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Web-information surrounding complementary and alternative medicine for low back pain: a cross-sectional survey and quality assessment

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ABSTRACT

Background: Low back pain (LBP) is expected to globally affect up to 80% of individuals at some point during their lifetime. While conventional LBP therapies are effective, they may result in adverse side-effects. It is thus common for patients to seek information about complementary and alternative medicine (CAM) online to either supplement or even replace their conventional LBP care. The present study sought to assess the quality of web-based consumer health information available at the intersection of LBP and CAM.

Methods: We searched Google using six unique search terms across four English-speaking countries. Eligible websites contained consumer health information in the context of CAM for LBP. We used the DISCERN instrument, which consists of a standardized scoring system with a Likert scale from one to five across 16 questions, to conduct a quality assessment of websites.

Results: Across 480 websites identified, 32 were deemed eligible and assessed using the DISCERN instrument. The mean overall rating across all websites 3.47 (SD = 0.70); Summed DISCERN scores across all websites ranged from 25.5–68.0, with a mean of 53.25 (SD = 10.41); the mean overall rating across all websites 3.47 (SD = 0.70). Most websites reported the benefits of numerous CAM treatment options and provided relevant information for the target audience clearly, but did not adequately report the risks or adverse side-effects adequately.

Conclusion: Despite some high-quality resources identified, our findings highlight the varying quality of consumer health information available online at the intersection of LBP and CAM. Healthcare providers should be involved in the guidance of patients' online information-seeking.

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1. Introduction

Low back pain (LBP) is a chronic condition with one of the highest worldwide prevalence rates approximating 75–84% of individuals experiencing LBP at some point in their lifetime.¹ A systematic review from 2012 highlights that LBP predominantly affects individuals from 40–80 years of age, and more frequently affects females.² LBP often results in a lower quality of life with severe cases causing cognitive impairment, work-related disabili-

ties, and loss of independence.³ Common therapies prescribed for patients experiencing LBP include non-steroidal anti-inflammatory drugs (NSAIDs), antidepressants, epidural steroid injections (ESIs) and various muscle relaxants.⁴ While these therapies have been effective at alleviating pain for many patients, their associated side effects can often make them difficult for patients with chronic LBP to consistently tolerate.^{5,6} Some notable side effects of conventional LBP treatments include nausea, vomiting, anxiety, and difficulty sleeping.⁷

As a result of unwanted side effects, many patients seek complementary and alternative medicine (CAM) in hopes of better treating or managing their LBP. While “complementary medicine” refers to any therapy that is used in addition to conventional therapy or standard medical care, “alternative medicine” refers to any therapy used in place of a conventional therapy.^{8,9} Some

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common CAM therapies for LBP include acupuncture, osteopathy, massage therapy, chiropractic treatment, and traditional Chinese medicine.^{10,11} A number of studies have highlighted that patients use CAM therapies for treating chronic conditions because they may be perceived as “natural and therefore safe”.¹² One study has found that patients with LBP may use CAM therapies simply because they find them to better manage their condition compared to conventional therapies.⁶ It is also known that many patients report they would consider trying CAM therapies for their LBP even if they knew very little about their efficacy and effectiveness.¹³

Currently, a lack of research exists that assesses the quality of consumer health information online at the intersection of CAM and LBP. This is worth exploring given that many patients do not inform their physician regarding their usage of CAM therapies,¹⁰ and may potentially self-medicate with CAM therapies that they read about online (i.e. low quality websites) which may contraindicate with their current medication treatment plan. The majority of patients with LBP seek help from conventional practitioners such as physiotherapists, family physicians, and psychiatrists as well as CAM practitioners such as chiropractors, osteopaths and acupuncturists. However, some patients may also use the internet to obtain additional opinions or confirm whether the treatment they are receiving from their healthcare provider is ideal.¹⁴ Some patients also consult the internet to find health-related information for their condition to later discuss it with their healthcare provider.¹² It is important that healthcare providers keep their patients well-educated about what resources to consult when independently managing their LBP.

The purpose of the present study was to assess the quality of online consumer health information surrounding CAM treatments for LBP. Our findings may help to better inform healthcare providers about the reliability, credibility, and overall quality of the information sources of information their patients are exposed to on the internet. This can better prepare healthcare providers to discuss such resources with their patients and guide them in identifying high-quality sources of publically-available information.

2. Methods

2.1. Search strategy and screening

A search strategy was developed to yield websites which a typical LBP patient may come across when searching for CAM therapy information. We elected to only search Google, as this is the most commonly-used search engine worldwide holding over 90% of the search engine market share, to reflect a typical user's behaviour.¹⁵ The six searches were developed by JYN as follows: “alternative medicine for low back pain”, “complementary and alternative medicine for low back pain”, “complementary medicine for low back pain”, “integrative medicine for low back pain”, and “natural remedies for low back pain”, “natural therapies for low back pain”. KG conducted these searches on May 7th, 2020 across four English-speaking countries to obtain a more internationally representative selection of commonly visited websites as follows: Australia (Google.com.au), Canada (Google.ca), the United Kingdom (Google.co.uk), and the United States (Google.com). Searches were conducted using the Google Chrome browser in incognito mode to ensure that the websites retrieved were not influenced by previous search histories.

2.2. Eligibility criteria

KG and another research assistant reviewed the search results from the first twenty websites (first two Google search pages) for each search term, and duplicate webpages across searches were removed. Websites were screened for eligibility and included if they

contained at least one webpage that contained CAM consumer health information for the treatment and/or management of LBP. For the purpose of this study, we identified and included CAMs based on the operational definition provided by Cochrane Complementary Medicine.¹⁶ Additionally, websites had to be accessible to the general public (i.e. not subscription-based) and published in the English language. The following exclusion criteria were applied: peer-reviewed articles, as these are generally not read by patients/the general public; websites containing a broken URL; encyclopaedias (i.e. Wikipedia); only videos (i.e. YouTube); forums; major online retailers (i.e. Amazon); and eBook websites, such as Google Books, as the whole resource could not be accessed for free.

