

HEALTH SERVICES RESEARCH

Adherence to Back Pain Clinical Practice Guidelines by Brazilian Physical Therapists

A Cross-sectional Study

Fabrício S. de Souza, PT, MSc,* Carlos E. Ladeira, PT, MScPT, EdD,[†] and Leonardo O.P. Costa, PT, PhD*[‡]**Study Design.** This was a cross-sectional observational study.**Objectives.** (i) to investigate whether Brazilian physical therapists make clinical decisions for patients with low back pain based upon clinical practice guidelines and (ii) to determine whether the physical therapists are able to recognize differential diagnoses of low back pain associated with red or yellow flags.**Summary of Background Data.** Early adherence to clinical practice guidelines may accelerate recovery and reduce the costs associated with low back pain. It is unknown whether Brazilian physical therapists follow clinical practice guidelines to make their clinical decisions in the treatment of patients with low back pain.**Methods.** The sample consisted of physical therapists from two Brazilian physical therapy associations. The data were collected via electronic survey and face-to-face interviews. The survey was composed of six hypothetical clinical cases of low back pain, which served as a basis to evaluate clinical decisions and adherence to clinical practice guidelines for low back pain. The study participants had 27 possible answers for each clinical case and could choose up to five answers. The results were analyzed in three ways: full adherence, partial adherence, or no adherence to the recommendations from clinical practice guidelines.**Results.** A total of 530 physical therapists were invited and 189 participated in the study (response rate = 35.6%). Full adherence to the guidelines was low for all six cases (rates ranging

from 5%–24%). Partial adherence to the guidelines was higher when compared with full adherence (rates ranging from 32%–75%). The participants were more likely to identify differential diagnoses associated with yellow flags than with red flags.

Conclusion. Brazilian physical therapists are not using the best available evidence in their clinical decision making for patients with low back pain. Wider dissemination of clinical practice guidelines should be urgently undertaken.**Key words:** clinical practice guidelines, low back pain, physical therapy, survey.**Level of Evidence:** 2**Spine 2017;42:E1251–E1258**

Low back pain (LBP) is one of the most common musculoskeletal condition in the clinical practice of physiotherapists.^{1,2} About 39% of people have at least one episode of back pain during their lifetime.^{3,4} Among all nonfatal health conditions, LBP stands out as the largest contributor to years lived with disability globally.⁵ Because of the growing negative socioeconomic impact of LBP,⁶ the use of the most efficacious treatment by physiotherapists is now more important than ever. Early adherence to evidence-based physical therapy treatments can accelerate patient recovery and reduce disability, thereby reducing costs related to LBP.⁷

Evidence-based practice is the best way to make clinical decisions.^{8–11} Evidence-based practice consists of a triad that takes into account the synthesis of the best evidence from clinical research, professional experience, and the values and preferences of patients.^{7,9,12} To facilitate the use of evidence-based practice in the treatment of LBP, researchers summarized the information from clinical trials on LBP into clinical practice guidelines (CPG).^{13,14} The purpose of CPG is to make clear and direct evidence-based recommendations to influence the therapists' decision making.^{15–17}

Several CPG have been published for the treatment of LBP.^{14,18–20} The CPG published by the American Physical Therapy Association (APTA)¹⁴ are freely accessible and their aims are (i) to guide assessments and combined treatments for specific cases of LBP and/or the referral of cases of differential diagnosis to experts, (ii) to suggest treatments

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that have evidence in the prevention of recurrence and chronification of LBP, and (iii) to show evidence of treatments that contribute to a transition from acute to chronic LBP. The recommendations of the APTA guidelines do not differ from others such as the European or the NICE guidelines.^{21,22}

Till date, no studies have assessed how Brazilian physiotherapists treat LBP. In other countries, studies were developed to measure the clinical decisions of physiotherapists in the treatment of LBP.^{23–27} Of these studies, four^{24–27} were conducted in the 1990s, when evidence-based practice was not widespread in clinical practice. The fifth study²³ was published recently and describes treatments for LBP and adherence to evidence-based practice. The data collection for this fifth study was conducted in 2007, when there were no CPG for the treatment of LBP in the United States.

Some studies have demonstrated the ability of therapists to identify the best treatment for nonspecific LBP^{21,28} and to screen for red flags²⁹ (when a medical referral is required); however, no studies have evaluated whether the physiotherapists were efficient in the diagnosis and treatment of patients with low back radiculopathy^{12,30} and LBP associated with yellow flags^{31–33} (when a psychological referral is needed). It is very important to diagnose and treat patients with LBP associated with radiculopathy or refer patients with yellow flag to a psychologist because often these patients increase costs because of surgery (in the case of patients with LBP associated with radiculopathy)¹⁴ and chronic pain or disability (conditions often associated with depression).^{30,34} An effective treatment of LBP with radiculopathy can prevent spending on surgery,³⁵ and an effective treatment of patients with yellow flag for depression can prevent the development of chronic back pain and disability.^{36,37}

OBJECTIVES

- (1) To investigate whether Brazilian physiotherapists adhere to the CPG published by the APTA.¹⁴
- (2) To determine whether physiotherapists are able to recognize differential diagnoses of LBP associated with red or yellow flags.

