The effects on organizational climate following healthcare worker involvement in a participatory wellness initiative

A project in partnership with
Vancouver Coastal Health at George Pearson Centre

Final Report

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Occupational Health & Safety Agency for Healthcare in BC
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Executive summary

Research on the Canadian workforce has consistently indicated that healthcare workers are at greater risk of workplace injuries than any other occupational group and with a large percentage of those being musculoskeletal injuries.

In additional to physical demands, healthcare workers experience other psychosocial stresses related to organizational culture and job satisfaction. Research has shown that a combination of these work-related characteristics, such as high work demands coupled with individual characteristics (e.g. psychological stress, gender, and personality), can predict job satisfaction, work stress, and the chances of reporting a work-related injury.

Past initiatives in Vancouver Coastal Health have focused primarily on physical factors associated with the reduction or elimination of musculoskeletal injuries. This project endeavored to explore the effects of mental well-being on physical health and safety through a wellness intervention using a holistic approach.

Front-line workers at George Pearson Centre selected massage therapy as the wellness intervention of choice. Six questionnaires were completed by participants, three pre-intervention and three post-intervention. The questionnaires asked participants to rate various psychosocial factors as well as pain severity and pain interference on well-being.

For the intervention period, participants were offered 20 minute on-site relaxation massage sessions once a week for four weeks. Massage was performed by a Registered Massage Therapist while participants were fully clothed sitting prone.

Results showed a statistically significant decrease in post-intervention pain severity ($p = 0.038$), although the impact did not have a lasting effect. Psychosocial factors either showed an increase in rating or no significant change.

The results of this study suggest that using massage therapy as a wellness intervention would have the greatest impact on those already experiencing musculoskeletal symptoms. The program would need to be sustainable to produce long term effects.

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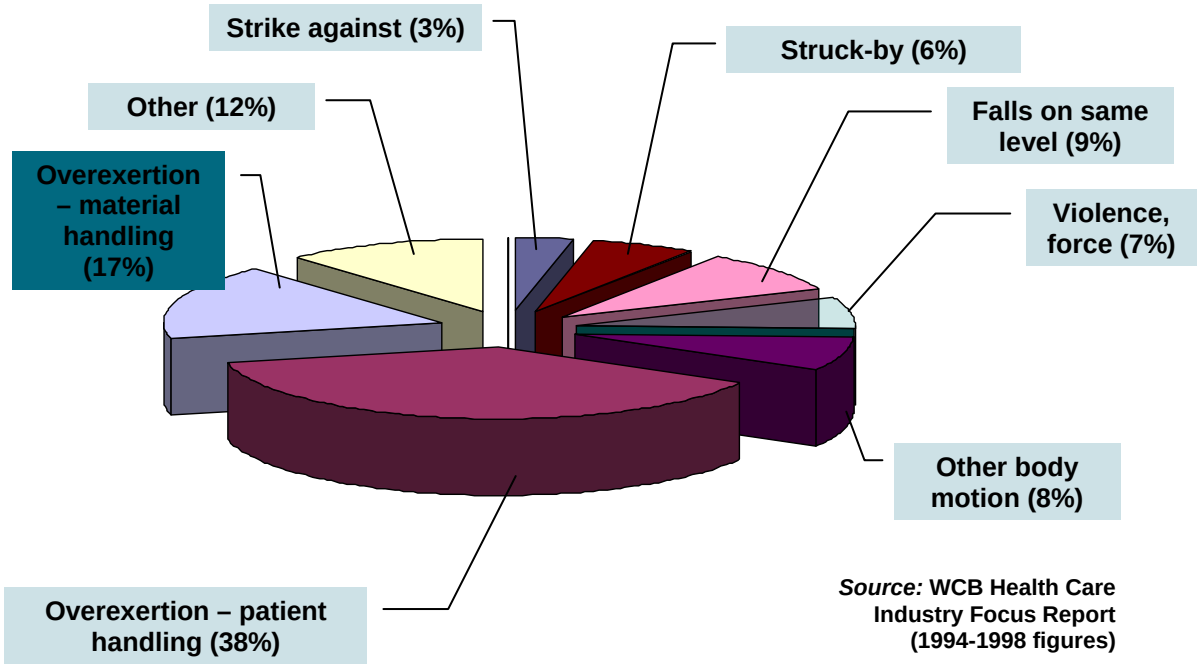
Background

Research on the Canadian workforce has consistently indicated that healthcare workers have a greater risk of workplace injuries than any other occupational group. Approximately half of these injuries are musculoskeletal related (Figure 1). In response to this, many initiatives have been implemented to reduce the risk of injury and assist with safe early return to work; however, the injury rates continue to be high. To date, initiatives have primarily focused on the physical aspects of preventing musculoskeletal injuries (MSI), such as implementing engineering controls, or providing education and training.

