16 - FREQUENCY AND INTENSITY OF LOW BACK PAIN IN PARTICIPANTS IN A FITNESS CORPORATE PROGRAM

MÍRIAM RAQUEL MEIRA MAINENTI, CAMILA RODRIGUES,
FÁTIMA PALHA DE OLIVEIRA, ALEXANDRE MORAES DE MELLO
UFRJ - Rio de Janeiro - RJ - Brazil
miriam.mainenti@hotmail.com

Introduction

In Brazil and in the world nowadays, the main companies are beginning to worry about their employees' health. Hence, they are striving to promote both their health and quality of life, which also results in the reduction of withdrawal from work and in a better quality production. Low back pain (pain in the lumbar region of the vertebral spine that possesses several etiologies) is one of the biggest causes of absenteeism in work. Over many decades (CAILLIET, 1976; DREISINGER & NELSON, 1996) it has been recorded that this illness affects around 80% of all population at least in one moment of their lives. According to Santos (1996), in Brazil there is an estimation which claims that 56.89% of the individuals who are affected by this pain are withdrawn from work for a certain period of time, thus provoking economic damages. Most of back injuries are in the lumbar region (70%), followed by the thoracic (11%), and the cervical ones (7%) (HALL, 1992).

The most frequent causes of pain in the lumbar region are: protrusion or hernia of the intervertebral cord, injury of soft parts, bone breaking, and disc malnutrition. Moreover, it presents important risk factors for its occurrence: sedentary lifestyle, few hours of sleep and long periods in a seated position. Oliver and Middleditch (1998) state that "The incidence of musculoskeletal disorders among individuals who work in the administrative field is higher than that in other sectors of industry".

A large Brazilian company, Petrobras, has invested in programs which aim the prevention of diseases and promotion of health. One of them is the Health Promotion Centre (HPC) in the state of Rio de Janeiro, operationalized through a partnership with Escola de Educação Física e Desportos of the Universidade Federal do Rio de Janeiro (UFRJ). HPC offers classes of localized gymnastics (and its variations), stretching, bike indoor, tai-chi, yoga, aerobic activities (treadmill and stationary bike), and muscle building. All those practices are planned and accompanied by functional and nutritional evaluations carried out periodically.

Among the employees enrolled in HPC until March, 2005, approximately 20% reported in their first functional evaluation that they were affected by pain in the lumbar region. After this verification, the team of HPC professionals began to systematically accompany their algic status.

The present research has the objective of quantifying the frequency and intensity of low back pain among the HPC users, comparing their status before and after their enrollment in a systematic program of physical activity, proposed and supervised by physical education professionals.

Materials and Methods

To better investigate the intensity and frequency of the pain reported by the subjects, a research was conducted by means of a questionnaire sent through the company internal electronic mail system, adapted from one (Fig. 1) previously validated by the World Health Organization (WHO) (FLECK, M. et al., 1999).

I - When you enrolled at the HPC, how would you classify your low back pain?

I.1 - Frequency of the Pain:	I.2 - Intensity of the Pain:
1- Never (0% of the week)	1- None (0%)
2- Rare (25% of the week)	2- Little (25%)
3- Sometimes (50% of the week)	3- Moderate (50%)
4- Repeatedly (75% of the week)	4- Much (75%)
5- Always (100% of the week)	5- Extreme (100%)
Answer:	**Answer:**

II - As regards your present condition, how would you classify your low back pain?

I.1 - Frequency of the Pain:	I.2 - Intensity of the Pain:
1- Never (0% of the week)	1- None (0%)
2- Rare (25% of the week)	2- Little (25%)
3- Sometimes (50% of the week)	3- Moderate (50%)
4- Repeatedly (75% of the week)	4- Much (75%)
5- Always (100% of the week)	5- Extreme (100%)
Answer:	**Answer:**

III - Do you perform any other activity in the HPC besides muscling?
Answer:
IV - Besides other physical activities in the HPC, are you under any treatment for the lumbar region in special?
Answer:

Figure 1 - Questionnaire for the Verification of the frequency and Intensity of Low Back Pain.

Casuistry

The questionnaire was applied to 217 users of the HPC who had been selected to participate in the study. All of them reported to feel pain in the lumbar region (from small discomforts up to frequent pain) when they enrolled in the program. Since the verification of their assiduity by the *Wellness Trainer* 4.0 (*Technogym System*) Program, the sample was divided into two groups: 65 composed the Practitioner Group (PG), with a regular practice of physical activity at least twice a week, while 152 composed the Control Group (CG), with individuals who had not performed any physical activity in the last two months.

