Research Article
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# Benefits of Back School in functional capacity and pain intensity of patients with chronic low back pain.

## Benefícios da Escola de Postura na capacidade funcional e na intensidade da dor de pacientes com lombalgia crônica.

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**Abstract**
**Introduction:** Due to the high incidence of low back pain in the population, is very important to study methods of prevention and treatment for this disease. The Back School, an approach that aims to provide to participants the increase of self-care, associating primary prevention to health education, has been suggested for the treatment of patients with chronic low back pain. **Objective**: The aim of this study was to evaluate the benefits of Back School on functional capacity and pain intensity, in short and medium term, at patients with chronic low back pain. **Methods**: Fifty eight patients with chronic low back pain, selected at UniCesumar physical therapy's clinic, were evaluated, by an independent examiner, using Roland-Morris Questionnaire, Pain Visual Analogue Scale and asked about medications consumption. In sequence, all the patients were randomized into two groups: 1) School Program and 2) Control. The group 1 patients participated of Back School program, composed of theoretical-practical classes, twice a week, totaling ten classes of 60 minutes; and group 2 were followed only by phone calls. The data were statistically analyzed by Mann-Whitney U test, Friedman and Wilcoxon, using the significant values of $p < 0,05$. **Results**: Fifty three patients finished the study and were analyzed after the treatment protocol, as well as three and six months sequent. The improvement in pain intensity and functional capacity was statistically significant only in the Back School group. **Conclusion**: In the present study, it was verified the effectiveness of Back School program to improve pain intensity and functional capacity of patients with chronic low back pain.
**Keywords:** Low Back Pain; Health Education; Rehabilitation.

**Resumo**
**Introdução**: Devido à alta incidência de lombalgia na população, estudar métodos que abordem a prevenção e o tratamento dessa afecção é de suma importância. A Escola de Postura, abordagem que objetiva proporcionar aos participantes o aumento do autocuidado, associando a prevenção primária à educação em saúde, tem sido sugerida para o tratamento de pacientes com lombalgia crônica. **Objetivo**: O objetivo deste estudo foi avaliar os benefícios da Escola de Postura na capacidade funcional e na intensidade da dor, a curto e médio prazo, em pacientes com lombalgia crônica. **Método**: Cinquenta e oito pacientes com lombalgia crônica, selecionados na clínica de Fisioterapia da UniCesumar, foram avaliados por um examinador independente, através do Questionário Roland-Morris, da Escala Visual Analógica da dor e questionados quanto ao consumo medicamentoso. Na sequência, todos foram aleatorizados em dois grupos: 1) Escola de Postura e 2) Controle. Os pacientes do grupo 1 participaram do programa de Escola de Postura, composto por aulas teórico-práticas, com frequência de duas vezes por semana, totalizando dez aulas de 60 minutos; e os do grupo 2 foram acompanhados apenas por meio de ligações telefônicas. Os dados foram posteriormente analisados estatisticamente através dos testes "U" de Mann-Whitney, Friedman e Wilcoxon, sendo considerados estatisticamente significantes os valores de $p < 0,05$. **Resultados**: Cinquenta e três pacientes terminaram o estudo, sendo reavaliados após o protocolo de tratamento, assim como aos três e seis meses sequentes. A melhora de intensidade de dor e da capacidade funcional foi estatisticamente significativa apenas no grupo Escola de Postura. **Conclusão**: No presente estudo, verificou-se efetividade da Escola de Postura na melhora da capacidade funcional e intensidade da dor dos pacientes com dor lombar crônica.
**Palavras-Chave:** Dor lombar; Educação em saúde; Reabilitação.

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## INTRODUÇÃO

The low back pain, defined as a pain, muscular tension or rigidity between the costal board line and the lower gluteal crease, can be classified as acute, when persistent for less than six weeks; sub acute, between six weeks and three months; and chronic, when persist for more than three months. This condition also can be classified as "specific", when is caused by a pathophysiological factor as, for example, disc herniated, osteoporosis or fracture; and "non-specific" when there aren't any specific cause, and the principal symptoms are pain and inability. Approximately 90% of all low back pain individuals are affected by the "non-specific"".[1]

The low back pain is a relevant health public problem, it reaches approximately 70% to 80% of the general population, at least once in life, interrupting labor activity or daily activities. It is estimate that it affect 15% to 30% of north-American population and it's the principal reason of absent from work in people under 45 years.[2,3] Silva, Fassa and Valle[4] assessed the prevalence of chronic low back pain at an adult population in south Brazil and related that 76,7% of individuals with chronic low back pain presented difficulties in perform labor activities, being 97% absent of work due pain.

