

Original Investigation | LESS IS MORE

Effect of Primary Care–Based Education on Reassurance in Patients With Acute Low Back Pain

Systematic Review and Meta-analysis

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IMPORTANCE Reassurance is a core aspect of daily medical practice, yet little is known on how it can be achieved.

OBJECTIVE To determine whether patient education in primary care increases reassurance in patients with acute or subacute low back pain (LBP).

DATA SOURCES Medline, EMBASE, Cochrane Central Register for Controlled Trials, and PsychINFO databases were searched to June 2014.

DESIGN Systematic review and meta-analysis of randomized and nonrandomized clinical trials.

STUDY SELECTION To be eligible, studies needed to be controlled trials of patient education for LBP that were delivered in primary care and measured reassurance after the intervention. Eligibility criteria were applied, and studies were selected by 2 independent authors.

MAIN OUTCOMES AND MEASURES The primary outcomes were reassurance in the short and long term and health care utilization at 12 months.

DATA EXTRACTION AND SYNTHESIS Data were extracted by 2 independent authors and entered into a standardized form. A random-effects meta-analysis tested the effects of patient education compared with usual care on measures of reassurance. To investigate the effect of study characteristics, we performed a preplanned subgroup analysis. Studies were stratified according to duration, content, and provider of patient education.

RESULTS We included 14 trials (n = 4872) of patient education interventions. Trials assessed reassurance with questionnaires of fear, worry, anxiety, catastrophization, and health care utilization. There is moderate- to high-quality evidence that patient education increases reassurance more than usual care/control education in the short term (standardized mean difference [SMD], -0.21; 95% CI, -0.35 to -0.06) and long term (SMD, -0.15; 95% CI, -0.27 to -0.03). Interventions delivered by physicians were significantly more reassuring than those delivered by other primary care practitioners (eg, physiotherapist or nurse). There is moderate-quality evidence that patient education reduces LBP-related primary care visits more than usual care/control education (SMD, -0.14; 95% CI, -0.28 to -0.00 at a 12-month follow-up). The number needed to treat to prevent 1 LBP-related visit to primary care was 17.

CONCLUSIONS AND RELEVANCE There is moderate- to high-quality evidence that patient education in primary care can provide long-term reassurance for patients with acute or subacute LBP.

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Reassurance, that is, the removal of fears and concerns about illness, is a core aspect of daily medical practice.¹ Fears and concerns about illness are known to influence physical health,^{2,3} motivate consulting behavior,⁴⁻⁶ and may lead patients to seek expensive and inappropriate interventions.^{7,8} The World Health Organization recognizes the contribution of such psychological factors to the burden of illness and considers that primary care practitioners are ideally placed to provide first-line management of these factors.⁹ Clinical practice guidelines for low back pain,¹⁰ neck pain,¹¹ irritable bowel syndrome,¹² and stable angina,¹³ all specifically recommend that a patient's fears and concerns are addressed—that the patient is reassured. However, little is known about how such reassurance can be achieved.^{14,15}

Reassurance can be especially difficult to achieve when a diagnosis is unclear or unavailable.¹⁶⁻¹⁸ In fact, there is clear evidence that attempts by practitioners to manage distress in these patients can lead to an unexpected increase in fear and concern.^{17,19} For example, Lucock et al²⁰ found that concern increased after patients with nonspecific abdominal symptoms were assured that no disease was present. Similarly, Pincus et al²¹ found that outcomes worsened after patients with nonspecific symptoms were given emotional assurances by their physician. These findings have led some to suggest that the current recommendations to provide reassurance are at best misunderstood^{15,22} and are at worst medically contraindicated.²³

Low back pain (LBP) is a nonspecific illness for which reassurance is recommended by clinical guidelines.¹⁰ It is the second most common symptom-related reason for people to see a physician.²⁴ High levels of psychological distress in these patients has been linked to high health care costs^{25,26} and to the development of chronic pain.^{27,28} In the United States, direct costs of LBP are estimated to be \$50 billion annually,²⁴ and in the United Kingdom this figure approaches £2.8 billion.²⁹ Primary care practitioners currently provide the least expensive care for LBP.⁸ There is potential to further reduce costs if patients can be reassured effectively. However, explicit guidance on how reassurance can be achieved in patients with LBP is not available.

One option to reassure patients is to provide diagnostic test results. In LBP, routine diagnostic imaging is discouraged¹⁰ because these tests are expensive,³⁰ may not be reassuring,³¹ and do not appear to improve health outcomes.^{32,33} Despite this, physicians order imaging in 25% of LBP consultations,³⁴ and this figure is increasing.³⁴

Another option to reassure patients is to clearly explain their symptoms and educate them about the problem.²¹ Although most medical consultations involve advice and explanation, when the information is provided to the patient using preplanned, structured techniques it is referred to as patient education.³⁵ Patient education can be as simple as a booklet or as comprehensive as a multiple session program informed by behavioral techniques such as pacing and graded exposure. Patient education interventions for LBP have been extensively reviewed³⁵⁻³⁹; there is conflicting evidence for its effects on pain and disability outcomes^{35,39} and strong evidence for positive effects on return to work outcomes.³⁵ However, to our knowledge, no systematic review has examined whether

patient education is an effective method of reassurance. It is also not known if certain characteristics of these interventions can influence effects on reassurance. Characteristics that appear to influence the effectiveness of patient education interventions include duration of intervention,³⁵ the practitioner involved,^{40,41} and content covered.³⁷

The primary aim of this systematic review was to determine whether patient education in primary care increases reassurance (reduces fear and concern) in patients with acute or subacute LBP. A secondary aim of this review was to investigate whether the effect of patient education on reassurance is influenced by certain characteristics of the interventions.

