



REVISTA BRASILEIRA DE REUMATOLOGIA

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Review article

Back schools in Brazil: a review of the intervention methodology, assessment tools, and results

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ARTICLE INFO

Article history:

Received on 23 March 2013

Accepted on 4 April 2013

Keywords:

Posture

Education in health

Health promotion

Adult

Brazil

ABSTRACT

The Back School is characterized as an educational program aimed at individuals who have chronic pain in spine. In Brazil, a growing number of research studies on the effects of such programs have been observed in the last decades. Thus, the purpose of this systematic review was to identify studies on Back Schools carried out in Brazil with a population of adults and elderlies, and to compare their intervention methodologies, data collection tools, and results. A search for scientific articles and Master's and doctoral theses in several databases was conducted. The keywords used in that search were *Postural Program*; *Postural School*; *Back School*; *Back Care Education*; *Back Education*, as well as the respective terms in Portuguese. Eighteen studies were found, being fourteen quantitative and four qualitative studies. The studies showed many differences between them, in both the interventions proposed and the methodological design. However, the use of similar tools for assessing pain intensity, functional capacity, and quality of life between the quantitative studies allowed a partial comparison of the efficacy of those programs. The studies included in this systematic review demonstrated, in general, the immediate efficacy in reducing pain and improving functional capacity and quality of life after the Back School. Results, however, are still conflicting regarding the efficacy in the medium and long terms. Thus, it becomes necessary to conduct further studies that include follow-up assessments in the medium and long terms in order to obtain more accurate conclusions about the efficacy of Back Schools.

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Escolas posturais desenvolvidas no Brasil: revisão sobre os instrumentos de avaliação, as metodologias de intervenção e seus resultados

RESUMO

A Escola Postural se caracteriza como um programa educativo direcionado a indivíduos que apresentam dores crônicas na coluna vertebral. No Brasil observou-se, nas últimas décadas, um número crescente de pesquisas sobre os efeitos desses programas. Assim, o objetivo desta revisão foi identificar as pesquisas sobre as Escolas Posturais desenvolvidas no Brasil com a população de adultos e idosos, comparando-se metodologias de intervenção, instrumentos de coleta de dados e resultados. Realizou-se uma busca sistemática de artigos científicos e teses e dissertações em várias bases de dados. As palavras-chave utilizadas na

Palavras-chave:

Postura

Educação em saúde

Promoção da saúde

Adulto

Brasil

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<http://dx.doi.org/10.1016/j.rbre.2014.02.007>

busca foram *Postural Program*; *Postural School*; *Back School*; *Back Care Education*; *Back Education*, e os respectivos termos em português. Foram encontrados dezoito estudos, sendo quatorze quantitativos e quatro qualitativos. Os estudos apresentam inúmeras diferenças entre si, tanto nas propostas de intervenções quanto no desenho metodológico. Contudo, a utilização de instrumentos semelhantes para a avaliação da intensidade da dor, da capacidade funcional e da qualidade de vida entre os estudos quantitativos permite uma comparação parcial da eficácia desses programas. Os estudos incluídos nesta revisão demonstram, em geral, a eficácia imediata na diminuição da dor e na melhora da capacidade funcional e da qualidade de vida após a Escola Postural. Porém, observou-se que os resultados ainda são divergentes em relação à eficácia no médio e longo prazos. Deste modo, torna-se necessária a realização de novos estudos que contemplem reavaliações a médio e longo prazos para que conclusões mais precisas sobre a eficácia das Escolas Posturais sejam obtidas.