Many cause and factors are related to low back pain and, generally, more than one are associated.[5] Studies showed that age, low education, female, obesity, sedentary, poor posture, repetitive movements, carry weight at work and smoking are risk factors to low back pain.[4,6] Psychosocial and psychological factors, as stress, depression and unfavorable working environment, predisposes to the occurrence of low back pain.[7-9]

According to Knoplich,[2] the primary prevention of low back pain involves the care taken to avoid the presence of pain and the secondary prevention is given to those who have had episodes of pain. A measure to prevent pain and degenerative processes is to maintain good posture, which encloses the comprehension and body understanding of himself.[10] The actual guidelines to treat the chronic low back pain recommends postural correction and educational measures, in order to improve the functionality of spine.[11] The health education aims to disseminate new informations, stimulating changes of actions and attitudes. Therefore, methods that approach the primary prevention associated to health education should be use in low back pain cases. In this context, the Back School arise, an educational and prevention program, created in 1969, by the Swedish physiotherapist Mariane Zachrisson-Forssell, with the objective to prevent and reduces the low back pain.[2]

In Brazil, the Back School emerged in 1972, at Servidor Público Estadual de São Paulo Hospital, idealized by Jose Knoplich, being published in book and video for transmission to industry workers, in way to guide them about pain prevention in all environments, not only during the job.[2] After 80's, Back School start to expand with elaborated protocols involving a multidisciplinary approach, enabling many health professionals acts on the same problem.[12]

The aim of Back School is to provide to participants the increase of self-care, which includes a major acknowledgment about how to execute daily activities in the correct way, realize relaxing exercises and strengthen the muscles.[13]

Heymans et al.[14] found a moderated evidence of Back School in chronic low back pain patients, emphasizing the need to new studies with high quality methodologic.

Due the high incidence of low back pain in population and the huge physics, emotional and economics prejudice that occurs in affected individuals, study the methods which approach the prevention and treatment of low back pain is of paramount importance. The Back School fits in this frame, because associates the primary prevention to health education.

The aim of this study was to evaluate the benefits of Back School on functional capacity and pain intensity, in short and medium term, at patients with chronic low back pain.

## METHODS

This study was a randomized blind trial, realized at UniCesumar physical therapy's clinic, being previously approved by Committee on Ethics in Research of this institution with the protocol number 185/2011.

After assessed the routing and patients files with chronic low back pain of the referred clinic, patients received phone calls, were informed about the aims of the research, questioned about inclusion and exclusion criteria of the study and invited to participate of the study.

To be included in the study, the participants should have sought UniCesumar physical therapy's clinic with complaint of low back pain or disease that causes low back pain, and underwent to a treatment at this clinic or another one in the last five years and within the age range of 40 to 65 years old. Patients underwent to spine surgery in the last two years, with fibromyalgia, tumor, inflammatory or infectious diseases of the spine and fractures were excluded.

After get in touch with the participants by phone and explain about the study methods, the ones who agree in participate and filled the inclusion criteria, voluntarily signed the statement of informed consent.

Before the execution of treatment protocol, all patients were analyzed by an independent examiner, which means, he had no knowledge as to which group the patients would be designated. The evaluation included the following instruments: Visual Analogic Scale (VAS), to measure pain;[15] and Roland-Morris inability questionnaire, which is specific to low back pain.[16] The included

patients were also questioned about medications consumption before and after the treatment protocol.

Following, the individuals were divided through random number generated by computer, into two groups: Back School (1) and Control (2).

The individuals of group 1 participated of the Back School program, which consists in ten classes with sixty minutes each, taught twice a week, to classes of five to ten persons. The classes had theoretical and practical content, taught by physical therapy course professor. The theoretical content, applied in the first 30 minutes of the class, included notions of spine anatomy, biomechanics, spine conditions, posture, muscular balance, ergonomics care and crisis situation. Classes were expository and dialogued, with audiovisual resources as multimedia, videos and informative brochures. The practice included stretching exercises, strength, body awareness, posture training, positioning in daily activities and guidelines, which were performed in the final 30 minutes, being the final five minutes dedicated to relaxing exercises (Chart 1).