2.3. Data extraction and website quality assessment

KG and another research assistant data extracted the following items: website URL, website type, types of CAM therapies, types of non-CAM therapies (if present), whether the website appeared in more than one search (different search terms and/or regions), as well as scores for the sixteen DISCERN questions. Different webpages from the same website captured by searches were considered a single item for the purpose of DISCERN instrument quality assessment¹⁷; we therefore conducted a quality assessment of websites and not individual webpages. The DISCERN instrument is the first standardized quality index of consumer health information, which allows health professionals or patient users to evaluate the quality of health information.¹⁷ It was developed with the input of an expert panel, health information providers, and patients in collaboration with the National Health Service, British Library, and Oxford Research and Development Programme. The DISCERN instrument contains 16 questions that are divided between three sections. All questions are rated from 1 (lowest quality) to 5 (highest quality) on a Likert scale. Section 1 of the DISCERN instrument is comprised of questions 1 to 8 which assesses the overall reliability of the information provided. The scores obtained from this section allow the user to determine whether the source provides accurate information without being influenced by any conflicts of interest. These scores also assess whether the information source is providing information based on a sufficient evidence-base. Section 2 is comprised of questions 9 to 15 which assess the quality of information surrounding the treatment choices. The scores obtained from Section 2 indicate whether the benefits, side-effects, and mechanisms for the treatments being presented in the information source are adequately discussed. This section also considers whether the information source discusses a variety of treatment options and what the consumer audience should expect if they are to avoid pursuing any treatment. Lastly, Section 3 contains question 16, which highlights the quality rating of the information source as a whole. The scores from this section take into consideration both the reliability of the information source as well as the quality of the information surrounding the treatment choices.

Following the identification of all eligible websites and to standardize the data extraction and the use of the DISCERN instrument, JYN, KG and the other research assistant pilot tested its use on three separate websites and resolved any discrepancies across each item through discussion. Next, KG and the other research assistant independently completed the data extraction and assessed the quality of consumer health information on each eligible website using the DISCERN instrument. JYN reviewed all scores with KG and the other research assistant and resolved discrepancies without unduly modifying scores. The average of the two assessors' scores were calculated for each question across all websites, providing an overall summed DISCERN score between 15 and 75, based on the scores for the first 15 questions. Additionally, the average score and standard deviation for each DISCERN item was also calculated along with an average score for all 16 items.

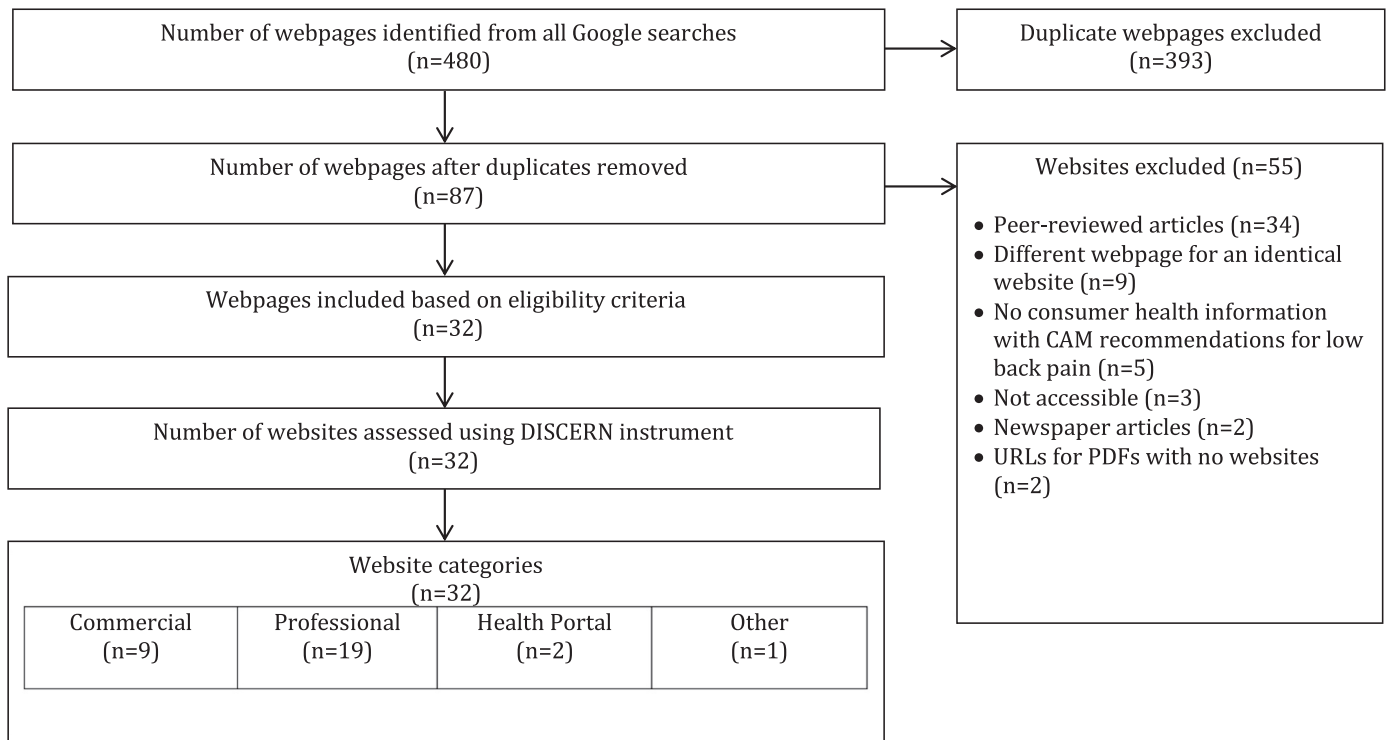


Fig. 1. Web information search strategy and assessment flowchart.

3. Results

3.1. Search results

We identified 480 webpages across all Google searches, of which 87 were unique. Fifty-five unique webpages were excluded because they were peer-reviewed articles (n=34), had a different webpage for an identical website (n=9), were not accessible (n=3), were online newspaper articles (n=2), or were URLs for PDFs with no websites (n=2). Five webpages were also excluded because they did not contain any CAM consumer health information for the treatment and/or management of LBP. Therefore, we included 32 webpages and their respective websites, assessing each one using the DISCERN instrument. This process is depicted in Fig. 1.

3.2. General characteristics of eligible websites

The 32 eligible websites were classified into four separate categories, as follows: professional, commercial, health portal, and other. Professional websites included those that were created by healthcare organizations or by individual healthcare professionals and experts (n=19). Commercial websites included those which presented content with the purpose of generating revenue through products, services, or advertisements fees (n=9). Health portal websites included those which presented information that encompassed a variety of general health topics (n=2). One website was classified as other because it did not fall into any of the other classifications. Twenty-four websites appeared when the same search term was used for a different country, and only eight websites were unique to a search term used for a specific country, as follows: Australia (n=3), United States (n=3), and United Kingdom (n=2).

The most common CAM therapies discussed across the 32 websites were acupuncture (n=26), yoga (n=17), chiropractic (n=16) and herbal remedies (n=10). Many of these websites (n=22) also provided treatment recommendations for non-CAM therapies such

as surgery, NSAIDs, ESIs and over-the-counter (OTC) prescription medications. Eleven websites discussed recommendations for CAM therapies only. The details surrounding the general characteristics of these eligible websites are shown in Table 1.

