Preliminary Trial on the Effectiveness of Early Intervention Manual Therapy in Reducing Costs of Presenteeism Due to Musculoskeletal Pain

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Abstract

Objective: (a) Establish the baseline annual cost of presenteeism due to musculoskeletal pain among administrative employees within the business and financial services group of a major university, (b) study the impact of an early intervention manual therapy treatment program in reducing costs of employee presenteeism due to pain.

Methods: This study uses a modified 25-question version of the Work Limitations Questionnaire (WLQ) developed by the Health Institute of the New England Medical Center. Surveys were administered to employees prior to and immediately following intervention therapy. Parametric and nonparametric statistical methods are employed to establish significance and construct confidence intervals of study outcome measures.

Results: Study results indicate that the annual cost of presenteeism due to pain within the baseline group (n=60) was approximately $222,360 per year, with a 95% confidence interval of ($180,000, $264,720). The treatment was found to reduce the cost of presenteeism in the treatment group (n=24) from a mean of $3,846 per employee to $2,087 per employee. Results of the treatment group are statistically significant for the mean (p=.0016) and the median (p<.0003). Study results showed a 46% decrease in employee presenteeism, yielding a 292% return on investment based on gains in employee productivity.

Conclusions: Study results show that musculoskeletal pain plays a significant role in the productivity of employees and their ability to perform work-related tasks. This study provides evidence that early intervention manual therapy is effective in mitigating the costs of employee presenteeism.

KEY WORDS: Productivity, Presenteeism, Manual Therapies, Musculoskeletal Pain, Early Intervention

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INTRODUCTION

The mounting prevalence and cost burden of musculoskeletal pain are increasingly recognized as a major health issue in the U.S. and internationally.[1,2,3] The World Health Organization's global initiative known as International Bone and Joint Decade 2000-2010 reports that musculoskeletal conditions are the most common cause of severe long-term pain and the most costly of all disease categories, accounting for one-fourth of the total global cost of illness.[4] It is further recognized that the vast majority of occupational injuries and illnesses are due to musculoskeletal injuries.[5]

As such, a significant portion of the economic burden of musculoskeletal pain is borne by employers in the form of direct and indirect costs. Direct costs consist of costs such as medical and pharmacy, whereas indirect costs include long- and short-term disability, reduced health and safety, and lost productivity in the form of absenteeism and presenteeism.

Presenteeism, the focus of this paper, is defined as "the decrement in performance associated with remaining at work while impaired by risk factors or health problems."[6] It is estimated that presenteeism accounts for about 60% of an employer's total direct and indirect health costs and 84% of productivity costs, whereas by comparison absenteeism comprises only about 10% of total health costs.[7-11] The total annual cost of lost productive time due to pain among active workers in the U.S. is estimated at $61.2 billion.[12]

Absenteeism and disability can be difficult to quantify and therefore have been largely unmeasured and/or underestimated[6]

despite the fact that these costs, especially presenteeism, far outweigh medical and pharmacy costs. The purpose of this study is to measure the impact on presenteeism of an early intervention program implemented at the University of California San Diego (UCSD) to treat employee musculoskeletal injury and pain. The program, known as PainFree, was introduced on campus in early 2005 to control escalating workers' compensation and health plan costs associated with the treatment of these prevalent and often costly employee injuries. The program is a unique plan of treatment consisting of deep tissue manual therapy developed by the Dorn Companies.* The program also provides early identification and treatment to employees in the early stage of injury, prior to the condition developing into an advanced state with the employee filing a worker's compensation claim or seeking treatment through the university's health benefits plan.

An annual review of the UCSD program showed a $246,000 reduction in direct workers' compensation costs for musculoskeletal injuries from the prior year period in departments in which the program had been introduced. Recognizing that treatment costs, however, are only one component of the costs associated with employee pain and injury, the university commenced to study the impact of the program on employee productivity. Previous studies indicate that manual therapy can be a more effective and cost-efficient treatment than traditional physical therapy or general practitioner care for musculoskeletal pain.[13,14,15] This study extends the previous literature by focusing on both manual therapy for early intervention and the effect of this treatment on employee lost productivity.