METHODS

Sample

A total of 530 physiotherapists affiliated with two Brazilian musculoskeletal physical therapy associations were invited to participate in this study. To be eligible, the physiotherapists had to be affiliated to these associations and had to treat at least one case of back pain a week. All participants read and agreed with a consent form approved the Ethics Committee of Universidade Cidade de São Paulo, Brazil and by the chairs of both associations. For privacy reasons (in a confidentiality agreement), the names of the two associations will not be disclosed in this article.

Data Collection Instrument

The physiotherapists were asked to answer a survey (Appendix 1—English version and Appendix 2—Brazilian-Portuguese version, <http://links.lww.com/BRS/B272>), which was adapted from other acute and subacute LBP instruments.^{28,29,23} The content for the vignettes was based on patient treatment-based classification subgroups,³⁸ detailed in the recent clinical practice guideline published by the APTA.¹⁴ These instruments have been validated for measuring clinical decisions and assessing CPG.^{29,39,40} We decided to use vignettes rather than other types of reviews of practice because of feasibility and low cost.

The survey not only gathered demographic data, but also asked the participants to answer questions on six clinical cases. Below each case, there was a table with 27 treatment options. One of these options was a text box in which the professional could write a different treatment modality to the options provided. The participants were instructed to select at least one and up to five treatment options that they would use for each clinical case in the first week of treatment. The vignettes were translated into Brazilian-Portuguese by three physiotherapists that were fluent in both languages. Before the beginning of the study, we sent the translated vignettes to a group of 20 postgraduate and PhD students (all with a background in physiotherapy) to test readability and interpretability of the translated vignettes.

Adherence to CPG was analyzed based on the selected treatment techniques. Three specialized therapists assessed the specific treatment techniques selected by the participants. All three have clinical experience in the treatment of LBP, and a PhD degree and peer-reviewed publications in musculoskeletal physical therapy.

The clinical cases can be considered as reliable. The authors from the original English version used the Fleiss kappa (k) to calculate agreement among the three PT experts for each vignette:

- Case 1 (Acute nonspecific LBP with hypomobility): $k = 0.85$
- Case 2 (Subacute LBP with signs of kinesiophobia): $k = 0.80$
- Case 3 (Acute LBP with radiculopathy and directional preference): $k = 0.84$
- Case 4 (Subacute LBP with red flag): $k = 1.0$
- Case 5 (Acute LBP with lumbar instability): $k = 0.94$
- Case 6 (Subacute LBP with yellow flag): $k = 0.90$

The interpretation related to the choice of interventions and/or differential diagnosis (red and yellow flags) for each clinical case was based on the CPG for LBP published by the APTA.¹⁴ The interventions that are the most effective in the treatment of each specific case of LBP were considered mandatory. The interventions that are adjuvants in the recovery process or the prevention of chronicity of pain, but are not as efficient as the mandatory interventions, were considered nonmandatory interventions. The interventions

that have been shown not to contribute to the treatment of LBP were invalid interventions. According to this criterion, the treatment options for the clinical cases of the survey are shown in Table 1.

The study participants were not informed in advance about the criteria used for analysis of the answers to the clinical cases used in this study. Previous American⁴¹ and Canadian²⁸ studies on adherence to CPG in the treatment of LBP also conducted similar surveys.

Data Collection

The data were collected through an electronic survey on Survey Monkey (pt.surveymonkey.com). The main researcher sent an email invitation with the access link to the office of each association. The secretaries from the associations forwarded the email to their respective members. This process was repeated three times to ensure the highest possible response rate. The subjects had six weeks to answer the survey, after which they were excluded from the

TABLE 1. Treatment Options for the Clinical Cases Based on APTA Guidelines for LBP