The patients designated to Control group were followed through weekly phone calls, answering questions about general state, without any orientation by the researchers. After the end of the study, the control group were routed to received physical therapy treatment of their choice.

The evaluation was repeated, by the same examinator, in the end of the program, three and six months after the end of Back School program, using the same instruments of the initial evaluation.

The collected information were statistically analyzed through SPSS program 15.0 version, being consider significant the results with $p < 0.05$. To analyze the distribuition of data, was used the Kolmogorov-Smirnov test. Since data did not presented a normal distribuition, were used the Median (Md) and Quartis (Q1; Q3) to characterized of the results of numerical data. For categorical data, frequency and percentage were used. For comparison between groups, the "U" Mann-Whitney test was used and for comparison of variables between the four moments (before, after, three and six months after treatment) within groups, the Friedman test was used. For the analysis of medications consumption before and after treatment, the Wilcoxon test was used.

## RESULTS

Were selected 223 routing and patients files with chronic low back pain of UniCesumar physical therapy's clinic, being 165 excluded for different reasons. Therefore, fifty-eight patients were included in this study, being 29 designed by randomization to group 1 (Back School) and 29 to group 2 (Control).

Five patients from group 1 left treatment, being two for unavailability of time, one for family health problems and two without reason. Thus, completed the study and were analyzed 53 patients. (Figure 1)

About group 1 patients, six were male and eighteen female; fifteen were married, four single, four divorced and one widower. The most prevalent professions of

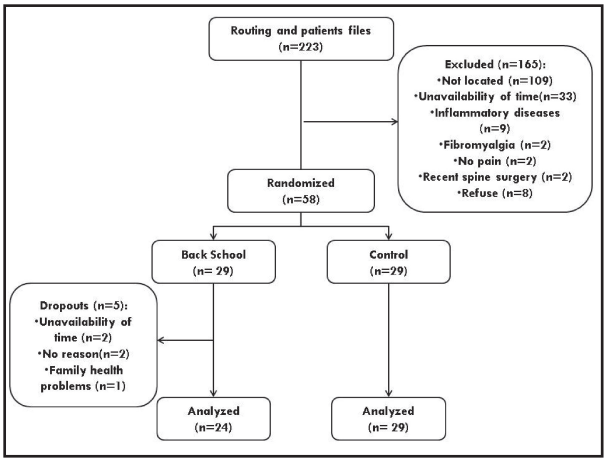


**Figure 1**. Distribution of subjects included in the study.

**Chart 1**. Back School Protocol.

| | |
|---|---|
| **PHASE 1: THEORY**<br>Duration: 30 minutes | CLASS 1 and 2: Spine anatomy<br>CLASS 3 and 4: Spinal biomechanics<br>CLASS 5: Spine Disorders<br>CLASS 6: Posture and muscle balance<br>CLASS 7 and 8: Causes and ways to avoid pain<br>CLASS 9: Ergonomic care<br>CLASS 10: Care in crisis situations |
| **PHASE 2: PRACTICE**<br>Duration: 25 minutes | CLASS 1: Sit, lie down and lift correctly<br>CLASS 2: Remain standing and walking correctly<br>CLASS 3: Crouch, pick up objects and load them correctly<br>CLASS 4: Correct rotations of the spine<br>CLASS 5: Ideal sleeping position<br>CLASS 6 and 7: Postures while performing household activities<br>CLASS 8: Postures while performing daily activities<br>CLASS 9: Postures while performing work activities<br>CLASS 10: Appropriate sports activities for the spine<br>All classes approach stretching and strengthening exercises. |
| **PHASE 3: RELAXING**<br>Duration: 5 minutes | Individually or in pairs. |

group 1 were housewife (21%), seller (13%) and mason (13%). In group 2 there were seven males, 22 females; 19 were married, five single, two divorced and three widower. The most prevalent professions of group 2 were housewife (29%), seamstress (17%) and seller (13%). When compared the patients characteristics in the beginning of the study throught "U" Mann-Whitney test, were found significant differences in pain intensity variable, measure by VAS (Table 1).

The results analyzes obtained after treatment protocol were found significant differences ($p<0.05$) in pain intensity and functional capacity only in patients underwent to Back School (Table 2 and 3).