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Introduction

The World Health Organization (WHO) proclaimed the period between 2001 and 2010 as the "Decade of Bone and Joint", in order to raise awareness for musculoskeletal pathologies and pain.^{1,2}

Back pain is the most common musculoskeletal disorder; it is estimated that 60% to 80% of the world population will, at some point in their life, suffer from it.³⁻⁷ Of these individuals, it is estimated that 40% will develop a picture of chronic pain,⁸ which is defined by the WHO as sporadic episodes of pain over a period of six months, or a pain that lasts over three months, which may lead to frequent work absenteeism, early retirement, and lower productivity.^{9,10}

Chronic low back pain is relevant, because it creates physical, mental, and emotional distress due to the inability of the individual to control it and due to the reduced functional capacity.^{4,11,12} These changes trigger a reduction in the quality of life of individuals and contribute to the chronicity of the problem.^{13,14}

In 1969, Mariane Zachrisson-Forsell, a Swedish physiotherapist, proposed an educational program called the Back School, aimed at reducing the features of chronic low back pain.^{15,16} The translation of the name of the program into Portuguese has varied, and the most commonly used terms are: *Escola de Coluna*,^{17,18} *Escola de Postura*,^{8,19} *Escola Postural*^{20,21} e *Programa de Educação Postural*²² (*Back School*, *Postural School*, *Back School*, *Postural Education Program*).

The main objective of the Swedish Back School was to educate and ergonomically improve the posture of individuals with back pain, enabling them to actively protect themselves against spinal injuries. The proposed approach was a physiotherapist teaching four lessons of 45 minutes each, twice a week. Based on the etiology of back pain and on electromyographic studies, Forsell believed that, when performing appropriately activities of daily living (ADL), individuals would be able to prevent or control their pain.^{15,16} In the first lesson of the program, notions about the spine, causes of pain, and postures of relaxation are addressed. In the second lesson, theoretical orientations on ADL are issued, emphasizing the sitting and standing posture, and with exercises at home. In the third lesson, the participants practice the previously received informa-

tion; transport of objects and lifting practice are addressed, and exercises for the lower limbs are practiced at home. In the last lesson, patients are encouraged to practice regular physical exercise to decrease pain; finally, the contents of previous classes are reviewed.^{15,16}

After the Swedish Back School, different programs emerged; while the original objectives were retained, the number of classes and the contents were modified.^{17,23,24}

In Brazil, back school was implemented in 1972, at the Hospital do Servidor Público de São Paulo by physician Joseph Knoplich,^{17,18,24} but only in 1998 was the first research on a back school program developed in Brazil published.¹⁷

In the literature, there are several publications on back schools, as well as systematic reviews comparing the results of previous studies on the effectiveness of back schools.²⁵⁻²⁷ However, only one study conducted in Brazil was found in a systematic review of articles,²⁷ which prevents the summarization of the researchers' interest and of the studies that have been developed in this country. There are two reviews published in Brazilian journals that address back schools and discuss the structure of programs in Europe, North America, and Brazil.^{17,18} However, these reviews did not present data on the Brazilian scientific production.

Thus, this study aimed to answer the question: do the studies developed in Brazil demonstrate the effectiveness of the back school programs and allow for this educational approach to be recommended in healthcare services? To answer this question, studies that evaluate back schools developed in Brazil with adults and older populations were identified, determining research methods, intervention proposals, data collection instruments, and results.

Methodology

A literature search was conducted in Scopus, ScienceDirect, PubMed, and SciELO databases. The keywords used were: *Postural Program*; *Postural School*; *Back School*; *Back Care Education*; *Back Education*; and the respective terms in Portuguese. The studies had to meet the following inclusion criteria: (a) described, developed, and evaluated a theoretical and/or practical educational program related to the teaching of the proper performance of ADLs, (b) developed in Brazil from 1970 onwards, and (c) applied to people over 18 years old. The exclusion criteria were: (a) studies linked to work activities, and (b)

studies directed to patients with acute and subacute pain, i.e., with less than three months' duration.

In order to include dissertations and theses that were not published in scientific journals, a survey was conducted with the same keywords in the CAPES Bank of Theses and Dissertations (Banco de Teses e Dissertações da CAPES - BTDC).

The initial selection was performed by the reading the titles and the city where the back school programs were applied. For potentially eligible studies, in addition to the reading of the titles, the abstracts were also read. The articles that initially met the inclusion criteria were read and analyzed in full; after final analysis, those that met all inclusion criteria were included.