Out of the initial total number of subjects, 77 answered the questionnaire (43 from the PG and 34 from the CG). All those who reported to be participating in some physiotherapeutic treatment were excluded from the sample. Thus, the final number of participants in the research was 34 (PG) and 23 (CG), as shown in Table 1.

Table 1 - Sample Characteristics

ps	Males	Females	Age (years)	TBM (kg)	Height (m)
tioners	24	10	48.18 ± 6.28	77.18 ± 16.32	1.72 ± 0.09
ol	11	12	43.96 ± 8.48	77.29 ± 16.37	1.67 ± 0.09
ue			0.04	0.98	0.06

ulated using the t test student
s are presented as mean ± standard deviation
= Total Body Mass

Physical Training

After a detailed functional evaluation, the subjects were conducted to the professionals responsible for the prescription of the training program. Training consisted of an aerobic part of 20 to 30 min (on treadmill or recline bike) and a session of 2-3 series of 4-8 resisted exercises, which included large muscular groupings of superior and inferior limbs, and torso. The choice of the exercises respected each participant's initial condition of pain and biological individuality.

Statistical Analysis

Two variables were analyzed: frequency and intensity of pain. In order to compare the values attributed before and after training, the Wilcoxon test was used, always considering 95% of confidence interval.

The experimental protocol was approved by the scientific committee of CPS and all the participants consented in the utilization of their data for the present scientific research.

Results

Low back pain frequency before and after enrollment in the systematic program of physical activity

The practitioner's group (PG) reduced in a significant way (T calculated - 0 - lower than T critical - 83 , showing that data groups before and after training are not equal) the value attributed to the frequency of low back pain from 3.01 0.99 to 2.16 0.82, while in control group (CG) the variation was lower (from 3.30 1.15 to 3.0 1.17), and with no statistical evidence (T calculated - 4 - higher than T critical - 3, showing that it is not possible to reject the fact that data groups before and after training are equal).

Figure 2 shows these differences. Classification varies from 1 to 5, signifying: 1- Never (0% of the week); 2- Rare (25% of the week); 3- Sometimes (50% of the week); 4- Repeatedly (75% of the week); 5- Always (100% of the week).

The practitioner's group (PG) reduced in a significant way (T calculated - 0 - lower than the T critical - 53 - showing that data groups before and after training are not equal) the value attributed to the intensity of the low back pain from 2.87 0,79 to 2.07 0.68, while in the control group (CG) the variation was lower (from 2.96 0.88 to 2.72 0.91) and with no statistical evidence (T calculated - 5 - higher than T critical - 3, showing that it is not possible to reject the fact that data groups before and after training are equal). Figure 3 shows these differences. Classification varies from 1 to 5, signifying: 1- None (0%); 2- Little (25%); 3- Moderate (50%); 4- Much (75%); 5- Extreme (100%).

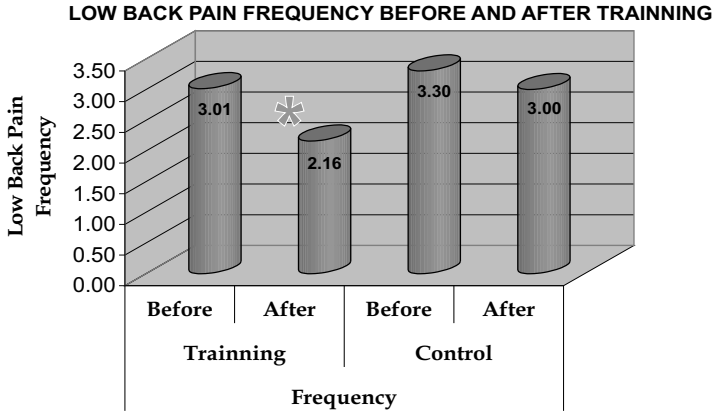

Figure 2 - Low back pain frequency. Values collected before and after the enrollment at a physical activity program at HPC - Petrobras. * = significant difference for p< 0.05 (*Wilcoxon* test).

