Effect of a Consumer-Focused Website for Low Back Pain on Health Literacy, Treatment Choices, and Clinical Outcomes: Randomized Controlled Trial

Paul William Hodges¹, MedDr, PhD, DSc; Leanne Hall¹, PhD; Jenny Setchell¹, PhD; Simon French², PhD; Jessica Kasza³, PhD; Kim Bennell¹, PhD; David Hunter⁵, PhD; Bill Vicenzino¹, PhD; Samuel Crofts⁶, MPH; Chris Dickson⁷, BA(Hons); Manuela Ferreira⁵, PhD

¹School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia
²Department of Chiropractic, Macquarie University, Sydney, Australia
³School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia
⁴Centre for Health Exercise and Sports Medicine, Department of Physiotherapy, University of Melbourne, Melbourne, Australia
⁵Institute of Bone and Joint Research, The Kolling Institute, Northern Clinical School, Faculty of Medicine and Health, University of Sydney, Sydney, Australia
⁶Centre for Epidemiology and Biostatistics, The University of Melbourne, Melbourne, Australia
⁷Department of Integrative Medicine, Chris O'Brien Lifehouse Hospital, Sydney, Australia

Abstract

Background: The internet is used for information related to health conditions, including low back pain (LBP), but most LBP websites provide inaccurate information. Few studies have investigated the effectiveness of internet resources in changing health literacy or treatment choices.

Objective: This study aims to evaluate the effectiveness of the MyBackPain website compared with unguided internet use on health literacy, choice of treatments, and clinical outcomes in people with LBP.

Methods: This was a pragmatic, web-based, participant- and assessor-blinded randomized trial of individuals with LBP stratified by duration. Participants were randomly allocated to have access to the evidence-based MyBackPain website, which was designed with input from consumers and expert consensus or unguided internet use. The coprimary outcomes were two dimensions of the Health Literacy Questionnaire (dimension 2: “having sufficient information to manage my health;” dimension 3: “actively managing my health;” converted to scores 1-100) at 3 months. Secondary outcomes included additional Health Literacy Questionnaire dimensions, quality of treatment choices, and clinical outcomes.

Results: A total of 453 participants were recruited, and 321 (70.9%) completed the primary outcomes. Access to MyBackPain was not superior to unguided internet use on primary outcomes (dimension 2: mean difference −0.87 units, 95% CI −3.56 to 1.82; dimension 3: mean difference −0.41 units, 95% CI −2.78 to 1.96). Between-group differences in other secondary outcomes had inconsistent directions and were unlikely to be clinically important, although a small improvement of unclear importance in the quality of stated treatment choices at 1 month was found (mean difference 0.93 units, 95% CI 0.03 to 1.84).

Conclusions: MyBackPain was not superior to unguided internet use for health literacy, but data suggest some short-term improvement in treatment choices. Future research should investigate if greater interactivity and engagement with the website may enhance its impact.
Trial Registration: Australian New Zealand Clinical Trials Registry (ANZCTR) ACTRN12617001292369; https://www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=372926
International Registered Report Identifier (IRRID): RR2-10.1136/bmjopen-2018-027516

(KEYWORDS)
low back pain; randomized controlled trial; internet resources; health literacy

Introduction

Background
Low back pain (LBP) is the leading cause of disability globally [1]. Unnecessary and ineffective management inflates its burden [2], and its impact is worsened by negative messages and beliefs [3,4]. Access to an evidence-based, consumer-focused tool to enhance health literacy and empower active participation in self-management and treatment selection could reduce the burden. Although tools are available, the evaluation of their effectiveness is limited.

The internet is a primary source of health-related information [5-7]. Up to 68% of individuals search for health-related information on the web [7,8]. Information is sought on the internet for treatment decision support [7,9,10], self-management advice [7,9], guidance regarding health care providers [10], increased knowledge [10,11], and preparation for consultations [10]. The advantages of the internet are accessibility, high reach, low cost, and scalability [12]. Unfortunately, most LBP websites are rated poorly [13-15], do not meet consumers’ needs [16], provide inaccurate information and treatment recommendations [17], and use inappropriate language [14]. Although systematic reviews provide modest evidence of the efficacy of internet-delivered interventions (eg, cognitive behavioral therapy [18,19]), whether information resources improve outcomes and behaviors is unknown.

