measure that could be accounted for by the company, there is a high likelihood of selection bias in these results. The participating companies and hence, supervisors, were likely those with the highest mental health literacy. Yet, we still found substantial levels of stigma in the participating population, so there is much to be done in this realm. Although worker and supervisor response rates were much higher once an employer agreed to participate, 27% and 44%, respectively, there is likely some self-selection bias within those who chose to participate. This may explain the relatively high scores regarding the prevalence of mental health disorders and some of the workplace factors like disability management policies and practices, and workplace social capital. Hence, the generalizability of our findings may be restricted to similar workplaces with supervisors and workers expressing similarly positive perceptions of the workplace.

Second, our survey approach required self-reported measures of supervisors, workers, and their workplaces. We cannot discount social desirability (supervisors and workers responding in a manner to please their employer) influencing the survey responses. The use of standardized measurement instruments would limit this effect. The similar ratings on workplace factors between supervisors and workers are also reassuring as one might expect supervisors to have a greater socially desirable response than workers.

Recommendations for research and practice

Notwithstanding these limitations, we can draw some important recommendations for research and practice from these results. First, given that 46% of the variation in the supervisor JAS-MH could be accounted for by the company to which a supervisor belonged, the workplace seems to be an important level at which to intervene as the greatest impact might be had here. Even after accounting for the employer to which a supervisor belonged, disability management policies and procedures are still an important determinant of the likelihood of supervisors to provide accommodations for workers with MHD. This further suggests that working with employers to develop strong disability management policies may impact the provision of accommodations for workers with MHD.

Second, our study results would suggest that training and education for supervisors to reduce stigma and increase confidence and mental health literacy would potentially increase the provision of accommodations for worker with MHD. Even in our potentially superior sample, there were still considerable levels of stigma around mental health in

the workplace. Finding effective ways of reducing stigma around mental health in the workplace is an important research goal.

Third, workplace factors do not appear to be strong determinants of whether or not a worker will find an accommodation helpful. Intuitively, this makes sense as workers' evaluation of an accommodation will be dependent on many external factors, including family situations, which we did not capture in this study. Further study with workers to determine what factors (including those external to the workplace) are associated with helpfulness of accommodations for mental health disorders would be useful, as this information can help identify and prioritize accommodations specific to worker's needs.

Fourth, we have recommended 10 accommodations that were ranked high by workers and supported by supervisors that might provide a good starting place for a discussion of potential accommodations for workers with a mental health disorder. Overall, supervisors are providing the types of accommodations that workers would find helpful. It might be useful to bring supervisors together to share and brainstorm potential accommodations that could be helpful to workers with MHD in their workplaces, as many seem to be providing helpful accommodations. An effective supervisor training program for reducing work disability incorporated this type of supervisor brainstorming into the training program.[33,34]

Conclusion

In conclusion, the factors associated with supervisors' likelihood to accommodate a worker with a mental health disorder were workplace disability management policies and practices, supervisor stigma, and supervisor education level. These findings are important for all work disability prevention stakeholders as they identify important targets for intervention. For example, simple applications may be to improve disability management policies and practices; or to train supervisors to improve their mental health literacy and decrease stigmatizing attitudes. Future research should test these interventions and other hypotheses generated and discussed in this report.

Workplace and supervisor factors do not appear to be strong determinants of whether or not a worker will find an accommodation helpful. Future research should identify what factors (including those external to the workplace) are associated with helpfulness of accommodations for mental health disorders. This information may help identify and prioritize accommodations specific to worker's needs.

Overall, supervisors are providing the types of accommodations that workers find helpful. We have recommended 10 accommodations that were ranked high by workers and also well supported by supervisors as a starting point for accommodation consideration. These should be further evaluated in a prospective study, confirming their value to workers with mental health disorders and their ease of use for supervisors.

Knowledge Transfer & Exchange

Advisory Board Meetings

The project advisory team was instrumental to this project. The first meeting of the Advisory Board was held on July 20, 2016 at the University of Winnipeg. The committee contributed valuable advice prior to the start of the study to ensure we collected the most appropriate information. The advisory board also participated electronically in our concept mapping exercise to help us develop a new measure of support (supervisor perspective) and preference (worker perspective) for accommodations for workers' with mental health disorders. At a final meeting of the advisory board on Dec 10, 2018 the board assisted in the development of messages to take away from this project. Finally, they continue to contribute through dissemination of the findings contained in this report to their networks. The project advisory team included:

- Ron Ferguson, formerly of Great West Life Insurance; now retired
- Sara MacDonald, KTE Associate at the Institute for Work & Health
- Paula Raposo, Manitoba Government and General Employees' Union
- Sue Roth, Safety Culture Specialist, SafeWork Manitoba
- Susan Tremblay, Labour Relations Officer – WCB; Manitoba Nurses Union

Presentations

Workers' Compensation Board of Manitoba

On September 19, 2019, Vicki Kristman presented to approximately 60 attendees at a session organized by Joanne Machado. The presentation was well received.