Lost productivity due to presenteeism is typically measured using employee questionnaires such as the Work Limitations Questionnaire (WLQ), a widely used instrument that has been extensively tested and validated.[9,16,17,18] The WLQ is a self-report questionnaire developed by Dr. Debra Lerner at the Health Institute of the New England Medical Center to measure the effect of chronic health problems on job performance and work productivity. As a preliminary trial on the effectiveness and cost-efficiency of the program, we use the WLQ to perform a non-randomized observational study to measure the impact of this program in reducing the costs of employee presenteeism due to musculoskeletal pain within the university's business and financial services group.

METHODS

Survey Methodology

A modified 25-question version of the Work Limitations Questionnaire was administered to employees of the business and financial services (BFS) group from February, 2006, through August, 2006. The business and financial services group consists of 241 employees who perform primarily administrative or clerical functions in the operational areas of finance, accounting, payroll, disbursements, receiving, and cashiering.

The WLQ measures, in percent of lost productive time, the degree to which physical and emotional problems interfere with the following work areas: time management, physical demands, mental/interpersonal demands, and output demands. Survey questions were modified to focus specifically on the role of physical pain or discomfort in interfering with employees' abilities to perform work-related tasks over the previous two-week period. Figure 1 provides a representative example of the manner that original questions on the WLQ were modified for the purpose of this study. Employees were asked to rate any impairment on a five-point scale with the options of "none of the time" (0%), "some of the time," "half of the time" (50%), "most of the time," and "all of the time" (100%). Employees also had the option to select "does not apply to my job."

Figure 1: Sample Modification of WLQ Question

Original survey question:
In the past two weeks how much of the time did your *physical health or emotional problems* make it difficult for you to a) work the required number of hours?

Modified survey question:
In the past two weeks how much of the time did *physical pain or discomfort* make it difficult for you to a) work the required number of hours?

Prior to administration of the WLQ survey, a 20-30 minute presentation was made to each individual department of the BFS group by the university's risk management department. Employees were informed about the purpose of the early intervention program for treating muscular pain and injury and the reason for using the WLQ to measure employee productivity. During the presentation, employees were provided with a demonstration of the intervention. All department employees were eligible to participate in the study. At the end of the presentation, employee consent was obtained through sign-up sheets from employees choosing to participate.

Surveys were administered in paper and electronic format to employees on a voluntary basis. Employee self-identification for a painful condition served as the selection criteria for participation in the treatment plan. Participation in the treatment program was not conditional on the submission of an initial WLQ survey, and no financial incentives or other inducements were offered to employees for completing or submitting surveys. Employees were instructed to submit completed surveys directly to risk management so surveys would not be routed through department supervisors. Prior to analysis, surveys were identified by code number so that individual names and answers would not be associated.

First, the questionnaire was made available to all employees (n=241) on a voluntary basis to establish a baseline annual cost of presenteeism due to pain within the BFS group. A second questionnaire was administered to employees who participated in the early intervention treatment program (n=117). The second questionnaire was administered immediately after the employee's conclusion of treatment. Questionnaires submitted by employees who completed both pre- and post-treatment

*Identification of the treatment provider and program name are for documentation purposes only and do not imply endorsement of the company or product.

surveys were analyzed to determine the effect of the early intervention program in reducing the cost of employee presenteeism due to pain. Only surveys with all questions completely answered were included in the study. Both parametric and nonparametric statistical methods were used to establish significance of the mean and median treatment effects and to construct confidence intervals for the cost savings attributable to reduced presenteeism.

Intervention Plan

The early intervention program consists of a system of treatment known as Trauma Release™ Techniques (TRT). Trauma Release™ Techniques are a unique form of manual therapy consisting of specific treatment protocols developed to treat soft tissue musculoskeletal injuries common to the workplace. Trauma Release™ Techniques was first used by the State of Colorado in 1999 to reduce the cost of treatment of musculoskeletal and repetitive motion workers' compensation claims. Unpublished studies of the state's experience show that the program was effective in reducing treatment costs by up to 80%.[19,20]

The treatment plan involves: identifying the trauma, defining the trauma, applying Trauma Release™ Techniques, and educating the employee on prevention and self-care. Employees are asked to identify their complaints on location charts diagramming pain patterns specific to their condition. After the location has been identified, the appropriate pain chart is cross-referenced to specific TRT treatment protocols.

The treatment protocol outlines the muscle groups affected and the Trauma Release™ Technique to be applied along with stretching exercises to instruct the employee in self-care. Early intervention treatment is delivered on-site by a specialist trained in Trauma Release™ Techniques. Employees receive a 30-minute session once per week. Employees received up to five sessions of treatment initially, with additional sessions provided as needed until symptoms were relieved.

