

ORIGINAL RESEARCH ARTICLE

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# Content analysis of the online information available about back pain

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## Abstract

**Background:** Low back pain (LBP) is growing health concern that affects millions of people around the globe, and there are many misconceptions regarding causes, imaging, and appropriate treatment choices. Common people usually search Google seeking information regarding LBP from different websites. However, the content of these widely accessible websites have not be evaluated in the light of evidence. The present study aims to analyze the information presented by these websites, summarize the content, and evaluate it against the published literature.

**Methods:** We conducted a systematic search of Google using search terms “low back pain,” “back pain,” “backache. NVivo software was used to capture the content from the internet. Content analysis (CA) was used to analyze online consumer information concerning LBP on the included websites.

**Results:** A total of 53 websites were included in the study by screening the search pages. There were erroneous information present on majority of the websites. Almost all of the websites consisted of nocebic terms. The causes were more oriented towards biomedical model. Treatment options mentioned did not concur with the recent clinical practice guidelines.

**Conclusion:** The Online information retrieved from a Google search lacks representation of the current best research. The findings of the study suggest that future development of websites must include information that is more accurate, and evidence driven. Online LBP information should be based on criteria that are more sensitive to the psychosocial factors that contribute to pain.

**Keywords:** Medical informatics, Low back pain, Biopsychosocial model, Consumer health information

## Background

Low back pain (LBP) is a growing public health crisis, with 540 million people experiencing it worldwide [1, 2]. Disability and disease burden associated with LBP is rising exponentially and is predicted to increase in the coming years [2, 3]. Back pain is a symptom that is a result of different known and unknown abnormalities and diseases [4]. It is usually defined by the location of pain between the lower rib margins and the buttock creases [5].

There has been an increase in clinical trials assessing treatment efficacy in the LBP population. However, there

is a mismatch between clinical practice and recent scientific evidence [3]. The current evidence suggests that many health professionals do not adhere to the clinical practice guidelines and do not use quality scientific evidence to support their clinical practice [6, 7]. Moreover, individuals with back pain do not have access to this scientific information in a gullible form.

There is a gap between health knowledge discovery and its public distribution which is usually attributed to ineffective dissemination [8, 9]. Blogs, web pages, and social media networking sites promise to be a dynamic and cost-effective method to propagate recent scientific evidence to the masses. In light of this, it is essential to explore if the websites are acting as a reliable source of information.

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A previous suggest that many factors influence patients' healthcare decisions, including advice from health professionals, family and friends, prior experiences, beliefs, and online information [10]. Most orthopedic patients use the internet to search for solutions to their health problems [11, 12]. In the current study, google was used to explore the websites that portrays information on LBP among the general public. A previous study demonstrated that online information about knee osteoarthritis is inaccurate [13].

Erroneous information may perpetuate wrong beliefs and notions among its consumers, including healthcare providers. Therefore, online content must be analyzed. The study aimed to summarize and explore the different aspects of information available online related to LBP. We hypothesized that websites content may not be in line with published literature.

## Methods

### Study design

A descriptive cross-sectional design was used to explore the information available on publicly accessed websites for LBP.

### Search strategy

We did internet searches on Google India on 16th October 2021 using the keywords "low back pain," "back pain," and "backache". Initial screening of websites was done by primary author on Google Chrome. We ensured that the search we did was almost identical to a search done by a lay individual looking for information on google. Google was selected because approximately 95.4% of all internet searches performed in India per annum are conducted via Google [14, 15]. We limited the probes to the first 30 web pages identified, this was done as per the click-through data, people are unlikely to explore web pages beyond the second page of a Google search. The time filter was used for a time frame of 2010 to 2021, and it was done to ensure that the web pages included were recent or updated.

We included any online information written in English and targeted at consumers. The videos, if any, listed on the web pages were also included in the analysis. The websites were excluded if (a) the information was targeted at healthcare providers, (b) had insufficient information, or the content was only available for subscribers, and (c) websites redirecting to YouTube links.

