AFRICAN JOURNAL OF MEDICINE and medical sciences

VOLUME 33 NUMBER 3 SEPTEMBER 2004

ISSN 1116—4077

Afr. J. Med. med. Sci. (2004) 33, 201-205

Nigerian back school model: development and effect on industrial workers' knowledge of back pain and back care

***AO Akinpelu and **DO Odebiyi**

**Department of Physiotherapy, College of Medicine, University of Ibadan, and **Department of Physiotherapy, College of Medicine, University of Lagos, Lagos Nigeria*

Summary

Back schools are health education programmes on back pain. Many back schools have been developed for different populations since 1969 when the first one was developed in Sweden, but none for the Nigerian setting. The need to develop a back school that would be appropriate for the Nigerian environment was therefore identified. As a step towards its development, this preliminary study was carried out to determine the effect of a back school model (BSM) on some Nigerian industrial workers' knowledge of low back pain and back care. The subjects were 110 workers of a soap industry in Lagos, Nigeria. A pre-test, post-test quasi-experimental design was used. The BSM consisted of two 45 minute teaching sessions on structure and functions of the back, epidemiology and causes of back pain, correct postures and demonstration of exercises that may prevent/alleviate back pain. Data on demographic information, low back pain (LBP) experience, knowledge of back structure and back care were collected using a questionnaire with closed ended questions, which was completed before, immediately after and 8-weeks after BSM administration. The results showed that the subjects' mean knowledge score increased significantly from an initial value of 16.1+5.3 to 24.0 + 5.6 ($p<0.05$) immediately after and 23.1+3.9 ($p<0.05$) 8 weeks after BSM administration. Educational attainment had no influence on subjects' knowledge scores before or 8 weeks after BSM administration. Reported experience of LBP and duration on the job had no significant influence on subjects' knowledge scores before, immediately or 8-weeks following BSM administration. It was concluded that the BSM was effective in improving the workers' knowledge of LBP and back care. We believe that this finding justifies the effort to develop the Nigerian model of back school.

Keywords: *Back school model, low back pain, knowledge and care.*

Résumé

Cette étude preliminaire évaluait l'effect de courbatures sur l'état des travailleurs industrielles. Cent-dix travailleurs dans une usine de savonerie a Lagos au Nigéria était faite et consistait de 45 minutes d 'enseignements de la structure de dos(Colone vetébrale) ses functions et l'épidemiologie de courbatures abdominales, le positionement et les exercices pratiques pour réduire les douleurs. Leur donnees démographiques étaient obtenues a l'aide d'un questionnaire structuré. Les résultats montraient que les travailleurs avaient un score moyen de connaissance significativement eleve de 16.1±5.3 a 24.4 ± *5.6 (P<0.05) apres les cours pratieues et 23.1*±3.9 (P<0.05) huit(8) semaines aprés l'aptitude. Ce plaisir éducationel n'avait aucune influence sur le score des connaissances des sujects avant et apres 8 semaines du test d'aptitude. L'experience rapporte que des coubatures et la duree du travail n' avaient pas d'influence significative aux sujects durant l'aptitude. Il a été conclu que cette éducation sur le ménagement des courbatures était effective et améliorait leur condition et montre le besion des centres d'entrainement aus nigérians.

Introduction

Pain may be experienced any where in the back, but over 80% of all serious back problems occur at the lumbrosacral or low back area [1]. Low back pain (LBP) is undoubtedly the most predominant of the numerous musculoskeletal disabling conditions [2] and one of the most common musculoskeletal disorders seen by health care practitioners all over the world [4]. It is the most common diagnosis for which patients are treated in outpatient physiotherapy settings [4, 5]. It causes much disability in patients, especially those under the age of 45 years [6, 7]. Seventy to eighty percent of people in Western society have at least one episode of LBP in a lifetime [8]. Nwuga [9] reported that 88% of a group of Nigerians aged above 60 years have had at least one episode of LBP in their lifetime. Omokhodion and Osungbade [10] also reported that 54% of a small sample of Nigerian automobile mechanic had LBP. With these high prevalence rates, LBP has enormous implications for health care.