	Mandatory Interventions	Nonmandatory Interventions That Could be Adjuvants of the Mandatory Intervention	Invalid Interventions
Case 1 Acute nonspecific LBP with hypomobility	a) Spinal mobilization (non-thrust) and/or spinal manipulation (thrust). b) Education to pursue or maintain an active lifestyle.	Education of home exercise program, or exercises of endurance and fitness, or exercises of coordination, endurance, and strengthening, or education in symptom alleviating posture and movements (biomechanical principles).	a) Bed rest, lumbar brace or corset and imaging. b) Passive interventions (Interferential current, TENS, Laser, Ultrasound).
Case 2 Subacute LBP with signs of kinesiophobia	a) Education to address kinesiophobic behaviours. b) Education to pursue or maintain an active lifestyle.	Education of home exercise program, or exercises of endurance and fitness, or exercises of coordination, endurance, and strengthening, or education in symptom alleviating posture and movements (biomechanical principles).	a) Bed rest, lumbar brace or corset and imaging. b) Passive interventions (Interferential current, TENS, Laser, Ultrasound).
Case 3 Acute LBP with radiculopathy and directional preference	a) Exercises: centralization and directional preference. b) Education to pursue or maintain an active lifestyle.	Education of home exercise program, or exercises of endurance and fitness, or exercises of coordination, endurance, and strengthening, or education in symptom alleviating posture and movements (biomechanical principles).	a) Bed rest, lumbar brace or corset and imaging. b) Passive interventions (Interferential current, TENS, Laser, Ultrasound).
Case 4 Subacute LBP with red flag	Refer to a medical doctor without intervention		
Case 5 Acute LBP with lumbar instability	a) Exercises: coordination, endurance, and strengthening b) Education to pursue or maintain an active lifestyle.	Education of home exercise program, or exercises of endurance and fitness, or education in symptom alleviating posture and movements (biomechanical principles).	a) Bed rest, lumbar brace or corset and imaging. b) Passive interventions (Interferential current, TENS, Laser, Ultrasound).
Case 6 Subacute LBP with yellow flag	First option: a) Refer to the psychologist without intervention. Second option: a) Refer to the psychologist and maintain physical therapy treatment. b) Education to pursue or maintain an active lifestyle	Education of home exercise program, or exercises of endurance and fitness, or education in symptom alleviating posture and movements (biomechanical principles), or education to address kinesiophobic behaviors.	a) Bed rest, lumbar brace or corset and imaging. b) Passive interventions (Interferential current, TENS, Laser, Ultrasound).

APTA indicates American Physical Therapy Association; LBP, low back pain.

study. To maximize response rates, data were also collected in person with printed surveys at events organized by these associations in 2015.

Data Analysis

Initially, descriptive statistics were performed. The answers from the vignettes were interpreted as follows: (i) full adherence to the guidelines (*i.e.*, at least two correct mandatory interventions were selected for each case); (ii) partial adherence, (*i.e.*, at least one correct mandatory intervention was selected); and (iii) no adherence, (*i.e.*, none of the mandatory interventions were selected). According to the CPG, the case scenario 4 requires immediate medical referral (only one mandatory intervention). Therefore, we did not consider partial adherence for this specific case.

Considering the principles of evidence-based practice, the mandatory interventions match the best evidence from clinical research; therefore, they were used as the criteria for interpretation of adherence to the guidelines. The other interventions were not interpreted strictly, because they may have been influenced by the clinical experience of the professionals and/or related to the choices of the patients.

Logistic regression models were also used to calculate possible associations between adherence to CPG as a dependent variable (dichotomized as yes or no) and the following independent variables: time since graduation, highest degree earned, number of patients treated per month, private or public university, and place of work. First, we tested each independent variable using univariate analysis. All variables with a *P* value lower than 0.20 were tested in a multivariate model (if applicable).

RESULTS

The data collection period was from July 2015 to November 2015 and 530 physiotherapists were invited to participate in the study. Of these, 158 physiotherapists answered the electronic survey and 31 responded in person at events sponsored by national associations, totaling 189 participants (response rate = 35.6%). Not all participants who gave their consent answered all of the questions. Thus, the sample ranged from 180 participants for Case 1 and 162 participants for Case 6 (Figure 1). It is worth noting that the

sample had a high percentage of musculoskeletal or sports specialists and master's level professionals (Table 2).

Table 3 shows the number and percentage of treatment options selected for each clinical case. Selections were grouped into three categories: (i) mandatory interventions for each clinical case, (ii) nonmandatory interventions that could be adjuvants of the mandatory intervention, and (iii) invalid interventions.

The mandatory intervention "education to pursue or maintain an active lifestyle" had a rate of selection below 20% for all cases. Among the invalid interventions, "bed rest" and "lumbar brace or corset" were the options with the lowest rate of selection, remaining below 2% in all cases, which represents good adherence to the guidelines. Similarly, "interferential currents and TENS" had a rate of selection under 40% and "laser and ultrasound" below 15%. X-ray or magnetic resonance imaging also showed a low selection rate of less than 20%.