Figure 1: Sources of injury in healthcare



The current healthcare system is plagued by difficulties associated with recruitment and retention; high rates of work injuries; illnesses and absences from work; and escalating costs. There is an increasing concern about infectious diseases, chemical-induced disorders, violence, and stress. Many of these factors overlap and integrate with one another, making solutions for prevention difficult. Slowly, unsafe work conditions impact the ability to deliver quality care.

In British Columbia, the 2000 Workers' Compensation Board (WCB) of BC Focus Report on Occupational Injury and Disease[1], and the Occupational Health and Safety Agency for Healthcare in BC (OHSAH) studies on Alternative Level Care[2] and Intermediate Care facilities[3,4] revealed that time-loss injury rates vary considerably by healthcare sub-sector (Acute, Long Term Care, and Community Care), and by occupation (Registered Nurse, Licensed Practical Nurse and, Care Aide). Nurses do have the highest use of sick hours than any workforce in Canada.[5,6] For example, according to Statistics Canada, in 1999 nursing personnel had longer duration of time-loss and were

more likely to miss work each week due to an illness or injury than employees in any other sector or other types of shift-working occupations.[7,8]

Workload is the most consistent stressor occurring in nursing occupations, including acute care nurses, surgical nurses and general hospital nurses.[9,10,11] Key job stress factors associated with ill health among health care workers in published studies have been work overload[12], pressure at work[13,14,15], lack of control over work or a lack of participation in decision making[16,17], poor social support[18,19], problems with management style such as unsupportive leadership or a lack of communication/feedback[20,21], staff shortages or unpredictable staffing, scheduling or long work hours[22], and work/life balance conflicts[39,40].

Research has shown that a combination of these work-related characteristics such as high work demands coupled with individual characteristics (psychological stress, gender, and personality) can predict job satisfaction, work stress, and the chances of reporting a work-related injury.[23,24,25]. In a study conducted by the Hospital Employees Union (HEU) in BC, 58% of 881 randomly selected union members felt either mentally or physically stressed at the end of their workdays[26].

The literature suggests that workers who are dissatisfied with their work are more likely to report low back problems. Back pain and other MSIs are of multi-factorial origin, with work related physical loads in relation to personal functional capacity only partially explaining the high number of MSIs in healthcare. Psychological factors may directly influence mechanical loading on the body through changes in posture, movement and exerted forces. For example, a nurse who is under time pressures to complete a task may increase hurried movements with high accelerations and poor postures. As a result, over time they may have increased muscle tone that will precede the development of MSI signs and symptoms to a point where the nurse may have an enhanced perception of the signs or symptoms or a reduced capacity to cope. Therefore, psychological stress may either increase the signs and symptoms or increase the nurses' perceptions of the signs or symptoms resulting in reporting an injury before one has actually occurred.

To combat work related anxiety, depression, and musculoskeletal pain, many have recommended Massage Therapy.[27,28,29] Massage Therapy is described as the systemic manipulation of the soft tissues of the body. The movements of gliding, compressing, stretching, percussing and vibrating of the muscles are regulated to produce specific treatment responses.[30]

Massage Therapy may effectively treat low back pain as it has been shown to reduce pain in other painful syndromes. For example, massage therapy has been shown to decrease pain associated with fibromyalgia[31], chronic fatigue[32], migraine headaches[33], and improved trunk and pain flexion performance with increases in serotonin and dopamine levels, two important neurotransmitters. Cherkin et al.[34] reported that those receiving massage therapy had less severe back pain symptoms than those that received either acupuncture, or a control group. In a study by Brennan and De Bate, nurses in the study group received a 10 minute chair massage while the control group received a 10 minute break.[35] The study group reported significantly lower stress perception (using the Perceived Stress Scale) after the chair massage. No significant changes were seen in the control group. In addition to reducing pain and tension levels, massage therapy has been found to increase relaxation and improve the overall mood of patients.[36]

Project objectives

With past initiatives focusing primarily on physical factors in the reduction/elimination of musculoskeletal injuries, this project endeavored to explore the effects of mental well-being on physical health and safety through a wellness intervention. The holistic approach of a wellness intervention focuses on the promotion or maintenance of good health rather than correction of poor health. The objectives of this initiative were to:

1. Identify and evaluate workplace morale and job satisfaction of front-line long-term care staff.
2. Use a participatory approach for development of a staff-focused relaxation modality.
3. Determine the effects of the relaxation modality on:
    a. Workplace stress
    b. Job satisfaction
    c. Pain and discomfort

Methods

Research design

The evaluation of this project followed a quasi-experimental time-series design. The intervention facility was George Pearson Centre (GPC), a facility with high sick time and musculoskeletal injury rates. GPC is a residential care facility for adults with severe disabilities in Vancouver, British Columbia, Canada. There are 200 employees working at GPC.

