194 - INTERVENTION PROGRAMME FOR THE PREVENTION OF BACK PAIN IN SCHOOLCHILDREN

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INTRODUCTION

Research in recent decades in countries with a high level of development shows that technological progress goes hand in hand with the population's adoption of a lifestyle for which our body's evolutionary development is not prepared (sedentary habits, smoking, alcohol, an unsuitable diet etc).

It used to be thought that back pain occurred as a result of an alteration in the structure of the spinal column, due to problems like scoliosis or a slipped disc. As it has gradually been shown that back pain is not always caused by an organic change in the spinal column, studies have begun to be made of factors associated with a higher risk of the problem. Back pain is one of today's major ailments, to the extent that it might be termed «the illness of the 21st century».

The main purpose of this study is to design and assess an intervention programme for preventing back pain in schoolchildren aged between 10 and 12.

METHOD

Data collection:

11 schools on the island of Mallorca (Spain) were chosen using stratified random sampling techniques, depending on the following variables: the size of the school (small=one class per year, big=two or more classes per year); the type of school (state, state subsidized, private); the location of the school (urban or rural).

All the schools on the island were classified into one of 12 strata (formed by combining the different variables). It was immediately observed that no school fitted into the «small, private, rural» stratum, so the sample was reduced to 11 possible strata. 10% of the schools in each stratum were randomly chosen, rounded off to the next highest number. The randomized selection process was performed by randomly choosing a paper with a number corresponding to a particular centre. From the resulting schools, two were then selected.

Subjects:

The sample group comprised a total of 137 schoolchildren, aged between 10 and 12. 71 of them were boys (51.8%) and 66 girls (48.2%). The control group was made up of 74 subjects while the experimental one was made up of 63.

		Experimental Group	Control Group	Total
Age		11.1	10.2	10.7
Gender	Boys	52.4%	51.4%	51.8%
	Girls	47.6%	48.6%	48.2%

Table 1. Distribution of sample by age and gender

Questionnaire:

The questionnaire and data-collection method were first validated in a study, using the test-retest method. All the subjects filled in the questionnaire, which was made up of 18 questions typed on one side of a sheet of paper. In accordance with a review of scientific literature, the questions dealt with what are considered to be risk factors associated with the prevalence of back pain or its characteristics and/or consequences. The questions enquired about the subjects' height and weight (BMI); their sporting habits (how often they do sporting activities, choosing from “less than 2 hours a week”, “2-4 hours a week”, “over 4 hours a week” and whether they play a sport as a member of a sporting association or not); a diagnosis of scoliosis, a diagnosis of heterometry of the lower limbs; the existence and number of episodes of back pain; the occurrence of back pain during the last seven days; back pain in bed or when getting up; restrictions in work or leisure activities due to back pain; any received treatment; the occurrence of painful episodes or more intense ones, if they already exist, during menstruation; the occurrence of painful episodes during or at the end of PE classes; being able to leave school materials at school; the type of schoolbag they use (with or without wheels); their subjective perception of the weight of their schoolbag; tiredness from carrying the schoolbag; an awareness of how vulnerable they can be to back pain; an interest in caring for their health; habitual use of the sofa; supporting their back completely when lying on the sofa; bending their knees when picking something up off the floor; asking for help when carrying a heavy object; carrying the schoolbag on one or both shoulders; pulling a bag on wheels with the same hand; trying to carry just what is strictly necessary in their schoolbag; observation of their posture when sitting at home; observation of their posture when sitting at school; frequent changes of posture when sitting on a chair at home; frequent changes of posture when sitting on a chair at school; regular physical exercise; and prior information they might have received about back pain.

Procedure:

Once a programme had been designed and the sample group selected, two meetings were held, one with teachers from the schools and the other with the mothers and fathers of students from the sample group. The purpose was to present the study to each group and explain the importance of the subject and procedure that would be followed throughout the entire research study.

Once the timescale for the intervention programme had been defined, the initial round of questionnaires was given out to both the control and experimental group in order to obtain baseline information. Immediately afterwards, the intervention programme was conducted. This consisted of 6 one-hour sessions (4 theoretical and 2 practical sessions) over a period of 4 weeks. The 4 theoretical sessions were given within the school timetable as part of a subject known as «environmental awareness». The two practical sessions were given during PE classes. The theoretical content matter centred on the human anatomy and physiology; the fundaments of back pain and associated risk factors; promoting physical exercise; ergonomics and posture; and an analysis of the use of schoolbags. The practical sessions dealt with a postural analysis, how to carry objects, work on balance, breathing and relaxation.

When the intervention programme had been given to the experimental group, the questionnaires were given out again

to both groups in order to check whether the programme had had the desired effect. The sample group was monitored to assess their retention over time by giving them the questionnaire a third time three months later.

