

Current Use of Lumbar Traction in the Management of Low Back Pain: Results of a Survey of Physiotherapists in the United Kingdom

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ABSTRACT. Harte AA, Gracey JH, Baxter GD. Current use of lumbar traction in the management of low back pain: results of a survey of physiotherapists in the United Kingdom. *Arch Phys Med Rehabil* 2005;86:1164-9.

Objective: To identify the current use of traction and the types of patients, treatment parameters, and treatment modalities used in conjunction with traction.

Design: Postal survey, with 4 sections: professional characteristics of respondent, current use of traction, patient selection, and treatment parameters.

Setting: Musculoskeletal outpatient departments (private and nonprivate practitioners).

Participants: Random sample (N=1491) of chartered physiotherapists in the UK who work in the management of low back pain (LBP).

Interventions: Not applicable.

Main Outcome Measures: Descriptive analysis of information on current use and practice in applying traction.

Results: A response rate of 83% (n=1239) was achieved; 41% (n=507) use lumbar traction, which is most commonly used in the management of subacute LBP patients presenting with nerve root symptoms. Treatment parameters were established for weights (5–60kg), frequency (2–3 times weekly), and length of treatment (4wk). In addition, traction is commonly used with other modalities (87%): mobilizations, advice, and exercise.

Conclusions: Survey results show the continued use of lumbar traction despite the recommendations of numerous guidelines. Results also clarify the types of patients and the parameters used in the application of traction.

Key Words: Low back pain; Physical therapy techniques; Rehabilitation; Traction.

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LOW BACK PAIN (LBP) is a common cause of disability and work loss in Western society, yet despite the availability of numerous clinical guidelines on LBP produced worldwide, there is still a lack of consensus about its most effective management.^{1,2} Physiotherapy (PT) interventions

for the management of LBP are wide and variable, but the efficacy of many is still questionable. One such intervention is traction, which may be applied in many forms: motorized lumbar traction (traction applied by a motorized pulley), autotraction (the patient exerts the traction force through a pulling or pushing action), gravitational traction (traction through a suspension device), or manual traction (forces exerted by the therapist).

In both its 1996 and 1999 guidelines, the UK Royal College of General Practitioners (RCGP) stated that “there is little evidence to support the continued use of traction in the management of LBP.”^{1(p16)} Despite this, many surveys have shown its continued use: with 7% of the LBP patients in the Republic of Ireland and the UK,³ with 13.7% in Northern Ireland,⁴ 7% in the Netherlands,⁵ 21% in the United States,⁶ and up to 30% of patients with acute LBP and sciatica in Canada.⁷ Despite such continuing widespread use, the evidence for traction use remains inconclusive because of the poor methodologic quality of trials^{8,9}; there are, therefore, no agreed clinical guidelines for its use.¹⁰

In future clinical trials that examine the effectiveness of traction, it is important to address not only methodologic quality but also the appropriateness of the intervention,⁹ particularly because inappropriate treatment procedures or inadequate treatment doses may lead to serious performance bias.¹¹ A trial may be of a high methodologic quality, but if its treatment procedures are inappropriate, that weakness will affect the strength of the overall conclusion.¹² Traction treatments can be defined in terms of weights, frequency of treatment, and the duration of treatment. However, a recent systematic review⁹ of the effectiveness of traction for LBP showed the difficulty of establishing clinical parameters for its use because little basic research has been undertaken in this area. The review found that when clinical treatment parameters were examined from the perspective of experts,¹³⁻¹⁵ many of the published articles did not use recommended clinical parameters, ie, recommended weights or suggested lengths of treatment to show an effect. Indeed, the only “high-quality” study identified in the review had to be excluded because it did not meet the experts’ clinical treatment parameters.

Expert opinion, although an important starting point, may not be representative of what is actually being done in clinical practice. In the absence of high-quality research to guide parameter selection, it is important—as a starting point—to look at how traction is being used clinically.