Methods

This systematic review and meta-analysis was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement.⁴²

Search

A sensitive search strategy using MEDLINE (Ovid), EMBASE, Cochrane Central Register for Controlled Trials, and PsychINFO databases was developed to identify potentially eligible studies. The initial search took place in November 2013 and was repeated in June 2014. Studies were identified that investigated education, advice, and information provision using the following key words or their variations: *reassurance, education, psychoeducation, advice, information, consultation, and counseling*. The search strategies of the Cochrane Back Review Group⁴³ were then used to identify clinical trials on LBP. Results from the 2 components of the search were then combined. Full-search strategies for each database are provided in eAppendix 1 in the Supplement.

Eligibility Criteria

Studies were considered eligible for inclusion if they met the following criteria:

1. The study design was a randomized or nonrandomized clinical trial.
2. Participants were adults with acute (less than 6-weeks' duration) or subacute (6 to 12-weeks' duration) LBP. Groups with mixed duration LBP were considered if more than 70% of participants reported acute or subacute symptoms.
3. Interventions took place in primary care, operationalized according to the World Health Organization definition "...incorporates curative treatment given by the first contact provider along with promotive, preventive, curative and rehabilitative services."^{44(p2)}
4. At least 1 intervention consisted of individual patient education (including advice and information) delivered by a primary care practitioner (eg, a general practitioner, physiotherapist, nurse). Patient education could be written or verbal information of any duration and was considered to be "...any set of planned condition-specific educational activities in a one-to-one situation, designed to improve patients' health behaviors and/or health status in regard to the low back pain problem."^{35(p4)}

5. Measured reassurance as an outcome of the intervention. Reassurance was operationalized to include any measure of fear, illness concern, worry, anxiety, catastrophization, distress, or health care utilization taken after the intervention. Health care utilization could include either the number of LBP-related primary care visits (continuous scale) or whether patients had revisited primary care up to 12 months after intervention (dichotomous scale).

Studies were excluded if they did not meet all of the inclusion criteria or evaluated education as part of a multidisciplinary intervention; more than 30% of the participants reported their LBP to be chronic or reported no LBP; involved group education; or were testing educational material given outside of a face-to-face consultation, eg, via mail-out. Multidisciplinary interventions were excluded because the effect of patient education cannot be separated from the other intervention components. Interventions on participants with chronic LBP were excluded because reassurance is more commonly recommended by clinical guidelines for acute or subacute LBP.¹⁰ Education interventions that were given in groups or via mail-out were excluded because they are less reflective of treatments that are delivered in primary care.

Study Selection

After duplicates were removed, potentially eligible studies were identified by screening titles and, if necessary, abstracts. Title and abstract screening was performed independently by 2 authors (A.C.T. and either M.H. or H.L.). Two authors (A.C.T. and either M.H. or H.L.) also assessed the full text of all studies that potentially fulfilled the eligibility criteria. Disagreements were resolved by discussion. Only articles published in English and German were included. Articles published in German were translated by 1 author (M.H.). The characteristics of each trial are summarized in **Table 1**.

Data Collection and Extraction

Data on all outcomes and study characteristics of interest were extracted from each published article and entered into a standardized form. All data were extracted by 2 independent reviewers (A.C.T. and N.H.).

When outcomes of interest were incompletely reported, authors were contacted via email. If no response was given within 2 weeks, an additional email was sent, followed by a third and final email 1 week later to request the data.

Data Analysis

Continuous outcome data for each study were expressed as standardized mean differences (SMDs) between groups. If standard deviations could not be extracted and were not provided by authors, we used the standard deviations that were reported at baseline. In studies where only the range was reported, a standard deviation was calculated by dividing the reported range by 4.⁴⁵

If studies were considered to have similar clinical characteristics, we would proceed with a meta-analysis. We combined individual psychological outcomes that reflected our operationalized definition of reassurance in a single meta-analysis of “overall reassurance.” If a study measured more than

1 reassurance construct (eg, fear, catastrophizing, and distress), the scale reporting the largest SMD was included in the meta-analysis. Outcomes measured between 1 week and 4 months were categorized as “short-term” reassurance and at 12 months, “long-term” reassurance. Studies were included in the primary analyses if the comparison groups were “usual care,” reflected usual care (manual therapy, traditional education booklet), or controlled for time with the therapist (eg, neutral booklet, attention control). A separate meta-analysis was performed on health care visits at 12 months.