Objectives
This study aims to evaluate access to an LBP website [20] that integrates evidence-based LBP information developed through consumer consultation and expert consensus [21]. We hypothesize that the MyBackPain website more effectively improves health literacy (primary outcome), choice of evidence-based treatments, and clinical outcomes in people with LBP than unguided use of internet resources.

Methods

Trial Design
We conducted a two-arm pragmatic, web-based, superiority randomized controlled trial. It was prospectively registered (Australian New Zealand Clinical Trials Registry ACTRN12617001292369), and the protocol has been published [22]. Ethical approval was obtained from the University of Queensland Ethics Committee (#2017000995). Written informed consent was obtained from all participants.

Participants
We recruited community participants with current LBP using newsletters, email lists, consumer groups, websites, social media, and newsletters to members of a health insurer (Medibank Private). Inclusion criteria were current LBP of any duration, aged 18 years and above (no upper age limit), current residence in Australia, adequate English to use the MyBackPain website, and internet access. Participants were excluded if they reported a previous or existing serious spinal pathology (fracture, cancer, or infection) or specific diagnosis including sciatica (participants with leg pain but no diagnosis of sciatica were not excluded), lumbar spinal stenosis, or nerve root compromise.

Procedure
This trial was conducted on the web. Potential participants were provided with a web link to the participant information sheet and consent form. Those who consented completed an eligibility screening form and, if eligible, were invited to complete the baseline questionnaires. They were given contact details of the trial coordinator at baseline and at each follow-up assessment to ask any questions. Data were recorded in REDCap (Research Electronic Data Capture; hosted at the University of Queensland) [23,24]. In addition to primary and secondary outcomes, baseline data included duration of the current pain episode, demographics (age, gender, height, mass, education, job, and job status), and details about their low back symptoms (including location, intensity, duration, frequency, and past treatments; see Table 1 for specific questions and response options).

The participants were sent two reminders to complete the baseline data. Primary and secondary outcomes were collected at baseline and at 1, 3, 6, and 12 months after randomization. Pain intensity (pain visual analogue scale; see Secondary Outcomes), websites visited, and treatments used were recorded weekly until 3 months (primary endpoint) and then monthly until 12 months. Outcome data at each time point were collected using REDCap (automated email reminders), and up to three reminders were sent. To encourage retention, participants were entered into a draw for an iPad mini on completion of all data collection.
Table 1. Baseline characteristics of participants by group.

| Characteristics                                      | Group 1 (n=226) | Group 2 (n=214) |
|------------------------------------------------------|-----------------|-----------------|
| Acute\(^a\), n (%)                                   | 59 (26.1)       | 53 (24.8)       |
| Chronic\(^b\), n (%)                                 | 167 (73.9)      | 161 (75.2)      |
| Age at consent (years), mean (SD)                    | 47.8 (14.1)     | 48.1 (14.0)     |
| **Gender, n (%)**                                    |                 |                 |
| Female                                               | 174 (77)        | 161 (75.2)      |
| Male                                                 | 49 (21.7)       | 53 (24.8)       |
| Other                                                | 3 (1.3)         | 0 (0)           |
| Height (cm), mean (SD)                               | 168.8 (10.1)    | 169.6 (9.3)     |
| Mass (kg), mean (SD)                                 | 83.7 (20.1)     | 83.7 (20.7)     |
| BMI (kg/m\(^2\)), median (IQR)                       | 28.9 (24.5-33.6) | 27.7 (24.1-32.6) |
| **Level of education, n (%)**                        |                 |                 |
| High school certificate                              | 38 (16.8)       | 30 (14)         |
| Trade certificate                                    | 25 (11.1)       | 22 (10.3)       |
| Diploma                                              | 37 (16.4)       | 29 (13.6)       |
| Advanced diploma                                     | 12 (5.3)        | 13 (6.1)        |
| Bachelor degree                                      | 59 (26.1)       | 57 (26.6)       |
| Postgraduate degree                                  | 36 (15.9)       | 52 (24.3)       |
| Other                                                | 19 (8.4)        | 11 (5.1)        |
| **Employment status, n (%)**                         |                 |                 |
| Full time/full duties                                | 77 (34.1)       | 81 (37.9)       |
| Full time/selected duties                            | 8 (3.5)         | 2 (0.9)         |
| Part time/full duties                                | 33 (14.6)       | 43 (20.1)       |
| Part time/selected duties                            | 22 (9.7)        | 9 (4.2)         |
| Not working/unemployed                               | 4 (1.8)         | 6 (2.8)         |
| Not working/employed/retraining                       | 2 (0.9)         | 1 (0.5)         |
| Not working/unemployed/retraining                     | 4 (1.8)         | 7 (3.3)         |
| Not working/unemployed                                | 13 (5.8)        | 12 (5.6)        |
| Not seeking employment                               | 64 (29.3)       | 53 (24.8)       |
| Aboriginal/Torres Strait Islander, n (%)             | 3 (1.3)         | 3 (1.4)         |
| Born in Australia, n (%)                             | 159 (70.4)      | 161 (75.2)      |
| First experience of LBP\(^c\), n (%)                 | 14 (6.2)        | 12 (5.6)        |
| **Number of episodes of LBP, n (%)**                 |                 |                 |
| 1-5                                                  | 24 (11.3)       | 16 (8)          |
| 5-10                                                 | 16 (7.5)        | 23 (11.4)       |
| 10-15                                                | 11 (5.2)        | 10 (5)          |
| 15-20                                                | 7 (3.3)         | 14 (7)          |
| More than 20                                         | 63 (29.7)       | 54 (26.9)       |
| I am never without LBP                               | 91 (42.9)       | 84 (41.8)       |
| Ever been given a diagnosis of LBP, n (%)            | 128 (56.6)      | 125 (58.4)      |
| Have pain or altered sensation in buttocks/legs, n (%) | 166 (73.5)    | 155 (72.4)      |