RESULTS

A total of 117 BFS group employees participated in the early intervention program during the eight-month study period. Questionnaire response rates were 25% (60/241) for the baseline survey, and 21% (24/117) for the follow-up survey. The 60 survey responses served as the baseline group, and the subset of 24 surveys served as the treatment group for evaluating the effect of treatment. A flowchart of trial participation appears in Figure 2.

The average number of therapy sessions for the 117 employees participating in treatment was 4.84, and the average number of sessions was 5.21 for the subset of 24 treatment group employees who completed follow-up surveys. Frequency distributions appear in Table 1.

It is believed that the relatively low response rates are mainly attributed to three factors. First, participation in the treatment program was not conditional on submission of a WLQ survey which were administered on a voluntary basis. Second, no incentives – financial or otherwise – were provided to induce employees to complete initial or follow-up surveys. Third, there may be a natural tendency for employees to suspect an employer's motive for wanting to measure individual productivity.

The main outcome variable from the WLQ questionnaire

Figure 2: Flowchart of Study Population

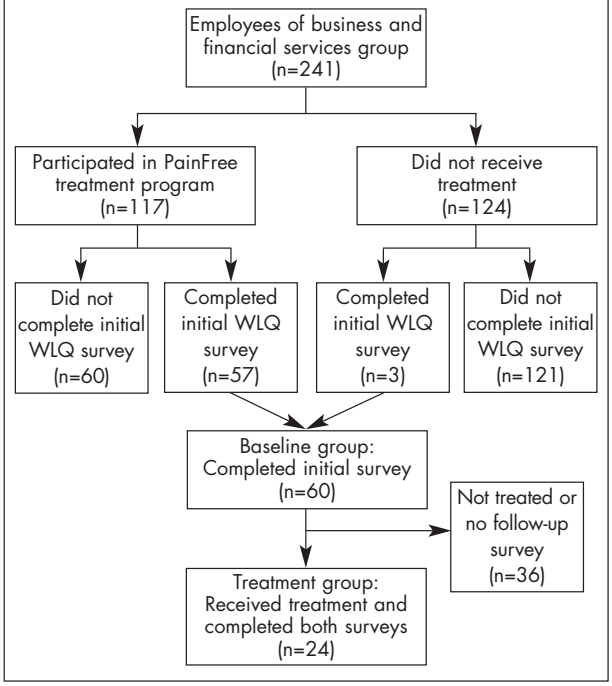


Table 1: Frequency Distribution – Number of Sessions

	All Treated Employees		Employees in Follow-up Group	
No. of Sessions	Number of Employees	Proportion of Total	Number of Employees	Proportion of Total
1	8	0.068	0	0.000
2	10	0.085	1	0.042
3	11	0.094	2	0.083
4	4	0.034	0	0.000
5	50	0.427	14	0.583
6	20	0.171	5	0.208
7	5	0.043	1	0.042
8	3	0.026	0	0.000
9	3	0.026	0	0.000
10	0	0.000	1	0.042
11	3	0.026	0	0.000
Total	117	1.000	24	1.000

This table shows the distribution of the number of sessions per treated employee for the group of all treated employees (n=117) and for the subset of treated employees who completed follow-up surveys (n=24). The average number of treatment sessions received was 4.84 for the group of all treated employees, and 5.21 for the follow-up group.