Questionnaires

Six matched questionnaires were distributed: three pre-intervention (questionnaires 1, 2, and 3) and three post-intervention (questionnaires 4, 5, and 6) (Figure 2). Staff were given a study identification number for the entire study. In Questionnaire 1, participants were asked to rank a descriptive list of four personal wellness programs (massage therapy, integrative energy healing, nap/sleep room, and no wellness program) from their most preferred to least preferred. Massage therapy was chosen as the most preferred relaxation modality by 87.5% of respondents.

Figure 2: Evaluation methodology. Q = Questionnaire

Questionnaires 1, 2, 5, and 6 were placed in the facility mail box of each staff. Completed questionnaires were returned to the unit clerk at each of the 6 wards. The ward that submitted the most questionnaires during each phase of the evaluation received a gift basket. Questionnaire 3 was completed by participants in conjunction with a medical case history form immediately prior to receiving their first massage therapy session. Questionnaire 4 was completed by participants

immediately following their final massage therapy session or during the week after the massage program (intervention period) if they did not receive a massage in the final week of the program.

Originally, this project was intended to evaluate the effects of a relaxation modality on direct patient care staff only. Questionnaires 1 and 2 reflect this intention. However, this was changed after further consideration of the evaluation to also include non-direct patient care staff. These participants are included in Questionnaires 3 to 6.

Questionnaires contained "psychology at work" questions derived from the constructs developed by the General Nordic Questionnaire for Psychological and Social Factors at Work (QPS Nordic)[37,38,39,40,41] related to organizational culture, job demands, social interaction, and control at work. Questionnaires 3 to 6 also included the Brief Pain Inventory.[42]

Relaxation intervention — Massage therapy sessions

Massage therapy sessions took place in a designated room at GPC. The treatment room was divided into three sections with curtains that could be drawn around each section. A waiting area with chairs and a water cooler was adjacent. Natural and fluorescent light illuminated the room. Art decorated the room walls and soft music was played at all times.

Massage therapy sessions were offered at the facility by Registered Massage Therapists (RMT) Monday to Friday from 1 to 5 p.m. for four weeks. Participants were allowed to sign up for one 20 minute massage therapy session each week. The employer allowed participants to take a paid break from work (in addition to regular breaks) to attend their session if they desired. Sign up took place in the cafeteria in each prior week.

Four RMTs provided massage therapy. For the four weeks, two RMTs worked Monday to Friday, one worked Monday to Wednesday and Friday, and one worked Thursdays only. Participants were assigned to the next available RMT when they arrived for each session; and did not necessarily receive treatment from the same RMT as in their previous session.

Participants completed a medical case history form at their first session to identify counter indications to massage therapy. Massage therapy was performed with participants fully clothed sitting prone on a massage chair. RMTs were instructed to use the following treatment techniques only, based on recommendations of the Massage Therapy Association of BC: tapotement (vibration, percussion), effleurage (glide, touch, or stroke lightly), petrissage

(kneading, rolling, wringing), passive stretching, grade 1 or 2 joint mobilization, traction, and active and passive range of motion. Treatment was limited to the neck, shoulders, upper back, lower back, and arms. These treatment techniques reflected massage therapy for the purposes of general relaxation rather than specific therapy. Areas treated, treatment techniques used, and home treatment recommendations were recorded for each session.

Statistical methods

Standard descriptive statistics (e.g., percentage, mean, and standard deviation) were calculated to demonstrate the demographics of subjects and characterize the distribution of variables.
Factor analysis with rotated component matrix was used to construct principal components for psychological and social questions. After a few factor analyses using surveys 1, 2, and 3, the items were categorized into three constructs (organizational culture, job demand, and social interaction) in terms of loading factors (>=0.50); also, each component had a Cronbach's Alpha value of greater than 0.65.

Test-retest reliability analysis was used to examine reliability of three components between surveys 1 and 2; The Cronbach's Alpha for reliability ranged from 0.65 to 0.84.

Total scores were computed for subjects who answered all questions for each component; control at work, individual questions (feeling exhausted, quality of working life, willing to recommend the program, and willing to participate the program) separately. According to the scoring booklet for the Brief Pain Inventory, the mean of pain severity was computed over 4 severity items; and pain interference was computed over 7 interference items. The Friedman Test, a non-parameter method, was used to test differences of three components; control at work, and individual questions as well as pain severity and interference between surveys 3, 4, 5 and 6.