**Had problems with your bowel or bladder function since your back pain started, n (%)**

| Characteristics                                   | Group 1 (n=226) | Group 2 (n=214) |
|--------------------------------------------------|----------------|----------------|
| Bladder                                          | 21 (9.3)       | 17 (7.9)       |
| Bowel                                            | 22 (9.7)       | 15 (7)         |
| Bladder and bowel                                | 30 (13.3)      | 22 (10.3)      |
| No                                               | 153 (67.7)     | 160 (74.8)     |
| Had treatment for current episode of LBP, n (%)  | 142 (62.8)     | 116 (54.2)     |
| Had treatments for previous episodes of LBP, n (%)| 174 (82.5)     | 166 (82.6)     |
| Have other medical conditions, n (%)             | 141 (62.4)     | 134 (62.6)     |
| Have pain in other part of spine, n (%)          | 134 (59.3)     | 132 (61.7)     |
| Feel pain in other areas of body, n (%)          | 143 (63.3)     | 130 (60.7)     |

a<6 weeks duration following period of no pain for at least 4 weeks.
b≥6 weeks duration.
cLBP: low back pain.

Randomization and Allocation Concealment

The study biostatistician prepared the randomization schedule using stratification permuted block randomization, with block sizes of 6 to 12 stratified by symptom duration (acute LBP: <6 weeks duration with at least 4 weeks interval from a preceding episode; chronic LBP: all other presentations). After completion of baseline data, participants were randomized sequentially according to the schedule and provided with information regarding their mode of internet access.

Blinding

Participants and investigators (except the project manager) were blinded to treatment allocation. All participants were advised in the participant information sheet that the study aimed to investigate the impact of internet use on their LBP. To maintain blinding, all participants recorded the address of any website visited for information regarding LBP over 12 months. The intervention group had access to the password-protected MyBackPain website. The control group was not aware of this website and was unable to access it until the website was launched to the public on July 30, 2019, after the primary endpoint had passed for all participants. Given that all outcome measures were self-reported, outcome assessments were also blinded. A blinded biostatistician conducted the data analysis.

Textbox 1. Four overarching principles of the MyBackPain website.

**Principles**

- To enhance consumer confidence to manage their condition and make evidence-based treatment choices and avoid ineffective, unnecessary or harmful investigations and treatments
- To demedicalize and normalize low back pain (LBP) with messages that reinforce that back pain is a natural part of life for many and in most cases can be managed with early return to activity
- To provide tools for individuals to identify the necessity for further investigation, management, or both
- To engage users in healthy behaviors and attitudes to reduce the burden of LBP

Control

Participants randomized to the control group were asked to use the internet to obtain information about LBP in a self-directed manner and record the address of any relevant websites weekly (weeks 1-12) and monthly (months 3-12) web-based diaries. They did not have access to or knowledge of the MyBackPain website, at least until after the primary endpoint. We cannot exclude the possibility that some control participants might have become aware of and used the site after its launch. At launch,
89 control participants were yet to complete a long-term follow-up.