EPID@Work Plenary

On September 8, 2019, Vicki Kristman presented the development of the Job accommodation scale for Mental Health at an internal scientist plenary at the new Research Institute at Lakehead University. The presentation was titled "The Job Accommodation Scale for Mental Health (JAS-MH): Development of a new measure of employer support for job modifications for mental health disorders."

Conference Presentations

In addition to the presentation of the preliminary findings at the 2018 Canadian Association for Research on Work and Health (CARWH) in Vancouver (where attendance was funded through this grant), we also had the opportunity to present the findings at other conference that we were funded to attend for other purposes or where the opportunity was at no cost:

- **Kristman VL**, *Armstrong JJ*, Corbière M, Shaw WS, Harlos K, Cernigoj M. Factors associated with supervisor support of job accommodations for common mental disorders in the workplace. Work Disability Prevention and Integration (WDPI) Conference, Odense, Denmark, June 4 - 7, 2019. (Poster presentation)

- **Kristman VL**, *Armstrong JJ*, Corbière M, Shaw WS, Harlos K, Viel C, Cernigoj M. Factors associated with supervisor support of job accommodations for mental health disorders in the workplace. Canadian Society for Epidemiology and Biostatistics Biennial Conference, Carleton University, Ottawa, May 13-15, 2019. (Poster presentation)
- **Kristman VL**, *Armstrong JJ*, Corbière M, Shaw WS, Harlos K, Viel C, Cernigoj M. Factors associated with supervisor support of job accommodations for mental health disorders in the workplace. Canadian Society for Epidemiology and Biostatistics Biennial Conference, Carleton University, Ottawa, May 13-15, 2019. (Poster presentation)
- **Kristman VL**, *Armstrong JJ*, Corbière M, Shaw WS, Harlos K, Viel C, Cernigoj M. Factors associated with supervisor support of job accommodations for common mental disorders in the workplace. 2019 Showcase of Health Research, St. Joseph's Care Group, Thunder Bay, Ontario, February 8, 2019. (Podium presentation)
- *Armstrong JJ*, **Kristman VL**. Development of the job accommodation scale for mental health through concept mapping and structural equation modeling. 2019 Showcase of Health Research, St. Joseph's Care Group, Thunder Bay, Ontario, February 8, 2019. (Poster presentation)
- **Kristman VL**, *Armstrong JJ*, Corbière M, Shaw WS, Harlos K, Viel C, Cernigoj M. Factors associated with supervisor support of job accommodations for common mental disorders in the workplace. 2019 Showcase of Health Research, St. Joseph's Care Group, Thunder Bay, Ontario, February 8, 2019. (Poster presentation)
- **Kristman VL**, *Armstrong J*, Viel C, Corbière M, Shaw WS, Harlos K, McEwen C, Cernigoj M. Supervisor and worker perspectives on workplace factors and job accommodations for mental health disorders in the workplace. St. Joseph's Care Group Showcase of Health Research 2018, Thunder Bay, Ontario, Canada. March 2, 2018. (Podium presentation)
- **Kristman VL**, *Armstrong J*, Viel C, Corbiere M, Shaw WS, Harlos K, Cernigoj M. Supervisor and worker perspectives on workplace factors and job accommodations for mental health disorders in the workplace. The 32nd International Congress on Occupational Health, Dublin, Ireland. April 29 – May 4, 2018. (Poster presentation)

Institute for Work & Health Presentations and Publications

Due to scheduling challenges, we were unable to get a Speaker's series or Disability Manager's presentation at the Institute for Work & Health booked before the expiration of funds. We still intent to give this presentation and also publish in the Institute's *At Work* lay publication.

Journal publication

Journal publications are also still in progress. As peer-review in academic journals can take a considerable amount of time, we are still in the process of publishing three articles based on the material in this final report. Unfortunately, payment to the journals can not occur until the manuscripts are accepted for publication. We will continue to

seek publication of these articles and will inform the Manitoba WCB before these are to be published.

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