All tests were two-sided significance levels of $p \leq 0.05$ estimated from Statistical Package for Social Sciences (SPSS) version 14. Partially missing values were automatically excluded from the analyses.

Results

Demographic data

Table 1 provides a breakdown of the distribution and return rates for questionnaires 1 through 6.

Table 1: Distribution and return rates for questionnaires 1 through 6

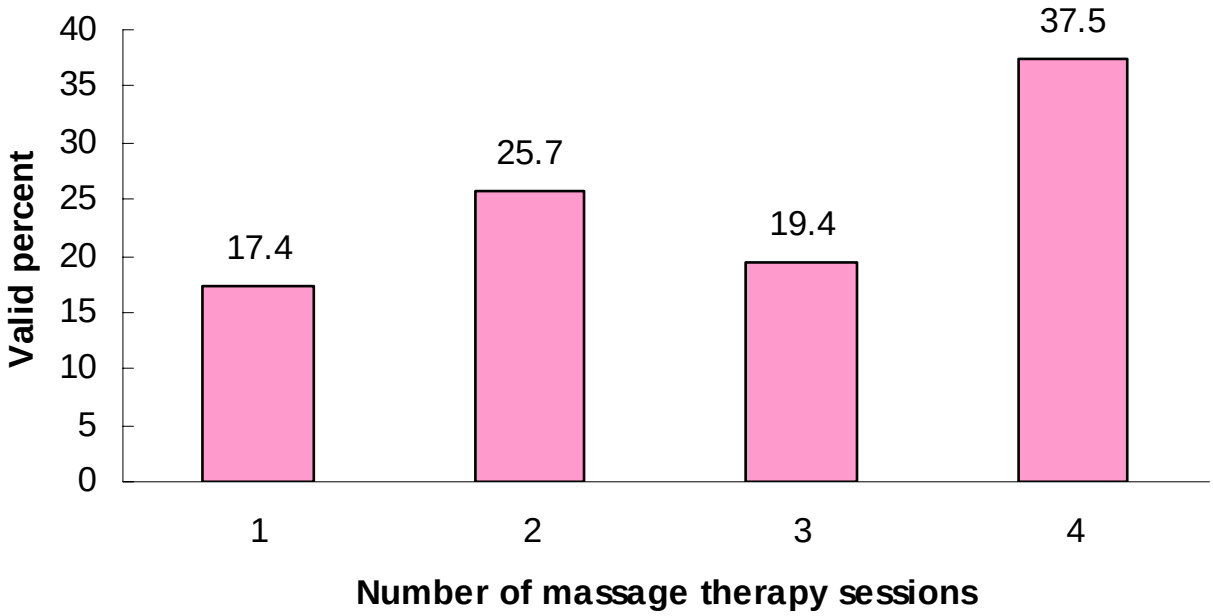
Questionnaire	Q1	Q2	Q3	Q4	Q5	Q6
Date	Feb 2005	Apr 2005	May 2005	June 2005	Aug 2005	Sept 2005
Number of questionnaires distributed	155	155	144	144	160	160
Number of questionnaires returned	109	80	144	115	80	81
Percentage of questionnaires returned	70.3%	51.6%	100.0%	79.9%	50.0%	50.6%

Demographic information was provided by 98 participants. Eighty percent of the participants were female while 20% were male. Most participants (38%) were between the ages of 41 and 50 years old or between the ages of 31 and 40 years old (20%). See Appendix 1 for further demographic results.

Number of massage therapy sessions

Participants received up to four sessions of massage therapy over a four week period. Figure 3 shows the frequency of the number of massage therapy sessions received by participants. Statistical analysis showed that the number of massages received by a participant did not influence their perception of psychological and social constructs.

Figure 3: Frequency of number of massage therapy sessions



Psychological and social constructs

Work culture showed a significant decrease from Q3 to Q6 ($p = 0.01$) (Figure 4) while massage therapy had no significant impact on job demands, social interaction, or control at work. Data showed trends toward improvement of quality of life associated with the massage intervention, but this decreased after the intervention period as indicated by responses in Q4 (Figure 5). There was no significant change in staff feeling a lack of recognition in the workplace (Figure 6).