Statistical analysis:

Once the subjects had filled in the questionnaires, a statistical analysis of the data was performed. To compare the qualitative variables, the chi-squared test was used. To compare the mean values, the t-student test and ANOVA analysis of variance were used. A $p<0.005$ significance level was established. In those cases in which normality assumptions were not fulfilled, corresponding non-parametric tests were used. All the analyses were conducted with the SPSS-15 statistical software package for Windows.

RESULTS

A total of 178 subjects answered the questionnaire. The ages of the subjects taking part ranged from 10 to 12 years old, with an average age of 11.01 (0.58 s.d.). The average weight of the subjects was 44.53 kg (10.65 s.d.), with an average height of 149.74 cm. The mean BMI was 19.78.

In this study, we present the results for the experimental group for the three data-collection phases (the pre-test, post-test, and 3 month post-test) to find out what changes could be observed after the intervention programme and their durability over time. The data is shown in two tables, depending on whether the questions in the questionnaire had a dichotomous or polytomous answer.

In reference to the question that enquired how heavy the subjects' schoolbags felt, there was a drop in value from 3.32 to 2.90, and so there were significant differences before and after the intervention programme. After the 3-month questionnaire, a slight rise in value could be observed, but it remained below the initial pre-test value (Table 2).

When the subjects were asked how tired they felt when they carried their schoolbags, a situation much like the previous one occurred. After the programme, there was a significant drop in value, with a slight rise after 3 months although it still remained below the initial pre-test one (Table 2).

As for the belief that the weight of the schoolbags affects the subjects' backs, the effects of the intervention programme led to a significant rise in value when the pre and post-tests were compared. When the results of the 3-month post-test were analysed, no significant differences between the latter and the previous post-test could be observed, while differences with the pre-test were maintained (Table 2).

Question	Pre-test	Post.1	Sign. 1-2	Post.2	Sign. 2-3	Sign. 1-3
How heavy does your schoolbag feel?	3.32	2.90	0.049	3.06	1.000	0.581
Do you get tired carrying your schoolbag?	1.76	1.60	0.047	1.63	1.000	0.964
Do you think the weight of your schoolbag affects your back?	1.86	2.19	0.001	2.14	1.000	0.006

Table 2. Differences in the pre-test, post-test and 3-month post-test

The results of questions with dichotomous answers are shown in contingency tables, indicating the percentage of subjects that replied affirmatively to the different questions, since this answer is considered to be the correct or healthiest one (Table 3).

Bearing in mind that the two schools under analysis offer the opportunity for schoolchildren to leave school material there instead of toting it backwards and forwards, it is important to highlight that the percentage of schoolchildren who took advantage of this opportunity rose significantly after the intervention programme from 47.6% to 61.9%. This situation remained virtually the same after 3 months.

At present the tendency to carry schoolbags on one shoulder has gradually disappeared. Thus in the pre-test, 85.7% of the subjects claimed that they carried their schoolbag on both shoulders. In the post-test, big improvements were achieved (from 85.7% to 92.1%) but not sufficient to constitute significant differences. However, the improvements that were achieved were maintained three months later.

Since the weight of a schoolbag does not depend exclusively on the corresponding child's own wishes, what interested us most was to find out if they at least go through the contents to try and carry as little as possible. The effects of the intervention programme led to significant improvements of almost 11%, with the figures being maintained after three months.

QUESTION	Pre-test	Post.1	Sign.	Post.2	Sign.
When classes end, do you leave material at school?	47.6%	61.9%	X^2=35.24 E=0.004	63.5%	X^2=43.49 E=1.000
If you carry your schoolbag on your back, do you carry it on both shoulders?	85.7%	92.1%	X^2=19.15 E=0.219	92.1%	X^2=1.082 E=1.000
Do you just try to carry what is strictly necessary in your schoolbag so as to reduce its weight?	76.2%	87.3%	X^2=29.32 E=0.016	85.7%	X^2=0.859 E=1.000

Table 3. Differences in the pre-test, post-test and 3-month post-test.

DISCUSSION

The questions about how heavy their schoolbags felt and whether they got tired carrying them showed very similar results throughout the whole research process. This could be caused by the fact that they are two variables that depend on the real weight of the schoolbag and, as commented above, this is not exclusively dependent on the schoolchildren's own wishes. We

can see that in the post-test, big improvements were achieved, possibly due to a change in the way the schoolbag is carried. Nonetheless, throughout the study we observed that fashion has a very big influence on schoolchildren, which it is very hard to overcome. The prevailing fashion ends up by taking hold and, as a result, in the 3-month post-test some of the improvements were lost.