This descriptive survey of UK physiotherapists was undertaken to determine current clinical practice in the use of traction in the management of LBP. We investigated (1) the types of LBP patients who receive traction, (2) the treatment parameters used in the application of motorized traction, and (3) the treatment modalities and regimens used in conjunction with traction.

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METHODS

Survey Design

The design involved a cross-sectional (self-reported) postal questionnaire survey of chartered physiotherapists in the UK.

Sampling Frame

A random sample (N=1491) of physiotherapists specializing in musculoskeletal management (N=15,000) was accessed through the UK Chartered Society of Physiotherapy. The sample size was empirically chosen, but a retrospective analysis showed a confidence interval half width of 3%, based on the percentage of therapists (41%) who use traction; this was found to be acceptable. The survey was conducted between November 2002 and February 2003.

Questionnaire Design

The questionnaire was based on the literature on lumbar traction and discussions with physiotherapists experienced in manual therapy. A pilot study with 22 therapists was conducted before the main questionnaire distribution, and some questions were modified to ensure clarity. The final questionnaire contained 30 open and closed questions, seeking information within 4 sections: professional characteristics of the therapists, general information pertaining to the use of traction, patient selection, and treatment parameter selection.

The questionnaire package included the questionnaire, covering letter, and a prepaid, self-addressed envelope. To improve response rate and prevent unnecessary follow-up, 2 tick boxes were added to the covering letter asking nonresponding therapists to indicate that they did not work with LBP patients or that they worked with LBP patients but did not use traction in their management strategy. This gave an opportunity to assess the percentage of therapists who were not using traction in the management of LBP. Four weeks after the first distribution, a reminder letter with a second questionnaire was sent to all nonrespondents. A final postcard was then sent 8 weeks later; therapists were asked to tick the appropriate box on the postcard to indicate the reason for nonresponse. Available options were "I do not work with LBP patients," "I do not use traction with LBP patients," "I am not working as a physiotherapist," "I am retired," "I did not receive the questionnaire," "I am not interested in replying," or the questionnaire was "too long or difficult."

Statistical Analysis

The questionnaire was designed for the Formic system, version 2.^a Responses for closed questions were collated by computer scanning, all string variables were inputted by hand, and responses from open questions were grouped in common themes, coded, and entered on SPSS, version 11,^b for further analysis. Descriptive analyses included frequencies, means, modes, medians, and measures of variance, where appropriate. The majority of the survey variables were of nominal or ordinal level of measurement; planned associations between these variables were explored by using cross-tabulation and chi-square analysis. Some questions provided ratio data, and several paired *t* tests were performed to explore the relation between these variables. For such testing, we used a significance level of *P* less than .05.

RESULTS

Survey Response

Responses were obtained from 1239 of the 1491 physiotherapists contacted; the overall response rate was 83%. Of respon-

Table 1: Summary of Respondents' Profile

Respondents (n=507)	Valid Percentage (%)	Frequency (n)
Area of work (n=500)		
NHS trust	50.4	252
Private practice	35.0	175
Both NHS and private practice	14.6	73
Clinical experience (years qualified, n=503)		
3-5y	2.6	13
6-10y	18.3	92
>10y	79.1	398
LBP experience (n=505)		
1-3y	2.4	12
4-5y	10.3	52
6-10y	28.5	144
>10y	58.8	297
Postgraduate courses (n=504)		
Mulligan	81.1	411
Muscle imbalance	77.7	394
Maitland	71.2	361
McKenzie	64.9	329
Acupuncture	62.7	318
Cyriax	53.1	269
Neurogenic pain	44.8	227
MACP validated/MSc manual therapy	29.8	151
Muscle energy	6.3	32
Pilates	5.1	26
Psychosocial approach	3.6	18
Manipulation	3.4	17
Craniosacral therapy	1.4	7

Abbreviation: MACP, Manipulation Association of Chartered Physiotherapists.