At the end of article selection, data regarding the location and the type of study (qualitative or quantitative) were initially collected; then, the programs developed, the instruments used for data collection, and the results found were also recorded.

Results

Fig. 1 shows the flowchart of the adopted strategy to search and inclusion of articles. Of the 563 articles initially identified from the keywords in the period from 1970 to 2011, 527 were excluded because they had not been conducted in Brazil. Of the 36 articles addressing programs in Brazil, 20 were excluded after the abstract analysis, since they did not meet all the inclusion criteria. Therefore, 18 articles were selected for this review. Finally, two studies retrieved from the BTDC - a Ph.D. thesis and a Master's degree dissertation - were included.

Table 1 presents and describes in chronological order the 18 studies selected and included in this review, which developed programs in Brazil directed to the teaching of proper posture in ADL for people over 18 years of age. In this table authors, year of publication, title and place of study, and classification (qualitative, experimental, quasi-experimental and

semi-experimental) are identified.²⁸ Table 2 summarizes the qualitative studies and the instruments used. Table 3 contains the quantitative studies, presenting the sample size and data collection instruments, which were divided into instruments for measuring pain intensity, functional capacity, and quality of life.

The structure of the back school programs described in the analyzed studies varied regarding the teaching strategies, duration of the classes, and program. There was a predominance of programs organized in up to five lessons,^{8,21,29-36} featuring a tendency to follow the parameters of the Swedish Back School program, which is taught in four classes of 45 minutes each. However, six programs were administered in eight to 14 classes,^{20,37-41} and two programs were structured with 20 or more classes.⁴²⁻⁴³

Regarding the duration of the classes, classes of up to one hour duration^{8,21,29,32,33,36,41,43} and between one and two hours^{20,31,35,38,42} were predominant. In relation to the number of classes administered per week, most programs had classes once a week.^{8,20,32,33,35-39}

In general, the back school programs developed in the studies addressed all the topics that comprise the Swedish Back School.^{8,20,21,30-32,34-39,41-43} These programs addressed theoretical notions on the spine and causes of pain, provided theoretical and practical guidelines on ADL, performed exercises and relaxation postures, and encouraged the practice of home exercises. The studies by Caraviello,²⁹ Ribeiro,³³ and Souza⁴⁰ developed only theoretical classes and exercises.

The programs were taught either by physical therapists,^{8,20,21,31,32,40,42} physical therapists and physicians,³³ physical therapists and physical education teachers,³⁶ or by multidisciplinary teams.^{29,30,34,39,43}

The studies were performed predominantly in the state of São Paulo, where eight studies were retrieved, pertaining mostly to the University of São Paulo,^{8,29,30,33,34,36,39,43} and Rio Grande do Sul, from where five studies were retrieved.^{20,21,35,41,42} Other studies have been developed in the Northeastern and Northern regions. Most were linked to hospitals and univer-