Very good results were achieved in the post-test and 3-month post-test in generating an awareness that schoolbags are a risk factor in back pain. As commented in the previous paragraph, fashions are highly influential, but if we want to change an established custom, the first and most important step is to make schoolchildren realize that something is not right. Then they may feel willing to change.

The study also explored whether schoolchildren take advantage of being able to leave material at school so that they do not have to carry it home unnecessarily. The results were satisfactory, together with the associated question that enquires whether schoolchildren try to carry as little weight as possible in their schoolbags. After three months, the results show that the effects of the intervention programme persisted. Talking to the schoolchildren during the intervention programme, we observed certain shared behaviour patterns. For example, children who do not leave material at school or try to reduce the weight of their schoolbag claim that often they can only do without one notebook or schoolbook. They justify this by saying «it's just one book so I might as well take it».

Our aim was to make the schoolchildren aware that however little they can reduce the weight of the bag, they should still do so, because to avoid back pain, all these little actions and minor details are like tiny drops of water: they seem insignificant in isolation but in time they fill a whole glass.

Continuing with the subject of schoolbags, in the pre-test, 85.7% of the schoolchildren said that they carried their bag on both shoulders. Although this value improved in the post-test (92.1%), it was not sufficient to obtain a significant difference. However, for us it is a satisfactory achievement that the immense majority of schoolchildren carry their bag correctly. Given these high values, and thinking back 15 years to the time when the immense majority of schoolchildren carried bags over one shoulder, we decided to observe them when they left school to see how they really carried their bags. We were positively surprised to confirm that the achieved results were true. However, talking to the schoolchildren about this, we reached the conclusion that once again fashion comes to the fore. Carrying a bag on one or both shoulders is not currently a distinguishing feature that sets schoolchildren apart: fashion today depends on the height at which the bag is carried: the lower it is, the «more fashionable it is», regardless of whether the student is a boy or a girl.

CONCLUSIONS

From the results that were obtained from the intervention programme, after analysing the whole process we can conclude that both the methodology that was used and the contents of the programme are suitable for use with schoolchildren aged between 10 and 12 in order to prevent back pain.

It should be noted that three months after the conclusion of the intervention programme, more adequate answers were given by the experimental group, in terms of the prevention of back pain, for all the variables under analysis when compared with the pre-test.

One self-criticism must be made. Among the scientific community, many studies have been made of back pain, but almost all of them are descriptive and they do not go any further by coming up with solutions. Very few studies are based on intervention programmes or, more specifically, on programmes for use in schools. What is clear is that in Mallorca, schoolchildren aged between 10 and 12 are aware of what back pain is and some of them suffer from it or have suffered from it at some point in their lives.

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INTERVENTION PROGRAMME FOR THE PREVENTION OF BACK PAIN IN SCHOOLCHILDREN

ABSTRACT

Introduction: The main aim of this study was to design and assess an intervention programme to prevent back pain in schoolchildren aged 10 to 12.

Methods: The study was conducted using 137 schoolchildren (71 boys and 66 girls), aged between 10 and 12, in Mallorca (Spain). The schools were chosen using stratified random sampling techniques, depending on the size, type and location of the schools. The questionnaire and data-collection method were first validated using the test-retest method. The intervention programme, which consisted of 6 one-hour sessions (4 theoretical and 2 practical), took place over a period of 4 weeks.

Results: The questions referring to how heavy the schoolbags felt and whether carrying them was tiring gave similar results throughout the entire research process ($p<0.05$ for the post-test and $p>0.05$ for another post-test three months later). Big improvements were achieved in raising the children's awareness that schoolbags are a risk factor in back pain, that some materials should be left in school, and that the weight of the schoolbags should be kept to a minimum ($E<0.05$). After three months, the results show that the effects of the intervention programme still persist.

Conclusions: From the results of the said programme, after an analysis of the entire process, we can conclude that both the methodology and the contents are suitable for use with schoolchildren aged 10 to 12 in order to prevent back pain.

Keywords: back pain, schoolchildren, healthcare promotion.

INTERVENTION POUR LA PRÉVENTION DES MAUX DE DOS EN MILIEU SCOLAIRE

RÉSUMÉ

Introduction: L'objectif de la présente étude est l'élaboration et l'évaluation d'un protocole d'intervention pour la prévention des maux de dos chez les écoliers âgés de 10 à 12 ans.

Méthodes: Cette étude porte sur 137 élèves (71 garçons et 66 filles) d'entre 10 et 12 ans résidant à Majorque (Espagne). La sélection des écoles s'est faite par randomisation stratifiée, en fonction du type d'établissement, de sa taille et de sa localisation. Le questionnaire et la méthodologie employée pour la collecte de données ont préalablement été validés dans le cadre d'une étude au moyen de la méthode test-retest. L'intervention a consisté en 6 séances d'une heure: 4 séances théoriques et 2 séances pratiques qui se sont déroulées sur 4 semaines.