dents, 41% (n= 507) indicated they used traction by returning the completed questionnaire, 45% (n= 553) returned the letter indicating that they did not use traction, and 12% (n=151) indicated they did not treat LBP (due either to retirement, change of job, or career break). A further 2% (n=28) returned the survey and covering letter uncompleted. Prepaid postcards (n=252) were sent to nonrespondents, of which 39% (n=98) were returned; 51% (n=50) of these did not use traction with LBP; 11% (n=11) were no longer working in musculoskeletal management; 6% (n=6) felt the questionnaire was too long/difficult; 4% (n=4) were not interested in replying; and 28% (n=27) gave other responses, for example, the therapist was overseas, on holiday, or too busy. The nonresponse bias showed that the most common reason for noncompletion was that "the therapist did not use traction in the management of LBP." Because the questionnaire represented the views of those who used traction, this nonresponse rate did not affect our results, and because of the high response rate, it had only a small effect on the overall percentage of therapists using traction.

Respondents' Profile

Data on respondents' profiles showed that this was an experienced group (table 1) of therapists working in both the National Health Service (NHS) and private practice; 99% (n=504) of the therapists had completed postgraduate training courses (range, 1-9; mean, 5), which indicated they were continuing to update their clinical skills.

Table 2: Chronicity of LBP Presenting in Caseload and Receiving Traction

Characteristics	Most Often Seen (%)	Second Most Often Seen (%)	Least Often Seen (%)
Chronicity of LBP presenting in caseload			
Acute	26.8 (n=134)	20.4 (n=102)	52.4 (n=264)
Subacute	29.3 (n=146)	59.6 (n=297)	11 (n=55)
Chronic	44.5 (n=222)	21.2 (n=106)	34.3 (n=171)
Chronicity of LBP patients receiving traction			
Acute	32.7 (n=144)	21.5 (n=95)	45.8 (n=144)
Subacute	41.2 (n=188)	50.9 (n=232)	7.9 (n=36)
Chronic	33.6 (n=152)	23.4 (n=106)	43 (n=195)

Caseload Profile

Respondents were asked to estimate the percentage of their caseload that received treatment for LBP: this ranged from 1% to 100%, with a mean of 45.3% (median, 40%; mode, 40%; interquartile range [IQR], 0%–60%). Respondents were also asked to rank the level of LBP chronicity (ie, “acute,” <6wk from onset; “subacute,” 7–12wk; “chronic,” >12wk) based on the relative percentage in their caseload (table 2). Although all levels of chronicity were treated, chronic LBP (CLBP) patients were seen most commonly, followed by subacute patients, with acute LBP seen least often. Chi-square analysis revealed a highly significant association (χ^2 test=130.23, $P<.001$) between how often acute LBP patients were seen in relation to the practice setting. In the NHS setting, only 17% (n=23) reported seeing acute LBP “most often”; in private practice, it was 68% (n=90). Subacute LBP showed a weak but not significant association. CLBP similarly showed a strong association with practice setting; NHS staff were more likely to see CLBP (73%, n=159) than were private practitioners (12%, n=27) (χ^2 test=125.269, $P<.001$). Those who worked in both sectors had a more even representation of all levels of chronicity.

Therapists estimated that 5% (median, mode) of their LBP patients received traction; the range reported was wide (1%–95%), because of extreme outliers, but the IQR was 2% to 10% with 76% of respondents using traction with 10% or less of their LBP patients. Results indicated that, regardless of practice setting, traction is most commonly used for the treatment of subacute LBP and used less frequently with acute or CLBP (see table 2).

Traction Modes

Respondents indicated that motorized traction with a split tabletop was the most commonly used type of traction (79%, n=400); however, manual traction was also used consistently (53%, n=266). Other forms of traction such as autotraction and gravitational traction were used infrequently (5%, n=23; 4%, n=19, respectively).