The nonmandatory intervention "education in symptom alleviating posture and movements based on biomechanics" showed a good rate of selection of more than 40% in Cases 1, 2, and 3 and more than 24% in Cases 5 and 6. Spinal mobilization was also selected in more than 40% of Cases 1, 2, 3, and 5.

Table 4 shows the percentage of physiotherapists who fully adhered, partially adhered, or did not adhere to the guidelines. In all six cases, the rate of full adherence to the guidelines was low. In addition, the physiotherapists who adhered partially to the guidelines identified LBP associated with a yellow flag better than LBP associated with a red flag. Finally, none of the univariate regression models were able to predict adherence to the guidelines.

DISCUSSION

In general, the rate of full adherence to the CPG was low in all cases. The low rate of full adherence to CPG can be partly explained by the barriers that physiotherapists find in the implementation of evidence in clinical practice. A systematic review⁴² investigated the opinion of physiotherapists concerning evidence-based practice and showed that lack of time, inability to understand the statistical data, lack of employer support, lack of resources, lack of interest, and

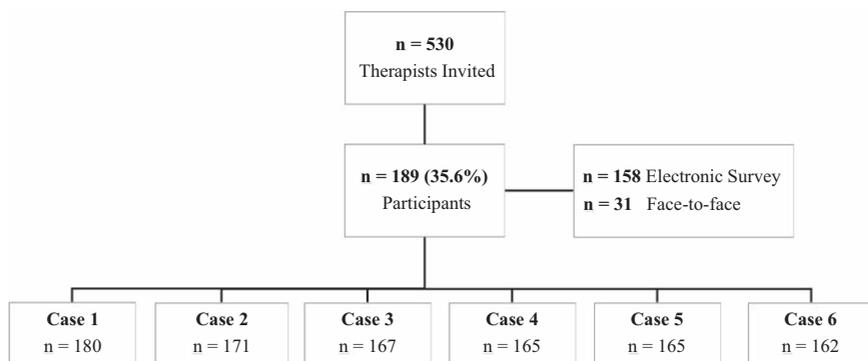


Figure 1. Flow recruitment and study participants.

TABLE 2. Participants Characteristics
(n = 189)

Variables	
Sex	
Male	142 (75.1)
Female	47 (24.9)
Age, yrs	35.6 (7.77)
Clinical experience, yrs	11.8 (6.8)
Number of back pain patients/month	
1 to 5	60 (31.7)
5 to 10	59 (31.2)
10 or more	70 (37)
University	
Public	51 (27)
Private	138 (73)
Academic training and expertise	
Bachelor	7 (3.7)
Experts	93 (49.2)
Masters	67 (35.4)
PhD	22 (11.6)
Specific technique for treating	
Yes	84 (44.4)
No	105 (55.6)
Main place of work	
Private office + clinic	125 (66)
Public Service	28 (14.9)
Home care	8 (4.2)
Fitness center	3 (1.6)
Other	25 (13.2)
<i>Categorical variables are expressed as number (%).</i>	
<i>Continuous variables are expressed as mean (SD).</i>	

difficulty generalizing the results are the main barriers for implementation. Another study⁴³ showed that Brazilian physiotherapists find that the language of publication of articles (mainly English) is the main barrier to the use of evidence in clinical decision making. This information is of concern, given that most of the literature is published in the English language.⁴⁴

A Swedish study⁴⁵ conducted a survey to investigate the attitudes and knowledge of the physiotherapists about the importance of CPG. Virtually all respondents recognized the importance of CPG; however, only 9% had easy access to these guidelines. Therefore, it is important that these guidelines be widely disseminated and freely accessible.

This gap between positive attitudes toward the guidelines and their actual use in practice contributes to a delay of 17 years between publication of the scientific evidence and its effective implementation in clinical practice.^{46,47} Unfortunately, this time frame directly affects the choice of more effective interventions and consequently increases spending on health.⁴⁸ Efforts should be done by multiple physiotherapy associations, registration boards and universities to help on the dissemination of key elements from guidelines.

Regarding the selection of mandatory interventions for each case, we found that education to pursue or maintain an active lifestyle (considered mandatory for most cases) had a lower selection rate than passive interventions or education based on biomechanical principles. The problem with this finding is that there is evidence that passive interventions for subacute LBP may favor the chronification of symptoms.²¹ Furthermore, it is known that the biomechanics education model favors increase in kinesiophobia, and contributes to an unfavorable prognosis.^{49,50}

Brazilian physiotherapists do not seem to distinguish between biomechanics education and education for maintenance of activities. Similarly, an Australian study⁵¹ concluded that physiotherapists do not seem to distinguish between education for the patient to remain active and education for back exercise. However, these authors suggest that more studies such as this are needed to confirm this interpretation.