Dichotomous data were transformed into SMD using the method recommended by the Cochrane Handbook⁴⁶ to allow pooling of treatment effects. Random-effects models were used in all meta-analyses to account for possible statistical heterogeneity. The generic inverse variance method was used to allow for the combination of dichotomous and continuous data. Sensitivity analyses were used to test whether the results were affected by differences in comparison groups, outcome measures, design limitations, participant pain duration, dichotomous data transformation, and effect size selection (from a single study). Funnel plots were used to identify publication bias. The number needed to treat (NNT) to prevent 1 subsequent primary care visit was calculated using established methods,⁴⁷ which are described in detail in the eMethods in the Supplement. All analyses, forest plots, and funnel plots were generated using RevMan5 software.⁴⁸

Subgroup Analyses

A priori subgroup analyses were performed to investigate whether the effect of patient education on reassurance was influenced by certain characteristics of the interventions. These analyses investigated the influence of intervention duration (brief [<5 minutes] vs intermediate [5-60 minutes] vs long [≥ 60 minutes]), source (physician vs physiotherapist vs nurse), and content (biopsychosocial vs biomedical). Patient education interventions were classified as “biopsychosocial” if the content described in the article included discussion of psychosocial factors and covered topics that are common to international clinical guidelines (eAppendix 2 in the Supplement).

Risk of Bias and Quality Assessment

Two independent authors (A.C.T. and N.H.) assessed individual study risk of bias using the Physiotherapy Evidence Database (PEDro) scale⁴⁹ and the overall quality of evidence using the GRADE (Grades of Recommendation, Assessment, Development, and Evaluation) approach.⁵⁰ These methods are described in detail in the eMethods in the Supplement (see also eAppendix 3 in the Supplement).

Results

The electronic search identified 6912 studies. After title and abstract screening, 6781 were excluded. Of the 131 full-text articles assessed for eligibility, 117 were excluded (eFigure 1 in the Supplement). A total of 14 studies fulfilled the eligibility criteria and were included in the review. Additional data from 6 of the studies⁵¹⁻⁵⁶ were obtained by contacting authors.

Table 1. Characteristics of Each Trial Included in the Study

Source [Country]	Participants, Intervention/Control, No.	Mean Age, y/Female Sex, %	Intervention		Control	Reassurance Measure	Follow-up	Practitioner Involved
			Format	Messages				
Bucker et al, ⁵¹ 2010 [Germany]	117/57	44/53	Information leaflet and link to comprehensive online patient information	Acute back pain is most often nonspecific. Stay active; bedrest for no longer than 2 d. Analgesia can be indicated to facilitate return to activity.	Neutral leaflet	Fear (FABQ)	1 wk and 3 mo	Physician
Burton et al, ⁵⁷ 1999 [UK]	83/79	44/55	<i>The Back Book</i> ^a	Messages from <i>The Back Book</i> . ^a	<i>Handy Hints</i> book ³⁸ (biomedical)	Fear (FABQ); health care use (visits)	2 wk, 3 mo, and 1 y	Physician
Cherkin et al, ⁵⁹ 1996 [US]	98/98	43/48	Reassurance (20 min) and booklet	Back pain is most often nonspecific and has a good prognosis. Imaging and specialty referral is not useful in many cases. Return to normal activity. Set goals for general exercise (eg, walking, swimming, stationary cycle).	Usual care	Worry (VAS); health care use (visits)	1, 3, and 7 wk, and 1 y	Nurse
Deyo et al, ⁶⁰ 1987 [US]	49/43	33/53	Education (5 min)	Causes of back pain including illustration of the spine. Explanation of a radiograph. Lack of utility in x-ray imaging for nonspecific back pain. Many of the structures that give rise to pain are not visible on x-ray imaging. Harms are associated with imaging (eg, radiation exposure).	Usual care and imaging	Worry (VAS); health care use (visits)	3 wk and 3 mo	Nurse
Hagen et al, ⁵² 2000 [Norway]	237/220	41/48	Interview, examination, and advice (2.5 h)	LBP is benign. Physical activity is encouraged to avoid muscle dysfunction. Minimize structural contributions to LBP. Explain normal radiographic findings and dedramatize reports. Explain physical examination findings. Specific advice on returning to daily activities.	Usual care	Anxiety (STAI)	3 and 12 mo	Physician and physiotherapist
Hay et al, ⁶¹ 2005 [UK]	201/201	41/53	Brief pain management (3 × 20 min)	Psychosocial factors can contribute to the problem. Advice on how to overcome barriers to recovery. Goal setting and pacing to encourage graded return to function. Encourage positive coping strategies. Discourage the premise "hurt=harm." Specific advice on returning to daily activities.	Manual therapy (3 × 20 min)	Fear (TSK); catastrophizing (PCS); health care use (visits)	3 and 12 mo	Physiotherapist
Hill et al, ⁵⁵ 2011 [UK]	56/19	47/57	Advice and discussion of fears/concerns with video (30 min); <i>The Back Book</i> ^a	Further treatment is unlikely to be beneficial and is discouraged. Messages from <i>The Back Book</i> . ^a	Usual care	Fear (TSK); catastrophizing (PCS); health care use	4 and 12 mo	Physiotherapist
Jellema et al, ⁶² 2005 [the Netherlands]	143/171	43/48	Psychosocial intervention to explore unhelpful beliefs and set goals (20 min); <i>The Back Book</i> ^a	Excessive fear, concern, and work difficulties can delay recovery. Thoughts, emotions, and behaviors contribute to back pain. Resume normal activities in a paced (gradual) way. Messages from <i>The Back Book</i> . ^a	Usual care	Fear (FABQ); catastrophizing (CSQ)	6, 13, 26, and 52 wk	Physician
Karjalainen et al, ⁶³ 2003 [Finland]	56/57	44/58	Interview, examination, and advice (2.5 h)	Physical activity is encouraged. Avoid bed rest. Based on the examination, you have a good prognosis. Exercising daily is helpful. Sick leave may be required. Specific advice on returning to daily activities.	Usual care	Health care use (visits)	3, 6, and 12 mo	Physician and physiotherapist