Modalities Used in Conjunction With Traction

Results also showed that patients received traction most commonly as part of a package (median, 100%; mode, 100%; IQR, 80%–100%), with only a small proportion receiving traction with advice (median, 0%; mode, 0%; IQR, 0%–15%). It was particularly interesting to note that traction was apparently rarely used in isolation (mean, .85%; median, 0%; mode, 0%; IQR, 0%).

In examining the treatment modalities used in conjunction with traction, respondents were asked to rank whether they used a modality “frequently,” “sometimes,” “rarely,” or “never.” The modalities used frequently were advice about the self-management of LBP (97%, n=477) and general exercises, including advice to stay active (89%, n=437). In addition, so-called “core stability exercises,” a relatively new addition to the physiotherapists’ repertoire, was used 80% (n=390) of the time. The most common types of manual therapy used frequently were mobilizations (60%, n=284), McKenzie regimen (45%, n=211), and neural techniques (38%, n=175) (table 3).

Table 3: Summary of Modalities Used in Conjunction With Traction

Modality	Frequently Used		Never Used	
	Valid Percentage (%)	Frequency (n)	Valid Percentage (%)	Frequency (n)
Advice re posture and management	96.8	477	0.2	1
General exercise/keep active	89.4	437	0.4	2
Core stability	80.4	390	1.9	9
Mobilizations	60.2	284	2.8	13
McKenzie	45.0	211	4.3	20
Neural	37.8	175	3.5	16
Massage	12.1	53	38.4	168
Heat	10.6	45	39.9	169
IFT	9.8	43	35.2	154
Other electromodalities	9.0	39	22.1	96
Manipulation	7.3	32	38.3	168
Other*	6.1	31		

NOTE. Categories are not mutually exclusive. Boldface represents most commonly recorded modalities.

Abbreviation: IFT, interferential therapy.

*Other modalities consisted of muscle energy techniques, acupuncture, Mulligan techniques, trigger points/soft tissue release, craniosacral therapy, and pain management classes.

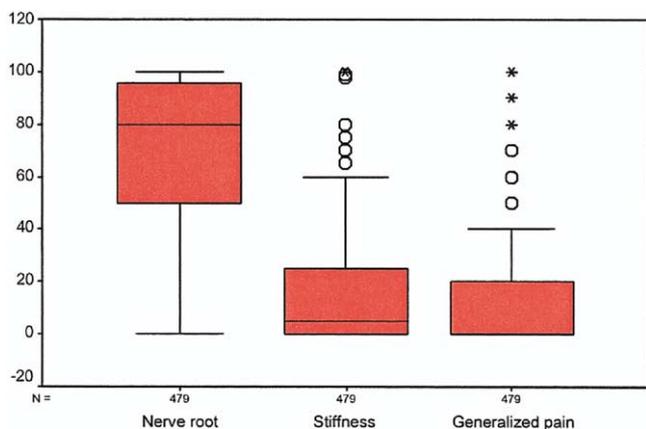


Fig 1. Percentage of traction used for LBP categories. NOTE. Standard error (SE) ranged from 1.45 to 0.99 (nerve root, 1.45; stiffness, 1.07; pain, 0.99). Standard deviation (SD) ranged from 31.8 to 21.7 (nerve root, 31.8; stiffness, 23.3; pain, 21.7).

The modalities most commonly cited as “never” used with traction were manipulation (38%, n=168), interferential (35%, n=154), massage (38%, n=168), and heat (40%, n=169).

Patient Selection for Traction

There are inherent problems with categorizing LBP,¹⁶⁻¹⁸ and they have previously caused difficulty in identifying the types of patients who receive traction. Manual therapy texts¹³⁻¹⁵ recommend that traction be used to treat patients with nerve root pain (with or without neurologic signs), to “mobilize a stiff spine,” or as a treatment for “generalized pain relief.” Therapists were asked to estimate the percentage of their patients who received traction across these 3 categories. Traction was reported as used most commonly to treat nerve root pain (median, 77.5%; mode, 100%; IQR, 50%–95%), and less frequently to treat “stiffness” (median, 5%; mode, 0%; IQR, 0%–25%) or “generalized pain” (median, 0%; mode, 0%; IQR, 0%–20%) (fig 1).