Recurrent episodes are a common feature of LBP [11], and up to 35% of those with LBP develop a chronic problem [12]. This tendency for recurrence or chronicity plus poor responses of patients to treatment probably led to the development of many approaches in LBP management. These include diagnostic and treatment approaches of Mennel [13], Maigne [14], Cyriax [15], McKenzie [16] Maitland [17] and Nwuga [18]. Back school constitutes another approach in the prevention and management of LBP.

Back school has it origin in Sweden, where the first back school was developed in a Volvo factory in 1969 [19]. Most other back schools such as the Canadian Back School, the California Back School, the American Back

Correspondence: Dr. Aderonke A. Akinpelu, Department of Physiotherapy, College of Medicine, University College Hospital, Ibadan, Nigeria.

School and the Derby Back School were developed in the early seventies [9]. These back schools provide information on anatomy and functions of the back; epidemiology and causes of LBP; correct resting and working postures and exercises for the prevention and/or alleviation of LBP [9,14). Education on LBP is usually done with the use of audio-visual materials and practical demonstrations by Physiotherapists and/or Orthopaedic surgeons [9,11,20]. Canadian back school gives a slot each to a Psychiatrist and Psychologist [19]. In most cases, back school clients are taught in groups, although, the American Back School also uses a one-to-one model [11].

Many studies have shown that back school is efficient in preventing back pain [21,22,23]. It has also been shown that when back school is used in conjunction with other treatment approaches, it is effective in improving the outcomes of interventions and it minimizes occurrence [24, 25]. A few studies have however reported no benefit of back school [26, 27].

In Nigeria, although the education of individual patients with LBP has always been part of the therapeutic intervention for current problem and prophylactic strategies against future occurrence of LBP, the use of back care education in the form of "Back School" is not common among Physiotherapists and other health workers [21]. As a step towards the development of a Nigerian Back School, this preliminary study was carried out to determine the effects of a back school model on a group of industrial workers' knowledge on low back pain and back care.

Materials and method

The subjects for this study were 110 staff members of a soap factory in Lagos, Nigeria. All workers of the factory except a few who were on annual leave during the study period participated in the study. Over time allowance paid by the factory management for the period of training served as incentive to the workers to participate in this study.

The subjects were divided into two groups: Office workers – that is, those involved in administrative duties, and Factory workers – that is, those involved with the dynamics of productions. A questionnaire with a closed-ended questions was used to collect the relevant information and data. The questionnaire was divided into two parts: Part 1 of the questionnaire collected demographic data and information on LBP experience during 12 months prior to the study. Part 2 listed 40 questions that assessed subjects' knowledge of the structure and functions of the back, causes of LBP and care of the back. Correct answer to each question was assigned a score of one and wrong answer or no idea response was scored zero. The maximum obtainable knowledge score was 40. Five experienced Physiotherapists with postgraduate qualifications in orthopaedic physiotherapy and/or spinal mechanical disorders and therapy have assessed the questionnaire earlier for content validity.

The study was an intervention study with a pre-test and post-test design. Subjects were asked to complete part 1 and part 2 of the questionnaire before the administration of the Back School Model (BSM) The BSM consisted of two 45-minutes teaching sessions on the structure and functions of the back; epidemiology and causes of LBP; practical demonstration of wrong and correct postures during common activities of daily living and exercises for the prevention and/or alleviation of LBP. For convenience of the factory management, the subjects were taught in two groups, factory workers and office workers. For each group, the first lecture was on the structure and functions of the back, and causes of low back pain. The second session was on practical demonstration of correct resting and working postures, as well as correct lifting technique. Teaching was facilitated with pre-prepared slides as audiovisual aids. Each subject was then given a copy of the 'Back School Handbook'. The Back School Handbook, was prepared by the authors, and it containes information on correct resting and working postures, and lifting technique. There was also a follow up by the safety manager of the company. He was charged with the responsibility of checking, encouraging and ensuring that subjects complied with the instructions on correct working and resting postures and correct lifting techniques. The subjects were asked to complete the part two of the questionnaire immediately after the administration and eight-weeks following the administration of the BSM.

