

How do we define the condition ‘recurrent low back pain’? A systematic review

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Abstract Recurrent low back pain (recurrent LBP) is a common condition, however, it is unclear if uniform definitions are used in studies investigating the prevalence and management of this condition. The aim of this systematic review was to identify how recurrent LBP is defined in the literature. A literature search was performed on MEDLINE, EMBASE, CINAHL, AMED, and PEDro. Studies were considered eligible if they investigated a cohort of subjects with recurrent LBP or if they were measuring the prevalence of recurrent LBP. Two independent reviewers assessed inclusion of studies and extracted definitions of recurrent LBP. Forty-three studies met the inclusion criteria. The majority of studies (63%) gave an explicit definition of recurrent LBP; however, the definitions varied greatly and only three definitions for recurrent LBP were used by more than one study. The most common feature given as part of the definition was the frequency of previous episodes of low back pain. Only 8% (3/36) of studies used previously recommended definitions for recurrent LBP. Large variation exists in definitions of recurrent LBP used in the literature, making interpretation of prevalence rates and treatment outcomes very difficult. Achieving consensus among experts in this area is required.

Keywords Recurrent low back pain · Non-specific low back pain · Definition · Review

Introduction

Low back pain (LBP) is reported to run a recurrent course in the majority of patients [1, 2]. This means that following an episode of low back pain it is likely that a patient will have further episodes of pain [3] causing suffering for the patient and time loss from work. A number of treatments have been developed to reduce the risk of recurrent low back pain (recurrent LBP) [4–11] with clinical trials conducted to evaluate how effective treatments are in patients with recurrent LBP [12–19].

The area of recurrent LBP is complex; as is the terminology used to describe it. For example, the term ‘recurrent LBP’ is used in many different ways by clinicians and researchers creating much confusion when trying to study this condition. One use of the term recurrent LBP is to describe an *outcome event* (e.g., a recurrence of an episode of LBP). This is applicable to a study design where patients with LBP are given a treatment and then followed over time to determine if they have a recurrence of their original LBP. A second use of the term recurrent LBP is to describe a *patient population* (e.g., patients with recurrent LBP). This is applicable when recurrent LBP is used as an inclusion criterion for a study investigating treatments for patients with recurrent LBP and we are then interested in how the authors define this type of patient.

While the two uses of recurrent LBP terminology may sound similar, they have quite different meanings. For example, some patients, after recovering from an episode of LBP, will have a recurrence at some future time. However, many researchers and clinicians would say a

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single episode of recurrence does not constitute the condition “recurrent LBP” but instead the patient has to experience a certain number of recurrences within a defined time period to fit this category.

We recently conducted a systematic review that investigated how recurrence as an *outcome event* was defined in the LBP literature. We found that definitions of recurrence of an episode of LBP varied widely making comparisons between studies difficult, if not impossible. However, to date, no study has comprehensively evaluated the definitions used in the literature to define recurrent LBP as a *patient population*.

It is important to clearly define recurrent LBP as a *patient population* in order to study treatment efficacy and prognosis for this group of patients. Without an agreed definition it is difficult to interpret the results of trials that evaluate the management of recurrent LBP or observational studies that attempt to estimate the prevalence of recurrent LBP or its prognosis. The only published recommended definition for recurrent LBP that we are aware of following a comprehensive search is that by von Korff in 1994: ‘back pain present on less than half the days in a 12-month period, occurring in multiple episodes over the year’ [2]. However, it is unclear if this definition is being used in research.

The purpose of this systematic review therefore, is to explore and summarise the definitions of recurrent LBP (as a *patient population*) that are currently used in the literature.

Methods

Search strategy

Identification of potential studies for inclusion was performed via a general search of Medline (1950 to November 2008), EMBASE (1974 to November 2008), CINAHL (1982 to November 2008), AMED (1985 to November 2008), and PEDro (1929 to November 2008). Keywords describing low back pain (low back pain OR back pain OR backache OR low back injury OR sciatica OR lumbago) AND recurrent (recurren\$) were used to identify papers in which recurrent LBP was studied.