In comparison between two groups in different periods of assessment (after treatment, three and six months of follow-up), were observed significant differences ($p<0,05$) in all revaluations both in pain intensity ($p=0,001$, $p=0,000$ e $p=0,000$, on three revaluations, respectively) and functional capacity ($p=0,018$, $p=0,013$ e $p=0,022$) in Back School group.

At initial evaluation, 22 patients (92%) of back School group (1) did not took any medications and two patients (8%) took analgesics. At revaluation after treatment protocol, were verified that none of Back School group patients took medications. At initial evaluation of control group (2), 17 patients (58,6%) did not took any medications, seven (24,1%) took analgesics, one patient (3,4%) took nonsteroidal antiinflammatory and four patients (13,8%) tooks analgesics and nonsteroidal antiinflammatory. At revaluation of control group were verified that 16 patiens (55,2%) did not took any medication, ten patients (34,5%) took analgesics, one patients (3,4%) took nonsteroidal antiinflammatory and four patients and two patients (6,9%) analgesics and nonsteroidal antiinflammatory.

Comparing to medications amount consumption before and after treatment, were not observed any significant differences inside Back School ($p=0,180$) and control group ($p=0,468$), however it was observed between groups ($p=0,000$).

## DISCUSSION

According to presented results, the Back school program presented significant benefits to improve pain intensity and functional capacity of patients underwent treatment, those results did not happened at control group. Although five patients (8,62%) did not completed the study, this little number of losses did not influenced study results. The losses just happened at Back School group and could be justified by the fact that control group patients were followed just by phone call and did not need to go to the study site.

Heymans et al.[14], in a systematic review including nineteen random trials, which only six methodolog-

**Table 1.** Baseline characteristics of patients included in the study.

| Variables | Back School (n=24) Md (Q1; Q3) | Control (n=29) Md (Q1; Q3) | P |
|---|---|---|---|
| **Age (years)** | 55 (48,25; 57) | 52 (48; 55) | 0,329 |
| **Time claims (months)** | 120 (60; 240) | 84 (54; 192) | 0,281 |
| **Visual Analogic Scale (cm)** | 3,7 (2,6; 6,2) | 5,5 (4,75; 7,75) | 0,049* |
| **Roland-Morris Questionnaire (points)** | 10,5 (8; 14) | 11 (7; 17,5) | 0,561 |

* Significant differences ($p<0,05$) – Mann-Whitney "U" test.

**Table 2.** Evaluation of Group 1 variables before, after treatment protocol and segments 3 and 6 months.

| Variables | Back School Group (n=24) | | | | |
|---|---|---|---|---|---|
| | Before | After | 3 months | 6 months | P |
| **Visual Analogic Scale (cm)** | 3,7 (2,6; 6,2) | 3,2 (1,68; 4,78) | 2,9 (1; 4) | 2,7 (0,48; 4,12) | 0,005* |
| **Roland-Morris Questionnaire (points)** | 10,5 (8; 14) | 6,5 (2; 11) | 4,5 (1; 9,25) | 3,5 (0,75; 10) | 0,000* |

* Significant differences ($p<0,05$) – Friedman Test.

**Tabela 3.** Evaluation of group 2 variables before after the treatment protocol and segments 3 and 6 months.

| Variables | Control Group (n=29) | | | | |
|---|---|---|---|---|---|
| | Before | After | 3 months | 6 months | p |
| Visual Analogic Scale (cm) | 5,5 (4,7; 7,7) | 5,5 (3,95; 7) | 5,4 (4,1; 7,5) | 6 (5,1; 8,75) | 0,246 |
| Roland-Morris Questionnaire (points) | 11 (7; 17,5) | 10 (5,5; 18,5) | 10 (4,5; 19) | 10 (5; 19.5) | 0,414 |

* Significant differences ($p<0,05$) – Friedman Test.

ic high quality, found moderate evidence suggesting that Back School promotes a short and medium term improve in pain intensity and function when compared to therapeutic alternatives, placebo or wait list. That found corroborates with the present study.

We emphasize, however, that the inclusion in this study of patients with specific and non-specific low back pain increases the risk of bias. The difficulties in determining the clinical diagnosis in practice is a justification for this inclusion.