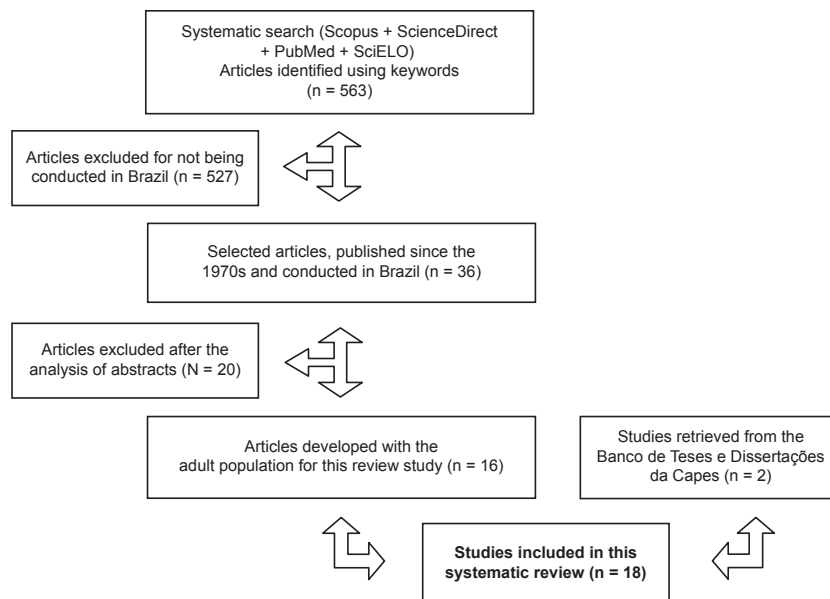


Fig. 1 – Flowchart of selection of articles from 1970 to 2011.

sity clinics, and only three were developed at primary care services.^{8,21,35}

The sample covered in the studies varied in size: – the smallest sample was comprised by four subjects,⁴⁰ and the largest, 110.³⁰

Only four qualitative^{20,37,38,42} studies were found; in these studies, interviews (individual or group) and participant observations were used as research instruments (Table 2). Such studies interpreted meanings and perceptions expressed by participants during or after the program completion.⁴⁴

Table 1 – Summary of studies included in this review.

Author/Year	Title	Study Site	Type of Study
FURLAN, 1998	Escola de Coluna – Programa desenvolvido no Instituto de Ortopedia e Traumatologia do HC FMUSP	IOT HC FMUSP	SE
SCHUCH, 2000	Escola Postural para a Terceira Idade	NUTTI – UNISINOS	QE
UES, 2003	Escola Postural para Terceira Idade	PSF Dante Westphalen, Cruz Alta- RS	SE
SOUZA, 2003	Escola postural: um caminho para o conhecimento de si e do bem-estar corporal	EsEF/UFRGS	Q
VIEIRA, 2004	A Escola Postural sob a Perspectiva da Educação Somática: a reformulação de um programa de extensão na EsEF/UFRGS	EsEF/UFRGS	Q
CARAVIELLO, 2005	Avaliação da dor e função dos pacientes com lombalgias tratados com um programa de Escola de Coluna	Lar Escola São Francisco UNIFESP – EPM	SE
TSUKIMOTO, 2006	Avaliação longitudinal da Escola de Postura para dor lombar crônica: através da aplicação dos questionários Roland Morris e Short Form Health Survey (SF-36)	DMR HC FMUSP	SE
GUEDES, 2007	A metodologia da problematização na Escola de Postura da UFPB: um processo emancipatório da educação gerontológica.	Clinical Physiotherapy School, UFPB	Q
SANTOS, 2008	Avaliação do programa Escola de Postura em pacientes com lombalgia crônica do Hospital Municipal de Rolim de Moura – RO	Hospital de Rolim de Moura/RO	SE
ARCANJO, 2008	Percepção sobre a qualidade de vida de mulheres participantes de oficinas educativas para dor na coluna.	Higher Education Institution, Fortaleza, Brazil	Q
ANDRADE, 2008	Escola de Coluna para pacientes com lombalgia crônica inespecífica: benefícios da associação de exercícios e educação do paciente	Clinical Physiotherapy School, Universidade Potiguar (UnP)-RN	E
RIBEIRO, 2008	Effectiveness of a back school program in low back pain	UFSP	E
FERREIRA, 2010	Efeitos de um programa de orientação para adultos com lombalgia	UBS and USF, Marília-SP	SE
TOBO, 2010	Estudo do tratamento da lombalgia crônica por meio da Escola de Postura	IMREA-HCFMUSP	SE
SOUZA, 2010	Efeitos da escola de postura em indivíduos com sintomas de lombalgia crônica	Physical Therapy Clinic of the FACIMED	SE
MARTINS, 2010	A eficácia da conduta do Grupo de Coluna em pacientes com lombalgia crônica	FUNFARME/FAMERP- SP	SE
BORGES, 2011	Efeitos da participação em um Grupo de Coluna sobre as dores musculoesqueléticas, qualidade de vida e funcionalidade dos usuários de uma Unidade Básica de Saúde de Porto Alegre	UBS em Porto Alegre – RS	SE
GARCIA, 2011	Effects of two physical therapy interventions in patients with chronic non-specific low back pain: feasibility of a randomized controlled trial	Physical Therapy Clinic of the UCSP- SP	QE

SE, semi-experimental; QE, quasi-experimental; Q, qualitative; E, experimental.