(continued)

Table 1. Characteristics of Each Trial Included in the Study (continued)

Source [Country]	Participants, Intervention/Control, No.	Mean Age, y/Female Sex, %	Intervention		Control	Reassurance Measure	Follow-up	Practitioner Involved
			Format	Messages				
Leonhardt et al, ⁵⁶ 2008 [Germany]	435/376	49/57	Motivational interviewing based on the transtheoretical model (20 min)	Exercise and goal setting to increase exercise is encouraged.	Usual care	Fear (FABQ)	6 and 12 mo	Nurse
Pengel et al, ⁵³ 2007 [Australia]	63/68	50/49	Advice sessions (3 × 30 min)	LBP is benign. Unhelpful beliefs are barriers to recovery. Being overly careful and avoiding light activity will delay recovery. Graded return to activity is encouraged.	Attention control	Anxiety (DASS); health care use (visits)	6 wk and 3, 6, and 12 mo	Physiotherapist
Roberts et al, ⁵⁴ 2002 [UK]	35/28	39/35	Physician-endorsed leaflet	Keep mobile. Minimize bed rest. Postural and mattress changes might be useful. Imaging the spine has limitations. Tips on performing daily activities (eg, getting out of bed). General exercise is encouraged.	Usual care	Anxiety (STAI)	2 d, 2 wk, and 3, 6, and 12 mo	Physician
Roland and Dixon, ⁶⁴ 1989 [UK]	483/453	38/?	Biomedical information booklet	Take care to bend the knees when lifting. Use abdominal muscles to support the back. Biomechanics of the back. Description of 5 exercises for back health.	Usual care	Health care use (visits)	2 wk and 12 mo	Physician
Storheim et al, ⁶⁵ 2003 [Norway]	34/29	42/50	Advice sessions (3 × 30 min) and physical examination	Use of stabilizing muscles during daily activities. It is safe to move the back without restriction. Take care with squat and lifting technique. Explanation of pain mechanisms. Coping strategies.	Usual care	Fear (FABQ)	18wk	Physician and physiotherapist

Abbreviations: CSQ, Coping Strategies Questionnaire; DASS, Depression Anxiety and Stress Scale; FABQ, Fear Avoidance Beliefs Questionnaire; LBP, low back pain; PCS, Pain Catastrophizing Scale; STAI, Spielberger State Anxiety; TSK, Tampa Scale of Kinesiophobia; UK, United Kingdom; US, United States; VAS, visual analog scale; visits, number of visits to primary care; ?, unknown.

^a A published 21-page booklet.⁶⁶ Key messages include the following: (1) there is no sign of serious disease; (2) the spine is strong; (3) back pain is a sign that the back is unfit; (4) self-management encouraged; (5) recovery relies on getting active; (6) positive attitudes are important.

Study Characteristics

The 14 eligible studies included a total of 4872 patients (Table 1). Five studies were from the United Kingdom,^{54,55,57,61,64} 2 from Norway,^{52,65} 1 from Finland,⁶³ 2 from Germany,^{51,56} 2 from the United States,^{59,60} 1 from Australia,⁵³ and 1 from the Netherlands.⁶² All articles were published in English except for 1,⁵¹ which was published in German. Interventions took place in general practices in 11 studies,^{51,54-57,59,61-65} physiotherapy practices in 1 study,⁵³ a walk-in outpatient clinic in 1 study,⁶⁰ and a multidisciplinary outpatient clinic in 1 study.⁵² Included participants had acute (<6 weeks) LBP in 6 studies,^{51,54,55,57,60,61} subacute (6-12 weeks) LBP in 5 studies,^{52,53,62,63,65} and mixed duration LBP in 3 studies.^{56,59,64}

Patient education was delivered using booklets in 4 studies^{51,54,57,64} and verbally in 10 studies.^{52,53,55,56,59-63,65} The interventions were considered to be “biopsychosocial” and consistent with guideline care in 10 studies.^{52,53,55,57,59,61-65} Interventions most commonly included instructions on the benign nature of LBP in 12 studies,^{51-55,57,59-63,65} advice to stay active in 12 studies,^{51-57,59,61-63,65} good prognosis in 9 studies,^{52-55,57,59,62,63,65} promoting self-management in 9 studies,^{52-55,57,59,61,62,65} and gradual return to usual activity including work in 8 studies.^{52,53,55,57,59,61-63} Comparisons were to

usual care in 10 studies^{52,54-56,59,60,62-65} and to control education in 4 studies.^{51,53,57,61} Control education interventions consisted of a biomedical booklet in 1 study,⁵⁷ a booklet unrelated to back pain in 1 study,⁵¹ attention control in 1 study,⁵³ and manual therapy in 1 study.⁶¹ Studies provided outcome data on fear avoidance,^{51,56,57,62,65} kinesiophobia,^{55,61} anxiety,⁵²⁻⁵⁴ worry,^{59,60} catastrophizing,^{61,62} and health care utilization.^{53,55,59-61,63,64}