Some of the invalid interventions that should not have been chosen, such as "bed rest", showed a selection rate below 3%, showing that physiotherapists do not support inactivity. The intervention related to imaging also showed a low rate of selection for all cases. We do not know whether the low percentage of selection is related to adherence to guidelines or other items that consistently show that imaging tests are not useful for patients with LBP.⁵² However, the passive intervention "interferential currents or TENS", although not recommended by any guidelines, also had a significant rate of selection for the treatment of patients with LBP. One hypothesis is that, culturally, physiotherapists are used to using analgesia techniques in patients with LBP, despite the fact that electrophysical agents are not recommended for these patients.^{19,53}

Our study showed that most Brazilian physiotherapists were able to identify psychosocial risk factors in the case related to LBP associated with a yellow flag. However, for interventions in the same case, they selected passive therapies, preventing full adherence to the guidelines (14.2%).

Regarding the case of LBP associated with a red flag (*i.e.*, the patient has symptoms of ectopic pregnancy and the vital signs indicate acute bleeding); we observed an extremely low rate of full adherence (24.8%). According to APTA guidelines,¹⁴ Case 4 is classified as a differential diagnosis of LBP that, according to strong evidence, requires immediate medical referral. The low rate of correct answers in this case showed that physiotherapists were not trained in red flag screening. Although a smaller proportion of cases of LBP is associated with a serious condition,¹⁴ early detection of these conditions is very important. The data indicate that physiotherapists should be better trained to identify serious conditions that require a referral to specialized services.

The current study showed a good response rate for the type of the study (35.6%). Similar studies often have response rates below 20%.^{21,54} However, the sample of the current study does not seem to be completely generalizable to the Brazilian population of physiotherapists since

TABLE 3. Number and Percentage of Treatment Options Selected for Each Clinical Case (n = 189)

Treatment Options	Case 1 (n = 180)	Case 2 (n = 171)	Case 3 (n = 167)	Case 4 (n = 165)	Case 5 (n = 165)	Case 6 (n = 162)
Acupuncture or dry needling	35 (19.4)	29 (17)	28 (16.8)	20 (12.1)	25 (15.2)	39 (24.1)
Back school	13 (7.2)	11 (6.4)	10 (6)	12 (7.3)	31 (18.8)	9 (5.6)
Bed rest	5 (2.8) [‡]	1 (0.6) [‡]	3 (1.8) [‡]	6 (3.6)	0 (0) [‡]	0 (0) [‡]
Education to pursue or maintain an active lifestyle	27 (15)*	19 (11.1)*	12 (7.2)*	19 (11.5)	32 (19.4)*	17 (10.5)*
Education of home exercise program	41 (22.8) [†]	28 (16.4) [†]	34 (20.4) [†]	26 (15.8)	48 (29.1) [†]	25 (15.4) [†]
Education in symptom alleviating posture and movements (biomechanical principles)	89 (49.4) [†]	75 (43.9) [†]	72 (43.1) [†]	43 (26.1)	65 (39.4) [†]	39 (24.1) [†]
Education to address kinesiophobic tendencies	43 (23.9)	75 (43.9)*	21 (12.6)	11 (6.7)	27 (16.4)	35 (21.6) [†]
Exercises: centralization and directional preference	37 (20.6)	63 (36.8)	85 (50.9)*	16 (9.7)	24 (14.5)	21 (13)
Exercises of coordination, endurance, and strengthening	56 (31.1) [†]	48 (28.1) [†]	42 (25.1) [†]	49 (29.7)	101 (61.2)*	36 (22.2)
Exercises of endurance and fitness	0 (0) [†]	0 (0) [†]	1 (0.6) [†]	0 (0)	15 (9.1) [†]	7 (4.3) [†]
Exercises: lumbar flexion	0 (0)	4 (2.3)	1 (0.6)	1 (0.6)	10 (6.1)	6 (3.7)
Interferential current or TENS	62 (34.4) [‡]	65 (38) [‡]	49 (29.3) [‡]	31 (18.8) [‡]	26 (15.8) [‡]	45 (27.8) [‡]
Ice or Heat	35 (19.4)	29 (17)	28 (16.8)	12 (7.3)	19 (11.5)	37 (22.8)
Laser or ultrasound	21 (11.7) [‡]	24 (14) [‡]	15 (9) [‡]	11 (6.7) [‡]	11 (6.7) [‡]	10 (6.2) [‡]
Lumbar brace or corset	1 (0.6) [‡]	2 (1.2) [‡]	3 (1.8) [‡]	0 (0) [‡]	1 (0.6) [‡]	1 (0.6) [‡]
Mechanical traction	7 (3.9)	15 (8.8)	27 (16.2)	9 (5.5)	11 (6.7)	7 (4.3)
Neurodynamic mobilization	15 (8.3)	50 (29.2)	78 (46.7)	17 (10.3)	15 (9.1)	15 (9.3)
Radiographs or magnetic resonance imaging	9 (5) [‡]	28 (16.4) [‡]	28 (16.8) [‡]	12 (7.3) [‡]	16 (9.7) [‡]	12 (7.4) [‡]
Refer to the doctor and maintain physical therapy treatment	27 (15)	50 (29.2)	47 (28.1)	54 (32.7)	18 (10.9)	31 (19.1)
Refer to the medical doctor without intervention	0 (0)	3 (1.8)	3 (1.8)	41 (24.8)*	0 (0)	6 (3.7)
Refer to the psychologist and maintain physical therapy treatment	1 (0.6)	8 (4.7)	1 (0.6)	12 (7.3)	8 (4.8)	130 (80.2)*
Refer to the psychologist without intervention	0 (0)	1 (0.6)	0 (0)	1 (0.6)	1 (0.6)	7 (4.3)*
Spinal mobilization (nonthrust)	101 (56.1)*	81 (47.4)	87 (52.1)	58 (35.2)	66 (40)	46 (28.4)
Spinal manipulation (thrust)	54 (30)*	12 (7)	17 (10.2)	24 (14.5)	32 (19.4)	13 (8)
Work conditioning or hardening	6 (3.3)	8 (4.7)	11 (6.6)	8 (4.8)	32 (19.4)	9 (5.6)
Work modification	34 (18.9)	13 (7.6)	15 (9)	18 (10.9)	29 (17.6)	10 (6.2)
Other	38 (21.1)	27 (15.8)	29 (17.4)	24 (14.5)	26 (15.8)	34 (21)