Table 2 – Qualitative studies, author and year, sample size, and methodology used for data collection.

Author/Year	Sample	Methodology for data collection
SOUZA, 2003	Ten subjects	Semi-structured interviews, field notes, and perceptions of class.
VIEIRA, 2004	65 subjects	Semi-structured interviews, participant's observations.
GUEDES, 2007	Ten subjects	Discussions and focal groups, data analysis from the perspective of Fiorin.
ARCANJO, 2008	Nine subjects	Analysis of responses to questions based on questionnaires, categorical analysis.

Table 3 – Quantitative studies, author and year, sample size, and methodology used for data collection.

Author/Year	Sample	Methodology of data collection			
		QoL ¹	FC ²	PI ³	Other ⁴
FURLAN, 1998	64 subjects			X	X
SCHUCH, 2000	Ten subjects			X	X
UES, 2003	Nine subjects			X	X
CARAVIELLO, 2005	30 subjects		X	X	
TSUKIMOTO, 2006	110 subjects	X	X	X	
SANTOS, 2008	39 subjects		X	X	X
ANDRADE, 2008	70 subjects		X	X	X
RIBEIRO, 2008	55 subjects	X	X	X	X
FERREIRA, 2010	41 subjects	X	X		
TOBO, 2010	43 subjects		X		X
SOUZA, 2010	Four subjects	X		X	
MARTINS, 2010	25 subjects	X	X	X	X
BORGES, 2011	29 subjects	X	X	X	
GARCIA, 2011	18 subjects		X	X	X

QoL, quality of life; FC, functional capacity; PI, pain intensity; Other, anamnesis, questionnaires, and tests, among others.

The quantitative method,²⁸ which addresses the variables using correlations and comparisons with specific statistical techniques (Table 3), was used in the remaining studies included in this review. Among these studies, two were experimental, characterized by a random sample divided into intervention group and control group;^{32,33} two were classified as quasi-experimental,^{36,41} in which there is a control group but without a randomized sample; and ten were semi-experimental, in which there is no control group.^{8,21,29-31,34,35,39,40,43}

Of the abovementioned quantitative studies, seven used only two evaluations, a pre-intervention before the beginning of the program, and a post-intervention immediately after the end of the back school.^{8,21,29,31,35,36,39-41} Other studies have re-evaluated individuals after one,^{30,32,33} two,³⁴ and four months.^{29,32,33} Only two studies reassessed the participants^{30,43} one year after the post-intervention assessment.

Among the instruments used in quantitative studies, evaluation of pain intensity and structured questionnaires to assess functional capacity and quality of life prevailed (Table 3).

Pain intensity was the most analyzed variable; 12^{14,21,29-33,36,37,39,40,43} of the 14 quantitative articles measured it. The Visual Analog Scale (VAS) was the most used (nine studies) assessment tool for that variable.^{39-33,35,39,40,43} Other studies have used the Visual Numerical Scale³⁶ and semi-structured questionnaires^{21,41} for the analysis of this variable.

Among the nine studies using VAS, seven^{30-32,35,40,42} found a significant decrease in pain intensity immediately after the completion of the back school. Among the studies that have made post-intervention assessment in the medium-term, Tsukimoto et al.³⁰ observed a significant difference between the first post-intervention assessment, performed one month after the completion of the classes, and the second post-intervention, performed after four months. However, these authors did not observe differences between these evaluations and those performed one year after the start of the back school.

In the two experimental studies^{32,33} with higher methodological quality, only Andrade et al.³² observed significant reduction in pain intensity after two re-evaluations: the first,

one month, and the second, four months after the completion of the classes.