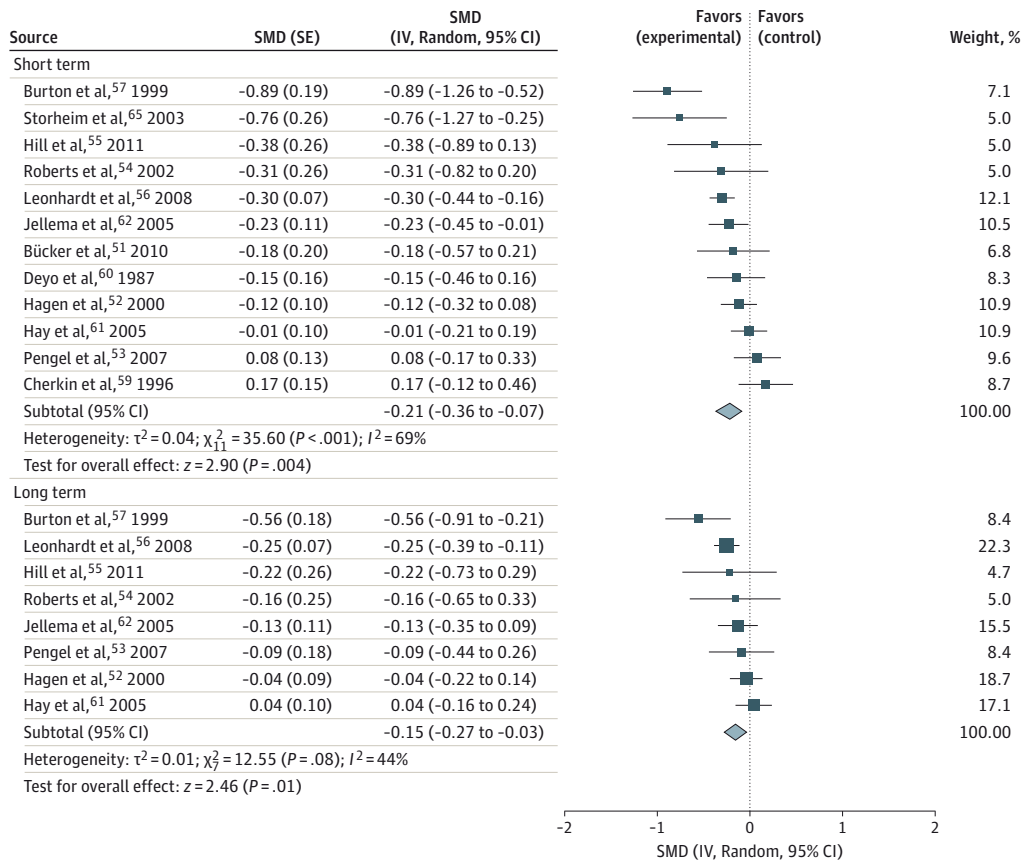
Risk of Bias

eTable 1 in the Supplement summarizes the risk of bias in individual studies. Two studies were classified as having low risk of bias (>7 of 10 PEDro score),^{53,57} 9 as having moderate risk of bias (5-7 of 10 PEDro score),^{52,54,56,59-63,65} and 3 as having high risk of bias (<5 of 10 PEDro scale).^{51,55,64} Only 1 study⁵⁷ blinded the therapist delivering the intervention, and 2 studies^{53,57} blinded the participants. Follow-up rates were in excess of 85% in 8 studies.^{53,54,56,59,60,62-64}

Reassurance

Twelve studies^{51-57,59-62,65} (n = 3015) measured reassurance (ie, fear, worry, anxiety) between 1 week and 4 months (short term), and 8 studies^{52-57,61,62} (n = 2346) measured reassurance at 12

Figure 1. Effects of Patient Education vs Usual Care/Control Education on Reassurance



IV indicates inverse variance; SMD, standardized mean difference.

months (long term) following the patient education intervention. We found moderate-quality evidence (12 studies; inconsistency I^2 , 68%) that patient education increases reassurance more than usual care/control education in the short term (SMD, -0.21; 95% CI, -0.36 to -0.07) and high-quality evidence (8 studies) that patient education increases reassurance more than usual care/control education in the long term (SMD, -0.15; 95% CI, -0.27 to -0.03) (Figure 1).

Pooled effect sizes remained stable when we accounted for differences in study quality, comparison group, symptom duration, use of dichotomous data transformations or, if studies measured more than 1 dimension of reassurance, our choice of effect size used in the meta-analysis (Table 2). Effect size estimates changed when results were stratified according to outcome measure. Pooled effect size estimates were larger on measures of fear (SMD, -0.34; 95% CI, -0.54 to -0.14) than on measures of worry (SMD, 0.01; 95% CI, -0.30 to 0.32), anxiety (SMD, -0.07; 95% CI, -0.24 to 0.10), and catastrophizing (SMD, -0.05; 95% CI, -0.31 to 0.22) (Table 2 and eFigure 2 in the Supplement).

Subgroup analysis demonstrated that education was significantly more effective when delivered by a physician (SMD, -0.38; 95% CI, -0.62 to -0.14) rather than a nurse (SMD, -0.12; 95% CI, -0.40 to 0.17) or a physiotherapist (SMD, 0.00; 95%

CI, -0.15 to 0.14) (Figure 2). All other subgroup analyses did not reach significance (eTable 2 in the Supplement; see also eFigures 3-6 in eAppendix 4 in the Supplement).