Table 2: Outcome Measures – Percent Productivity Loss

	Baseline Group (n=60)	Treatment Group		
		Pre-Therapy (n=24)	Post-Therapy (n=24)	Paired Difference (n=24)
Descriptive Statistics:				
Mean	6.09%	6.32%	3.43%	-2.89%
(95% CI)[a]	(4.93% to 7.25%)	(4.38% to 8.25%)	(1.73% to 5.12%)	(-4.56% to -1.22%)
St Dev	4.47%	4.57%	4.02%	3.95%
Skewness	1.06	1.51	1.88	-0.23
Kurtosis	1.32	3.32	4.15	0.19
Median	5.25%	5.15%	1.97%	-1.64%
(95% CI)[b]	(3.68% to 7.40%)	(3.11% to 9.18%)	(0.60% to 3.91%)	(-4.23% to -0.77%)
Min, Max	0%, 21.11%	1.24%, 21.11%	0%, 16.76%	-10.68%, 6.05%
Significance Tests, Two-Tailed:				
Mean: H_1:μ≠0	z=10.55; *p*<.0001	t=6.77; *p*<.0001	t=4.17; *p*=.0004	t= -3.59; *p*=.0016
Median[c]: H_1:M≠0	S=855.5; *p*<.0001	S=150; *p*<.0001	S=115.5; *p*<.0001	S= -113; *p*=.0003
Tests for Normalcy:				
Kolomogorov-Smirnov: D	0.10 (*p*=.1176)	0.15 (*p*>.1500)	0.20 (*p*=.0123)	0.16 (*p*=.1091)
Cramer-von-Mises: W^2	0.15 (*p*=.0235)	0.13 (*p*=.0470)	0.25 (*p*<.0050)	0.10 (*p*=.1142)
Anderson-Darling: A^2	1.06 (*p*=.0083)	0.89 (*p*=.0201)	1.51 (*p*<.0050)	0.57 (*p*=.1313)

This table contains descriptive statistics and significance tests for the percentage annual lost productivity due to pain-related presenteeism as measured from WLQ surveys. Paired differences are computed as post-therapy minus pre-therapy, i.e., negative differences represent a decrease in percent productivity loss. Statistics were computed using SAS v9.1 (SAS Institute Inc., Cary, NC, USA).

Notes:

[a] Assumes normal distribution.

[b] Based on order statistics (ranks) as in Hahn and Meeker[21]; distribution-free.

[c] Wilcoxon signed rank test where S denotes signed rank statistic; test assumes symmetrical distribution.

was the percent productivity loss associated with pain-related presenteeism. Table 2 displays outcome measures on this variable for the baseline group (n=60) and the treatment group (n=24). Baseline results indicate that 6.09% of productive time was lost on average because of pain-related presenteeism, with a 95% confidence interval of (4.93%, 7.25%). This finding is statistically significant (*p*<.0001) and is comparable to other studies that have measured lost productivity due to pain.[12]

WLQ survey results are also reported in annual hours of lost productivity per employee in Table 3, which assumes a 2,000-hour work year. The mean annual amount of lost productivity for the baseline group was 121.9 hours per employee, with a 95% confidence interval of (98.7, 145.0). Distributional properties and statistical test results are similar for both WLQ outcome measures (percent and hourly), as the hourly productivity loss is simply a scalar multiple of percentage loss.

Table 3: Annual Hours of Lost Productivity Per Employee

	Baseline Group (n=60)	Treatment Group		
		Pre-Therapy (n=24)	Post-Therapy (n=24)	Paired Difference (n=24)
Mean	121.9	126.3	68.5	-57.8
(95% CI)[a]	(98.7 to 145.0)	(87.7 to 164.9)	(34.5 to 102.5)	(-91.2 to -24.5)
St Dev	89.4	91.4	80.5	79.0
Skewness	1.06	1.51	1.88	-0.23
Kurtosis	1.32	3.32	4.15	0.19
Median	105.0	102.9	39.4	-32.7
(95% CI)[b]	(73.6 to 148.0)	(62.1 to 183.4)	(12.0 to 78.8)	(-84.6 to -15.4)
Min, Max	0, 422.2	24.8, 422.2	0, 335.2	-213.5, 121.1

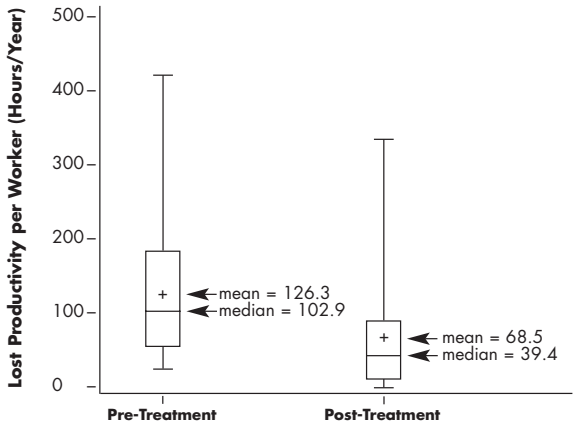
Descriptive statistics for number of hours of lost productivity per employee per year due to pain-related presenteeism assuming a 2000-hour work year.