Figure 4: Work Culture (out of 25)

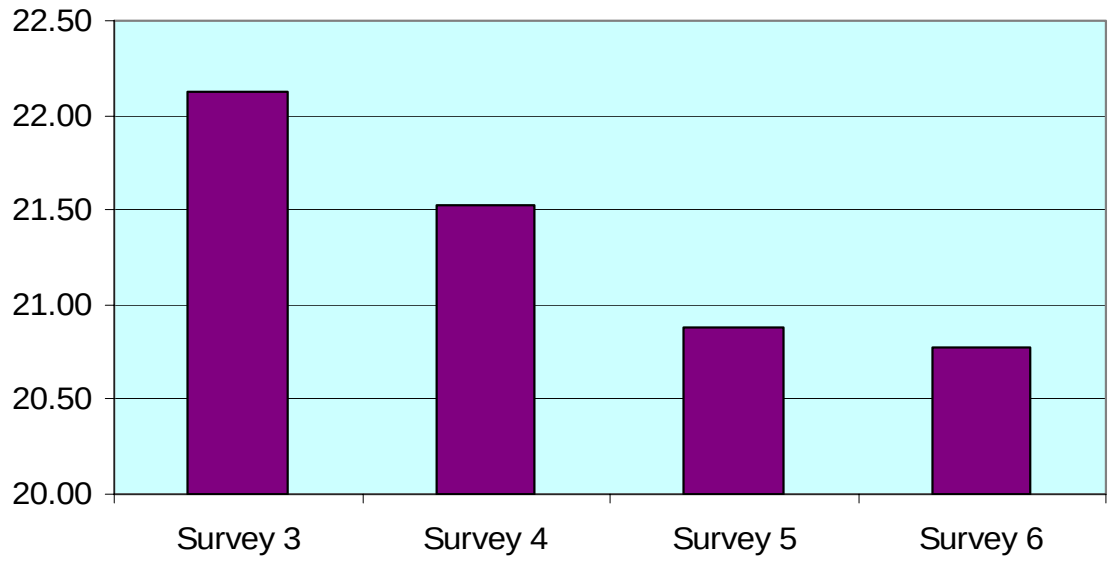


Figure 5: Quality of work life at GPC (out of 5)

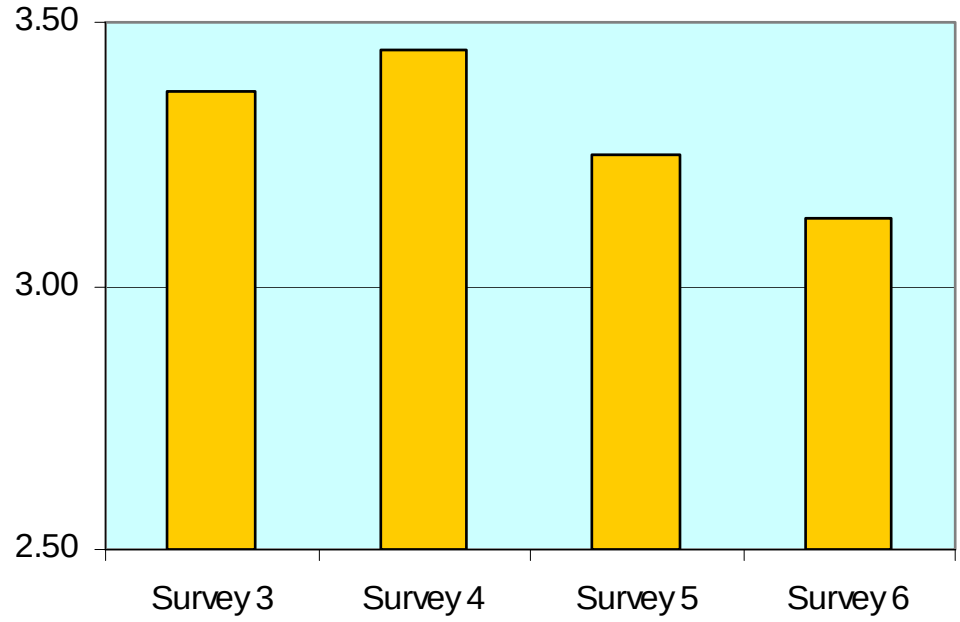
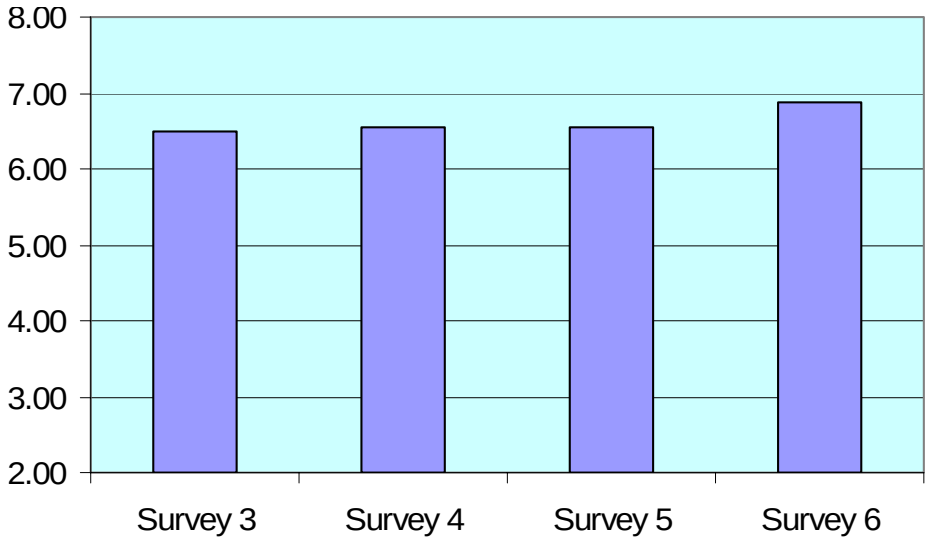