3.3. DISCERN instrument ratings

The average DISCERN score across all 32 websites was 53.25 (SD = 10.41). The average score for question 16, which assesses the overall quality of the publication, was 3.47 (SD = 0.68) across the 32 websites. The three websites which had the highest summed DISCERN scores were Family Medicine Wisconsin (68.00), St. Luke's Hospital (66.50), and Medical News Today (66.00). In general, these websites consistently scored four or five across all 15 questions in the DISCERN instrument. In contrast, the three websites with the lowest DISCERN scores were Advanced Integrative Medicine (25.50), Best Health Magazine (34.50), and Arapahoe Chiropractic (35.00). These websites consistently scored below a three across the 15 questions in the DISCERN instrument. We provide all of the DISCERN scores for each individual question and website in Table 2.

3.4. Trends identified across resources assessed

3.4.1. Websites clearly outlined and achieved their aims

Questions one and two ask whether the website clearly highlights its aims and whether those aims are achieved, respectively. Twenty of the 32 websites scored a four or higher on question one, and 23 of the 32 websites scored a four or higher on question two. Most websites provided a clear and concise description of the purpose behind the information presented and ultimately achieved the purpose outlined. Since most websites contained a detailed "About Us" section that was used as guidance for the content presented, this may explain why question one and two received relatively high mean scores of 4.08 (SD = 1.14) and 4.31 (SD = 0.83) respectively.

Table 1
General characteristics of eligible websites.

Website Name	URL	Website Category	Types of CAM Discussed	Types of Non-CAM Therapies Discussed	Searches Website Appeared
Agnesian	https://www.agnesian.com	Professional	Acupuncture, CBT, chiropractic therapy, massage therapy, meditation, yoga	Injection-based therapies and surgery	Yes
Advanced Integrative Medicine Arapahoe Chiropractic	https://aimedicine.com https://arapahoechiropractic.com	Professional Professional	Chiropractic therapy Acupuncture, anti-inflammatory diet, chiropractic therapy, yoga	None None	No, UK only No, USA only
Avogel Best Health Magazine	https://www.avogel.co.uk https://www.besthealthmag.ca	Professional Commercial	Herbal remedies Acupuncture, biofeedback, mindfulness therapies, herbal remedies	Muscle relaxants None	No, UK only Yes
DaoCloud	https://www.daocloud.com	Other	Acupuncture, craniosacral therapy, chiropractic therapy, glucosamine, osteopathic manipulation, massage therapy, meditation and progressive relaxation, vitamin D, tai chi, yoga	None	Yes
Dr. Axe	https://draxe.com	Professional	Anti-inflammatory diet, chiropractic therapy, prolotherapy, supplementary diets	None	Yes
Dr. Daniel Williams	https://www.drddanielwilliams.com	Professional	Acupuncture, anti-inflammatory diet, osteopathic manipulation, prolotherapy	None	No, USA only
Dr. Fabio	http://www.drffabio.com	Professional	Acupuncture, Alexander technique, balneotherapy, herbal remedies, meditation, music therapy, spinal manipulation, tai chi, vitamins	None	Yes
Everyday Health Family Medicine Wisconsin	https://www.everydayhealth.com https://www.fammed.wisc.edu	Commercial Professional	Acupuncture, herbal remedies, yoga, Acupuncture, chiropractic therapy, CBT, massage therapy, osteopathic manipulation, yoga	OTC medications, NSAIDs Antidepressants, OTC medications, muscle relaxants, injection-based therapies, narcotics, NSAIDs	Yes Yes
Health.com Healthcare Utah	https://www.health.com https://healthcare.utah.edu	Commercial Professional	Acupuncture, herbal remedies, Yoga Mindfulness-based therapies, meditation, yoga	Surgery, NSAIDs Anticonvulsants, antidepressants, NSAIDs, OTC medications, surgery,	Yes Yes
Healthline	https://www.healthline.com	Commercial	Acupuncture, chiropractic therapy, meditation, osteopathic manipulation, tai chi	ESIs, OTC medications, narcotics, ultrasound	Yes
Johns Hopkins Medicine	https://www.hopkinsmedicine.org	Professional	Acupuncture, biofeedback therapy, laser therapy, TENS, massage therapy, physical therapy, meditation and mindfulness-based therapies	Surgery	Yes

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Table 1 (continued)

Website Name	URL	Website Category	Types of CAM Discussed	Types of Non-CAM Therapies Discussed	Searches Website Appeared
Kenmore Centre for Health	https://www.kenmorecentreforhealth.com.au	Professional	Acupuncture, massage therapy, mindfulness-based therapy, spinal manipulation, tai chi, yoga	None	No, Australia only
Mayo Clinic	https://www.mayoclinic.org	Professional	Acupuncture, chiropractic therapy, massage therapy, meditation, TENS, yoga	Muscle injections, muscle relaxants, narcotics, OTC medications, NSAIDs, antidepressants	Yes
Medical News Today	https://www.medicalnewstoday.com	News	Acupuncture, anti-inflammatory diet, CBD oil, chiropractic spinal manipulation, physical therapy, spinal manipulation, TENS,	OTC medications, surgery, NSAIDs, opioids	Yes
Medicine Net	https://www.medicinenet.com	Health Portal	Acupuncture, chiropractic therapy, spinal manipulation, yoga,	OTC medications, ESIs, surgery	Yes
Nature's Intentions Naturopathy	https://www.naturesintentionsnaturopathy.com	Professional	Acupuncture, herbal remedies, homeopathy, physical therapy, vitamins,	None	No, Australia only
Orleans Integrative Medicine	http://orleansintegrativemedicine.com	Professional	Acupuncture, spinal mobilization	OTC medications, NSAIDs	Yes
Pain Week	https://www.painweek.org	Commercial	Acupuncture, Alexander technique, massage therapy, mindfulness-based therapies, pilates, spinal manipulation, tai chi, yoga,	Opioids, NSAIDs	Yes
Peace Health	https://www.peacehealth.org	Professional	Homeopathy	None	Yes
ProMed Spine	https://promedspine.com	Professional	Acupuncture, chiropractic therapy, massage therapy, homeopathy, yoga	Surgery	No, USA only
Reader's Digest Scripps	https://www.readersdigest.ca https://www.scripps.org	Commercial Professional	Herbal remedies and vitamins Acupuncture, biofeedback, massage therapy, mindfulness therapy, yoga	None Muscle relaxants, NSAIDs	Yes Yes
Spine Health	https://www.spine-health.com	Commercial	Acupuncture, CBT, chiropractic therapy, massage therapy, meditation,	OTC medications, ESIs, surgery	Yes
Spine Universe	https://www.spineuniverse.com	Commercial	Acupuncture, acupressure, chiropractic therapy, herbal remedies, massage therapy, osteopathic manipulation	ESIs, OTC medications, NSAIDs	Yes
St Luke's Hospital	https://www.stlukes-stl.com	Professional	Acupuncture, chiropractic therapy, dietary supplements, herbal remedies, homeopathy, physical therapy, tai chi, yoga	NSAIDs, muscle relaxants, steroids, opiates, ESIs, surgery	No, Australia only
University of Texas Southwestern Medicine	https://utswmed.org	Professional	Acupuncture, anti-inflammatory diet, biofeedback and mindfulness-based therapy, calcium supplementation, yoga	NSAIDs	Yes
Very Well Health	https://www.verywellhealth.com	Commercial	Acupuncture, Alexander technique, chiropractic therapy, CBT, massage therapy mindfulness-based therapies, tai chi, yoga	Opioids	Yes
Web MD	https://www.webmd.com	Health Portal	Acupuncture, biofeedback, chiropractic therapy, herbal remedies, massage, mind-based treatments, pilates, yoga	OTC medications, surgery, spinal decompression therapy	Yes

