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THE IMPROVEMENT OF FOOT CONDITIONS IN THE WORKPLACE AND SUBSEQUENT DECREASE IN ABSENTEEISM DUE TO SATISFACTION OF FOOTMAXX ORTHOTICS AS PART OF AN ONGOING CORPORATE FOOTCARE STUDY

A 3 – 18 MONTH RETROSPECTIVE REPORT OF AIR FLIGHT ATTENDANTS

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Abstract

This study tracks and evaluates the use of Footmaxx gait analysis diagnostic software and the correlating manufacture of Footmaxx orthotics for 1207 air flight attendants over a 3 to 18 month period. Follow-up questionnaires were conducted with 94 of these employees whose results were tabulated and statistical analysis performed.

Footmaxx technology captures a digital, dynamic scan of individual employee gait patterns with an advanced sensory force plate and proprietary software which translates dynamic gait pressure data into specifications for functional orthotic devices through gait analysis. The resulting orthotic is distinctive in its design specifications and the resulting functional shape configurations are unique to Footmaxx vs. orthotics produced from a cast or other “static” methods of assessment and production through other manufacturers. The Footmaxx orthotics are unique in that they provide functional control of the patient’s feet through midfoot correction and intrinsic “angles of rise”, rather than extrinsic rearfoot postings, which are typical of “casted/static” orthotics. Therefore the results of this study uniquely reflect the technology, therapeutic efficacy and high wear compliance of Footmaxx orthotics and cannot be applied generally to any orthotics manufactured by other assessment modalities and produced by other orthotic laboratories.

There were several steps to this study’s protocol. Initially, the employee’s biomechanics and musculoskeletal conditions were diagnosed by licensed clinicians both through clinical exams and the use of Footmaxx scanning technology. Next, information identifying symptoms, pain locations and foot conditions were tabulated. Employee absenteeism was also included as part of the documentation of which 32% attributed their absenteeism to both foot and musculoskeletal problems and 68% to other conditions. Gait and Pressure Analysis reports were ordered from Footmaxx to confirm biomechanical need and then employees were prescribed and fitted with a pair of Footmaxx orthotics.

Surveys were conducted both through follow-up questionnaires and telephone interviews for those employees prescribed and fitted with Footmaxx orthotics. This took place at a timeframe of 3-18 months following orthotic fitting. The majority of surveys were beyond 1 year of wear affirming the long-term corrective efficacy of Footmaxx orthotics. Overall improvement of condition and patient satisfaction were measured. The final results were very similar to other Footmaxx studies where an average improvement in condition and pain relief was 72.3% for all of the diagnostic categories combined and 85.9% for overall satisfaction for all categories combined. Additionally, the comfort level for Footmaxx orthotics was an exceptional 91% This study also showed the efficacy of both Footmaxx gait analysis technology and Footmaxx orthotics based on standardized patient information.

This report has also proven statistically and significantly that the employee satisfaction with Footmaxx orthotics was evident not only in their improved foot conditions, but also in their claims of enhanced work performance and increasing productivity within the workplace, as well as further decreasing absenteeism by approximately 2 days.

Introduction

The purpose of this study was to correlate the efficacy of Footmaxx orthotics over a period of 3 to 18 months and tracks therapeutic outcomes as well as any changes in foot and musculoskeletal conditions, pain relief, job enhancement and less absenteeism at work. 1207 employees were surveyed and tracked with a follow-up questionnaire. 94 employees were interviewed and the results analyzed.

Other similar studies and surveys have been conducted with other corporations. These studies also demonstrate statistical similarity in their results of improvement in work performance and satisfaction with Footmaxx orthotics. These independent studies show a parallel high probability that the wearing of Footmaxx orthotics provides an enhancement of work performance in the workplace as well as less employee absenteeism.

Design, Materials and Methods

The study consisted of 1207 “flight attendant” employees recording their year of birth, sex, pain location, pain severity, foot conditions, activities in the work day, health and fitness, absenteeism from work and orthoses worn (Fig. 1a).

