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A PROSPECTIVE CONTROLLED STUDY OF LOW BACK SCHOOL IN THE GENERAL POPULATION

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SUMMARY

There are no data on the efficacy of a back school in primary prevention of back pain in the general population or on the characteristics of the population who volunteers. After announcement in the local press, 494 healthy adults volunteered and paid for a back school course in Switzerland. A total of 371 controls were matched for sex, age, profession, nationality and back pain. A statistically significant decrease in numbers of doctor's visits was found by the participants during the following 6 months compared with the controls. However, there were no significant between-group differences in the four remaining parameters (presence and intensity of back pain, drug intake and sick leave). Three-quarters of participants changed their attitudes after the back school. Volunteering for a back pain prevention programme was associated with the presence of back pain problems. Reasons for volunteering are further discussed. Overall, the results of this study showed that a back school for the general population may not solve the problem of low back pain, but improves self-help in a subgroup of the population.

KEY WORDS: Back school, Low back pain, Education programmes, Back injury prevention.

BACK schools with both theoretical and practical educational programmes have been implemented as an alternative or complementary to medical treatment of low back pain since the late 1960s [1–5] and have since been evaluated for secondary prevention [6–25].

Primary prevention programmes have also been developed to reduce the occurrence of low back pain. In primary prevention, studies with control groups and data on lost workdays are rare, and results of educational programmes are conflicting [26]. However, in prospective studies in industry, the expected rate of back pain [27], compensation claims [28] and absenteeism [29] has been reduced.

The Swiss League against Rheumatism (SLR) started a nationwide back school programme for the general population in 1990. The first 772 participants were prospectively evaluated and compared to a sample of 593 control subjects.

Primary prevention addresses healthy individuals. In patients, educational programmes aim at encouraging the patient to take part in the management of his back problem and to be an active agent in the recovery process, with the underlying assumption that motivation is linked to symptoms [30, 31]. As participation in a programme such as the one evaluated in this study is voluntary, it raises the question of reasons for volunteering, especially when the course is intended for the general population and is organized outside of the workplace.

The evaluation of this back school programme focused on two aspects: what impact does the back school have on the participants in terms of back pain (prevalence and intensity) and its consequences (number of doctor's visits, drug intake and sick leave); and who volunteers for such a programme.

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METHODS

Setting

The SLR back school was widely advertised in the local press of major urban areas. It consisted of eight weekly lessons of 90 min in the evening. Participants were taught in small groups (7–12 participants) and were charged the equivalent of US$80.

The lessons were given by a physiotherapist trained in back school education. A multidisciplinary team of health professionals of Swiss rehabilitation units had prepared a 200 page handbook as a didactic base for the teachers. It comprised both theoretical and practical sections on epidemiology, anatomy, biomechanics, diagnostic tools, pain concepts, psychological aspects and stress management, ergonomics, workplace evaluation, muscle physiology, strength, fitness, sport activities and self-care. Teachers were instructed to put a major emphasis on practical notions such as active physical exercises and obstacle-course simulations of home and work environments, and to recommend continuous training possibilities such as those provided in the local gymnastics clubs, fitness resorts, etc.

The objective of the course was to change behaviour and attitude. Concerning behaviours, strong emphasis was put on the importance of physical activity and changes of habits in order to use the body in a less stressing way. For attitudes, the main approach was to stress the potential of the individual in dealing with back pain. The small number (7–12) of participants per group allowed personalized instruction.

TABLE I
Sociodemographic characteristics of participant and control groups

		Participant group ($n = 494$)	Control group ($n = 371$)	Missing participants/controls
Gender	Male	107 (21.7%)	64 (17.3%)	none
	Female	387 (78.3%)	307 (82.7%)	
Age (yr)	< 39	121 (24.5%)	107 (28.8%)	10 (2.0%)/0
	40–49	169 (34.2%)	114 (30.7%)	
	> 50	194 (39.3%)	150 (40.4%)	
Nationality	Swiss	466 (94.3%)	355 (95.7%)	6 (1.2%)/4 (1.1%)
	Northern Europe	16 (3.5%)	10 (2.7%)	
	Southern Europe	6 (1.2%)	2 (0.5%)	
Present activity	Housewife	165 (33.4%)	146 (39.4%)	11 (2.2%)/13 (3.5%)
	Qualified or highly qualified	203 (41.1%)	119 (32.1%)	
	Semi-qualified or non-qualified	84 (17.0%)	70 (18.9%)	
	Miscellaneous, retired, benefiting from an annuity	31 (6.3%)	23 (6.2%)	

Procedures

Participants who registered at back school courses during a 15 week period ($N = 772$) were investigated. They were asked to complete a questionnaire before entering the programme and 8 months later (i.e. 6 months after the end of the course). The questionnaire considered the prevalence and intensity of back pain, and the consequences of pain in terms of number of doctor's visits, drug intake and sick leave during the last 6 months. It also included sociodemographic data. The format was a multiple-choice questionnaire with the exception of pain intensity, where a visual analogue scale was used. In the second questionnaire, two open questions assessed changes in behaviour.

