**In patients with non-specific low back pain is a back school more effective than a back school combined with core strengthening in reducing the recurrence of back pain?**

**Introduction:**

Low back pain (LBP) has turned into a costly burden to society and is one of the leading causes of disability and loss of productivity in industrialized countries.1,2,4,8 Patients with LBP, which consists of a duration of one to two months, have an elevated risk of developing a chronic disability and seeking repeated care for their condition.1,8 Between 80% and 90% of the healthcare costs of back pain are incurred by 10% of individuals who develop chronic LBP and disability from their pain.1 LBP can be classified into three groups; severe spinal pathology, neurological involvement, and non-specific low back pain. The majority of LBP is non-specific which has no clear diagnostic, prognostic or treatment protocols.4 Non-specific LBP is defined as pain between the costal margins extending down to the inferior gluteal folds, normally accompanied by painful limitation of movement and eventually associated with referred leg pain.6

Chronic low back pain (CLBP) is further defined as pain that lasts for more than 12 weeks.4 CLBP may be associated with incorrect interpretation of pain, stress, an increase in anxiety, lack of social participation, and overall decline in physical function.4 Instead of undergoing expensive surgery, non-surgical management of patients with CLBP has normally consisted of increasing mobility of the spine, enabling the patient to exercise, and to increase physical and psychological abilities in order to help patients be able to self-manage their condition.1,4 Despite the proposed treatments listed, there is not a general agreement on the management of CLBP, nor has one treatment been proven superior when compared to any other form of treatment for this condition.5,8 Due to the lack of agreement in treatment approaches for the condition, there also exist discrepancies between countries in the various guidelines and therapeutic recommendations for treatment of patients with CLBP.8

Back school programs were first established in 1969 in order to better educate patients to be able to manage their own problems with chronic low back pain.1, 2,3,5,7 While there is some variation to the way back schools are delivered the basic back school program consists of the following: information about spinal anatomy and physiology, correct use of the spine and the role of lifestyle and motor habits, exercise programs for pain reduction, and spine function re-education.3, 5 Other topics that can be have been included in back school interventions are information on the biomechanics of the spine, correct posture, and ergonomics in the work environment.8 A moderate body of evidence suggest that back schools are effective to reduce pain, improve physical function, and improve return to work status in the short and intermediate term follow-up among patients who have chronic and recurrent LBP.1,2,3,5 ,8 In addition to this, there is moderate evidence that suggest that back schools are better than manipulation, exercise alone, and myofascial therapy for CLBP patients.8

While moderate evidence does exist for back schools, there currently is insufficient evidence on the effectiveness of back schools with the addition of exercise, as well as limited research addressing back schools compared to back schools with the addition of core-strengthening regimens to back schools.1, 8 Therefore, the purpose of this review is to outline and compare the efficacy of back school intervention to back schools with a core-strengthening component for patients with CLBP from a non-specific source. The findings to this clinical question will help determine if back schools are more effective with or without a specific core-strengthening component and also validating the physical therapists role in patient education and for core-strengthening of the CLBP patient.

**Summary of the evidence for back schools**

When reviewing the literature for back schools and back schools with core-strengthening for patients with CLBP from a non-specific cause, the studies used in this summary have research designs consisting of prospective cross-sectional, randomized control trials, and prospective cohort studies. One study was used in the review that consisted of a systemic review that will be included in the RCT section since this research sums up only RCT design studies. The review will focus on comparing studies of similar research design, interventions, and inclusion criteria then outcome measures used across all studies will be discussed. The purpose of the review will be to determine which back school intervention is more effective; those with core-strengthening components or those with out.

**Prospective cohort studies:**

The two prospective studies had two similar areas researched when looking at these two alone; back school with a form of exercise. One assessed the effect of back school with core-strengthening exercise on back impairment, disabilities, and pain coping strategies in patients with CLBP while the second study was an introduction of a novel back school that placed great emphasis on therapeutic exercise in general.1,7 Inclusion criteria from both studies were similar having patients above the age of 18, low back pain for more than 12 weeks, no previous back surgery, no serious spinal pathology, nor presence of cancer or systemic illness.1,7 The study by Yang et al had physicians confirm the diagnosis and screen for the above mentioned inclusion critera, while the study by Osamu et al used an MRI and CT scan to screen for serious pathology and an MD to determine who was eligible. Both studies used similar back school interventions that consisted of education of spinal anatomy, mechanism of LBP, and ways to decrease LBP through posture and positive coping strategies (i.e. exercise).1,7 There are differences across the two; the study by Yang et al emphasized core strengthening while the study by Osamu et al focused on both trunk strengthening and flexibility of the hamstrings and trunk.1,7 One other aspect was the use of a Quantitative functional evaluation in the study by Osamu which is new to the back school intervention approach.7 Measures used to evaluate improvements were trunk muscle endurance, and hamstrings extensibility which were used to document objective improvements compared to subjective outcome measure tools. Other differences were the time the back school was administered over. One study used 2 hours a week for 4 weeks to administer the intervention while the other study was carried out in 1 day for 3 hours.1, 7

 Both studies concluded that back school with core-strengthening or back school with therapeutic exercise were effective in reducing back specific disability and pain in the short term as well as improvement of quality of life in those who participated.1, 7 Taking both these studies together, one can conclude that while both forms of the back schools used are effective in reducing pain in CLBP, both used a form of exercise either core-strengthening or general therapeutic exercise. It seems that while the one study mentioned therapeutic exercise in general as their intervention, they still used similar exercise for trunk strengthening which could be for the reason of similar results.