Data analysis

Data were summarized using mean, standard deviation and percentage. The knowledge scores of the subjects before, immediately after and 8-weeks after the BSM administration were subjected to repeated measure of analysis of variance (ANOVA). The knowledge scores of the two categories of workers were analysed for significant difference using the independent t-test. Influence of subjects' educational attainment, reported LBP experience 12 months prior to study and number of years of working experience on their knowledge scores before, immediately after and 8-weeks after the administration of BSM was determined using ANOVA and independent t-test. Where ANOVA indicated significant difference, a post hoc analysis was carried out

Results

One hundred and ten subjects participated in the study, 50 of whom were office workers and 60 were factory workers. They were aged 36.6 ± 9.1 years old. The subjects' mean height was 1.7± 0.1 m, the mean weight was 69.1± 7.7 Kg and the mean body mass index was 25.4 ± 3.3 Kg/m^2 (Table.1). Eighty four (76.4%) subjects have been on the job for not more than 10 years while 26 (23.6%) had been on the job

Table 1: Age and physical characteristics of the subjects

	Office workers X	(SD)	Factory workers X	(SD)	t	P-value
Age (years)	35.5	8.8	37.5	9.5	0.28	0.44
Height (m)	1.7	0.7	1.7	0.7	0.53	0.33
Weight (kg)	70.4	8.4	68.0	7.1	0.11	0.26
BMI (kg/m²)	26.0	3.3	24.1	3.3	1.80	0.07

Critical t value (at d. f. = 108, á=0.05) =1.658

for over 10 years. Mean duration on the job was 6.2 ± 6.1 years for the office workers and 9.5 + 6.5 years for the factory workers. Fifteen (13.6%) of the workers had only primary school education, 37 (33.7%) had secondary school education and 58 (52.7%) had tertiary education. Seventy-eight (71.0%) of the workers reported low back pain (LBP) experience during 12 months prior to the study, with 37.3% having more than one episode. The percentage of office workers (68.3%) who reported LBP experience did not differ significantly (P=0.66) from that of factory workers (74%).

The mean knowledge score of the subjects was 16.1 ± 5.3 before the BSM administration. This increased to 24.0 ± 5.6 immediately after and 23.1 ± 3.9 eight weeks after the BSM administration. Analysis of variance indicated a significant difference in subjects' knowledge scores before, immediately and 8 weeks after BSM administration (table 2). Duncan post-hoc comparison showed that subjects' scores immediately after (t=11.8; P=0.00) and 8 weeks after (t=10.3; P=0.00) BSM administration were significantly higher than their scores before BSM administration. Table 2 also shows that the mean knowledge scores of the two groups of workers did not differ significantly before or after the administration of BSM.

Educational status had no significant influence on subjects' knowledge score prior to or eight weeks after the training (Table 3). However, there was a significant difference (P=0.04) in the knowledge scores of subjects in the three educational categories (primary, secondary and post secondary education) immediately after the BSM administration. Duncan post-hoc comparison showed that subjects with post secondary school education had significantly higher knowledge score than those with only primary school education (t=2.34; P=0.02). There was no significant difference in the knowledge scores of the subjects who reported experience of LBP and those who reported no experience of LBP 12 months prior to the study (Table 4).

Discussion and conclusion

The majority (71%) of the subjects reported experience of low back pain (LBP) during 12 months prior to the study and over a third of them had multiple episodes. These findings support the fact that LBP is a common problem among industrial workers [28] and that recurrence is a common feature of the problem [8]. There was no significant difference in the reported experience of LBP between the factory workers and the office workers, in spite of the dif ferences in their job activities. Generally, factory workers are involved in physical labour, spending more time standing and/or lifting, while the office workers were more sedentary, spending more time in sitting. This finding agrees with the observation that LBP occurs in sedentary workers as frequently as it occurs in heavy labour workers [7, 27].