**Outcome Measures**

**Primary Outcome**

We used dimensions 2 and 3 of the Health Literacy Questionnaire (HLQ) [27] as coprimary outcomes to determine the extent to which participants considered “having sufficient information to manage my health” and “actively managing my health,” respectively, at 3 months after randomization. The validated HLQ includes 44 items in nine dimensions, with each dimension considered individually [27]. Dimensions 2 and 3 included four items assessed using a 4-point Likert scale (1=strongly disagree; 4=strongly agree), converted to a score of 0 to 100 for analysis. The survey’s preamble asked participants to consider their LBP when answering.

**Secondary Outcomes**

Secondary outcomes were (1) other HLQ dimensions, (2) quality of treatment choices, and (3) clinical outcomes. Secondary measures from the HLQ were dimensions: 1 (“feeling understood and supported by healthcare providers”) and 4-9 (“social support for health;” “appraisal of health information;” “ability to actively engage with healthcare providers;” “navigating the healthcare system;” “ability to find good health information” and “understand health information well enough to know what to do”), assessed using 4-point (dimensions 1 and 4-5) or 5-point (dimensions 6-9) Likert scales.

The stated and observed quality of treatment choices was assessed in three ways:

1. Quality of treatment preference (stated): participants indicated on a 5-item scale (effective, somewhat effective, unsure, not very effective, and not effective) the degree to which they considered a subset of 10 treatments discussed in the MyBackPain website to be effective for LBP. Response to the question “Do you think these treatments are effective for people’s back pain? Note: think broadly about back pain, not just about your own.” Treatment choices were scored against the recommendations provided in the MyBackPain website according to the classifications of “good evidence,” “may work,” “not enough evidence,” “unlikely to work,” and “may be harmful” (Multimedia Appendix 1 shows the scoring matrix; scores from −20 to +22; a 1-point change would relate to a shift from being unsure of the efficacy of one treatment that is unlikely to work to considering it to be not very effective).

2. Quality of treatment preference (observed-scored): treatments used by participants (diary recording) were evaluated against the recommendations provided on the MyBackPain website. Each reported treatment was scored according to Multimedia Appendix 1 and summed (no upper and lower limits).

3. Quality of treatment preference (observed-proportion): the proportion of participants who chose treatments that are, according to MyBackPain, either recommended (“good evidence” and “may work”) or considered to have no effect or be harmful (“not enough evidence,” “unlikely to work,” and “may be harmful”) were assessed separately. Using diary data, participants were allocated a score of 1 if they used at least one recommended treatment and separately if they used a treatment that was harmful or had no effect. Proportions with scores of 1 were calculated.

LBP clinical outcomes were measured with the following validated tools: pain—visual analogue scale of average LBP in the last week (no pain” at 0 and “worst pain imaginable” at 100); disability—Roland Morris Disability Questionnaire [28] (scores from 0 to 24; higher scores indicate more disability); and quality of life—Assessment of Quality of Life–8 dimension (utility scores from 0.0 to 1.0, with higher scores indicating better quality of life).

**Adherence to Intervention**

We were unable to track the individual use of MyBackPain because of privacy concerns of the host sites (Arthritis Australia). We tracked the overall use of the site (number of sessions; new or returning users) using the Opentracker software.

**Sample Size**

Sample size calculation was based on an effect size of 0.30 for the coprimary outcomes. A sample size of 440 participants (a minimum of 110/440, 25% with acute LBP) was required to achieve 80% power to detect the desired effect size, type 1 error of 0.05, and allowing for a 20% loss to follow-up at 3 months.

**Statistical Analysis**

Data were analyzed using Stata version 16.0 (StataCorp) and included all participants in their randomized groups (intention-to-treat). The baseline characteristics of participants who did and did not provide primary outcomes were compared using two-tailed t tests or chi-square tests. Missing continuous outcomes were imputed using chained equations with predictive mean matching and five nearest neighbors, and missing binary outcomes were imputed using logistic regression imputation models with chained equations. The data were imputed separately for each randomized group. Imputation models for continuous outcomes included all baseline variables and all outcome variables, where possible. Imputation models for binary variables omitted binary baseline variables and outcome variables because of the potential for perfect prediction, including only continuous baseline variables. Estimates from 40 imputed data sets were combined using the Rubin rules [29].