*Mandatory interventions for each clinical case.

†Nonmandatory interventions.

‡Invalid interventions.

this sample has a high level of training and expertise. This is of concern because, despite the high level of training, the rate of full adherence to the guidelines was low. This is an indication that the results could be even worse in the general population of physiotherapists in Brazil. On the other hand, physiotherapists with lower levels of training may be more inclined to accept the guideline and allow them to direct their practice.

CONCLUSION

Brazilian expert physiotherapists do not make adequate use of the clinical practice guidelines for decision making in the management of patients with LBP. In addition, physiotherapists demonstrated better ability to recognize low back pain associated with a yellow flag than with a red flag. Measures to improve adherence to clinical practice guidelines should be urgently undertaken.

TABLE 4. Number and Percentage of Physical Therapists Who Fully, Partially, or Did Not Adhered to the Guidelines

	Fully Adhered to the Guidelines	Partially Adhered to the Guidelines	Did Not Adhere to the Guidelines
Case 1 n = 180 Acute nonspecific LBP with hypomobility	20 (11.1)	114 (63.3)	46 (25.5)
Case 2 n = 171 Subacute LBP with signs of kinesiophobia	11 (6.4)	72 (42.1)	88 (51.5)
Case 3 n = 167 Acute LBP with radiculopathy and directional preference	9 (5.3)	79 (47.3)	79 (47.3)
Case 4 n = 165 Subacute LBP with red flag	41 (24.8)	not applicable	124 (75.2)
Case 5 n = 165 Acute LBP with lumbar instability	24 (14.5)	85 (51.5)	56 (33.9)
Case 6 n = 162 Subacute LBP with yellow flag	16 (9.9)	122 (75.3)	24 (14.8)

LBP indicates low back pain.

➤ Key Points

- The level of adherence to guidelines by Brazilian physical therapists is not known.
- Low adherence to guidelines was observed.
- Brazilian physical therapists identify yellow flags better than red flags.