Inclusion criteria

To be included studies needed to meet all of the following criteria.

- A prospective, cohort study and/or randomised controlled trial
- Study population of patients with non-specific LBP.

- The study provides a definition of “recurrent LBP”, e.g., as an inclusion criterion in a trial or as a case definition in a prevalence study.

Exclusion criteria

- Papers written in non-English languages where a translation cannot be arranged
- Papers addressing surgical management of LBP.

Article inclusion

One reviewer (TS) applied the inclusion criteria to select the potentially relevant trials from the titles, abstracts, and key words of the references retrieved by the literature search. Then, two independent reviewers (TS and JL) applied the inclusion criteria to any retrieved studies for which inclusion was uncertain. The references of all included studies were checked to ensure that all studies examining recurrent LBP were included. No additional studies were included based on this hand-search process.

Data extraction

The definitions given for recurrent LBP were extracted from each study. The *features* used in the recurrent LBP definitions (e.g., number of previous episodes, duration of pain, severity of pain, etc.) were identified and the *criteria* used for each feature were recorded (e.g., at least 3 previous episodes of LBP).

Results

A total of 43 studies met the inclusion criteria (Fig. 1) [12–54]. Thirty studies investigated a patient population with recurrent LBP (definition given in the inclusion criteria of study) [12–19, 21, 22, 25–29, 32–38, 41, 42, 46–50, 52] and 13 studies measured the prevalence of recurrent LBP [20, 23, 24, 30, 31, 39, 40, 43–45, 51, 53, 54].

Explicit definitions of recurrent LBP were given in 63% of studies (27/43) [13–19, 22, 24, 27, 29–31, 35, 37, 39–43, 45–47, 49–51, 54]. A comprehensive list of these explicit definitions is given in Table 1. Only three definitions were used by more than one study; one definition was shared by three studies [16, 17, 37], a second definition was shared by two studies [13, 18], and a third definition was shared by two studies [31, 43].

There are several features that were commonly used by different studies as part of their definition of recurrent LBP. The most common feature used to define recurrent LBP was the frequency of previous episodes of LBP (14/43

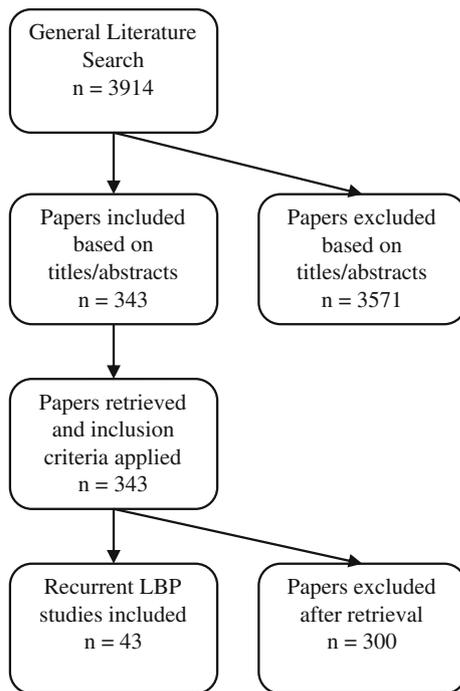


Fig. 1 Flow chart describing the results of the literature search

studies) [13–19, 22, 24, 27, 35, 37, 39, 40, 45, 47, 49, 51]. The criteria used to quantify the frequency of previous episodes, however, were very different. For example, Roelofs and colleagues quantified frequency of previous episodes as “ ≥ 2 episodes of low back symptoms in past year” [19] while Feuerstein et al. used “pain twice weekly over a minimum period of 6 months” [27]. Some definitions were more general in nature, defining frequency as “multiple spells over the past year” [14] or “repeated pain episodes over the past year” [16, 17]. Other definitions of frequency were related to seeking care; e.g., “at least one previous outpatient visit for low back pain over past year” [22] or “previous presentation to primary care with low back pain within the last 3 months” [18].