Abbreviations: CBD = cannabidiol; CBT = cognitive behavioural therapy; ESIs = epidural steroid injections; NSAIDs = non-steroidal anti-inflammatory drugs; OTC = over-the-counter; TENS = transcutaneous electrical nerve stimulation

Table 2.
DISCERN instrument ratings.

DISCERN Question		SECTION 2 How good is the quality of information on treatment choices?															SECTION 3 Overall Rating of the Publication			
Section	SECTION 1 Is the publication reliable?															SECTION 3 Overall Rating of the Publication				
	1. Are the aims clear?	2. Does it achieve its aims?	3. Is it relevant?	4. Is it clear what sources of information were used to compile the publication (other than the author or producer)?	5. Is it clear when the information was produced?	6. Is it balanced and unbiased?	7. Does it provide details of support and information?	8. Does it refer to areas of uncertainty?	9. Does it describe how each treatment works?	10. Does it describe the benefits of each treatment?	11. Does it describe the risks of each treatment?	12. Does it describe what would happen if no treatment is used?	13. Does it describe how the treatment may affect overall quality of life?	14. Is it clear that there may be more than one possible treatment choice?	15. Does it provide support for shared decision-making?	16. Based on the answers to all of the above questions, rate the overall quality of the publication as a source of information about treatment choices	Standard Deviation of Overall Score (Q16)	DISCERN Score (Sum of Q1-Q15)		
Website Name and URL																				
Family Medicine Wisconsin	https://www.fammed.wisc.edu	5.00	5.00	5.00	5.00	3.50	5.00	5.00	5.00	4.50	4.50	4.50	4.00	2.50	5.00	4.50	4.50	0.71	68.00	
St. Luke's Hospital	https://www.stlukes-stl.com	5.00	4.50	5.00	5.00	5.00	5.00	3.50	4.00	3.50	5.00	5.00	2.50	4.00	5.00	4.50	4.50	0.71	66.50	
Medical News Today	https://www.medicalnewstoday.com	5.00	5.00	5.00	5.00	4.50	5.00	4.50	3.50	5.00	5.00	4.00	3.00	4.50	4.00	4.00	4.00	0.00	66.00	
Spine Health	https://www.spine-health.com	5.00	5.00	4.50	5.00	4.50	5.00	4.00	3.00	4.50	5.00	3.00	4.00	3.00	5.00	4.00	4.00	0.00	64.50	
Very Well Health	https://www.verywellhealth.com	5.00	5.00	5.00	5.00	4.50	4.50	4.00	4.00	4.00	5.00	2.00	3.00	2.50	5.00	4.50	4.00	0.00	63.00	
Spine Universe	https://www.spineuniverse.com	5.00	5.00	4.50	3.00	4.50	5.00	4.50	3.50	3.50	5.00	4.00	4.00	3.50	4.50	3.50	4.00	0.00	63.00	
Mayo Clinic	https://www.mayoclinic.org	5.00	5.00	5.00	4.50	4.50	5.00	4.50	4.00	4.50	4.50	3.00	1.50	2.50	5.00	4.50	4.00	0.00	63.00	
Everyday Health	https://www.everydayhealth.com	5.00	5.00	5.00	3.50	4.50	5.00	4.00	3.50	5.00	5.00	3.50	2.00	3.50	4.50	3.00	4.00	0.00	62.00	
Dr. Fabio	http://www.drfabio.com	4.50	5.00	4.50	3.50	4.50	4.00	4.50	3.50	4.50	5.00	3.00	2.00	3.50	5.00	4.00	4.00	0.00	61.00	
Utah Healthcare	https://healthcare.utah.edu	4.50	5.00	4.50	1.00	4.00	4.50	4.50	4.50	4.50	4.50	4.50	4.00	2.50	4.50	4.00	4.00	0.00	61.00	
WebMD	https://www.webmd.com	5.00	5.00	4.50	3.00	4.00	5.00	4.50	4.50	4.50	4.50	4.00	2.00	3.00	4.50	2.50	4.00	0.00	60.50	
Healthline	https://www.healthline.com	5.00	5.00	5.00	5.00	3.50	3.00	4.00	1.00	5.00	5.00	3.00	1.50	3.50	5.00	4.00	4.00	0.00	58.50	

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Table 2. (continued)