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References

1. Beattie PF, Silfies SP, Jordon M. The evolving role of physical therapists in the long-term management of chronic low back pain: longitudinal care using assisted self-management strategies. *Braz J Phys Ther* 2016;20:580–91.
2. Nascimento PR, Costa LO. Low back pain prevalence in Brazil: a systematic review. *Cad Saude Publica* 2015;31:1141–56.
3. Hoy D, Bain C, Williams G, et al. A systematic review of the global prevalence of low back pain. *Arthritis Rheum* 2012;64:2028–37.
4. da CMCL, Maher CG, Hancock MJ, et al. The prognosis of acute and persistent low-back pain: a meta-analysis. *CMAJ* 2012;184:E613–24.
5. Disease GBD, Injury I, Prevalence C. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet* 2016;388:1545–602.
6. Maher C, Underwood M, Buchbinder R. Non-specific low back pain. *Lancet* 2017;389:736–47.
7. Childs JD, Fritz JM, Wu SS, et al. Implications of early and guideline adherent physical therapy for low back pain on utilization and costs. *BMC Health Serv Res* 2015;15:150.
8. Ritter B. Considering evidence-based practice. *Nurse Pract* 2001;26:63–5.
9. Philadelphia P. Philadelphia Panel evidence-based clinical practice guidelines on selected rehabilitation interventions for low back pain. *Phys Ther* 2001;81:1641–74.
10. Sackett DL, Rosenberg WM, Gray JA, et al. Evidence based medicine: what it is and what it isn't. *BMJ* 1996;312:71–2.
11. Costa LO, Moseley AM, Sherrington C, et al. Core journals that publish clinical trials of physical therapy interventions. *Phys Ther* 2010;90:1631–40.
12. Silva AM, Costa LC, Comper ML, et al. Cross-cultural adaptation and reproducibility of the Brazilian-Portuguese version of the modified FRESNO Test to evaluate the competence in evidence based practice by physical therapists. *Braz J Phys Ther* 2016;20:26–47.
13. Bouwmeester W, van Enst A, van Tulder M. Quality of low back pain guidelines improved. *Spine (Phila Pa 1976)* 2009;34:2562–7.
14. Delitto A, George SZ, Van Dillen LR, et al. Low back pain. *J Orthop Sports Phys Ther* 2012;42:A1–57.
15. Arnau JM, Vallano A, Lopez A, et al. A critical review of guidelines for low back pain treatment. *Eur Spine J* 2006;15:543–53.
16. AGREE Next Steps Consortium. The AGREE II instrument; (2010). The Appraisal of Guidelines for Research & Evaluation. Available at: <http://www.agreetrust.org/?o51397>. Accessed on March 12, 2016.
17. APTA. Vision sentence and vision statement for physical therapy; 2020. Available at: <http://www.apta.org/vision2020>. Accessed on May 10, 2015.
18. Chou R, Qaseem A, Snow V, et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Ann Intern Med* 2007;147:478–91.
19. Rossignol M, Poitras S, Dionne C, et al. An interdisciplinary guideline development process: the Clinic on Low-back pain in Interdisciplinary Practice (CLIP) low-back pain guidelines. *Implementation Sci* 2007;2:36.
20. Savigny P, Watson P, Underwood M, et al. Early management of persistent non-specific low back pain: summary of NICE guidance. *BMJ* 2009;338:b1805.
21. van Tulder M, Becker A, Bekkering T, et al. Chapter 3 European guidelines for the management of acute nonspecific low back pain in primary care. *Eur Spine J* 2006;15 (Suppl 2):S169–91.
22. National Institute for Health and Clinical Excellence. Low back pain: early management of persistent non-specific low back pain;