Treatment Details

This section of the questionnaire was targeted to therapists who used motorized traction on a split tabletop and asked questions on position, weights, length, and frequency of traction. It asked the respondents to provide details about the factors that influenced their choice of weights, as well as about the duration and frequency of traction. Respondents tended to list these factors but did not clearly indicate how it affected their choice.

Traction Position

The most common positions for applying traction were supine lying with the knees and hips flexed to 90° (67%, n=340) or supine with a pillow under the knees (19%, n=98).

Traction Weight

Respondents were asked to indicate the lowest and highest weight they most commonly used for women and men of small, medium, and large builds. Overall results showed that clinicians used a wide range of weights (1–126kg); however, box-plots (fig 2) showed that there were several outliers in the higher weight ranges, and data were positively skewed (1.2–1.9) to use of lighter weights of from 5 to 60kg (IQR, 10–40kg; mean range, 13–34kg; median range, 12–35kg). The

most common reasons given for weight choice was the size, weight, and build of the patient (74%, n=374), and the irritability, severity, and intensity of pain (53%, n=266). Although the patient’s sex was not rated highly as an influence on weight choice (6%, n=0), there were significant sex differences between weights used, as well as for the patient’s build (*t* test, *P*<.000). Higher weights tended to be used with men and with patients who were larger in size, weight, and build.

Duration of Traction Session

At the first session, patients treated for “nerve root” irritation or “pain” were most commonly treated for less than 10 minutes, whereas “stiffness” was more often treated for from 11 to 20 minutes. At subsequent treatments, the average duration for all 3 categories was 11 to 20 minutes (table 4). The factors that most commonly influenced the choice of treatment duration were severity and irritability of the condition (43%, n=219), response to treatment at this or a previous episode (29%, n=147), and whether the condition was in the acute or chronic stage (22%, n=113). In general, respondents did not indicate how these factors actually influenced their choice of traction duration, but some indicated that the more severe or irritable conditions received shorter treatment times.

Frequency of Treatment

Analysis showed that “nerve root” patients were likely to be seen 2 or 3 times a week (48%, n=200; 35%, n=143, respectively), whereas “stiffness” was treated 1 or 2 times a week (39%, n=106; 49%, n=134, respectively), and “pain” received treatment most commonly twice a week (56%, n=137). Frequency of treatment was influenced by several factors including the response to treatment (47%, n=237), the availability of appointments (46%, n=234), the severity and irritability of the patient’s condition (40%, n=205), and whether the patient was acute or chronic (22%, n=110) (table 5).

Length of Management Program With Traction

Respondents were asked to estimate the number of weeks that traction was required to obtain a lasting response; the mean time was 4 weeks (mode, 3–4wk; median, 3–4wk; range, 1–15wk), and there was little difference between LBP categories.

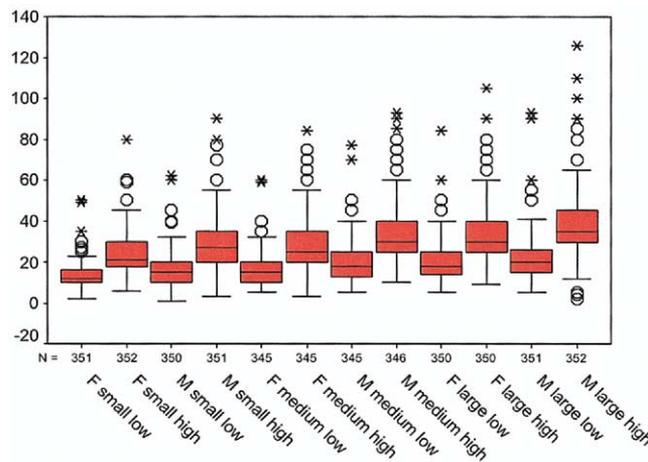


Fig 2. Traction weights for sex and build. NOTE. SE ranged from 0.35 to 0.85. SD ranged from 6.58 to 15.9.