Figure 6: Recognition (out of 10)



Pain severity, pain interference, and pain relief

Pain severity showed significantly different means between Q3 to Q6 ($p = 0.038$). Post hoc analysis showed pain severity decreased significantly between Q3 and Q4 ($p = 0.013$) (Table 2). However, pain severity showed an increasing trend from Q4 to Q6. Neither pain interference nor pain relief showed any significant change (Table 3).

Table 2: Description and comparison of frontline workers' pain severity, pain interference and pain relief among Q 3, 4, 5, and 6

	N	Mean (SD)	Min	Max	P value†
Pain severity					**0.038**
Q3	25	4.55 (2.08)	0.25	8.50	
Q4	25	4.46 (2.13)	0.50	8.00	
Q5	25	5.06 (2.21)	0.00	8.25	
Q6	25	5.08 (2.33)	0.75	8.00	
Pain interference					**0.188**
Q3	25	3.53 (2.14)	0.14	7.71	
Q4	25	3.82 (2.60)	0.00	8.86	
Q5	25	4.33 (2.60)	0.00	9.14	
Q6	25	4.41 (2.74)	0.00	9.14	
Pain relief					**0.504**
Q3	12	42.50 (21.37)	0	80	
Q4	12	50.83 (20.65)	20	80	
Q5	12	57.50 (22.21)	20	90	
Q6	12	53.33 (31.43)	0	90	

Note: P-value† were derived from Friedman Test, a nonparametric test, and the significant difference is at 0.05 level.
SD= standard deviation

Table 3: Description and comparison of frontline workers' pain severity between Q3 and Q4

	N	Mean (SD)	P value†
Pain severity			**0.026**
Survey 3	84	4.33 (2.09)	
Survey 4	84	3.96 (2.03)	

Note: P-value† were derived from Paired t- test, and the significant difference is at 0.05 level
SD= standard deviation.

As there appeared to be variation between immediate and long term effects of massage therapy, the results are summarized in Table 4.

Table 4: Summary of immediate and long term effects of massage therapy

Construct	Immediate effects (Q3 vs. Q4)	Long term (Q3 vs. Q5/6)
Work culture	worse	worse ($p < 0.05$)
Quality of work life	improved	worse
Recognition	improved	improved ($p < 0.05$)
Pain severity	improved ($p < 0.05$)	worse
Pain interference	improved	worse