Previous studies analyzed the effects of Back School in chronic low back pain. Yang et al.[17] implemented a Back School program lasting four weeks, two hours of classroom a week. The classes were taught by physical therapists, physiatrists and physicians assistants to groups of up to ten students. The content taught was based on lectures on anatomy and physiology of the spine and history of low back pain and posture mechanism column. Orientations, stretching and strengthening exercises, diaphragmatic breathing and relaxation were also conducted in a practical way. The research result showed that the Back School program associated with strengthening exercises was effective in reducing the intensity of pain, improved functional capacity and general health, as short-term effects. The protocol adopted in this study is similar to that applied by Yang et al.[17] and the results presented in the variables pain intensity and functional capacity in the short term, medium term and six months after completion of the treatment protocol.

These results were also found in other studies such as the one conducted by Tobo et al.[18], who analyzed the functional capacity and pain intensity of 43 patients with chronic low back pain, of both genders, mean age of 56.25 years. These subjects were submitted to a Back School program of thirty-four hours in four straight days, consisting of theoretical and practical activity, with return in two months for reevaluations, observed a statistically significant improvement in functional capacity and pain intensity.

Borges et al.[19] treated 29 patients with chronic musculoskeletal pain with a mean age of 55.9 years through a program conducted in five meetings lasting two hours each, being the first forty minutes theoretical and seventy minutes of exercise practical for trunk and lower limbs. Data analysis found that the program was effective with significantly improved of upper limbs, lower limbs and spine pain, functional capacity and quality of life of the participants.

Different results were observed in the study by Andrade Araújo and Vilar[3], which divided 57 patients into two groups: experimental and control. Patients in the experimental group participated in a Back School program theoretical and practical, consisting of four weekly classes of 60 minutes. Patients in the control group stayed in a waiting list. Were analyzes pain intensity, functional capacity and flexibility of the lumbar spine at three time points (beginning, four and 16 weeks) in each group. Significant improvement was observed only in the experimental group in the pain intensity, functional capacity and flexibility of the lumbar spine, and these results were maintained after 16 weeks only in the variables of pain intensity and functional capacity.

Significant improvement in lumbar flexibility, quality of life, functional status and pain intensity were also be observed in the study by Nogueira and Navega[20], in which thirty-one administrative workers sector with chronic nonspecific low back pain were treated through a weekly seven meetings, lasting one hour each. The authors believe that the beneficial results obtained with the program are due to the fact that activities were easily reproducible and related to the daily lives of workers.

On the other hand the study of Ribeiro et al.[21] evaluated the effectiveness of Back School program through two groups (intervention and control group) in patients with chronic low back pain. The intervention group participated of the Back School program, which consists of five practical classes of one hour each (four weekly and one after 30 days), performed by a physiotherapist and rheumatologists. The control group received medical visits during the same period, questionnaires about back problems and medication were applied, but no educational guidance was performed. The results showed no significant difference between the two groups regarding pain intensity, functional capacity, anxiety and depression. The Back School was more effective in decreasing drug use (anti-inflammatory and analgesic) and improves the general health.

In relation to medication consumption in the present study, the initial distribution of the groups was different, making it difficult to compare results, since the initial consumption of the Back School group was lower than control. It is noted, however, that after the treatment protocol decreased the consumption in the Back School and increased in the control group.

Recently Korelo et al.[22] implemented a kinesiotherapeutic group program allied to Back School program in ten individuals. The program consisted of twelve sections, taken once a week for three months. After completion of the program, was observed significant improvement in pain and functional capacity of participants individuals, those findings corroborate with the present study results.

As can be seen, the protocols of the Back School program vary in amount and duration of classes, number of participants, theoretical and practical content, assessment period and staff. Di Fabio[23] affirm that due to these variations in study methods, it is difficult to determine the effectiveness of Back School program. Already, Souza[24] affirm that the effectiveness of a program is directly linked to the training and motivation of the profes-

sionals involved, also being important adequate didactic-pedagogic manner.

Thus, despite the different protocols employed in Back School program, in general, studies point the effectiveness of the method, influencing the reduction of back pain and improved functional capacity of the participants.

Therefore, it is suggested that further studies be conducted in order to analyze the effectiveness of the Back School program, in short, medium and long term, especially combined with other interventions that are already present scientific evidence.

## CONCLUSION

In the present study, it was verified the effectiveness of Back School program to improve pain intensity and functional capacity of patients with chronic low back pain.

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