**Cross-sectional studies**

 When comparing the cross-sectional studies, one evaluated the compliance with education and exercise to determine if these interventions improved pain severity, number of attacks experienced after a back school intervention was given, and the second considered the effect of positive interventions such as exercise on the effect of back school on patients with CLBP.2, 3 The two studies had differences in their inclusion criteria. The study by Cakmak appeared to only have the criteria of attending a back school program at the facility where the study was conducted, while the study by Morata-Crespo et al had specific defined inclusion criteria for participants in the study (defined region of LBP, aged 18 to 65, and presence of no radicular symptoms). Exclusion criteria were addressed in the Morata-Crespo study but not mentioned by the Cakmak study.

The back school interventions were delivered in the same manner with informative sessions of basic spine anatomy, biomechanical reasons for LBP, modification of activities to improve LBP, posture, and practical applications of proper techniques for core exercise as well as lifting and ADL tasks that were less strenuous on the low back. The Morata-Crespo study had one difference in their intervention used; one individual session was added at the end of the study to address proper exercise technique as well as allowing questions by the participants. The Cakmak article did not address an individualized session for exercise guidance. Both studies delivered the back school intervention in group sessions with rehabilitation team members instructing all aspects of the intervention. Both studies conducted follow-up response to their studies at the immediate end of the back school as well as three months after the school. The study by Cakmak looked into the long-term with a follow-up at 6 months after completion. Both studies found improvements at the immediate end of the back school as well as at the three month follow-up in the Morata-Crespo study. The Cakmak et al study concluded that at 6 months their patients had improved also in terms of disability and perceived pain.

Both studies do show that educational interventions with some form of exercise (even though they both had slight differences) did prove to have increased benefits in patients with CLBP.

* + 1. **Outcome measurements**
		2. **Results**

* + 1. **Discuss the themes across studies and the similarities and differences between the articles.**

Conclusions/Discussion that includes;

* + 1. Critical analysis of the evidence and missing knowledge
		2. Reference to original PICO question. Were you able to answer your question? If not, what additional research would you recommend?
		3. Application to clinical practice and capstone project

References:

1. Yang E, Park W, Shin H, Lim J. The effect of back school integrated with core strengthening in patients with chronic low-back pain. *American Journal of Physical Medicine & Rehabilitation*. September 2010; 89(9):744-754
2. Cakmak A, Muslumanoglu L, Berker E, et al. The long term outcome of the Back School in patients with chronic mechanical low back pain. *Journal of Back & Musculoskeletal Rehabilitation*. July 2004; 17(3-4):83-89
3. Morata-Crespo AB, Tris-ara MJ, Marín-Redondo M, Ramos-Carrera N. Ripol-Munoz YE. Seguimiento de pacientes con dolor lumbar crónico tras tratamiento de escuela de espalada. *Rehabilitación.* 2006; 40(5): 248-255
4. Sahin N, Albayrak I, Durmus B, Ugurlu H. Effectiveness of Back School for treatment of pain and functional disability in patients with chronic low back pain: A Randomized Controlled Trial. *J Rehabil Med.* 2011; 43: 224-229
5. Monroe G, Paolucci T, Alcuri MR et al. Quality of life improved by multidisciplinary back school program in patients with chronic non-specific low back pain: a single blind randomized controlled trial. *European Journal of Physical and Rehabilitation Medicine.* 2011; 47: 1-9
6. Albaladejo C, Kovacs FM, Royuela A, Del Pino R, Zamora J. The Efficacy of a Short Education Program and a Short Physiotherapy Program for Treating Low Back Pain in Primary Care: A Cluster Randomized Trial. *Spine*. 2010; 35(5): 483-496
7. Shirado O, Toshikazu I, Kikumoto T, Takeda N, Minami A, Strax TE. A Novel Back School Using a Multidisciplinary Team Approach Featuring Quantitative Functional Evaluation and Therapeutic Exercises for Patients With Chronic Low Back Pain: The Japanese Experience in the General Setting. *Spine.* 2005; 30(10): 1219-1225
8. Heymans MW, Van Tulder MW, Esmail R, Bombardier C, Koes BW. Back Schools for Nonspecific Low Back Pain: A Systemic Review within the Framework of the Cochrane Collaboration Back Review Group. *Spine*. 2005; 30(19): 2153-2163