Perception of massage therapy

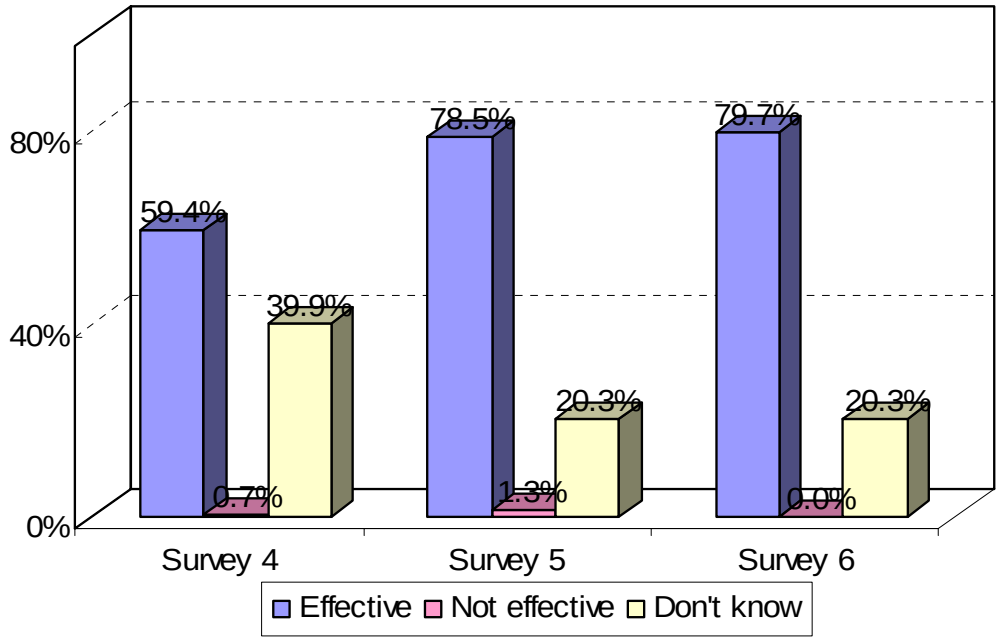
In Questionnaires 3 to 6, respondents were asked to indicate their perception of massage therapy. Positive perception of massage therapy increased from Questionnaire 4 to 6 with a greater percentage of respondents perceiving that massage therapy was effective (Table 5; Figure 7).

Table 5: Perception of Massage Therapy by survey 4, 5 and 6

	Survey 4 (n = 138)	**Survey 5** (n = 79)	**Survey 6** (n = 79)
Effective	82 (59.4%)	62 (78.5%)	63 (79.7%)
Not effective	1 (0.7%)	1 (1.3%)	0 (0%)
Don't know	55 (39.9%)	16 (20.3%)	16 (20.3%)

Fisher's Exact Test Chi-Square statistic = 0.002

Figure 7: Perception of massage therapy



Anecdotal comments

The following are anecdotal comments written by participants regarding the massage therapy program.

> "Twice, I experienced upper back pain from work. After having massage at the end of work, I could keep coming to work the next day. Also, the pain reduced fast which really surprised me. I'm not like before, after work, I go home and complain about my work to family members." (Q4, immediately following the four week intervention)

> "The program really helps relax me and provides a day or two of relief from stress/headache thus enables me to concentrate at work." (Q4, immediately following the four week intervention)

> "This therapy circumvented the need to take pain medication the next day." (Q4, immediately following the four week intervention)

> "It helped release some of the stress from my shoulders and neck which helped relieve my headaches. With zero headaches, my work days are much easier, my mood is good and I work better with others." (Q4, immediately following the four week intervention)

> "It was mentally refreshing to know that someone out there cares for our well being, from this I gained strength and encouragement to carry out highly physical and mentally challenging job tasks." (Q4, immediately following the four week intervention)

> "I felt that my employment was of value to the employer." (Q6, 12 weeks after the intervention)

Discussion

Research on the Canadian workforce has consistently indicated that healthcare workers have a greater risk of workplace injuries and more mental health problems than any other occupational group. According to Statistics Canada, in 1999 nursing personnel had longer duration of time-loss and were more likely to miss work each week due to an illness or injury than employees in any other sector or other types of shift-working occupations.[7,8]

To combat work related anxiety, depression, and musculoskeletal pain, many have recommended Massage Therapy.[27,28,29] Massage Therapy is described as the systemic manipulation of the soft tissues of the body. The movements of gliding, compressing, stretching, percussing and vibrating of the muscles are regulated to produce specific treatment responses.[30] Studies with on-site massage therapy programs in healthcare demonstrate that programs have a positive impact on different aspects of participants.

This evaluation, which endeavored to explore the effects of mental well-being on physical health and safety through a wellness intervention, demonstrated initial benefits in terms of pain severity with a possible improvement in job satisfaction and morale. Based on the results of this project, massage therapy appears to have significant effect on pain severity and therefore, the greatest benefit on individuals with pre-existing musculoskeletal symptoms.

However, a long term effect was not demonstrated. In fact, a trend towards worsening of pain symptoms and decreasing job satisfaction and morale was observed. It is possible that massage therapy sessions led participants to greater body awareness and pain awareness. The contrast between days when massage therapy was received with days when it was not received may have become more noticeable.

Interestingly, the perception of massage therapy increased from Questionnaire 4 to 6 with a greater percentage of respondents perceiving that massage therapy was effective. It is possible that this is simply due to the decreased number of respondents between Q4 and Q6, with a higher percentage of massage therapy "advocates" responding to the final two questionnaires. However, it's also possible that as time elapsed after the intervention (Q4 to Q6 was 12 weeks) the participants' realization and perception of the benefits of massage therapy increased.