The industrial workers' knowledge about LBP and back care prior to the administration of BSM was poor. This was evident by the low mean knowledge score of 16.6 out of 40, which amounted to only about 40% of the maximum obtainable score. This poor knowledge was irrespective of the workers' educational attainment. This finding may suggest the need for the inclusion of some forms of back care education programme into health education syllabus at primary and junior secondary school levels in

Table 2: Industrial workers' knowledge scores before, immediately after and 8- weeks after the administration of the back school model

	Knowledge score							
	Before Bsm		Immediately after Bsm		8-Weeks after Bsm			
	X	SD	X	SD	X	SD	F	P-Value
Factory workers (n=60)	16.3	6.0	23.2	6.0	23.1	3.4	33.55	0.00001
Office workers (n=50)	15.8	4.4	25.0	5.0	23.0	4.5	54.83	0.00001
t-value	0. 51		0.14		1.70			
p-value	0.62		0.89		0.09			

Critical F value= 3.92
Critical t value (at d. f. =108, á=0.05) =1.658
BSM – Back School Model

Table 3: Industrial workers' knowledge scores by educational status

	Knowledge score							
	Primary education (n=15)		Secondary education (n=37)		Post-secondary education (n=58)		F	P-Value
	X	SD	X	SD	X	SD		
Before BSM	15.87	6.59	15.89	5.71	160	4.95	0.06	0.98
Immediately After BSM	20.73	7.0	23.51	5.74	24.83	4.74	2.88	0.04
8 weeks After BSM	22.73	4.06	23.30	3.26	22.90	4.53	0.10	0.96

Critical F value = 2.68
BSM – Back School Model

Table 4: Industrial workers knowledge scores by reported LBP experience during 12 months prior to study

	Knowledge score					
	Subjects with LBP (n=32)		Subjects without LBP (n=78)		t	p- value
	X	SD	X	SD		
Before BSM	15.49	5.32	16.31	5.33	-0.75	0.46
Immediately After BSM	23.41	5.10	24.15	5.64	-0.65	0.52
8 weeks After BSM	23.22	3.29	23.99	4.16	0.28	0.78

Critical t value (at d. f. =108, á=0.05)=1.658
BSM – Back School Model
LBP – Low back pain

Nigeria. It may also imply that there is the need to educate all levels of industrial workers in Nigeria on how to prevent low back pain. The subjects' knowledge score increased to 24.0 (60%) immediately after the study. The improved knowledge agrees with the findings of previous studies [21, 29, 30, and 31] that back school significantly increases subjects' knowledge of back pain and back care. Subjects with post secondary or tertiary education gained significantly more knowledge than those with only primary education immediately after the BSM administration. This implies that higher educational attainment facilitates learning. However, this higher knowledge gain by subjects with tertiary education was not sustained by 8 weeks post BSM administration. This suggests the need for repeated administration of a back school to sustain the knowledge gain and the attendant benefits.

In conclusion, the back school model improved industrial workers' knowledge of LBP and back care. We believe that this finding justifies the need to develop a Nigerian model of back school which will put into consideration the environment and culture of the Nigerian people.

References

1. Rasch P J, Burke K R. Kinesiology and Applied Anatomy, Philadelphia, Lea and Febiger. 1978; 221-247
2. Cailliet R. Soft tissue pain and disability. F. A. Davis Company, Philadelphia 1986:4
3. Rose M. Manipulation and back School in the treatment of low back pain. Physiotherapy 1997; 83, 4 – 8.
4. Jette A M and Davids KD. A comparison of hospital-hospital based and private outpatient physical therapy practices. Physical Therapy. 1991; 74, 366-375.
5. Jette A M, Smith K, Haleg S M and Davis K D. Physical therapy episodes of care for patients with low back pain Physical Thererapy. 1994; 74, 101-110.
6. Deyo R A. Conservative therapy for low back pain: distinguishing useful from useless therapy. Jour nal of the American Medical Association. 1983; 250, 1057-1062.
7. Jette DU and Jette AM. Physical therapy and health outcomes in patients with spinal impairment. Physi cal Therapy 1996; 76,930-945.
8. Biering-Serensen F. A prospective study of low back pain patients in a general population: 1. Occurrence, recurrence and aetiology. Scandinavian Journal of Rehabilitation Medicine. 1983; 15, 71-79
9. Nwuga VCB. Old age and low back pain among Nigerians. Health Team. 1993; 1:6-8