In order to avoid bias in the answers, programme and evaluation were separated. The participants were asked to send the questionnaires back to the SLR and not to the teacher.

A control group matched for age, gender, professional status and nationality was selected from registries derived from a census of the Swiss population by a professional survey institute. As the prevalence of pain was high in the participant group, the control group was pre-selected by phone to match for back pain. Five hundred and ninety-three people received both questionnaires within an 8 month period. The control group had no control intervention.

Data analysis procedure

Subject attrition is a common problem in panel designs [32] and it occurred to some extent in the present study. Out of the 772 subjects in the participant group and 593 in the control group that were recruited for the first questionnaire, 494 (64%) and 371 (63%), respectively, completed the second questionnaire. However, the distribution among responders and non-responders did not differ significantly in the sociodemographic or in the study variables (duration and intensity of low back pain, number of doctor's visits, drug intake and sick leave). Besides, studies using a standard set of tested mail procedures average a 60–77% response rate; higher rates have been obtained, but with specific populations such as university alumni, chief justices of state supreme courts, sociologists [33]. We can thus consider the response rate in this study to be acceptable.

TABLE II
Back pain characteristics of participant and control groups

		Participant group ($n = 494$)	Control group ($n = 371$)	Missing participants/controls
Ever had back pain	Yes	465 (94.1%)	326 (87.9%)	4 (0.8%)/3 (0.8%)
	No	25 (5.1%)	42 (11.3%)	
Present pain	Yes	278 (56.3%)	180 (48.5%)	3 (0.6%/2 (0.5%)
	No	213 (43.1%)	189 (50.9%)	
Present pain intensity	High	18 (6.4%)	25 (13.9%)	13 (4.7%)/6 (3.3%)
	Intermediate	94 (33.8%)	74 (41.1%)	
	Low	153 (55.1%)	75 (41.7%)	
Time since pain onset	< 6 month	16 (3.4%)	11 (3.4%)	17 (3.7%)/11 (3.4%)
	< 1 yr	21 (4.5%)	28 (8.6%)	
	< 5 yr	139 (29.9%)	73 (22.4%)	
	> 5 yr	272 (58.5%)	203 (62.3%)	
Pain occurrence	Daily pain	63 (13.5%)	48 (14.7%)	22 (4.7%)/11 (3.4%)
	> 7 × /month	122 (26.2%)	73 (22.4%)	
	< 7 × /month	146 (31.4%)	98 (30.1%)	
	1–4 × /year	112 (24.1%)	96 (29.4%)	
Localization of present pain	Neck	11 (4.0%)	13 (7.2%)	15 (5.4%)/5 (2.8%)
	High back	22 (7.9%)	14 (7.8%)	
	Low back	134 (48.2%)	90 (59.0%)	
	Global	96 (34.5%)	58 (32.2%)	

TABLE III
Number of doctor's visits of participant and control groups (percentage calculated without missing answers)

		Participant group	Control group
More than 6 doctor's visits	Before	47 (10.5%)	30 (9.5%)
	After	17 (4.5%)	30 (11.7%)
Less than 6 doctor's visits	Before	159 (35.5%)	93 (29.3%)
	After	66 (17.4%)	51 (19.8%)
No doctor's visits	Before	242 (54.0%)	194 (61.2%)
	After	297 (78.2%)	176 (68.5%)
Overall doctor's visits	Change (*P* value)	0.0000	0.0046
Between-group *P* value	Before	0.13478	
	After	0.00135	

To test for differences between participants and controls, Pearson's χ^2 test for independent samples was used. To test for differences between the first and the second questionnaire within groups, McNemar's χ^2 test or Sign test both for paired samples were applied [34].

RESULTS

The population participating in the back school (Table I) was predominantly female (78.3%), Swiss (94.3%), over 40 yr old (73.5%) and had a medium or high professional status (41.1%). Most women (72%) indicating 'housewife' as their present activity had other professional qualifications. The control group did not differ significantly in these variables.