Section	DISCERN Question																		
	SECTION 1 Is the publication reliable?									SECTION 2 How good is the quality of information on treatment choices?							SECTION 3 Overall Rating of the Publication		
Website Name and URL	1. Are the aims clear?	2. Does it achieve its aims?	3. Is it relevant?	4. Is it clear what sources of information were used to compile the publication (other than the author or producer)?	5. Is it clear when the information or reported in the publication was produced?	6. Is it balanced and unbiased?	7. Does it provide details of additional sources of support and information?	8. Does it refer to areas of uncertainty?	9. Does it describe how each treatment works?	10. Does it describe the benefits of each treatment?	11. Does it describe the risks of each treatment?	12. Does it describe what would happen if no treatment is used?	13. Does it describe how the treatment affect overall quality of life?	14. Is it clear that there may be more possible treatment choice?	15. Does it provide support for shared decision-making?	16. Based on the answers to all of the above questions, rate the overall quality of the publication as a source of information about treatment choices	Standard Deviation of Overall Score (Q15)	DISCERN Score (Sum of Q1-Q15)	
Scripps	https://www.scripps.org	5.00	3.50	5.00	3.00	4.00	4.50	2.50	2.00	4.50	5.00	1.50	4.00	4.00	5.00	5.00	4.00	0.00	58.50
Dr. Axe	https://draxe.com	5.00	5.00	4.50	4.50	4.50	3.50	3.50	3.50	4.50	5.00	4.00	1.50	2.50	5.00	1.50	4.00	0.00	58.00
DaoCloud	https://www.daocloud.com	2.50	3.00	4.00	5.00	4.50	4.50	3.50	3.50	3.50	5.00	3.50	2.50	3.50	4.50	2.50	4.00	0.00	55.50
Johns Hopkins Medicine	https://www.hopkinsmedicine.org	5.00	5.00	5.00	3.50	2.50	5.00	4.00	1.0	4.00	5.00	2.00	1.50	1.50	4.50	3.50	3.50	0.71	53.00
Avogel	https://www.avogel.co.uk	4.00	4.00	4.00	4.50	4.50	2.50	4.50	2.50	4.50	5.00	2.50	1.50	2.50	4.50	1.00	3.00	0.00	52.00
Health.com	https://www.health.com	4.50	4.50	4.00	3.00	3.00	4.50	4.00	4.00	3.50	5.00	2.50	1.00	2.50	4.50	1.50	3.00	0.00	52.00
Kenmore Centre for Health	https://www.kenmorecentreforhealth.com	5.00	4.50	4.00	5.00	4.50	4.50	2.50	3.50	4.50	4.00	1.50	1.00	2.50	4.00	1.00	3.50	0.71	52.00
Peace Health	https://www.peacehealth.org	3.50	3.50	4.50	2.50	4.50	4.50	4.00	3.50	2.50	5.00	3.00	1.50	2.50	4.50	2.50	3.50	0.71	52.00
Pro Med Spine	https://promedspine.com	4.50	4.50	4.50	3.00	1.50	3.50	4.00	1.50	4.50	4.50	1.50	3.00	4.00	5.00	2.50	3.50	0.71	52.00
Medicine Net	https://www.medicinenet.com	5.00	4.50	3.50	4.50	3.50	4.50	4.00	3.00	3.50	4.00	1.50	1.50	2.50	4.50	1.50	3.00	0.00	51.50
University of Texas Southwestern Medicine	https://utswmed.org	3.50	2.50	4.00	3.00	4.50	4.50	3.50	4.00	3.50	3.50	3.00	1.00	1.50	4.50	3.50	3.00	0.00	50.00

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Table 2. (continued)

Section	DISCERN Question																		
	SECTION 1 Is the publication reliable?								SECTION 2 How good is the quality of information on treatment choices?							SECTION 3 Overall Rating of the Publication			
Website Name and URL	1. Are the aims clear?	2. Does it achieve its aims?	3. Is it relevant?	4. Is it clear what sources of information were used to compile the publication (other than the author or producer)?	5. Is it clear when the information or reported in the publication was produced?	6. Is it balanced and unbiased?	7. Does it provide details of additional sources of support and information?	8. Does it refer to areas of uncertainty?	9. Does it describe how each treatment works?	10. Does it describe the benefits of each treatment?	11. Does it describe the risks of each treatment?	12. Does it describe what would happen if no treatment is used?	13. Does it describe how the treatment may affect overall quality of life?	14. Is it clear that there may be more than one possible treatment choice?	15. Does it provide support for shared decision-making?	16. Based on the answers to all of the above questions, rate the overall quality of the publication as a source of information about treatment choices	Standard Deviation of Overall Score (Q15)	DISCERN Score (Sum of Q1-Q15)	
Dr. Daniel Williams	https://www.drdanielwilliams.com	3.00	4.00	4.50	2.00	1.50	3.00	2.50	1.50	5.00	5.00	2.50	3.50	2.50	5.00	4.00	3.00	0.00	49.50
Pain Week	https://www.painweek.org	3.50	4.50	5.00	3.00	4.00	4.50	3.50	2.50	1.50	3.50	1.50	1.50	2.50	4.50	3.00	3.00	0.00	48.50
Agnesian	https://www.agnesian.com	2.50	4.50	3.50	1.50	3.50	3.00	3.50	1.50	4.50	5.00	1.50	1.50	2.50	3.50	2.50	3.00	0.00	44.50
ReadersDigest	https://www.readersdigest.ca	2.50	3.50	3.50	2.50	1.50	2.50	3.50	4.50	3.50	3.50	2.50	1.50	2.50	4.50	2.00	3.00	0.00	44.00
Orleans Integrative Medicine	http://orleansintegrativemedicine.com	2.50	4.50	3.50	2.50	2.50	4.00	3.50	1.00	2.50	3.00	1.50	1.00	2.50	4.50	2.50	3.00	0.00	41.50
Nature's Intentions Naturopathy	https://www.naturesintentionsnaturopathy.com	2.50	3.50	3.50	1.50	1.50	2.50	2.50	1.50	2.50	4.00	1.50	1.50	2.50	3.00	3.50	2.50	0.71	37.50
Arapahoe Chiropractic	https://arapahoechiropractic.com	4.00	2.50	3.50	1.50	2.50	2.50	1.00	1.00	2.50	3.50	1.00	1.00	1.50	4.50	2.50	2.50	0.71	35.00
Best Health Magazine	https://www.besthealthmag.ca	1.00	n/a	2.50	1.50	1.50	4.00	3.50	1.00	3.50	4.50	1.50	1.00	3.50	4.50	1.00	2.50	0.71	34.50
Advanced Integrative Medicine	https://aimedicine.com	2.50	2.50	3.00	1.50	1.00	1.50	1.00	1.00	2.50	3.50	1.00	1.00	1.50	1.00	1.00	1.50	0.71	25.50
TOTAL Means		4.08	4.31	4.28	3.36	3.52	4.05	3.63	2.86	3.88	4.52	2.64	2.10	2.75	4.47	2.97	3.47	0.22	53.25
TOTAL Standard Deviations		1.14	0.83	0.68	1.33	1.21	0.99	0.94	1.29	0.92	0.63	1.14	1.07	0.71	0.77	1.21	0.68	0.33	10.41

3.4.2. Benefits versus risks of CAM treatment

Questions ten and 11 ask if the websites discussed treatment benefits and risks adequately, respectively, for each of the treatment options presented on the website. Twenty-six of the 32 websites scored a four or higher on question 10 as they thoroughly described the benefits for each of their treatment options. However, 25 of the 32 websites scored below a four on question 11 which highlights how the risks of certain treatment options were not discussed to the same extent as their benefits. Additionally, question 10 received the highest mean score of 4.52 (SD = 0.63) among the 15 DISCERN items, while question 11 received the second lowest mean score of 2.64 (SD = 1.14). The risks were primarily not discussed in practitioner-based websites of the "professional" category which advertise their services and treatment plans for patients.