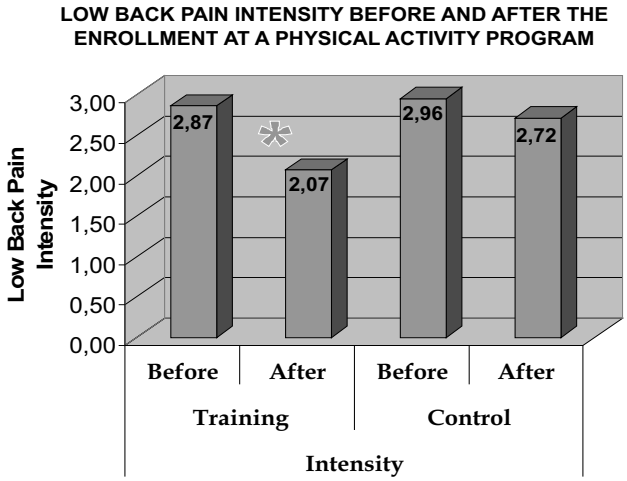

Figure 3 - Low back pain intensity before and after training. Values collected before and after the enrollment at a physical activity program at HPC - Petrobras. * = significant difference for p< 0.05 (*Wilcoxon* test).

Discussion and conclusion

The two-month training enabled a reduction in the frequency of the low back pain (Fig. 2), going from a value (3.01) which represented 50% of the week (Sometimes) to 2.16 (25% - Rare). Besides the fact that the statistical analysis proved the existence of an important difference between the values attributed before and after training, it is also shown that there was also an alteration in the perception of this frequency (Rare), which did not happen in the control group (Sometimes - Sometimes).

In the parameter "intensity in the low back pain", besides the statistical evidence, a qualitative improvement was observed in the practitioners: from 2.87 (approximately 3 - Moderate Pain) to 2.07 (approximately 2 - Little Pain) (Fig. 3).

Modifications in the perception of the pain probably occurred on account of a better nutrition of the intervertebral discs. The company's employees work for a long period of time in a seated position, and most of the time without leaning back properly. Important factors to the rise of low back pain are rectification of the lumbar spine provided by the seated position, added to an increased discal compression for not using the back of the chair. According to Oliver and Middleditch (1998), there are two ways of nourishing the intervertebral disc. First, it is throughout blood capillaries which surround the periphery of the *annulus fibrosus*, and the second is throughout the capillaries that pass under the endplates (cartilage which limits the disc in relation to other vertebral bodies). However, these two ways are not efficient as regards the disc in its totality (the most inner and outer parts are compromised), and a diffusion is necessary, enabled by changes in posture and overload, that is, by alterations in the intradiscal pressure. "Lying position withdraws the load of the spine and stimulates the influx of the fluid", the authors state, and this is important to the entrance of nutrients. Nonetheless, the several compressions exerted during the day, even those naturally caused by the weight-bearing stress, promote the efflux of the fluid, important to the exit of metabolics. The authors affirm that "the inflection of the lumbar vertebral column helps the transportation of metabolites" and if this dynamics is not respected, the disc, together with the entire functional unit to which it belongs, becomes "sick". Without the necessary fluid for the dissipation of the load, the vertebra will be more susceptible to possible tears, fractures, muscular or ligament distensions. Without expelling the products of the metabolism, the region will remain with substances which will physiologically damage the solution of the nucleus polposus.

The modification in the habits of the subjects of the present study by means of the performance of systematic physical activities promoted a better nutrition of the spinal vertebral column which, together with other factors, led to an improvement in their algic status.

Another possible cause for the involution of the low back pain in these practitioners is the muscular strengthening, as much local (erector spinal muscle) as general. A stronger organism will require less stabilization of the muscles of the torso in the several movements performed daily.

By maintaining the continuity of the frequency of the program's users, it is possible to predict that there will be a better control of the algic status, generating benefits to the employees' health and quality of life, besides the positive implications that will have an indirect influence upon the company range.

References

CAILLIET, R. *Lombalgias*. São Paulo: Manole, 1976.

FLECK, M.P.A. et al. Desenvolvimento da versão em português do instrumento de avaliação de qualidade de vida da Organização Mundial de Saúde (WHOQOL-100). *Revista de Saúde Pública*, v. 33, n. 2, p.198-205, 1999.

DREISINGER, T., NELSON, B. Management of back pain in athletes. *Sports Medicine*, April, v. 21, n. 4, p. 313 - 320, 1996.

HALL, S. *Biomecânica básica*. São Paulo: Guanabara Koogan, 1992.