Table 4: Treatment Duration for Each Category of LBP

Category	<10 Minutes	11–20 Minutes	21–30 Minutes
Nerve root irritation (%)			
1st session	76.8	22.3	1.1
Subsequent sessions	NA	87.2	12.3
Stiffness (%)			
1st session	40.9	56.9	2.2
Subsequent sessions	NA	73.7	25.5
Pain relief (%)			
1st session	61.8	37.7	0.4
Subsequent sessions	NA	85	13.8

Abbreviation: NA, not applicable.

Effects of Traction and the RCGP Guidelines

Respondents were asked if they agreed with the RCGP guideline¹ recommendations for traction use: 10.3% (n=51) stated yes, 64.2% (n=317) stated no, and 25.1% (n=124) were undecided. It is interesting to note that even though 10.3% accepted the guidelines, they continued to use traction. The reasons given for disagreeing or being undecided were that traction appeared to work in clinical practice (71.6%, n=363) and, less commonly, that the guidelines were based on poor quality research 4.7% (n=23).

Adverse Effects of Traction

As far as we know, no other survey has looked at the adverse effects of traction; when considering the continued use of traction, this is an important factor. A significant number of respondents (42%, n=207) stated that they had experienced adverse effects with traction; these effects were in the main not of a serious nature (short-term exacerbation of symptoms, pain on release of traction, headache, difficulty relaxing). In contrast, 2 respondents reported 1 episode of cauda equina symptoms and 1 patient who was hospitalized because of an acute onset of pain.

DISCUSSION

Our survey was the first of its kind and was done to define current clinical practice in the application of traction for LBP in the UK. We collected information pertaining to the types of patients receiving traction and the treatment regimens used (length and frequency of treatment sessions, weights of traction, length of overall treatment program). No large-scale survey to date has addressed the traction parameters used by clinicians, and our results provide important information on use of lumbar traction in the management of LBP. In the past, evidence of the effectiveness of traction has been inconclusive because of the poor methodologic quality and the clinical inappropriateness of research studies⁹; the results of our study can be used in conjunction with expert opinion to guide the selection of suitable treatment parameters in the design of future clinical trials.

Findings suggest that a high percentage of therapists (41%) continue to use traction in the management of LBP and that 76% of these therapists use traction with 2% to 10% of their patients. These findings agree with results of past studies in the UK and Ireland^{3,4} and indicate that clinical practice has not changed despite the widespread promotion of guidelines^{1,2,19-22} and implementation of various strategies to encourage evidence-based practice.²³ Our survey showed that the most common reason for continuing to use traction is that "it seemed to work clinically," and only a small proportion of respondents (5%) stated that it was because of the lack of high-quality

research in this area. This lack of compliance with clinical guidelines and reliance on personal clinical experience highlights the importance of strategies to change the behavior of health care providers.²³ Equally, to gain acceptance and compliance by clinicians it is essential that guidelines are based on high-quality, clinically appropriate trials.

Despite the fact that traction is used with a small proportion of LBP patients, it is clearly used most commonly with patients with nerve root irritation (with or without neurologic signs). One explanation for the lack of positive research findings from randomized trials is that patients with nonspecific LBP are regarded as a homogeneous group, when in fact they are a heterogeneous group consisting of several smaller homogeneous subsets, which are more likely to respond to a particular treatment appropriately targeted to that classification.¹⁶ The implication of these findings is that future trials of the effectiveness of traction should focus on LBP patients with nerve root signs. Although classification and identification of LBP can be difficult, nerve root pain is perhaps easier to classify than other less distinct groups.