A vast majority of the participants had already experienced back pain (94.1%), whatever their sex, age or profession (Table II). At the time they filled in the first questionnaire, 56.6% (missing answers not included) of the participants reported current pain, mainly in the low back. In the control group, 48.8% reported back pain, the difference between both groups reaching statistical significance (χ^2 (1) = 5.20, $P < 0.05$). Responses on the 10-point visual analogue scale (VAS) were classified in three categories (0–3: low; 4–6: intermediate; 7–10: high) in order to permit better comparison both within and between groups; pain intensity was significantly higher in the control group (χ^2 (2) = 12.98, $P < 0.01$).

Point prevalence of back pain in the participant group decreased significantly from 56.6% at the beginning to 40.7% 6 months after the end of the course (χ^2 (1) = 40.61, $P < 0.001$). However, it also decreased in the control group (48.8 and 37.7%, respectively, χ^2 (1) = 15.56, $P < 0.001$). Whereas point prevalence was significantly higher in the participant group *vs* the control group before the course (χ^2 (1) = 5.20, $P < 0.05$), the difference between the two groups was no longer significant at the time of the second questionnaire.

Current pain intensity, higher in the control group, did not decrease significantly in either group ($Z = 1.3470$, $P = 0.1780$ for the participants and $Z = 0.1132$, $P = 0.9099$ for the control subjects), but the difference was accentuated at the time of the second questionnaire (χ^2 (2) = 17.24, $P < 0.001$).

The number of doctor's visits (Table III) did not differ significantly in the two groups before the back school programme. Overall consultation rates decreased significantly in the participant group (χ^2 (1) = 77.81, $P < 0.001$). They also decreased in the control group (χ^2 (1) = 8.01, $P < 0.01$), but to a lesser extent. High rates of doctor's visits (defined as more than six visits in a 6 month period) as well as low rates (less than six doctor's visits) significantly decreased in the participant group. In the control group, low rates also decreased while high rates remained stable. Between-group analysis of the results showed a significantly higher decrease (χ^2 (2) = 13.21, $P < 0.01$) in the participant group after the intervention than in the control group.

Drug intake (Table IV) was higher in the control group in both questionnaires (χ^2 (2) = 6.17, $P < 0.05$ and χ^2 (2) = 10.44, $P < 0.01$, respectively). A decrease in drug intake was manifest in the participant group (χ^2 (1) = 27.67, $P < 0.001$) as well as in the control group (χ^2 (1) = 7.22, $P < 0.01$).

The majority of the individuals in both groups were working at the time of the first questionnaire and reported no sick leave in the previous months (86.7% in the participant group and 88.5% in the control group). At the time of the second questionnaire, these rates were significantly higher in both groups (95.7 and 93.6%, respectively).

A supplementary analysis was carried out to compare the development of the five main parameters from the first to the second questionnaire between both groups, using an unconditional approach. A significant difference, favourable for the participants, was documented again for number of doctor's visits (χ^2 (4) = 20.01, $P < 0.001$). However, there were no significant between-group differences in the four remaining parameters (presence and intensity of back pain, drug intake and sick leave).

The influences of sex and age were tested in each group. These variables had no influence in either group on life prevalence of back pain and on sick leave. Neither did they affect point prevalence in the participant group. They showed different effects in the two groups regarding pain intensity, number of doctor's visits and drug intake.

TABLE IV
Drug intake of participant and control groups (percentage calculated without missing answers)

		Participant group	Control group
Frequent drug intake	Before	91 (20.0%)	85 (26.6%)
	After	54 (14.1%)	62 (23.5%)
Rare drug intake	Before	77 (16.9%)	40 (12.5%)
	After	45 (11.7%)	34 (12.9%)
No drugs	Before	288 (63.2%)	195 (60.9%)
	After	285 (74.2%)	168 (63.6%)
Overall drug intake	Change (*P* value)	0.0000	0.0072
Between-group *P* value	Before	0.04581	
	After	0.00541	

In the participant group, women had significantly higher scores on these endpoints ($P < 0.05$, $P < 0.05$ and $P < 0.01$, respectively). Sex no longer affected the results at the time of the second questionnaire, except for drug intake which remained higher in women ($P < 0.05$). Age affected drug intake only, both before the course ($P < 0.05$) and at the end of the study ($P < 0.001$), with older participants (> 50 yr old) taking medication more often.

In the control group, sex had only slight effects, with women reporting higher pain prevalence at the beginning of the study ($P < 0.05$) and higher pain intensities at the end ($P < 0.05$). The effects of age were more extensive. Significant differences are systematically due to higher scores in older subjects. Age affected drug intake both at the beginning and at the end of the study ($P < 0.001$ and $P < 0.001$, respectively), point prevalence ($P < 0.001$ and $P < 0.01$) and pain intensity ($P < 0.05$ and $P < 0.01$). It affected number of doctor's visits ($P < 0.05$) in the second questionnaire.