OLIVER, J., MIDDLEDITCH, A. *Anatomia funcional da coluna vertebral.* Rio de Janeiro: Revinter, 1998.

SANTOS, A. *O exercício físico e o controle da dor na coluna* - Biomecânica, Epidemiologia, Avaliação. Protocolos práticos de exercícios. Rio de Janeiro: Medsi, 1996.

Míriam Raquel Meira Mainenti - Rua Comendador Siqueira, 1904/202 Pechincha - Jacarepaguá - Rio de Janeiro - RJ - Cep: 22743-030. miriam.mainenti@hotmail.com. Telefone: (21) 3392-9661.

FREQUENCY AND INTENSITY OF LOW BACK PAIN IN PARTICIPANTS IN A FITNESS CORPORATE PROGRAM

Low back pain is one of the biggest causes of employee absenteeism. In Brazil, 56.89% of the individuals have this problem, being withdrawn from work for a period of time, provoking economic damages. The majority of back injuries are in the lumbar region (70%), followed by the thoracic (11%), and the cervical ones (7%). The most frequent causes of pain in the lumbar region are: protusion or hernia of the intervertebral cord, injury of soft parts, bone breaking and disc malnutrition. Among the important risk factors for its occurrence are sedentary lifestyle, few hours of sleep, and long periods in a seated position. The present research was developed in a Brazilian company that has a Health Promotion Centre (HPC) with regular physical activities and nutritional orientation. The objective of the study was to quantify low back pain frequency and intensity, comparing the practitioners' status before and after enrollment at a systematic program of physical activities, performed under professional's supervision. A suitable questionnaire of a model validated for the World Health Organization (WHO) was applied. The sample comprised 57 participants, being 34 participants in the HPC and a control group with 23 non-engaged clients. After a two-month period, a reduction in the low back pain frequency was verified, passing from a value of 3.01 that represented 50% of pain during the week, to one of 2.16 (25%). Besides the statistical analysis evidencing an important difference between the attributed values before and after training, an alteration in the low back pain frequency was also recorded, which did not happen in the control group. As to its intensity, besides the statistical evidence, a qualitative improvement was observed in the practitioners: 2.87 (Moderate Pain) for 2.07 (Little Pain).

Key words: Low back pain; quality of life; corporate fitness.

FRÉQUENCE ET INTENSITÉ DE DOULEUR LOMBOSACRÉE DES PARTICIPANTS DE PROGRAME D'ATIIVITÉ PHYSIQUE DANS UNE ENTREPRISE

La douleur lombo-sacrée est l'une des plus grandes causes de l'absentéisme des employés. Au Brésil, 56.89% des individus ont ce problème, étant retiré du travail pendant une période, provoquant des dommages économiques. La majorité de lésions dorsales sont dans la région lombaire (70%), suivie du thoracique (11%), et la cervicale (7%). Les causes les plus fréquentes de la douleur dans la région lombaire sont : protusion ou hernie de la corde intervertébrale, dommages des pièces molles, rupture d'os et malnutrition de disque. Parmi les facteurs de risque importants pour son occurrence sont le style de vie sédentaire, peu d'heures de sommeil, et les longues périodes en position posée. La recherche actuelle a été développée à une

compagnie brésilienne qui a un centre de promotion de santé (CPS) avec des activités physiques régulières et l'orientation alimentaire. L'objectif de l'étude était de mesurer la fréquence et l'intensité de douleur lombo-sacrée, en comparant praticiens' avant et après l'inscription à un programme systématique des activités physiques, exécuté sous la surveillance du professionnel. Un questionnaire approprié d'un modèle validé pour l'organisation mondiale de la santé (OMS) a été appliqué. L'échantillon a comporté 57 participants, étant 34 participants au CPS et un groupe de commande avec 23 clients non-engagés. Après une période de deux mois, une réduction de la fréquence de douleur lombo-sacrée a été vérifiée, passant d'une valeur de 3.01 qui ont représenté 50% de douleur pendant la semaine, à l'un de 2.16 (25%). Sans compter que l'analyse statistique démontrant une différence importante entre les valeurs attribuées avant et après la formation, un changement de la fréquence de douleur lombo-sacrée a été également enregistré, qui ne s'est pas produite dans le groupe de commande. Quant à son intensité, sans compter que l'évidence statistique, on a observé une amélioration qualitative dans les praticiens : 2.87 (douleur modérée) pour 2.07 (peu de douleur).