From 3-18 months following the employees’ use of Footmaxx orthotics, a satisfaction questionnaire was distributed to employees fitted with these orthotics (see Fig.1b) to determine if there was any pain relief, improved performance in the work place or less absenteeism and satisfaction derived from Footmaxx orthotics. Additional questions asked were what type of shoes were worn, the length of time the Footmaxx orthotics were worn and the degree of comfort their orthotics provided.

In addition to written responses, follow-up telephone interviews were conducted which provided us with a total of 94 respondents. Follow-up questionnaires were somewhat difficult to attain partially due to the transient nature of flight attendants and our ability to track them down.

Normally, a return rate on large surveys such as these would be less than 10%. For our sample size of 1207 employees, our return is 7.8%, with 94 questionnaires. A population estimate indicates that only 6.7% of the airline employees were fitted with orthotics in the first place so a return rate on surveys should be 6.7%. Therefore, our 7.8% is more than adequate as a return percentage (see appendix).

Also, to correlate previous similar studies with this study, it had to be proven that the chief complaints were the same for the English et al study (1997) as this present study before proceeding. Therefore, all complaints, pain locations and foot conditions were tabulated and compared to the English study (1997). Although the study did not capture a tabulation of just one major symptom, there were some single entries. The majority were multiple symptom entries. Initially only the separate symptomatic entries were tabulated rather than all of the complaints including multiple conditions and considerable useful information was lost in the process (Harvey, 1982). Most patient symptoms could be related to their other symptoms as most musculoskeletal conditions are rooted in biomechanical abnormalities. When all the chief complaint percentage information was compared to the English study (1997) and its diagnoses and tested for similarity at 95% confidence; both t-test and F-test (0.30 and 1.89, 20 d.f, respectively; Appendix) showed no significance difference, so therefore both studies have a similar and parallel complaint percentage breakdown. Both studies showed similar improvement of foot condition and satisfaction with Footmaxx orthotics. English (1997) had improvement in condition at 75.3% and satisfaction at 80.2% and our study resulted in 72.3% and 85.9%, respectively. This further indicates no significant difference between the mean, variance and sample populations in these studies (Kreyszig, 1970)

A ranking from 1-4 was used to determine satisfaction, pain relief and work enhancement. Satisfaction with the therapeutic efficacy of the Footmaxx orthotics was expressed as a percentage and work enhancement as a 1 or 0 representing improvement or no improvement. N/A was designated 0. A ranking of 4 would indicate extreme satisfaction (100%) and extremely unsatisfied would be 25%, eliminating any sample bias.

As recommended by a theoretical statistician (Dr. M. Anand, pers comm.), a chi-square; Fisher test of significance was used to analyze the data to determine if there was a relationship between satisfaction of Footmaxx orthotics and work performance. This same test was used to determine if there was a significant relationship between Footmaxx orthotic use and less absenteeism in the workplace. A linear trend test was also used to determine if there was significance for both satisfaction of Footmaxx orthotics vs. work performance and the use of Footmaxx orthotics vs. less absenteeism.

Results

Of the 1207 flight attendants studied, a reported 572 (48.6%) were male and 605 were female (51.4%). The baby boomers were the mean age at 38.2 years (Fig. 3, 1961.8 mean year of birth, std deviation, 11.2 years). The largest pain location was lower back followed by heel pain and the largest foot condition was calluses followed by bunions. The smallest group was neuroma. 1.3% had diabetes, 1.2% rheumatoid arthritis and 4.1 % had osteoarthritis. In the follow-up questionnaires, only 6 pair of orthotics were rejected, and 9 pair did not fit well into shoes and therefore were not worn. Enhanced work performance was 72.3% and satisfaction was 85.9%, statistically similar to English (1997). 91.3% found their Footmaxx orthotics to be comfortable when worn in mainly athletic shoes, work boots, dress shoes and loafers 75-100% of the time (See Appendix). It was discovered that the chi-square test ($=515.03$) was extremely significant ($p<0.0001$) for the relationship between satisfaction of Footmaxx orthotics and work improvement showed a linear trend as well (Excel, Worksheet1). The contingency table that was set-up for the use of Footmaxx orthotics vs. less absenteeism by up to 2 days, also showed a significant relationship by chi-square ($=184.7$) and Fisher test of significance ($p<0.0008$). The linear trend, however showed a significant move towards $<$ or $=$ 2 days of less absenteeism and was further confirmed. (Excel Worksheet 2).