Notes:

[a]Assumes normal distribution

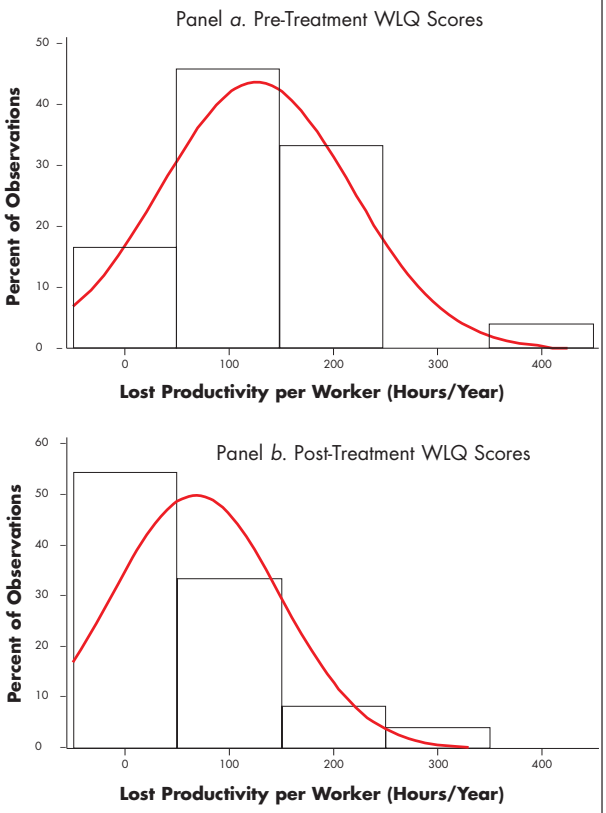
[b]Based on order statistics (ranks) as in Hahn and Meeker[21]; distribution-free.

Figure 3: Box Plots of Pre- and Post-Treatment WLQ Scores



The box plots in this figure depict distributional properties of individual questionnaire scores measuring worker hours of lost productivity. The graphs were generated as skeletal-style box-and-whisker plots in SAS 9.1. Whisker endpoints indicate minimum and maximum observed values. Box edges indicate first and third quartiles.

Figure 4: Distribution of Pre- and Post-Treatment WLQ Scores



Panels *a* and *b* display histograms of individual worker hours of lost productivity prior to and after treatment, respectively, along with normal curves fitted to each empirical distribution.

Results of the treatment group (n=24) showed that painful physical conditions were responsible for 6.32% of employee lost productivity on average prior to treatment, with a sample median of 5.15%. The mean and median lost productivity in annual hours were found to be 126.3 and 102.9, respectively, prior to treatment. It is logical that pre-treatment survey results for the treatment group would be slightly higher than baseline, as this sample group includes only employees that reported impairment due to pain, whereas the baseline group includes employees with or without reported pain.

Post-treatment surveys showed that lost productivity for the treatment group was significantly reduced based on a two-tailed test of the paired difference of both the mean (-2.89%; p=.0016) and median (-1.64%; p=.0003) as reported in Table 2. Survey results for the treatment group showed a 46% reduction in mean lost productivity, from 6.32% to 3.43%.

Prior to statistical analysis of the treatment effect, the treatment group samples were examined for skewness. Box plots of pre- and post-therapy hours of lost productivity for the treatment group appear in Figure 3 and seem to indicate positive skewness, consistent with the descriptive statistics from Table 2. Skewness is also evident from the frequency histograms displayed in Figure 4.

The treatment increment, a measure of the reduction in lost productivity, however, does not appear to be notably skewed. A histogram of the treatment increment is displayed in Figure 5.

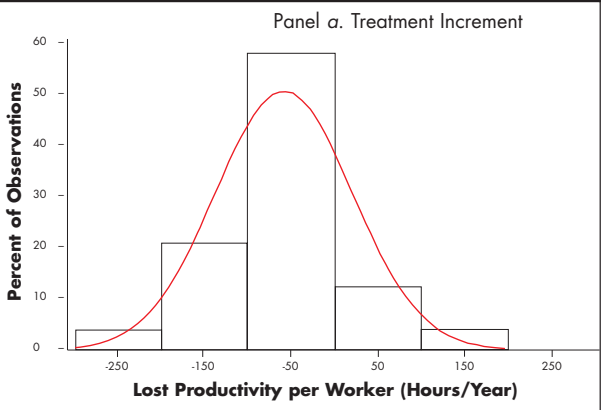
As indicated by Figure 5, the distribution of the treatment increment appears to be approximately symmetrical. However, a slight departure from normality is detected by standard normalcy tests reported in Table 2, which indicate they are not statistically significant ($.1091 < p < .1313$).