Traction weights are of particular interest in the design of a study; several previous trials in this area have used sham traction, that is, a low weight that is perceived to be negligible. However, because the mechanism by which traction may affect the lumbar spine is not fully understood, it cannot be assumed that sham traction with low weights will not have an effect.²⁴ In some cases, the sham traction weight has been within the weight regimens recommended by clinical experts for treatment, meaning that the control is potentially active. It is important therefore to establish traction weights for use in future clinical trials. The survey results support the use of lower weights (5–60kg), which is similar to that suggested by the principal manual therapy texts (10–85kg).¹³⁻¹⁵ In past traction studies, only 46% used weights that were within these guidelines.⁹

Existing texts agree that acute nerve root patients should receive traction treatment daily, whereas those with stiffness may receive treatment less frequently. However, the results of our survey showed a very different response, with nerve root patients being seen no more than 3 times weekly and only 9% (n=39) of therapists seeing them daily. Interestingly, a main factor affecting the frequency of treatment was the availability of appointments (46.2%, n=237) and, to a lesser extent, the condition of the patient. This is possibly a reflection of pressures within the UK NHS. In contrast to expert opinion, it would appear that frequency of treatment would not need to be daily but rather 2 or 3 times a week. This may help address the difficulties of patient compliance and treatment costs in a trial.

Studies^{3,4} in the past have shown that PT is characterized by a diverse array of modalities, exercises, and manual therapy treatments. So in addition to understanding the treatment parameters used when applying traction, it is also essential to understand how traction is used within a polytherapy approach. Our results indicate that traction is used principally as part of a package of treatment modalities; therapists use not only a passive approach to the management of LBP (with the use of traction and

Table 5: Reported Frequency of Treatment for Each Category of LBP

Time	Daily	3 × Weekly	2 × Weekly	1 × Weekly
Nerve root (%)	9.4	34.6	48.4	7.5
Stiffness (%)	1.5	10.6	49.1	38.8
Pain (%)	2.4	22	55.7	19.9

mobilization techniques) but also an active approach with the involvement of the patient through advice about self-management and exercises (general or specific). Jette and Delitto⁶ noted that PT treatments are initially more passive but become more active as the patient responds to treatment. Ideally, future trials should also reflect this polytherapy approach to the management of LBP.

Previous studies in this area have been principally explanatory trials (looking at traction in isolation); these types of trials assess efficacy by looking at the benefits of treatment under ideal conditions with a carefully defined group. However, this fails to address questions about its effectiveness in clinical practice because a treatment may work in an ideal setting but not in everyday life.²⁵ A pragmatic trial, on the other hand, evaluates a treatment policy rather than the treatment itself; it is not concerned with how the treatment works but whether it works in clinical practice. It allows for variations between patients that occur in real clinical situations.²⁶ Pragmatic trials address the overall effectiveness of therapies as they would be used routinely by clinicians.^{27,28} Past trials on the effectiveness of traction have typically been poorly designed, but using a pragmatic design incorporating the findings of this survey would ensure a high-quality study that is clinically appropriate and be a more appropriate trial of the potential role of traction in the management of LBP.

Limitations of the Study

This survey was conducted with a random sample of UK physiotherapists. However, this information is unlikely to be transferable to other countries where different types of traction (autotraction, gravitational traction) may be used or where their traction regimes may be influenced by other expert opinion.

We asked therapists to indicate parameters of treatment with traction. Some therapists stated that it was difficult to answer sections of the questionnaire, for example, the sections on weights and overall length of treatment regimes. Although this could have been overcome by asking therapists to record traction regimens with individual patients, it would have been difficult to complete within the time constraints of this research.

CONCLUSIONS

The results of this survey show that despite recommendations of various LBP guidelines,^{1,19-22} traction continues to be used by UK physiotherapists in the management of LBP. In addition, our results clarify the types of patients who receive traction and how traction is used clinically (parameters and modalities used in conjunction with traction).

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Suppliers

- a. Formic Ltd, Kingston-upon-Thames, Surrey, England.
- b. SPSS Inc, 233 S Wacker Dr, 11th Fl, Chicago, IL 60606.