Four other features were used by studies as part of their definition of recurrent LBP. These features included specifying the number of previous episodes of LBP (e.g., “at least 10 times” [39]), the duration of pain (e.g., a recurrent episode must last for “ ≥ 2 consecutive days with low back pain” [19]), the severity of pain (e.g., “low back pain affecting physical capacity to work and resulting in sick leave” [29]), and the pain course (e.g., “report regular or prolonged pain at two consecutive interviews” [51]). These features were used in 4 [13, 18, 39, 47], 11 [16–19, 27, 29, 30, 37, 46, 50, 54], 5 [13, 18, 22, 29, 41], and 5 [31, 42, 43, 51, 54] studies, respectively. Eleven out of the 27 studies that gave definitions for recurrent LBP combined various definition features [13, 16–19, 22, 37, 51, 54] (e.g., “*pain twice weekly* [frequency] for at least 6 months

[duration]” [27]). von Korff’s recommended definition for recurrent LBP [2] was used by only 3 of 36 studies (giving explicit definitions) [16, 17, 37] published since his 1994 paper.

In only two papers (5%) did the definition of recurrent LBP explicitly differentiate between patients whose episodes of LBP are separated by periods of recovery and those that have flare-ups of LBP but do not fully recover. In these two studies a recovery period of 4–6 weeks [49] and ≥ 6 weeks [42] between episodes was used.

Discussion

This paper found that less than two thirds of studies gave explicit definitions for recurrent LBP (63%). Studies used a range of different features to define recurrent LBP and for each of these features the criteria varied greatly. The most common feature used to define recurrent LBP was the frequency of previous episodes of LBP and this was reported in only 33% of studies. Only 8% (3/36) of studies (published after 2000) used the previously recommended definition of von Korff [2].

It is clear from the results of this study that there is little agreement on the definition of recurrent LBP. In fact, only three definitions of recurrent LBP were used by more than one study. Not only did studies use different features to define LBP but the criteria for these features also varied remarkably. As an example although frequency of episodes was the most commonly used feature to define recurrent LBP [13–19, 22, 24, 27, 35, 37, 39, 40, 45, 47, 49, 51] the criteria ranged from “at least one episode over past year” [22] to “pain twice weekly” [27]. This demonstrates the importance of reaching a consensus on both the features, and operational criteria for each feature, when defining recurrent LBP. It is likely that the lack of a consensus definition for recurrent LBP has contributed to the different findings with regards to the prevalence [20, 30, 31] and effectiveness of treatments [13, 16, 17, 50] for recurrent LBP reported in the literature.

Not only does variability in definitions of recurrent LBP affect research findings and the ability to translate these findings into clinical practice, but it also affects the clinical treatment of LBP by hindering the ability of multidisciplinary teams to communicate effectively. Rarely is a patient treated by only one health profession over the course of care. Differences in patient category definitions (e.g., recurrent LBP) between team members may negatively influence the treatment of a patient. Therefore, achieving standardised definitions for patient categories such as recurrent LBP is an extremely important first step.

There are two approaches that can be taken to deal with the large variability in definitions of recurrent LBP. The

Table 1 Definitions of recurrent LBP, separated by definition feature, for the 27 studies giving explicit definitions of recurrent LBP