For the primary outcomes and continuous secondary outcomes, mean differences between groups were estimated at each time point using longitudinal linear mixed-effects models. These models included all data from 1, 3 (primary endpoint), 6, and 12 months as outcomes for each participant. The models included an interaction between month and randomized group as a fixed effect and random intercepts for participants. Models were adjusted for baseline values of the outcome and stratification variables (symptom duration). Similar longitudinal logistic regression models were used for secondary binary outcomes, with results presented as odds ratios and risk ratios at each time point. Model assumptions and the validity of the imputed data sets were assessed using standard diagnostic plots. No statistical adjustments were made for multiple testing. Complete case analyses were also performed.
Results

Recruitment was conducted from December 6, 2017, to January 16, 2019, with follow-up completed on January 16, 2020. We enrolled 453 participants who completed the baseline assessment (Figure 1). In total, 13 withdrew (different time points), and their data were excluded from the analysis. The groups were similar at baseline (Multimedia Appendix 2). Loss to follow-up at the primary endpoint (3 months) was 26.1% (59/226) in the control group and 28% (60/214) in the MyBackPain group. Those lost to follow-up were younger and had fewer previous episodes of LBP (Multimedia Appendix 2).

For the primary outcomes at 3 months, between-group differences in dimensions 2 (mean difference $-0.87$ units, 95% CI $-3.56$ to $1.82$) and 3 (mean difference $-0.41$ units, 95% CI $-2.78$ to $1.96$) of the HLQ were small with wide CIs (Multimedia Appendix 3).

For secondary outcomes, the MyBackPain group scored greater for treatment choice (stated) than the control group at 1 month ($-0.91$ units, 95% CI $0.16$ to $1.67$), but differences beyond that time point were of inconsistent direction and unlikely to be clinically significant (Multimedia Appendix 3), as was the observed proportion of participants selecting a recommended treatment at all time points (Table 2). Between-group differences in other secondary outcomes (other HLQ dimensions and clinical outcomes) at any time point were of inconsistent direction.

The results for the complete case analysis were similar (Multimedia Appendices 4 and 5), except that more participants (observed-proportion) in the treatment group were likely to select a recommended treatment (odds ratio 5.76, 95% CI 1.01 to 32.71; risk ratio 1.29, 95% CI 1.01 to 1.58) at 3 months (Table 2).

Up to the launch date (after the primary endpoint for all participants), the MyBackPain website was accessed an average of 3.4 times, each by 183 unique users. This represented 85.5% (183/214) of the patients allocated to the MyBackPain group.

Figure 1. CONSORT (Consolidated Standards of Reporting Trails) flow diagram. LBP: low back pain.
Their ability to manage their own health than unguided use of the internet, but the data suggest some short-term improvement in treatment choices. One interpretation is that improvement in these elements of health literacy may be satisfied by the general use of information on the internet but that the quality of the resulting actions (ie, treatment selection) depends on the quality of the information provided. The control group’s lower treatment choice scores concur with a recent review that identified only 43.3% of treatment recommendations provided by freely accessible websites were accurate [17]. The treatment recommendations provided in MyBackPain are based on expert panel consensus.

On the basis of population data for the HLQ domains from the Australian Bureau of Statistics, our sample had similar health literacy at baseline (dimension 2: our data=mean 3.12, SD 0.6, vs Australian Bureau of Statistics data for individuals who report a back problem=mean 3.13, relative SE 0.5; dimension 3: 3.23, SD 0.6, vs 3.03, SE 0.6). However, our sample had low quality of life utility scores compared with Australian norms (our data: mean 0.55, SD 0.22, vs mean 0.799, 95% CI 0.792-0.806 [31]). Despite the co-design of MyBackPain in individuals with LBP, the presentation of information might not be optimal for those with low quality of life [32]. MyBackPain was designed as an information resource. The information is provided in multiple formats but with limited interactivity. Benefits might be enhanced by greater interactivity, such as inclusion of a web-based discussion group [33], regular action plans [34], or provision of active intervention. Refinement of MyBackPain would require assessment because recent evidence highlights inconsistent evidence for the efficacy of web-based cognitive behavioral therapies for LBP [18,19,35,36], interactivity [12], and personalization [36,37].

### Treatment Selection

This study provides preliminary evidence that access to MyBackPain might achieve short-term improvement in their ability to manage their own health than unguided use of the internet, but the data suggest some short-term improvement in treatment choices. One interpretation is that improvement in these elements of health literacy may be satisfied by the general use of information on the internet but that the quality of the resulting actions (ie, treatment selection) depends on the quality of the information provided. The control group’s lower treatment choice scores concur with a recent review that identified only 43.3% of treatment recommendations provided by freely accessible websites were accurate [17]. The treatment recommendations provided in MyBackPain are based on expert panel consensus.