The second most commonly used variable for back school analysis was the improvement in functional capacity. For the analysis of this variable, seven studies^{29-33,36,37} used the Roland-Morris Questionnaire (RMQ)⁴⁵ and three studies^{8,34,35} used the Oswestry Disability Index (ODI) questionnaire.⁴⁶ Comparing the functional capacity, it was observed that six of the seven articles^{29-32,36,39} described a significant improvement in functional capacity when using the RMQ. Of these studies, five^{29,31,33,36,39} observed differences immediately after the end of the back school. The study by Tsukimoto et al.³⁰ obtained significant improvement one month, four months, and one year after the intervention.

Among the studies on functional capacity who used the ODI questionnaire, all observed significant improvements in functional capacity at the end of the program; Tobo et al.³⁴ found improvement two months post-intervention.

In the two experimental studies^{32,33} identified in this review, only the study by Andrade et al.³² indicated a significant improvement in functional capacity immediately after, and one month after the back school. However, this improvement was not maintained in the post-intervention assessment performed four months after completion of classes.

Among the instruments analyzed in this review, those for quality of life evaluation were the least used. The Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36)⁴⁷ was used by five studies.^{8,30,33,35,40} The studies observed a significant improvement in six^{8,35} and seven areas^{30,40} at the post-intervention assessment. In the study by Tsukimoto et al.,³⁰ the improvement was maintained for a year in the functional capacity, physical aspects, pain, general state of health, and vitality domains. From the comparison between studies using the SF-36 questionnaire, it was observed that the pain and functional capacity domains showed significant improvements in four of five studies.^{8,30,35,40} It was also observed that in four of these studies,^{30,33,35,40} the means of physical aspects and pain domains, in the pre-intervention assessment, were below 50% of the maximum value; in the post-intervention assessment, the means were above 50% in all studies. Of the

studies included in this review, only that by Ribeiro et al.³³ observed a significant improvement in the general health status domain for a period of four months.

Discussion

Published articles indicate that the research developed in Brazil to evaluate the effectiveness of back schools is recent; most of these studies were published in the 2000s, which differs from other regions such as Europe, where studies have been developed on this topic since the 1980s.⁴⁸⁻⁵⁰

However, regarding the instruments included in the quantitative studies cited in the present review, they follow the trend of international publications. According to the systematic review by Chapman et al.,⁵¹ which included 354 experimental studies on the effectiveness of treatments for chronic low back pain published from 2007 to 2011, the instruments that assess functional capacity and quality of life are prevalent. Instruments for assessing functional capacity are more recurrent, mainly ODI and RMQ, which were used in over 50% of the studies.⁵¹ The assessment of quality of life also appeared in over 40% of the studies; the SF-36 was the most used tool.⁵¹ Only the instruments for assessment of pain intensity were not as significant; they were employed in only 20% of the studies,⁵¹ unlike the studies included in this review, in which the evaluation of this variable was the most used.

Although the application of these instruments is important for comparing results from different studies, in final analysis, the differences in the duration of the program and the content covered hindered the comparison. This difficulty has also been emphasized by authors who conducted systematic reviews on back schools.²⁵⁻²⁷

Another important limiting factor for evaluating the effectiveness of back schools in Brazil is the low quality of the studies.⁵² Of the 14 quantitative studies, only four had a control group and only two were fully experimental. This is the main obstacle for studies conducted in Brazil to be considered relevant and have their results compared to those from other publications in systematic reviews, since one of the inclusion criteria for systematic reviews on interventions for chronic low back pain is that the study is experimental.⁵² The other limiting factor is the language in which the article was published. Ribeiro's study, published in the English language in 2008, was integrated into the review of van Middelkoop et al.;²⁷ this did not happen with the article by Andrade et al.,³² an experimental study of good quality published in the same year, possibly because it was published in Portuguese.