3.4.3. Leaving LBP untreated

Question 12 asks whether the website comments on the consequences for patients who choose not to pursue any treatments. Among all other items in the DISCERN instrument, item 12 had the lowest mean score of 2.10 (SD = 1.07) with 21 of the 32 websites scoring a two or lower. While many websites did discuss a variety of alternative treatment options, the consequences of not pursuing any treatment were rarely discussed.

3.4.4. Treatment implications on quality of life

Question 13 asks whether the website discusses how the usage of certain treatments will have a larger scale impact on the patient's quality of life. Many websites discussed this briefly, but it was not observed to be a major focus of the treatment's implications. This item received a mean score of 2.75 (SD = 0.71), with 20 out of 32 websites scoring a 2.5 or lower. While many websites specifically discussed how treatments impact pathophysiology and help alleviate pain, the greater impact that treatments have on the patient's quality of life were generally lacking.

3.4.5. Multiple CAM treatment options

Question 14 seeks to identify whether the websites discussed multiple treatment options. Among all other items in the DISCERN instrument, item 14 had the second highest mean score of 4.47 (SD = 0.77), with 30 of the 32 websites scoring above a four, and 29 of the 32 websites highlighting more than one option for CAM therapies. For example, most websites that discussed treatments requiring physical manipulation, such as chiropractic therapy, also discussed the usage of herbal remedies or vitamin therapy as well.

3.5. Recommended websites for patients and consumers

These websites had a mean DISCERN score of four or higher across the first 15 questions and also had an overall DISCERN score above 60. Ten of the 11 websites scored a five on question 2 which seeks to determine if the website achieved its defined aims. Question six asks whether the information presented is balanced and unbiased; all 11 websites scored a four or higher on this item as they primarily contained objective language and the organization's competing interests did not appear to impact the quality of the information being presented. Ten of the 11 websites also scored a four or higher on item five, which assessed whether the website reported when the information included was first produced. These websites included in-text citations and bibliographies to identify that the information was based upon peer-reviewed articles and clinical practice guidelines. Table 3 provides the 11 recommended websites for patients and consumers seeking CAM treatment recommendations for LBP.

4. Discussion

The purpose of this study was to assess the quality of online consumer health information surrounding CAM treatments for LBP. Patients often and increasingly consult the internet to find information they can later discuss with their healthcare providers, to gather a second opinion when making healthcare decisions, or even to self-medicate without consultation with a medical professional.¹⁸ Among patients who do see a healthcare professional for LBP, some may consider seeking out CAM therapies when the treatments recommended are minimal effective or result in adverse side effects.⁶ Healthcare providers should, therefore, have an understanding of the quality of information their patients may be exposed to on the internet so that they can assist them in making informed healthcare decisions.

4.1. Summary of the main results

Our study found 32 eligible websites with consumer health information regarding CAM therapies for the treatment of LBP. The overall summed DISCERN score was 53.25 (SD = 10.41), and mean DISCERN score when assessing the overall quality of the publication (question 16) was 3.47 (SD = 0.7). While the mean score was above a four for six DISCERN items (questions one, two, three, six, ten, and 14), it was also below a three for five (questions eight, 11, 12, 13 and 15). By analysing the trends in the data across multiple DISCERN items, it was found that the current information across online sources varied considerably in quality.

4.2. Comparative literature

While to our knowledge, our study is the first to assess websites containing CAM consumer health information for back pain, our findings can be compared to similarly published literature. Previous studies that have assessed the quality of web-based information on LBP have consistently found poor results.^{19, 20} One study found that the percentage of websites that contained LBP treatment recommendations which were in agreement with information found in clinical practice guidelines was 43.28%.¹⁹ The majority of these websites did not provide comprehensive recommendations as the proportion of guideline recommendations reported was very low. Another study published in 2003, assessed the quality of information surrounding LBP treatments on 60 websites using a self-designed data extraction form which scored websites on a scale of 1 to 38.²⁰ Fifty-eight of the websites assessed were found to score below half of the maximum score.²⁰ Two additional studies from 2001 and 2012, using a similar methodology to the present study, also deemed websites with health information surrounding low back pain to be of low quality.^{21, 22} The study from 2001 assessed 73 websites, of which only nine were considered to be of high quality based on their self-designed data extraction form. Twenty-eight of the 73 websites contained evidence-based health information, yet only 27 of the 73 websites had the necessary citations needed to verify the recommendations delivered on the respective website.²¹ The 2012 study highlighted that the majority of information pertaining to the treatment and management of LBP on the internet was not consistent across websites, nor was it in line with the recommendations found in evidence-based clinical practice guidelines.²²

Such trends are similar across studies that assessed CAM information. One 2018 study aimed to evaluate the quality of information found on websites making CAM recommendations for a variety of general health conditions. The authors noted that most websites with CAM recommendations failed to reference any credible sources or clinically significant results from the peer-reviewed medical literature.²³ They also found that most websites reported

Table 3.
Recommended websites for patients and consumers.

Website name	URL	DISCERN score (Sum)	Overall rating (Q16) score	Website category	Target audience
Family Medicine Wisconsin	https://www.fammed.wisc.edu	68.00	4.50	Professional	General public/patients, healthcare providers, researchers
St. Luke's Hospital	https://www.stlukes-stl.com	66.50	4.50	Professional	General public/patients
Medical News Today	https://www.medicalnewstoday.com	66.00	4.00	Commercial	General public/patients, healthcare providers, researchers
Spine Health	https://www.spine-health.com	64.50	4.00	Commercial	General public/patients, healthcare providers, researchers
Spine Universe	https://www.spineuniverse.com	63.00	4.00	Commercial	General public/patients, healthcare providers, researchers
Very Well Health	https://www.verywellhealth.com	63.00	4.00	Commercial	General public/patients
Mayo Clinic	https://www.mayoclinic.org	63.00	4.00	Professional	General public/patients, healthcare providers, researchers
Everyday Health	https://www.everydayhealth.com	62.00	4.00	Commercial	General public/patients
Dr. Fabio	http://www.drfabio.com	61.00	4.00	Professional	General public/patients
Healthcare Utah	https://healthcare.utah.edu	61.00	4.00	Professional	General public/patients, healthcare providers, researchers
Web MD	https://www.webmd.com	60.50	4.00	Health Portal	General public/patients

the advantages of CAM therapies, but failed to describe their associated side-effects or harms.²³ Another study published in 2004 assessed the quality of online information specifically pertaining to CAM treatments for cancer.²⁴ The study found a lack of consistency between websites when discussing the most effective CAM therapy for treating cancer. Some websites also recommended CAM therapies which are known to be dangerous for patients, or which have little to no scientific evidence to support their usage.²⁴ Finally, a 2008 study assessed the quality of online CAM information with respect to glaucoma treatment; the authors found misleading CAM therapy recommendations, whereby the safety and efficacy of these interventions were not supported by the medical literature.²⁵