10. Omokhodion F O and Osungbade O O. Health prob lems of automobile mechanics in Nigeria. Tropical Doctor. 1996; 26, 102-104.
11. Apts DW. Back Injuries prevention Handbook. Levis publishers, Chelsea, U.S.A 1996; 88-96.
12. Taimela S, Kujala UM, Salminem JJ and Viljanen T. The prevalence of low back pain among children and adolescents: A nationwide, cohort-based ques tionnaire survey in Finland. Spine. 1997; 22, 1132-1136.
13. Mennell J. The Science and Act of Joint Manipula tion. Vol. Δ London Churchill and A. Ltd. 1952; 12-14
14. Maigne R. The concept of painlessness and oppo site motion in spinal manipulations. Amer. J. Phys. Med. 1965; 44: 55-59
15. Cyriax J. Textbook of Orthopaedic medicines. Vol. 1 5th ed. Balliere Tindall, London 1980.
16. McKenzie R A. The lumbar spine; Mechanical di agnosis and therapy. Spinal publication, Walkanae, New Zealand. 1981.
17. Maitland G D. Vertebral Manipulation 5th edition Butterworths. 1986.
18. Nwuga VCB. Manual Treatment of Back pain. Shameson C.I Ltd, Nigeria. 1990.
19. Zachrisson Forssell M. The back school. Spine. 1981; 6, 104-6.
20. White AH. Back School and other conservative approaches to low Back pain. St. Louis, CV Mosby Co.1985; 1-15.
21. Nwuga VCB. Evaluative study of an education programme for patients with back pain. International Journal of Research. 1982; 4(3), 307-309.
22. Weber M, Cedraschi C, Roux E, Kissling RO, Von Kanels S and Daluit GA. Prospective control study of low back school in general population. British Journal of Rheumatology. 1996; 35(2), 178 – 83.
23. Frost H, Lamd SE and Shackleton C H. A functional restoration programme for chronic low back pain: A prospective outcome study. Physiotherapy 2000; 86: 285-293.
24. Lindstrom I, Ohlund C, Eek C, Wallin L, Peterson L, Fordyce W and Nachemson A. The effect of graded activity on patients with sub-acute low back pain: A randomized prospective clinical study with an operant –condition behavioural approach. Physi cal Therapy. 1992; 72(2), 279-290.
25. DiFabio R. Efficacy of comprehensive rehabilita tion programs and back school for patience with low back pain: A metal-analysis. Physical Therapy. 1995; 75(8), 865-879.
26. Porteau-Cassard L, Zabraniecki L, Dromer C and Fourais B. A back school programme at the Toulouse –Purpan Teaching Hospital. Evaluation of 144 pa tients. Revue Du Rhumatisme, English Edition. 1999; 66(10), 477 – 83.
27. Indahl A, Haldorsen EH, Holm S, Reikeras O and Ursin H. Five years follow-up study of a controlled clinical trial using light mobilization and an infor mative approach to low back pain. Spine. 1998; 23(23), 2625-30.
28. Toroptsova NV, Benevolenskaya LI, Karyakin AN, Sergeen IL and Erdesz S. Cross-sectional study of low back pain among workers at an industrial en terprise in Russia. Spine. 1995;(3) 328-332.
29. Schenk RJ, Diran RL and Stachura JJ. Learning ef fects of a back education program. Spine. 1996; (21),19.
30. Cedaschi C, Reust P, Lorenzicoldi F and Vischea T L. The gap between back pain patients, knowledge and scientific knowledge and it evolution after a back school teaching programme: a quantitative evaluation, patient education and counseling. 1996; 27-30.
31. Sanya AO and Ogunjuyigbe OO. Effects of formal back care education on lifting habits of school chil dren. Journal of the Nigeria Medical Rehabilitation Therapist. 1999; 4, 7-9.

Received: 11 June 2003
Accepted: 16 June 2004