The authors of this article acknowledged the limitations of studies published in Brazil, but consider it important that researchers working with chronic back pain have knowledge of the existing publications on back schools, especially at a time when the government is investing in measures aimed at promoting health education and the reduction of damage caused by chronic diseases, mainly in primary care services.⁵³

It can be inferred that the studies evaluating the effectiveness of back school programs developed in Brazil (which, due to poor quality, have a strong possibility of bias) showed a decrease in pain intensity and an improvement in func-

tional capacity in the short-term, but the results of the studies evaluating the effectiveness in the medium- and long-term are conflicting, requiring further studies to confirm the duration of improvement achieved after participation in back school programs. These results are similar to those presented by authors who conducted systematic reviews on the topic.²⁵⁻²⁷

Studies evaluating the quality of life by the SF-36 questionnaire suggest that the pain and physical aspects domains are the most affected in participants of Back Schools, and that these subjects present a significant improvement in these domains soon after the intervention. Results related to quality of life have not been included in systematic reviews of back schools; however, three international experimental studies⁵⁴⁻⁵⁶ published in the last years also observed a greater involvement of the pain and physical aspects domains, with a mean below 50 points for the sample in the pre-intervention assessment. These studies identified an improvement in the quality of life of the study participants after six months⁵⁶ and one year of intervention.⁵⁵

It is possible to relate the improvement of the quality of life of participants of back school in the studies cited with respect to reducing the pain and improving functional capacity, gains afforded by the greater knowledge of the spine and the pathologies that affect this area, and by learning the proper way to perform ADL. Furthermore, the importance of social interaction provided by back school classes must be considered,⁶ since the group system allows people with similar problems to share their difficulties, their doubts, and their achievements.

Thus, the effectiveness of back school in the short term can be related to an improvement in general health, which involves physical, social, and emotional aspects. This interpretation corroborates the finding of a significant improvement in most areas covered by the assessment of quality of life found in studies conducted in Brazil^{8,30,35,40} and abroad.⁵⁴⁻⁵⁶

The study by Ribeiro et al.,³³ which developed only theoretical activities to learn to perform ADL, was the only study in this review that showed unfavorable results in the post-intervention assessment. This finding suggests that practical activity and exchange of experiences among participants, when teaching the proper way to perform ADs, are important pedagogical strategies for reducing pain and improving functional capacity and quality of life. Perhaps the mere theoretical explanation of the proper implementation of ADL is not enough to incorporate new habits, reducing the possibility of interaction between the participants. This is an issue that should be more thoroughly investigated in future studies.

Final considerations

This review aimed to conduct a search for studies that evaluate the effectiveness of back schools developed in Brazil with a population of adults and elderly subjects, identifying research methods, intervention proposals, data collection instruments, and results. It was observed that almost all the scientific literature on the subject has been developed in the last decade, revealing the recent interest in research in this

area. However, there are still few experimental studies with a control group and random sample, as well as few qualitative studies.

It was observed that, apart from a low methodological quality of most studies, the structure of the programs is quite diverse, making it difficult to compare them. However, regarding the contents of the programs and tools used in quantitative studies, it can be stated that there is consistency among them. In most studies that evaluated the quality of life, some improvement of physical, emotional, and social aspects was observed, which can be related to group dynamics developed in this type of intervention.

In short, based on the work presented here, the results on the effectiveness of back school programs developed in Brazil are still very questionable, due to low methodological quality of the studies and lack of a greater number of publications that evaluate the results in the medium- and long-term. Although the pain relief and improvement in functional capacity and quality of life in the immediate post-intervention are relevant, since they can be a stimulus for increased investment in the maintenance of exercises and incorporation of healthy postural habits, the application of more resources is important to ensure the improvement of chronic diseases in the long run.

This review indicates, therefore, that there is no evidence of the effectiveness of back school programs developed in Brazil to justify their recommendation for healthcare services in Brazil.

Financial support

Coordination for the Improvement of Higher Education Personnel (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES), National Council for Scientific and Technological Development (Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq).

Conflicts of interest

The authors declare no conflicts of interest.

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