The results of our study are slightly more positive than the results in the aforementioned literature focusing on the quality of online information pertaining to the treatment of LBP, which may be attributed to a variety of factors. The first is because of the development of new websites, as many included in our study were not available on the internet when previous studies were conducted. For the websites which had already existed, they may have been updated to accurately reflect the information found in the current literature and clinical practice guidelines. Our results may also differ because our study assessed online LBP information using the DISCERN instrument, while the previous studies, in comparison, had used both self-designed data extraction forms and a variety of other instruments. While DISCERN seeks to determine the overall quality of the information source through multiple domains and variables, previous studies have focused more on the accuracy, readability, and credibility of the content on websites by using instruments such as the Flesch Kincaid Grade Level (FGKL), HONcode, and self-created data extraction forms.²¹⁻²³

4.3. Implications for practice

A previous study has found that despite the vast amount of information available on the internet, patients feel overwhelmed when attempting to make independent healthcare decisions.²⁶ Another study found that most patients value their family physician's opinion more than the information they find on the internet.¹⁴ Patients who do actively consult the internet for health-related suggestions also tend to ask more questions during appointments and follow their physician's advice more closely as well.²⁷ Therefore, it is crucial that healthcare professionals guide their patients in the right direction when they independently search the internet for health-related information. This guidance can help patients make better healthcare decisions after they have considered an ex-

pert's opinion on the web-based information they had previously read. Conventional practitioners can also consider expanding their knowledge on CAM treatments as patients often have inquiries about the effectiveness of these treatments and they would value receiving information that directly addresses their concerns.²⁸ Clinicians should continue to support their patients who may be struggling to take ownership over their health when independently consulting the internet for health-related information.

4.4. Implications for research

In the present study, most websites outlined clear aims and successfully achieved them. They also provided relevant information for patients by discussing the benefits of various treatment options suggested, however, the majority of websites did not adequately discuss the risks or areas of uncertainty regarding the treatment options they presented. As most websites included in this study were created by healthcare practitioners, discussing the risks may have been avoided as this may turn patients away from using the treatments offered by the practitioner's clinic or hospital.²⁹ High quality websites should be constructed based on evidence-based resources such as clinical practice guidelines which summarize the peer-reviewed medical literature and present both the risks and benefits of various treatment recommendations. One example of such a resource, includes clinical practice guidelines for the treatment and/or management of LBP containing CAM recommendations; in one systematic review, the authors found that the majority of these guidelines provided a wide-variety of CAM recommendations,³⁰ which could be used as a starting point in improving the consumer health information on websites such as those assessed in the present study. Another study assessing 16 systematic reviews found consistent evidence supporting the usage of acupuncture for relieving chronic LBP.³¹ Since acupuncture was the most prevalent CAM therapy discussed among the websites assessed in our study, these systematic reviews may also serve as a useful resource which could be adapted for these aforementioned websites. Overall, there is a sufficient evidence-base available for website developers to include pertinent information surrounding the benefits, risks, and side-effects for a number of CAM therapies in the context of LBP.

4.5. Strengths and Limitations

Strengths include the fact that both data collection and assessment were conducted in duplicate, in addition to the use

of the DISCERN instrument which is both widely-used, and has been found to be both reliable and valid. Another strength included searching Google across four different countries; this allowed for the retrieval of a more internationally-representative sample of websites, in addition to increased applicability of findings for healthcare providers and researchers from multiple geographic locations. Selecting Google as the sole search engine used also best reflected patient's information-seeking behaviour, given its high popularity and very large market share. A notable limitation is the fact that websites were assessed cross-sectionally thus providing a snapshot of the information available online, however, website consumer health information is consistently changing over time. Additionally, the present study did not assess for the readability or accuracy of the content found on the included websites.

4.6. Conclusion

Patients regularly consult the internet to seek information about CAM for the treatment and/or management of LBP. The purpose of our study was to assess the quality of consumer health information for CAM at the intersection of treating LBP. Although it appears that the current web-based information is of a slightly higher quality than what similar and previously-published literature had identified, a number of quality-related issues still exist across the sample of websites assessed. Based on the scores obtained from the DISCERN instrument, it was found that websites commonly lacked discussing the risks of certain therapies, and failed to incorporate information on what could happen if LBP is left untreated. Websites also did not adequately discuss how certain treatment recommendations could affect the patient's overall quality of life. Healthcare providers should be aware of the information their patients may encounter outside of a clinical setting, which can ultimately better prepare them to assist them in the discussion and identification of high-quality sources of publicly-available information online.

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Author contributions

JYN: Conceptualization, Methodology, Investigation, Formal Analysis, Writing-Original Draft, Writing Review & Editing. **KG:** Investigation, Formal Analysis, Writing -Original Draft, Writing Review & Editing.

Declaration of Competing Interest

The authors declare that they have no competing interests.

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Ethical statement

This study involved a search and review of publicly available online information only; it did not require ethics approval or consent to participate.

Data availability

All relevant data are included in this manuscript.