| Studies | Previous LBP | | Duration | Severity | Pain course | Recovery |
|--|--|---|--|---|-------------------------|--|
| | Number of episodes | Frequency | | | | |
| Patient population of recurrent LBP (inclusion criteria) | | | | | | |
| Bruce [22] | | At least one over the last year | | LBP resulting in an outpatient visit | | |
| Cairns [13] | At least one | | | LBP resulting in alteration in normal activities or care seeking | | |
| Feuerstein [27] | | Pain twice weekly | Minimum of 6 months | | | |
| Harkapaa [29] | | | At least 2 years | LBP affecting physical capacity to work and resulting in sick leave | | |
| Jones [14] | | Regular LBP involving repeated acute bouts | | | | |
| Jones [15] | | Repeated acute episodes of LBP experienced as multiple spells | | | | |
| Koumantakis [16] | | Repeated pain episodes in last year | <6 months in total | | | |
| Koumantakis [17] | | Repeated pain episodes in last year | <6 months in total | | | |
| Linton [35] | | ≥4 pain episodes over the past year | | | | |
| Little [18] | LBP at least once (>3 months previously) | | Current LBP ≥3 weeks | LBP resulting in presentation to primary care | | |
| McGorry [37] | | Repeated pain episodes over 6 months | <1/2 of reporting days | | | |
| Müller [41] | | | | Sick leave due to recurrent LBP | | |
| Nyiendo [42] | | | | | Discreet episode of LBP | ≥6 weeks with no LBP |
| Roelofs [19] | | ≥2 episodes of LBP symptoms in the past 12 months | ≥2 consecutive days of LBP | | | |
| Stig [46] | | | >4 weeks of pain in past years with ≥2 weeks of pain currently | | | |
| Symmons [47] | Current LBP with history of previous episodes of LBP | | | | | |
| Triano [49] | | ≤6 episodes of LBP over the past years prior to present episode | | | | 4–6 weeks free of LBP prior to current episode |
| Tsao [50] | | | LBP >3 months | | | |

Table 1 continued

| Studies | Previous LBP | | Duration | Severity | Pain course | Recovery |
|---|--------------------|---|---------------------------|----------|---|----------|
| | Number of episodes | Frequency | | | | |
| Prevalence of people with recurrent LBP | | | | | | |
| Burton [24] | | 1–6 spells over previous 3 years | | | | |
| Hestbaek [30] | | | >30 days LBP in past year | | | |
| Kääriä [31] | | | | | Pain at baseline and f/u | |
| Mikkelsen [39] | At least 10 times | | | | | |
| Moseley [40] | | >4 episodes in the last 2 years | | | | |
| Raspe [43] | | | | | Pain at baseline and f/u | |
| Stanford [45] | | Pain frequency reported as: about once per month, weekly, more than once per week, on most days | | | | |
| Van den Heuvel [51] | | 4-point scale (seldom/never, sometimes, regular, prolonged) | | | Regular/prolonged LBP at two consecutive interviews | |
| Yip [54] | | | LBP for at least 1 day | | Pain at baseline and f/u | |

f/u Follow-up

first is to choose the definition that allows measurements with optimal clinimetric properties. The second approach is to aim for consensus on a definition of recurrent LBP among experts in this area. While both approaches appear reasonable, given the diversity of definitions used in the literature and summarised by this review, it appears that reaching expert consensus on a definition for recurrent LBP would be a timely and viable first step. Once consensus is reached, a clinimetric analysis of the definition can follow. In the meantime, we would suggest that for future research the following features should be included as part of a definition of recurrent LBP. Firstly the authors should provide a definition of an episode of LBP that includes a definition for the start and end of the episode. We would advocate the de Vet definition (period of LBP lasting more than 24 h preceded and separated by a period of at least 1 month without LBP) [55] as suitable for this purpose. Secondly a definition to classify someone as having recurrent LBP needs to consider the number of previous episodes of LBP and the time span they occurred over (e.g., at least 2 episodes in the past 12 months). These recommendations reflect the opinions of the authors based upon

review of the current literature. While they are opinion based; given the diversity of definitions currently being used, any attempt at standardisation would be beneficial.

It is possible that despite the comprehensive nature of our search strategy some studies with definitions of recurrent LBP were missed. However, any further studies included would most likely increase the heterogeneity of our findings not decrease it; therefore it is unlikely that our results would change.

Conclusions

This review demonstrates that large variation exists in definitions of recurrent LBP used in the literature, making interpretation of research in this area difficult. There is a clear need for a consensus to be reached on an appropriate definition for recurrent LBP.

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