Health Care Utilization

Seven studies^{53,55,59-61,63} measured LBP-related visits at a 12-month follow-up. We found moderate-quality evidence (7 studies, limitations in design) that education reduces LBP-related primary care visits more than usual care/control education (SMD, -0.14; 95% CI, -0.28 to 0.00) (Figure 3). The mean rate of any primary care consultation from 3 control groups^{55,61,64} (ie, the “Patient’s Expected Event Rate”) was 35% at 12 months. The estimated “number needed to educate” to prevent 1 LBP-related primary care visit over 12 months was 17.

Discussion

Main Findings

This systematic review and meta-analysis provides moderate- to high-quality evidence that patient education provided by primary care practitioners can reassure patients with acute LBP. These effects are maintained for up to 12 months. Patient education is also associated with reduced

Table 2. Summary Results of Sensitivity Analyses

Sensitivity Analysis Variable	No. of Studies	Sample Size, No. of Participants		Heterogeneity, I^2 , %	SMD (95% CI)
		Education	Control		
Study quality					
High	5	870	787	85	-0.32 (-0.62 to -0.03)
Moderate	4	365	362	30	-0.13 (-0.31 to 0.04)
Low	3	354	277	0	-0.13 (-0.30 to 0.04)
Comparison treatment					
Usual care	8	1125	1021	49	-0.20 (-0.34 to -0.07)
Control education	4	464	405	85	-0.23 (-0.59 to 0.14)
Multiple reassurance measures					
Largest effect included	12	1589	1426	68	-0.21 (-0.35 to -0.06)
Smallest effect included	12	1589	1426	71	-0.18 (-0.33 to -0.03)
Outcome measure					
Fear	7	1107	969	72	-0.34 (-0.54 to -0.14)
Nonspecific anxiety	3	335	316	20	-0.07 (-0.24 to 0.10)
Worry	2	147	141	54	0.01 (-0.30 to 0.32)
Catastrophizing	2	183	193	23	-0.05 (-0.31 to 0.22)
Duration of symptoms					
Acute (<6 wk)	7	1072	916	76	-0.22 (-0.43 to -0.01)
Subacute (6-12 wk)	5	517	510	59	-0.19 (-0.39 to 0.01)
Dichotomous variables in meta-analysis					
Transformed data included	12	1589	1426	68	-0.21 (-0.35 to -0.06)
Transformed data excluded	11	1540	1383	71	-0.21 (-0.37 to -0.06)

Abbreviation: SMD, standardized mean difference.

LBP-related health care visits. Preplanned subgroup analyses suggest that patient education is more reassuring when provided by physicians than when provided by nurses or physiotherapists.

Strengths and Limitations

We have used a clear definition of reassurance that is consistent with contemporary models²¹ and with previous reviews in the field.^{15,31} The methods used to conduct this review were in line with those recommended by the Cochrane Back Review Group⁴³ and the Cochrane Handbook.⁴⁶ We sought additional data from all authors who measured, but did not report on, fear, concern, or health care utilization in their original article, thus making our effect estimates as comprehensive as possible. Sensitivity analyses did not suggest overinflation of effect size estimate by design limitations (Table 2), nor did inspection of funnel plots suggest evidence of publication bias (eAppendix 5 in the Supplement).

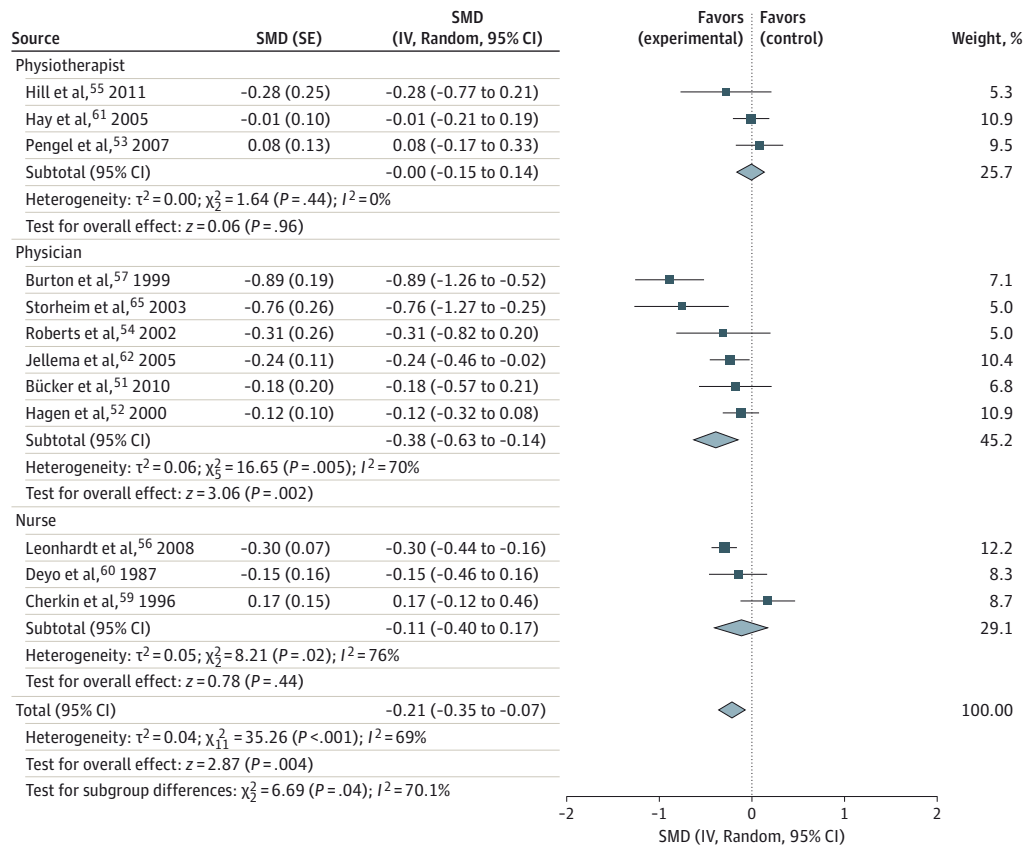
There are some limitations that need to be considered when interpreting our findings. First, heterogeneity was substantial in our meta-analysis on short-term reassurance ($I^2 = 68%$) (Figure 1). Post hoc explorative analyses found that a source of heterogeneity was from 1 study reporting large effects (eFigure 10 in eAppendix 6 in the Supplement). This was a high-quality trial that tested the effect of a booklet designed to allay patient fear avoidance beliefs. There are several reasons for large effects over and above any specific treatment effect including sampling error and uncontrolled confounding variables. Alternatively, it could be that the booklet used in this study contained simple messages that