References

- Heliövaara M, Sievers K, Impivaara O, Maatela J, Knekt P, Makela M, Aromaa A. Descriptive epidemiology and public health aspects of low back pain. *Ann Med*. 1989;21:327–333. doi:10.3109/07853898909149216.
- Hoy D, Bain C, Williams G, March L, Brooks P, Blyth F, et al. A systematic review of the global prevalence of low back pain. *Arthritis Rheum*. 2012 Jun;64(6):2028–2037. doi:10.1002/art.34347.
- Weiner DK, Haggerty CL, Kritchevsky SB, Harris T, Simonsick EM, Nevitt M, et al. How does low back pain impact physical function in independent, well-functioning older adults? Evidence from the health ABC cohort and implications for the future. *Pain Med*. 2003 Dec;4(4):311–320. doi:10.1111/j.1526-4637.2003.03042.x.
- Koes BW, van Tulder MW, Thomas S. Diagnosis and treatment of low back pain. 2006 Jun 17; 332(7555): 1430–1434. 10.1136/2Fbmj.332.7555.1430
- Dubois J, Scala E, Faouzi M, Decosterd I, Burnand B, Rodondi P-Y. Chronic low back pain patients' use of, level of knowledge of and perceived benefits of complementary medicine: a cross-sectional study at an academic pain center. *BMC Complement Altern Med*. 2017 Dec;17(1):193 10.1186/2Fs12906-017-1708-1.
- Kanodia AK, Legeedza AT, Davis RB, Eisenberg DM, Phillips RS. Perceived benefit of complementary and alternative medicine (CAM) for back pain: a national survey. *J Am Board Fam Med*. 2010;23(3):354–362. doi:10.3122/jabfm.2010.03.080252.
- Abdel Shaheed C, Maher CG, Williams KA, Day R, McLachlan AJ. Efficacy, tolerability, and dose-dependent effects of opioid analgesics for low back pain: a systematic review and meta-analysis. *JAMA Intern Med*. 2016;176(7):958–968. doi:10.1001/jamainternmed.2016.1251.
- Complementary, Alternative, or Integrative Health: What's In a Name? [Internet]. National Center for Complementary and Integrative Health. U.S. Department of Health and Human Services; 2018 [Accessed 2020 May 8]. Available from: <https://www.nccih.nih.gov/health/complementary-alternative-or-integrative-health-whats-in-a-name>
- Ng JY, Boon HS, Thompson AK, Whitehead CR. Making sense of "alternative", "complementary", "unconventional" and "integrative" medicine: exploring the terms and meanings through a textual analysis. *BMC Complement Alternat Med*. 2016 Dec 1;16(1):134 <http://doi.org/>. doi:10.1186/s12906-016-1111-3.
- Shipton EA. Physical therapy approaches in the treatment of low back pain. *Pain Ther*. 2018 Dec;7(2):127–137 10.1007/2Fs40122-018-0105-x.
- Tsang VHM, Lo PHW, Lam FT, Chung LSW, Tang TY, Lui HM, et al. Perception and use of complementary and alternative medicine for low back pain. *J Orthopaed Surg*. 2017 Sep;25(3) 10.1177/2F2309499017739480.
- Bishop FL, Yardley L, Lewith GT. A systematic review of beliefs involved in the use of complementary and alternative medicine. *J Health Psychol*. 2007 Nov;12(6):851–867. doi:10.1177/1359105307082447.
- Santaguida L, Gross A, Busse J, Gagnier J, Walker K, Bhandari M, Raina P. Complementary and alternative medicine in back pain utilization report. *AHRQ Publication*. 2009:221.
- Bowes P, Stevenson F, Ahluwalia S, Murray E. 'I need her to be a doctor': patients' experiences of presenting health information from the internet in GP consultations. *Br J Gen Pract*. 2012 Nov;62(604):e732–e738 10.3399/2Fbjgp12X658250.
- Search Engine Market Share Worldwide. StatCounter Global Stats [Internet]. 2020 [Accessed 6 August 2020]. Available from: <https://gs.statcounter.com/search-engine-market-share/all/>
- Cochrane Complementary Medicine. Operational definition of complementary medicine. [Accessed 6 August 2020]. Available from: <https://cam.cochrane.org/operational-definition-complementary-medicine>
- Charnock D. *University of Oxford, British Library. The DISCERN handbook: Quality criteria for consumer health information on treatment choices*. Abingdon: Radcliffe Medical; 1998.
- Volkman JE, Luger T, Harvey K, Hogan TP, Shimada SL, Amante D, McInnes DK, Feng H, Houston TK. The National Cancer Institute's Health Information National Trends Survey [HINTS]: a national cross-sectional analysis of talking to your doctor and other healthcare providers for health information. *BMC Fam Pract*. 2014 Dec;15(1):111 <http://doi.org/>. doi:10.1186/1471-2296-15-111.
- Ferreira G, Traeger AC, Machado G, O'Keefe M, Maher CG. Credibility, accuracy, and comprehensiveness of internet-based information about low back pain: A systematic review. *J Med Internet Res*. 2019 May 7;21(5):e13357. doi:10.2196/13357.
- Butler L. Online Foster NEBack Pain. A cross-sectional survey of the quality of web-based information on low back pain. *Spine*. 2003 Feb;28(4):395–401. doi:10.1097/01.brs.0000048497.38319.d3.
- Li L, Irvin E, Guzman J, Bombardier C. Surfing for back pain patients. *Spine*. 2001;26:545–557. doi:10.1097/00007632-200103010-00020.
- Hendrick PA, Ahmed OH, Bankier SS, et al. Acute low back pain information online: an evaluation of quality, content accuracy and readability of related websites. *Manual Ther*. 2012 Aug;17(4):318–324. doi:10.1016/j.math.2012.02.019.
- Chen AT, Taylor-Swanson L, Buie RW, Park A, Conway M. Characterizing websites that provide information about complementary and integrative health: Systematic search and evaluation of five domains. *Interact J Med Res*. 2018;7(2):e14. doi:10.2196/ijmr.9803.

24. Schmidt K, Ernst E. Assessing websites on complementary and alternative medicine for cancer. *Ann Oncol*. 2004 May;15(5):733–742. doi:[10.1093/annonc/mdh174](https://doi.org/10.1093/annonc/mdh174).
25. Gunasekera V, Ernst E, Ezra DG. Systematic internet-based review of complementary and alternative medicine for glaucoma. *Ophthalmology*. 2008;115(3):435–439. doi:[10.1016/j.ophtha.2007.07.001](https://doi.org/10.1016/j.ophtha.2007.07.001).
26. Hart A, Henwood F, Wyatt S. The role of the internet in patient-practitioner relationships: Findings from a qualitative research study. *J Med Internet Res*. 2008;10(2):e36.
27. Iverson SA, Howard KB, Penney BK. Impact of internet use on health-related behaviors and the patient-physician relationship: a survey-based study and review. *J Am Osteopath Assoc*. 2008;108(12):699–711. doi:[10.7556/jaoa.2008.108.12.699](https://doi.org/10.7556/jaoa.2008.108.12.699).
28. Holt N, Pincus T, Vogel S. Reassurance during low back pain consultations with GPs: a qualitative study. *Br J Gen Pract*. 2015 Oct;65(639):e692–e701. doi:[10.3399/bjgp15X686953](https://doi.org/10.3399/bjgp15X686953).
29. Bergus GR, Levin IP, Elstein AS. Presenting risks and benefits to patients: The effect of information order on decision making. *J Gen Intern Med*. 2002 Aug;17(8):612–617. doi:[10.1046%2Fj.1525-1497.2002.11001.x](https://doi.org/10.1046%2Fj.1525-1497.2002.11001.x).
30. Ng JY, Mohiuddin U. Quality of complementary and alternative medicine recommendations in low back pain guidelines: a systematic review. *Eur Spine J*. 2020 Aug;29(8):1833–1844. doi:[10.1007/s00586-020-06393-9](https://doi.org/10.1007/s00586-020-06393-9).
31. Liu L, Skinner M, McDonough S, Mabire L, Baxter GD. Acupuncture for low back pain: An overview of systematic reviews. *Evid Based Compl Alternat Med*. 2015;2015:1–18. doi:[10.1155/2015/328196](https://doi.org/10.1155/2015/328196).