Discussion

This research study was not only designed to interpret the efficacy of Footmaxx orthotics but to determine their integral relationship between overall therapeutic satisfaction and performance enhancement in the workplace. Findings were very similar to the English (1997) finding that Footmaxx orthotics provide excellent biomechanical correction with a significant reduction in symptoms for most of the diagnostic categories. The study may show that Footmaxx orthotics do decrease absenteeism by a certain extent; 6.5% of the surveys returned said that it did make a difference; 28.5 said there was no work change or absenteeism decrease; 40.5% said it was n/a and 24.5% did not answer the question at all. 32% of our sample did say that they took work off because of foot problems and musculoskeletal complaints. It would lead one to believe that if the employee is satisfied with the Footmaxx orthotics, that their work performance would be enhanced and therefore absenteeism would decrease. Absenteeism represented 68% due to other reasons in the original sample. Of the remaining 32% who stated they were absent for either foot or musculoskeletal conditions, absenteeism was reduced for 6.5% of those respondents and further enhanced their work performance. This represents >1 day or <2 days of less absenteeism. It was taken into consideration that most people that did not answer the question on absenteeism probably did not equate less kinetic chain pain, or time off work if less than half a day (such as chronic lateness due to pain) as relevant to foot orthotics. Despite this, still $6.5/32 = 20\%$ had improvement of foot conditions and musculoskeletal complaints from the sample and this was proven significant by a 2 sample t-test between percents; two-tailed probability test significant at $t = 0.0001$. These rate calculations (in this case improvement) have been proven to be very accurate in prediction (Harvey, 1982). Further, the results of this study show that there was work improvement due to therapeutic benefits and increased comfort of Footmaxx orthotics. This is a statistically significant relationship in that work improvement can be predicted even as a decrease in absenteeism can be identified from this data. This is a significant step in implementing a gradient of need, by using a chi-square test and linear trend to predict that need, as well as determining how the employee will benefit from using Footmaxx orthotics in the long term.

Results that were calculated for the respondents that admitted absenteeism averaged 95.8% for orthotics satisfaction and 83.3% work improvement. This predicted 90% falls in between these two percentages and by looking at Figure 4, at 1 day less absent, 90% is the result indicating a great degree of accuracy with our results.

Statistics Canada reports absenteeism similarities for all airline job classifications showing an average time off of 7.4 days/employee/year. (Akyeampong, 1999). If we divide 2 days absenteeism improvement in our study into 7.4 days airline absenteeism on average, the result is 27 % days of absenteeism that can be attributed to foot and related conditions. This benefit is comparably close to the 32% of employees who initially said they had foot and related conditions contributing to their absenteeism. However, we could expect up to 32% to have anywhere from partial days to > 2 days less absenteeism due to Footmaxx orthotics and conclude that approximately 2 days of less absenteeism per employee per year is possible with the use of Footmaxx orthotics in this study with flight attendants.

It is noted that airline employees most likely fall under the Stats Can job classification heading of Service Producing, Travel and Accommodation which averaged 7.7 work days absent, 7.2 for men and 10.2 for women (Akyeampong, 1999). There is no specific category for flight attendants. However, the number of days absent is very similar to the national average on a yearly basis and therefore with continued use of Footmaxx orthotics, employees in general, would experience approximately 2 less days of absenteeism, enhanced work performance and derived therapeutic benefit.

SUMMATION OF RESULTS DUE TO FOOTMAXX ORTHOTIC USAGE IN THE WORKPLACE

- 1.73-2.5 days less absenteeism on average through Footmaxx orthotic usage
- 23.4% - 32% of days absenteeism attributed to foot and related musculoskeletal problems
- 85.9% therapeutic satisfaction with Footmaxx orthotics
- 91.3% found their Footmaxx orthotics comfortable resulting in high compliance
- 72.3% employees indicated improved work performance through use of Footmaxx orthotics

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Appendix

Comparison Studies – print-outs