Clinical implications

The results of this project suggest that targeted individuals (i.e. those with pre-existing symptoms) are most likely to benefit from a massage therapy workplace wellness program. The program must be sustained as only short term effectiveness was observed. For further impact, combining a massage therapy program with other health and safety programs is strongly recommended. Appendix 2 outlines three program proposals based on the results of this project.

Limitations

The investigators acknowledge some limitations to this study, which may have had an affect on the results. This study was conducted using a quasi-experimental methodology called time series in which baseline data is established in order to confirm validity of data collected before and after the intervention. While it is advantageous for identifying systematic patterns from data collected in equally spaced periods of time, it lacks the power of a study involving a control group. A control group was not used in this study due to the difficulty in finding similar participants to compliment

the staff at this unique facility. Using different wards at GPC as a control group for other wards receiving massage therapy was considered. This idea was rejected because of communication between wards may influence the results.

Funding limited the length of time of each massage therapy session as well as the number of weeks of intervention. Longer massage sessions over more weeks may have impacted the results. The massage techniques were intentionally limited, but may have influenced the results.

Appendix 1: Demographic data

Demographics of subjects at baseline survey

	Number of Subjects	Mean ± SD	Median	Minimum	Maximum
Age (years)	98	46.4 ± 8.9	48	25	62

SD = Standard Deviation

Demographic		Number of Subjects	Percentage (%) of Total
Age Group (years)			
	21-30	5	5.1
	31-40	20	20.4
	41-50	37	37.8
	51-62	36	4.7
Gender			
	Male	21	20.2
	Female	83	79.8
Job Title			
	RCA	49	52.1
	Registered Nurse	16	17.0
	LPN / LRN	18	19.2
	OT / UC / PT / RA	11	11.7
Affiliation			
	HEU	19	19.6
	BCNU	25	25.8
	HSA	5	5.2
	BCGEU	30	30.0
	Other	18	18.6
Job Status			
	Full time	73	68.9
	Part time	31	21.2
	Casual	2	1.9
Rotating Shift			
	Yes	79	75.2
	No	26	24.8
Shift Hours			
	< 8 hours	17	16.0
	8 hours	78	73.6
	> 8 hours	3	2.8
	< 8hours - 8 hours	5	4.7
	8 hours - > 8 hours	3	2.8

Appendix 2: Program proposals based on the project results

Program A

Rationale:
Results indicate that the intervention significantly improves pain severity.

Target intervention:
Massage therapy (MT) incorporated within the PEARS program. Those who participate within the PEARS program are identified with having a sprain or strain (MSI), and likely experience pain or discomfort. Receiving MT, as one intervention offered in the PEARS program, in combination with other PEARS interventions (i.e. physiotherapy and workplace modification) may increase their daily function, increase their ability to cope and manage functioning with their condition, and safely remain at work with minimized risk of injury.

Criteria:
MT can only be received in combination with other PEARS interventions (i.e. active physiotherapy and workplace modification). MT cannot be assessed in isolation.

Program B

Rationale:
Results indicate improvements but not statistical significance with workplace satisfaction and morale. The lack of statistical significance may be due to the design of the study or short time period of the intervention phase.

Target intervention:
This proposal would involve a one year implementation of the intervention on a ward known to have a history of poor morale and decreased team dynamics and high injury rates (i.e. Ward 2). On-site massage therapy provided once a week for two hours. Each session would be approx. 15 minutes, allowing for 8 sessions.

Cost:

- Nominal fee charged to the staff ($3-5) with the remainder covered by the employer (range of MT/hour $35-45)
- One time fee: Purchase of a prone massage chair ($400)
- Staff wages (if employer allows sessions during work shift)

Measurements:

- Pre/post survey to measure job satisfaction, organizational culture, and workplace stress
- MSI rates
- Absenteeism
- Attrition of participants

Program C

Rationale:
Results indicate improvements but not statistical significance with workplace satisfaction and morale. The lack of statistical significance may be due to the design of the study or short time period of the intervention phase.

General Intervention:
This proposal would involve a one year intervention offered to the whole facility. On-site massage therapy provided to each ward once every two weeks for one hour. Each session would be approx. 15 minutes, allowing for 4 sessions. Not all staff on shift would be able to be treated. A control group or control facility should be considered to strengthen the results of the study.

Cost:

- Nominal fee charged to the staff ($3-5) with the remainder covered by the employer (range of MT/hour $35-45)
- One time fee: Purchase of a prone massage chair ($400)
- Staff wages (if employer allows sessions during work shift)

Measurements:

- Pre/post survey to measure job satisfaction, organizational culture, and workplace stress
- MSI rates
- Absenteeism
- Attrition of participants

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