Seventy-six per cent of the participants mentioned behavioural changes in their everyday life activities, such as climbing the stairs instead of using the elevator, using points of support (e.g. armrests) whenever possible, counter-balancing when carrying loads, etc.

Finally, 95% of the participants were satisfied with the course.

DISCUSSION

We expected a decrease in back pain prevalence and intensity after the back school, along with a reduction in the other back pain-related features in the participant group in comparison with the control group. This hypothesis was confirmed for number of consultations with physicians only. The decrease in consumption of medical services parallels the result obtained with telephone contacts for osteoarthritis [35].

For the other parameters, both groups improved. Pain prevalence decreased significantly, though in both the participant and the control group. In the controls, this result may be linked with the natural history of back pain episodes, confirming the good spontaneous course described in the literature [36–38].

Overall perception of pain intensity was not modified after the back school. Results were better in the participant group, but did not reach statistical significance.

As data are self-reported, it is impossible to evaluate the costs of back pain and the possible savings linked with the decrease in doctor's visits and drug use in the participants. Other studies also showed a trend towards a decrease in the costs of back pain (linked with medical consumption and sick leave) after a primary prevention programme [29, 39, 40]. However, these studies concerned on-site interventions. Our study dealt with subjects from a general population who volunteered for an educational programme unconnected to any institution or business.

Who volunteered for such a programme? Our results strongly support the assumption that volunteering for a back pain prevention programme is associated with the presence of back pain problems. Life prevalence was very high in the participant group, with back pain problems dating back from more than 5 yr in the majority of the participants. Nearly 40% reported daily pain or more than seven episodes of pain a month. These data suggest that the aim in this population is not to prevent the occurrence but the recurrence of back pain as in a secondary, and not a primary, prevention programme. This result shows that although primary prevention supposedly addresses healthy individuals, motivation for volunteering is linked with symptoms.

The participants were mainly women. Studies on the relationships between gender and health may account, at least partially, for the higher rate of volunteering in women: the rates of acute and chronic health problems are higher at all ages among women than among men [41], and women use health services and medications more often than men [42]. In addition, women generally tend to be more compliant with treatment regimens [41] and have a more conscious relationship with their body and health [43].

More conscious relationships with one's body and health are also a feature of medium and high socio-professional categories [43]. A large proportion of the participants were qualified or highly qualified individuals, and only a small proportion were non-qualified. This result parallels those obtained in cardiovascular heart disease prevention programmes [44]. Thus, the subjects who volunteered represented a particular sample, and our results are not applicable as such to the general population. This raises the issue of motivation, not only when comparing our volunteer subjects to the general population, but also when comparing them to the control group.

Why did the control group, selected for the same prevalence of back pain, not volunteer for a prevention programme? Sociodemographic variables such as sex, age, professional status and nationality do not account for these reasons as the control group was matched with the participant group on these variables.

An explanation for volunteering might be found in the different ways participants and controls try to solve their back pain problems, at least regarding two types of behaviours, i.e. number of doctor's visits and drug intake. Dependence versus independence towards health professionals may account for the decrease in consultations of the participants who tried to solve their problems actively with the back school, whereas the control group continued to go to see the doctor.

Drug intake was significantly higher in the control group. Drug intake and participation in a back school programme can be considered in terms of health locus of control [45–47] as two different ways of dealing with back pain problems. The locus of control construct concerns the allocation of responsibility for an outcome [48]. Back school emphasizes self-control, and self-responsibility and self-care are among its major focuses. Studies on locus of control in pain patients suggest that the use of medication may also be a means of self-control [49–51]. Both behaviours can thus be

viewed as referring to a control located in the individual's own behaviour, perhaps within a more active frame for the back school group. Our study design does not allow us to draw firm conclusions on this issue, as attitudes towards back pain were not quantified; this shortcoming must be acknowledged. Relationships between health locus of control, health behaviours and determinants for the participation in a back school programme may be an issue for future research.

Participants' satisfaction with the programme was very high, which parallels the results reported in other studies [52–55]. Three-quarters of the participants said that they changed their behaviours, such as using correct positions, bending and carrying as well as exercising regularly. The changes in their everyday life activities may also affect the individuals' psychological well-being (if for no other reason than they are complying with a most up-to-date trend: health promotion and prevention).

Overall, the results of this study showed that a back school for the general population may not solve the problem of low back pain, but improves self-help in a subgroup of the population.

How to reach the rest of the population raises an important issue when implementing prevention programmes, and our results as to who volunteers parallel those of other prevention campaigns (e.g. cardiovascular heart disease [44]). To create motivation regarding prevention in the other groups raises questions such as how different groups view back pain, its causes and its consequences, or ways to get rid of it or to prevent it.

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