Mots clés : Douleur lombo-sacrée ; qualité de la vie ; forme physique de corporation

FRECUENCIA E INTENSIDAD DE LA LUMBALGIA EN PARTICIPANTES EN UN PROGRAMA DE ACTIVIDADES FÍSICAS EN EL AREA DE *FITNESS* CORPORATIVO

La lumbalgia es una de las principales causas del ausentismo del empleado. En Brasil el 56, 89% de los individuos la padecen y su ausencia del trabajo durante un período de tiempo provoca pérdidas económicas a las empresas. La mayoría de las lesiones dorsales está en la región lumbar (70%), seguida por la torácica (11%) y las cervicales (7%). Las causas más frecuentes del dolor en la región lumbar son: protrusión o hernia del disco intervertebral, lesión de piezas suaves, ruptura del hueso y desnutrición del disco. Entre los factores de riesgo importantes para su ocurrencia están la forma de vida sedentaria, pocas horas de sueño y largos períodos en una posición asentada. La actual investigación fue desarrollada en una compañía brasileña que tiene un centro de promoción de la salud (CPS) con actividades físicas regulares y orientación alimenticia. Nuestro objetivo fue cuantificar la frecuencia y la intensidad de la lumbalgia antes y después del desarrollo de un programa sistemático de actividades físicas, realizado bajo la supervisión de profesores de Educación Física, a través de un cuestionario validado por la Organización Mundial de la Salud (WHO). La muestra abarcó a 57 personas, de las cuales apenas 34 participaron activamente. Los 23 no activos constituyeron un "grupo de control" a ser comparado al primer grupo. Tras un período de dos meses se verificó una reducción en la frecuencia de lumbalgia del grupo activo antes y después de los entrenamientos, de un valor de 3,01 - el 50% de dolor durante la semana - a uno de 2.16 - el 25%. Asimismo se registró una alteración en la frecuencia de lumbalgia, lo que no sucedió en el grupo de control. En cuanto a su intensidad, además de la evidencia estadística, una mejora cualitativa fue observada en los activos: 2.87 (dolor moderado) para 2.07 (poco dolor).

Palabras clave: Lumbalgia; calidad de vida; *fitness* corporativo.

FREQÜÊNCIA E INTENSIDADE DE LOMBALGIA EM PARTICIPANTES DE UM PROGRAMA DE ATIVIDADES FÍSICAS NA ÁREA DE *FITNESS* CORPORATIVO

A lombalgia (dor na região lombar da coluna vertebral que possui diversas etiologias) é uma das maiores causas do absenteísmo no trabalho. Estima-se que no Brasil 56,89% dos indivíduos são acometidos por essa dor e afastados do trabalho por um determinado tempo, provocando prejuízos econômicos. A maioria das lesões do dorso envolve a região lombar (70%), ficando a torácica com 11%, e a cervical com apenas 7%. As causas mais freqüentes da dor na região lombar são: protusão ou hérnia do disco intervertebral, lesão de partes moles, fratura óssea e má nutrição discal. Além disso, há fatores de risco importantes para sua ocorrência: sedentarismo, poucas horas de sono e longos períodos na posição sentada. A presente pesquisa foi desenvolvida em uma empresa brasileira na qual se desenvolve um programa de promoção da saúde através do oferecimento de atividades físicas regulares. O objetivo foi quantificar a freqüência e a intensidade de lombalgia, comparando o estado dos praticantes antes e após a inserção num programa sistemático de atividades físicas, sob supervisão de profissionais de educação física. Aplicou-se um questionário adaptado de um modelo validado pela Organização Mundial de Saúde (OMS). A amostra contou com 57 participantes, sendo 34 ativos no programa e 23 do grupo controle. Após o período de 2 meses, verificou-se que houve uma redução na freqüência da lombalgia, passando de um valor (3,01) que representava 50% de dores durante a semana (às vezes) para 2,16 (25% - raro). Além de a análise estatística comprovar diferença importante entre os valores atribuídos para antes e após o treinamento, registrou-se também a alteração na freqüência de lombalgia (às vezes - raro), o que não aconteceu no grupo controle. Quanto à intensidade da lombalgia, além da comprovação estatística, uma melhora qualitativa foi observada nos praticantes: 2,87 (dor moderada) para 2,07 (pouca dor).

Palavras-chave: Lombalgia; qualidade de vida; *fitness* corporativo.