Given these results and because of the relatively small sample size, both parametric and nonparametric methods were used to analyze the treatment effect. Confidence intervals for the mean and median percentage treatment effect are reported in Table 2. The sample mean and sample median are -2.89% and -1.64%, with 95% confidence intervals of (-4.56%, -1.22%) and (-4.23%, -0.77%), respectively.

The median is generally viewed as the more appropriate measure of location for distributions that are skewed. Both the sample mean and sample median for all sample groups (including baseline and treatment) are statistically significant in two-tailed tests; no p-value exceeded 0.0004. The corresponding hourly measures in Table 3 indicate a mean reduction in lost productivity of 57.8 hours per employee with a 95% confidence interval of (-91.2, -24.5). The median reduction in lost productivity was 32.7 hours per employee with a 95% confidence interval of (-84.6, -15.4). These results provide strong evidence of a reduction in the percentage amount of lost productivity following treatment.

Because the a priori hypothesis is that the amount of lost productivity would decrease following treatment, one-tailed tests were performed on the percent productivity loss using

Figure 5: Distribution of Treatment Increment



This figure portrays the distribution of individual employee treatment increment (after-treatment minus before-treatment) of WLQ scores measuring hours of lost productivity. Also shown is a normal curve fitted to the empirical distribution. The mean and median values of the treatment increment are –57.8 and –32.7 hours per year, respectively, indicating a reduction in the average number of hours of lost productivity.

parametric and nonparametric paired-variate tests. The results are reported in Table 4. A paired t-test was used to test for a reduction in mean percent productivity loss, and the Wilcoxon matched-pair signed rank test was used to test for a reduction in the median. Both the mean and median treatment effect were significant in lower-tailed tests at conservative significance levels of p=.0004 (mean) and p<.005 (median).

Table 5 reports the estimated baseline dollar cost of pain-related presenteeism and the estimated cost savings associated with treatment. These cost estimates are based on an average annual department compensation including salary and benefits of $60,849. The mean baseline annual cost of lost productivity was estimated at $3,706 per employee, with a 95% confidence interval of ($3,000, $4,412). The total mean baseline cost of lost productivity for the baseline group (n=60) is $222,360 with a 95% confidence interval of ($180,000, $264,720).

Results for the treatment group (n=24) are also shown in Table 5. For this group, the mean pre-treatment cost of lost productivity was estimated at $3,846 per employee, with a 95% confidence interval of ($2,671, $5,021). The mean post-treatment cost of lost productivity was estimated at $2,087 per employee, with a 95% confidence interval of ($1,051, $3,121). The gain in productivity was $1,759 with a 95% confidence interval of ($742, $2,775). The total gain in productivity for the treatment group (n=24) is $42,216 with a 95% confidence interval of ($17,808, $66,600).

DISCUSSION

Current research suggests that employee musculoskeletal pain and injury continue to be a prevalent and costly problem for employers. Furthermore, studies have shown that hard-to-measure costs of employee presenteeism comprise the largest component of the total costs associated with these conditions. As such, employers are incented to identify effective, cost-efficient modalities for treating musculoskeletal pain, reducing presenteeism costs, and developing ways to

Table 4: Test for Negative Treatment Effect

	Hypothesis	Outcome
Paired-difference t-test	H_1: (μ_2 - μ_1)< 0	t= -3.59; p=.0004
Wilcoxon matched-pair signed rank test	H_1: (M_2 - M_1)< 0	$\sum(+)$ = 263; $\sum(-)$ = 37; p<.005

Comparison of pre-treatment (survey 1) and post-treatment (survey 2) measures of percent lost productivity. The alternative hypothesis of a negative treatment effect (i.e., a reduction of lost productivity following treatment) is tested using both a paired-difference t-test and the Wilcoxon matched-pair signed rank test.