targeted specific fear avoidance beliefs more effectively than the messages contained in more complex interventions of other trials. When this study is removed, heterogeneity (I^2) reduced from 68% to 52% and the effect size estimate was lower (SMD, -0.15; 95% CI, -0.27 to -0.03).

Second, as we were unable to find any study that used a specific measure of reassurance, we used outcomes that reflect the established definition.^{15,31} This required us to combine measures of different constructs (eg, fear, anxiety, catastrophizing) into “overall reassurance.” Although fear, anxiety, and catastrophizing are usually considered to be distinct, there is some recent evidence to suggest that they may not be as distinct as previously thought⁶⁷ and could all be considered as “pain-related distress.”⁶⁸ When we examined the separate components of reassurance in our sensitivity analysis, we found that there may be differences in effect size when studies were stratified according to these components (Table 2), though there was significant overlap in the confidence intervals around each pooled estimate (eFigure 2 in the Supplement). It appears that education might be more effective at reducing some components of reassurance, for example patients’ fears, than it is at reducing other components such as anxiety, catastrophization, or worries. However, our a priori decision to pool these outcomes, and thus represent overall reassurance, was justified by the aim and context of the review, the lack of specific measures of reassurance, and the overlap between psychological constructs.

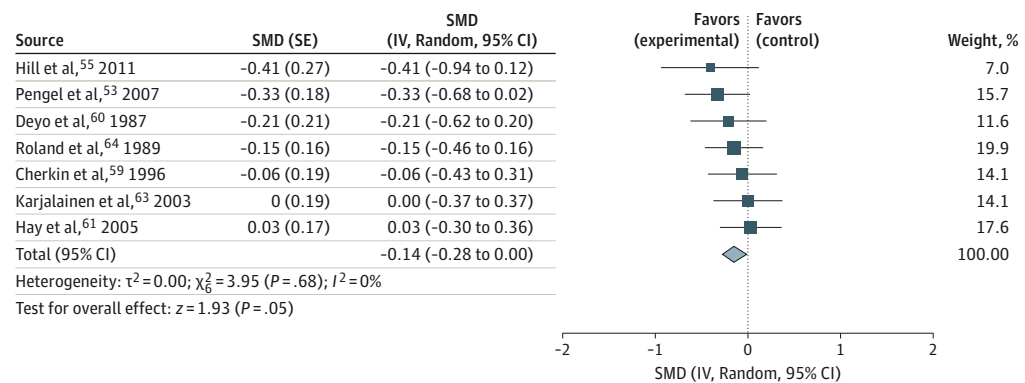
A final limitation of this review is that we did not assess the direct effect of patient education interventions on func-

Figure 2. Differences in Short-term Effects of Patient Education Interventions on Reassurance, When Interventions Are Stratified According to the Deliverer of the Intervention



IV indicates inverse variance; SMD, standardized mean difference.

Figure 3. Effects of Patient Education vs Usual Care/Control Education on the Number of Primary Care Visits in the 12 Months After Intervention



IV indicates inverse variance; SMD, standardized mean difference.

tional outcomes such as pain and disability, nor did we assess the intermediate effect of increased reassurance on improvements in function. This will be an important area for future research; evidence suggests that reduced fear and distress in particular might mediate improvements in function.⁶⁹ However, in addition to its intermediate role, we also suggest that reassurance is an important outcome in and of itself. Current theory

suggests that effective reassurance involves a shift in a patient's cognitive appraisal of their health problem. Reappraisal of the problem then reduces health-seeking behavior in spite of ongoing symptoms.²¹ For nonspecific conditions, where ongoing symptoms are likely and the risk of excessive health care use is high, reassurance is a particularly relevant outcome in primary care.

Interpretation

Our data suggest that when practitioners are trained to deliver structured patient education interventions, the reassurance this provides to patients is superior to usual care. A recent survey of Australian general practice activity found that only 20% of primary care physicians report giving advice and education of this type in the treatment of LBP.³⁴ Patient education methods suitable for delivery in primary care have the potential to reduce the burden of LBP.

Our findings also suggest that patient education delivered by a physician, rather than a physiotherapist or a nurse, appears to be most reassuring to patients (Figure 2). When the goal of communication is to persuade a concerned patient to change their beliefs or behavior, the authority and credibility of the source is critical.⁴⁰ Thus, within primary care, physicians may be best placed to provide education with the utmost authority and conviction.