2009. Clinical guideline 88. Available at: <http://www.nice.org.uk/CG88>. Accessed on May 10, 2015.
23. Ladeira CE, Samuel Cheng M, Hill CJ. Physical therapists' treatment choices for non-specific low back pain in Florida: an electronic survey. *J Man Manip Ther* 2014;109-18.
 24. Jette AM, Delitto A. Physical therapy treatment choices for musculoskeletal impairments. *Phys Ther* 1997;77:145-54.
 25. Jette AM, Smith K, Haley SM, et al. Physical therapy episodes of care for patients with low back pain. *Phys Ther* 1994;74:101-10; discussion 10-5.
 26. Battie MC, Cherkin DC, Dunn R, et al. Managing low back pain: attitudes and treatment preferences of physical therapists. *Phys Ther* 1994;74:219-26.
 27. Mielenz TJ, Carey TS, Dyrek DA, et al. Physical therapy utilization by patients with acute low back pain. *Phys Ther* 1997;77:1040-51.
 28. Li LC, Bombardier C. Physical therapy management of low back pain: an exploratory survey of therapist approaches. *Phys Ther* 2001;81:1018-28.
 29. Jette DU, Ardleigh K, Chandler K, et al. Decision-making ability of physical therapists: physical therapy intervention or medical referral. *Phys Ther* 2006;86:1619-29.
 30. Fritz JM, Delitto A, Erhard RE. Comparison of classification-based physical therapy with therapy based on clinical practice guidelines for patients with acute low back pain: a randomized clinical trial. *Spine (Phila Pa 1976)* 2003;28:1363-71; discussion 72.
 31. Main CJ, George SZ. Psychologically informed practice for management of low back pain: future directions in practice and research. *Phys Ther* 2011;91:820-4.
 32. Nicholas MK, Linton SJ, Watson PJ, et al. Decade of the Flags" Working G. Early identification and management of psychological risk factors ("yellow flags") in patients with low back pain: a reappraisal. *Phys Ther* 2011;91:737-53.
 33. Stewart J, Kempenaar L, Lauchlan D. Rethinking yellow flags. *Man Ther* 2011;16:196-8.
 34. Nicholas MK, George SZ. Psychologically informed interventions for low back pain: an update for physical therapists. *Phys Ther* 2011;91:765-76.
 35. Peul WC, van den Hout WB, Brand R, et al. Leiden-The Hague Spine Intervention Prognostic Study G. Prolonged conservative care versus early surgery in patients with sciatica caused by lumbar disc herniation: two year results of a randomised controlled trial. *BMJ* 2008;336:1355-8.
 36. Kovacs FM, Seco J, Royuela A, et al. Spanish Back Pain Research. The correlation between pain, catastrophizing, and disability in subacute and chronic low back pain: a study in the routine clinical practice of the Spanish National Health Service. *Spine (Phila Pa 1976)* 2011;36: 339-45.
 37. Du Bois M, Szpalski M, Donceel P. Patients at risk for long-term sick leave because of low back pain. *Spine J* 2009;9:350-9.
 38. Fritz JM, Cleland JA, Childs JD. Subgrouping patients with low back pain: evolution of a classification approach to physical therapy. *J Orthop Sports Phys Ther* 2007;37:290-302.
 39. Rutten GM, Harting J, Rutten ST, et al. Measuring physiotherapists' guideline adherence by means of clinical vignettes: a validation study. *J Eval Clin Pract* 2006;12:491-500.
 40. Bishop A, Foster NE, Thomas E, et al. How does the self-reported clinical management of patients with low back pain relate to the attitudes and beliefs of health care practitioners? A survey of UK general practitioners and physiotherapists. *Pain* 2008;135: 187-95.
 41. Fritz JM, Cleland JA, Brennan GP. Does adherence to the guideline recommendation for active treatments improve the quality of care for patients with acute low back pain delivered by physical therapists? *Med Care* 2007;45:973-80.
 42. Mota da Silva T, da Cunha Menezes Costa L, Garcia AN, et al. What do physical therapists think about evidence-based practice? A systematic review. *Man Ther* 2014;388-401.
 43. Silva TM, Costa LC, Costa LO. Evidence-Based Practice: a survey regarding behavior, knowledge, skills, resources, opinions and perceived barriers of Brazilian physical therapists from Sao Paulo state. *Braz J Phys Ther* 2015;19:294-303.
 44. Shiwa SR, Moseley AM, Maher CG, et al. Language of publication has a small influence on the quality of reports of controlled trials of physiotherapy interventions. *J Clin Epidemiol* 2013;66:78-84.
 45. Bernhardtsson S, Johansson K, Nilsson P, et al. Determinants of guideline use in primary care physical therapy: a cross-sectional survey of attitudes, knowledge, and behavior. *Phys Ther* 2014;94: 343-54.
 46. Li LC, van der Wees PJ. Knowing is not enough; we must apply. Willing is not enough; we must do". *Phys Ther* 2015;95: 486-91.
 47. Westfall JM, Mold J, Fagnan L. Practice-based research—"Blue Highways" on the NIH roadmap. *JAMA intern med* 2007;297: 403-6.
 48. Buxton M, Hanney S, Morris S, et al., editors. Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK. London: UK Evaluation Forum (Academy of Medical Sciences, MRC, Wellcome Trust); 2008.
 49. Brox JJ, Storheim K, Grotle M, et al. Systematic review of back schools, brief education, and fear-avoidance training for chronic low back pain. *Spine J* 2008;8:948-58.
 50. Louw A, Diener I, Butler DS, et al. The effect of neuroscience education on pain, disability, anxiety, and stress in chronic musculoskeletal pain. *Arch Phys Med Rehabil* 2011;92: 2041-56.
 51. Keating JL, McKenzie JE, O'Connor DA, et al. Providing services for acute low-back pain: a survey of Australian physiotherapists. *Man Ther* 2015;145-52.
 52. Chou R, Atlas SJ, Loeser JD, et al. Guideline warfare over interventional therapies for low back pain: can we raise the level of discourse? *J Pain* 2011;12:833-9.
 53. Khadilkar A, Odebiyi DO, Brosseau L, et al. Transcutaneous electrical nerve stimulation (TENS) versus placebo for chronic low-back pain. *Cochrane Database Syst Rev* 2008;CD003008; doi: 10.1002/14651858.CD003008.pub3.
 54. Hendrick P, Mani R, Bishop A, et al. Therapist knowledge, adherence and use of low back pain guidelines to inform clinical decisions—a national survey of manipulative and sports physiotherapists in New Zealand. *Man Ther* 2013;18:136-42.