Table 5: Estimated Annual Cost Savings

		Annual Cost for Employees Treatment Group (n=24)		
	Annual Cost Baseline Group (n=60)	Pre-Therapy	Post-Therapy	Annual Cost Savings Attributable to Treatment
Per Employee:				
Mean	$3,706	$3,846	$2,087	$1,759
(95%CI)	($3,000 to $4,412)	($2,671 to $5,021)	($1,051 to $3,121)	($742 to $2,775)
Median	$3,195	$3,134	$1,199	$998
(95%CI)	($2,239 to $4,503)	($1,891 to $5,585)	($365 to $2,400)	($469 to $2,574)
Aggregate:				
Mean	$222,360	$92,304	$50,088	$42,216
(95%CI)	($180,000 to $264,720)	($64,104 to 120,504)	($25,224 to $74,904)	($17,808 to $66,600)
Median	$191,700	$75,216	$28,776	$23,952
(95%CI)	($134,340 to $270,180)	($45,384 to $134,040)	($8,760 to $57,600)	($11,256 to $61,776)

Estimated annual cost of lost productivity due to pain-related presenteeism for baseline and treatment groups, assuming an average annual compensation of $60,849 (salary and benefits).

measure outcomes in return on investment from human capital.

The objective of this preliminary study was to estimate the annual cost of presenteeism due to employee pain within the business and financial services group of a major university and to assess the impact of early intervention manual therapy in reducing these costs. Study results show that musculoskeletal pain plays a significant role in the productivity of employees and their ability to perform work-related tasks within the BFS group.

The annual baseline cost of presenteeism due to pain is estimated at $3,706 per employee on average, at an annualized cost of $222,360 for the baseline group (n=60). While statistically significant baseline measures were obtained, we do not generalize these results to the entire BFS group (n=241) because nearly all employees in the baseline group received treatment (57/60) whereas overall, about half of BFS employees (117/241) participated in the treatment program.

Regarding the treatment effect, trial results for the treatment group indicate that manual therapy can be an effective and cost-efficient early intervention. Annual presenteeism costs for employees in the treatment group were significantly reduced from $3,846 to $2,087 on average for a mean productivity gain of $1,759 per employee. Total productivity gain for the treatment group (n=24) is estimated at $42,216. The total actual cost of treatment for the 24 employees in the treatment group was $10,765, creating a return on investment (ROI) of 292%.

We can attempt to estimate the total cost savings and ROI for the treated group (n=117) as a whole if we can infer that the pain characteristics of this group are similar to those of the treatment group (n=24). The frequency distributions of treatment sessions from Table 1 indicate that a similar profile for the two groups exists, suggesting that such a generalization is plausible. Under these inferences, the mean aggregate costs of presenteeism for the treated group can be estimated at $449,982 (pre-treatment) and $244,179 (post-treatment), resulting in a mean productivity gain of $205,803.

The total actual cost of treatment for the 117 employees in the treated group was $46,924, potentially resulting in a ROI of 339%. The higher ROI as compared to the treatment group is related to the average number of treatment sessions being slightly lower for the treated group (4.84) versus the treatment group (5.21), as can be seen from Table 1.

These ROI calculations are based solely on cost savings from reduced presenteeism and ignore other costs that would be associated with reduced medical and workers' compensation claims rates. In addition, there are non-pecuniary benefits, such as improved physical and psychological well-being of employees that this study does not attempt to account for.

It should be noted that a study of this subject matter poses several challenges with respect to achieving a rigorous randomized, controlled trial. A randomized study with control group from a practical standpoint is complicated. From an employer perspective, establishment of selection criteria determining which employees will participate in the treated group and those that will participate in the control group, could raise employee preferential treatment concerns.

Hence, the study design with respect to the submission of surveys and employee eligibility to participate in treatment was conducted on a strictly voluntary and independent basis. This methodology may tend to bias the sample pool and survey responses toward employees that are in need of treatment versus those that are not, perhaps skewing results.

Second, as discussed earlier, we cannot dismiss the notion that employees are likely to suspect an employer's motives for measuring individual productivity. Due to these limitations, a truly randomized and controlled employer-sponsored study would need to factor such considerations into the study design.

Having said this, it is worth noting that our baseline results are comparable with other studies on employee pain and presenteeism costs.[12] Although rigorous randomized controlled studies are needed before causality can be determined conclusively, these preliminary data suggest that early intervention manual therapy could produce similar outcomes in other settings and provide motivation for additional studies, including longitudinal analysis, to further clarify the effect of this intervention technique on employee pain and productivity. JHP