To prevent 1 subsequent visit to primary care the NNT for education was 17. By comparison, the NNT estimated by Rolfe and Burton³¹ for diagnostic testing was 20. Kroenke³⁰ estimated that with an NNT of 20, the cost of diagnostic testing is between \$4000 and \$16 000 to prevent a \$100 primary care visit. Given that patient education can take place in a single visit, the comparable cost estimate for patient education to prevent 1 further visit is \$1700. Although these are small effects,

when indirectly compared with the reassuring effects of diagnostic testing, patient education might be a more brief, less costly, and equally reassuring option to provide in primary care.

Recommendations for Research and Practice

This review provides moderate- to high-quality evidence in favor of using patient education to reassure patients with acute LBP in primary care. There may be alternative interventions that are reassuring to patients in primary care. Future research is needed to determine if physical interventions, for example exercise programs, are reassuring and whether these can be combined with education to enhance treatment effects. Alternative strategies may be needed to target the concern component (worry, anxiety, and catastrophization) of reassurance. Further research is also needed to determine the mediating role of reassurance in the causal pathway to improve other important clinical outcomes such as pain and disability.

Conclusions

There is moderate- to high-quality evidence that for patients with acute or subacute LBP, patient education in primary care can provide long-term reassurance.

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Invited Commentary

Reassuring Patients About Low Back Pain

Roger Chou, MD

Low back pain is one of the most commonly encountered conditions in clinical practice. Despite trends showing increasing use of advanced imaging tests, opioids, and invasive surgical and interventional procedures, with attendant increases in costs, the prevalence and burdens associated with low back pain appear to be on the rise.¹

Most acute low back pain improves substantially within the first 4 weeks. However, a small proportion of patients with acute low back pain go on to develop chronic disabling symptoms. Such patients often are refractory to treatments and account for the majority of the costs associated with low back pain. Preventing the transition from acute to chronic low back pain is therefore an important goal of current evaluation and management strategies.

Back pain is best understood as a complex biopsychosocial condition. For example, the presence of common degenerative findings on spinal imaging poorly correlates with the presence of and severity of low back pain or the likelihood of



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developing chronic disabling symptoms. Rather, predictors of chronicity are primarily psychosocial.² Clinical practice guidelines recommend an approach to low back pain management that includes an emphasis on self-care and the identification and management of psychosocial contributors to chronicity, with early interventions to address such factors when present.³

Reassurance is frequently recommended in patients with pain conditions but has been described as being supported by “a surprisingly thin evidence base.”⁴ Reassurance is a complex process involving the dynamic interplay between a caregiver and the patient. The goal of reassurance is to alleviate patient worries and fears regarding low back pain and to positively change associated behaviors. Common concerns in patients with back pain are that it signifies a serious underlying problem such as cancer, that the back pain will prevent the ability to work or participate in activities they enjoy, or that the back pain signifies the onset of progressive or permanent damage. Such worries may lead patients to avoid normal activities that cause discomfort because of concerns that they will further damage the back (fear avoidance behavior) or to believe that the worst possible outcome (eg, permanent pain and disability) is inevitable (catastrophizing). These types of behaviors, referred to as maladaptive coping strategies, are an important predictor of chronicity.² Psychological symptoms such as

anxiety, which may be associated in part with illness concerns, also predict chronicity. A number of therapies for low back pain—such as advice to remain active, exercise therapy, and cognitive-behavioral therapy—aim in part to address and correct maladaptive coping beliefs and behaviors.

A systematic review in this issue of *JAMA Internal Medicine* by Traeger and colleagues⁵ evaluated the effects of primary care-based education on reassurance in patients with acute or subacute low back pain. The review was generally well conducted, meeting standards for identification of studies, selection of studies for inclusion, risk of bias assessment, and data synthesis. It included 12 randomized trials in which education was delivered through a self-care booklet or verbally. The education content varied but commonly included concepts consistent with evidence-based clinical practice guidelines, such as the benign nature and generally favorable prognosis of low back pain, advice to stay active with graded return to usual activity, and promotion of self-management. The review found primary care-based education to be associated with improved measures of reassurance vs usual care or a control intervention through 12 months. The magnitude of effect was relatively small, based on pooled standardized mean differences (−0.15 to −0.21), and was mainly present in trials in which education was given by a physician rather than a nurse or physiotherapist. However, education was also associated with fewer subsequent low back pain-related primary care visits (equivalent to a number needed to treat with education of 17 to avoid 1 low back pain-related primary care visit). Although the review estimated a cost of \$1700 to prevent 1 further visit, this calculation may be an overestimate because it appeared to be based on the entire cost of the clinic visit in which education occurred. Patient education is likely to occur in the context of a visit for low back pain that is already taking place; thus, the additional costs with the intervention may actually be much lower.

A challenge in interpreting the findings of the review is that there is no standardized measure for reassurance. Rather, the review combined results for different constructs conceptually related to reassurance, such as measures of fear, catastrophizing, worry, or anxiety. The use of different measures might explain some of the observed statistical heterogeneity in pooled analyses because the effects were largest for measures of fear, with no clear effects on the other outcome types. Another issue in interpreting the findings is that effective blinding of patients and caregivers is difficult in studies of patient education. Observed effects could therefore be related in part to