Résultats: Les éléments se référant au poids du sac à dos et au degré de fatigue qui en résulte offrent des résultats très similaires tout au long du processus de recherche ($p<0.05$ en post-test et $p>0.05$ au bout de trois mois). En ce qui concerne les points suivants: prise de conscience du facteur de risque que représentent les sacs à dos pour les problèmes de dos, laisser le matériel scolaire au collège et charger le moins possible le sac à dos, on observe des progrès importants ($E<0.05$). Les résultats démontrent qu'au bout de trois mois les effets de l'intervention durent encore.

Conclusions: À partir des résultats obtenus au terme de l'intervention et après avoir analysé tout le processus, nous pouvons conclure que tant la méthodologie utilisée que le contenu de l'intervention elle-même sont aptes à être utilisés chez les écoliers de 10 et 12 ans pour prévenir les maux de dos.

Mots-clés: maux de dos, écoliers, promotion de la santé.

INTERVENCIÓN PARA LA PREVENCIÓN DEL DOLOR DE ESPALDA EN ESCOLARES

RESUMEN

Introducción: El presente estudio tiene como principal objetivo diseñar y evaluar un protocolo de intervención para la prevención del dolor de espalda en escolares de entre 10 y 12 años.

Métodos: El presente estudio se llevó a cabo en 137 escolares (71 niños y 66 niñas) de entre 10 y 12 años, de Mallorca (España). La selección de los colegios se realizó por aleatorización estratificada, en función de tamaño del centro, tipo y ubicación. El cuestionario y la metodología de recogida de datos fueron previamente validados en un estudio previo mediante el método test-retest. La intervención, que constó de 6 sesiones de una hora: 4 teóricas y 2 prácticas, que se desarrollaron durante 4 semanas

Resultados: Los ítems referentes a cuán pesada resulta la mochila y si cansa el hecho de transportarla muestran unos resultados muy similares a lo largo de todo el proceso de investigación ($p<0.05$ en postest y $p>0.05$ al cabo de tres meses). En la concienciación de que las mochilas son un factor de riesgo de padecer dolor de espalda, dejar material escolar en el colegio y cargar la mochila con el mínimo peso posible se consiguieron mejoras importantes ($E<0.05$). Al cabo de tres meses los resultados demuestran que los efectos de la intervención todavía perduran.

Conclusiones: A partir de los resultados obtenidos en la intervención, y después de analizar todo el proceso, podemos concluir que tanto la metodología utilizada como el contenido de la propia intervención son aptas para ser utilizados en escolares de entre 10 y 12 años para prevenir el dolor de espalda.

Palabras clave: dolor de espalda, escolares, promoción de la salud.

INTERVENÇÃO PARA A PREVENÇÃO DA DOR NAS COSTAS EM ESTUDANTES

RESUMO

Introdução: O presente estudo tem como principal objectivo desenhar e avaliar um protocolo de intervenção para a prevenção da dor nas costas em estudantes de entre os 10 e os 12 anos.

Métodos: O presente estudo foi levado a cabo junto de 137 estudantes (71 rapazes e 66 meninas) de entre os dez e os 12 anos, de Maiorca (Espanha). A selecção das escolas foi realizada por aleatorização estratificada, em função do tamanho do estabelecimento de ensino, tipo e localização. O questionário e a metodologia de recolha dos dados foram previamente validados num estudo prévio mediante o método test-retest. A intervenção que constou de 6 sessões de uma hora: 4 teóricas e 2 práticas foi desenvolvida ao longo de 4 semanas

Resultados: Os itens referentes a quão pesada resulta a mochila e se cansa transportá-la revelam uns resultados muito similares ao longo de todo o processo de investigação ($p <0.05$ em postest e $p> 0.05$ ao fim de três meses). Na consciencialização de que as mochilas são um factor de risco para padecer dor nas costas, deixar material escolar na escola e cargar a mochila com o mínimo peso possível, conseguiram-se melhorias importantes ($E <0.05$). Ao fim de três meses os resultados demonstram que os efeitos da intervenção ainda perduram.

Conclusões: A partir dos resultados obtidos na intervenção, e depois de analisarmos todo o processo, podemos concluir que tanto a metodologia utilizada como o conteúdo da própria intervenção estão aptos para serem utilizados em estudantes de entre os 10 e os 12 anos para a prevenção da dor nas costas.

Palavras-chave: dor nas costas, estudantes, promoção da saúde.