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### Treatment Selection

This study provides preliminary evidence that access to MyBackPain might achieve short-term improvement in
treatment choices. The largest component of the website, as requested by consumers [10], is a treatment comparison tool. This tool provides summaries of the treatment, the quality of evidence for efficacy, and pros and cons for its use with an evidence icon that provides a quick reference of the level of evidence and effectiveness [21]. Summaries were developed with input from an international expert team and consumers [21]. Although no other studies have tested the effectiveness of web-based information to improve treatment choices, studies that are not specific to LBP have reported reduced health care usage (improved self-management and decreased use of ineffective treatments) related to high-quality, evidence-based, web-based information [38].

We did not include treatment selection as a primary outcome because of the novelty of our measures. The measures were tested for comprehension in individuals with LBP but had unknown psychometric properties. The observed and stated measures of treatment choice were based on expert consensus recommendations in the website. Alignment of stated and observed choices with the recommended treatments resulted in a higher score. Better stated treatment choices by the MyBackPain group at 1 month provide stimulus for further work. No group difference at 3 months implies that sustained improvement might require sustained engagement with the website.

Web Resource Evaluation
It is recommended that information resources be tested for the credibility and accuracy of content [39]. According to these criteria, the MyBackPain website has a strong foundation supported by research with consumers [32] and expert consultation for content accuracy [21,40]. Multimedia Appendix 6 [10,21,25,32,41-43] considers MyBackPain against evidence standards for digital health technologies [41].

Limitations
There are several limitations that need to be considered. First, there was a large loss to follow-up, which is common in web-based trials [35,44]. Although multiple imputations were implemented, if participants were lost to follow-up due to worsening of their condition, this analysis may not be appropriate. Second, the individual use of MyBackPain could not be tracked. That 14.5% (31/214) of the treatment group did not access MyBackPain is disappointing, but it is important to note that the trial was pragmatic and designed to evaluate natural use.

Conclusions
This is the first randomized controlled trial of an information resource for LBP to test its impact on health literacy, quality of treatment choices, and clinical outcomes. Unlike most websites for LBP, MyBackPain was specifically designed to meet the needs of individuals with LBP and included a focus on treatment choices. The results provided no evidence of differences between groups for the primary outcomes related to health literacy. There is limited preliminary evidence of the impact of empowerment on making informed choices for the management of their condition, which is the intention of improved health literacy. Loss to follow-up should be considered when interpreting these results. Future work should consider the potential to enhance impact through the addition of interactivity and interventions and greater support provided to users to engage with the resource.

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Authors’ Contributions
PWH had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. All authors contributed to the conceptualization and design of the study, data acquisition, analysis and interpretation, and drafting of the manuscript. All authors critically revised the manuscript for important intellectual content. Statistical analysis was primarily performed by JK and SC, and funding was obtained by PWH, KB, DH, and BV.

Conflicts of Interest
DH is on advisory boards for Merck Serono, Tissuegene, TLC Bio, Pfizer, Lilly, Novartis, Biobone, and Flexion, outside of the submitted work.

Multimedia Appendix 1
Scoring matrix for evaluation of quality of treatment preference.
[DOCX File, 21 KB-Multimedia Appendix 1]

Multimedia Appendix 2
Baseline characteristics and outcome scores of participants who did and did not report both primary outcomes, reported as number (percentage) unless otherwise stated.
[DOCX File, 27 KB-Multimedia Appendix 2]
**Multimedia Appendix 3**
Mean (SD) of continuous outcomes and mean difference (95% CI) between MyBackPain and control groups over the 12-month study period.

[DOCX File, 23 KB-Multimedia Appendix 3]

**Multimedia Appendix 4**
Complete case data: mean (SD) of continuous outcomes and mean difference between groups over time (MyBackPain and control).

[DOCX File, 30 KB-Multimedia Appendix 4]

**Multimedia Appendix 5**
Complete case data: number (percentage) of participants choosing treatment types (binary outcomes).

[DOCX File, 22 KB-Multimedia Appendix 5]

**Multimedia Appendix 6**
Evidence for effectiveness standards.

[DOCX File, 21 KB-Multimedia Appendix 6]

**Multimedia Appendix 7**
CONSORT-eHEALTH checklist (V 1.6.1).

[PDF File (Adobe PDF File), 385 KB-Multimedia Appendix 7]

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Abbreviations

HLQ: Health Literacy Questionnaire
LBP: low back pain
REDCap: Research Electronic Data Capture