### Content analysis

We used content analysis (CA) as a tool to analyze online consumer information regarding LBP on different websites. CA is a research tool used to determine the presence of certain words, themes, or concepts within some

given data (for example texts, conversations etc.) [16]. The data was extracted from the web pages by both the authors and were analyzed. Based on the study conducted by Nielsen and colleagues [17], in which they identified the information needs of patients with LBP. We extracted the following data: (a) causes of LBP, (b) management options mentioned, (c) diagnostic tools recommendations, (d) when to visit a doctor. These are highlighted and presented in the results section.

### Data analysis

The identified websites were imported into the NVivo software using N capture. It is a free web browser extension that lets you record content including web pages, online PDFs, and Twitter tweets into the software. The software was used to identify the overall themes on which the website content was based upon. Word cloud was created to identify the most common words that appeared on these websites. The causes and management strategies were extracted and reported.

## Results

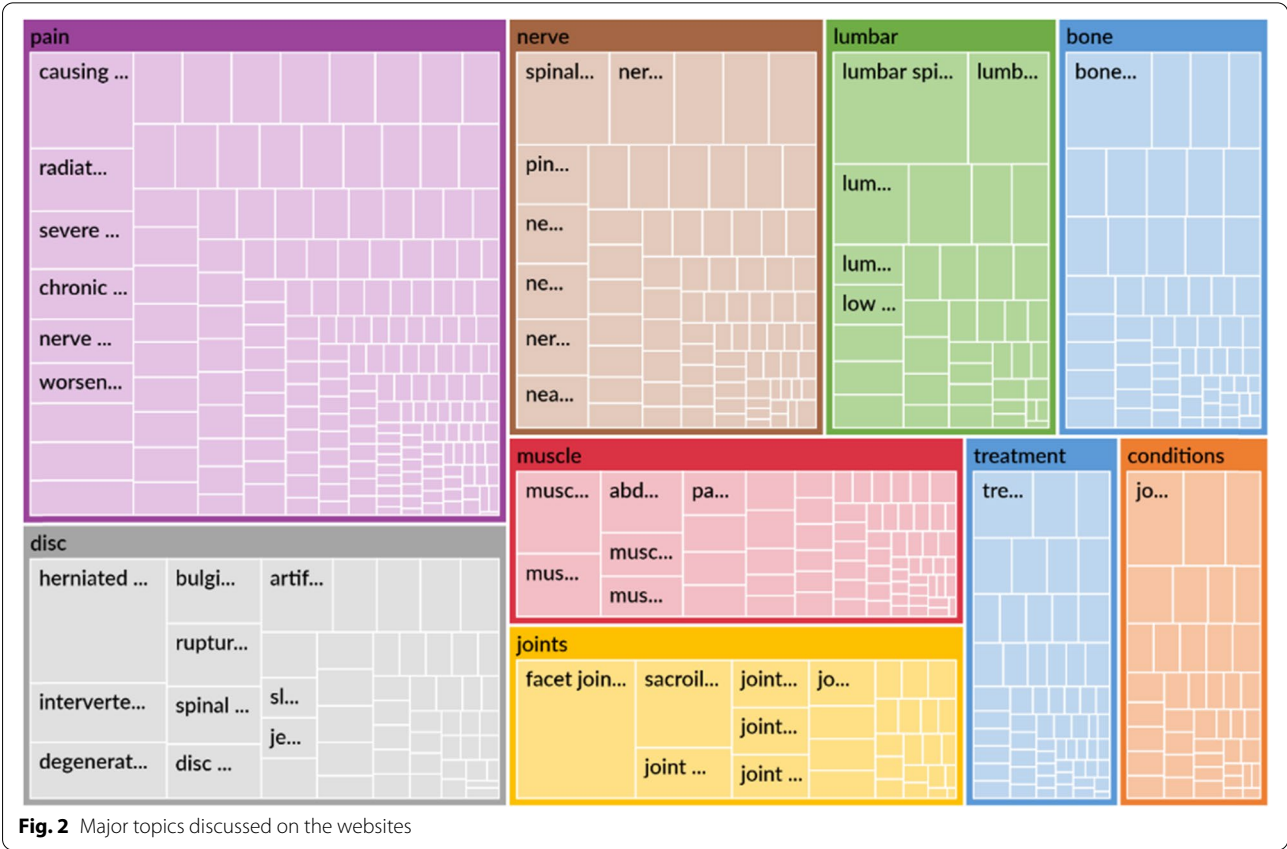
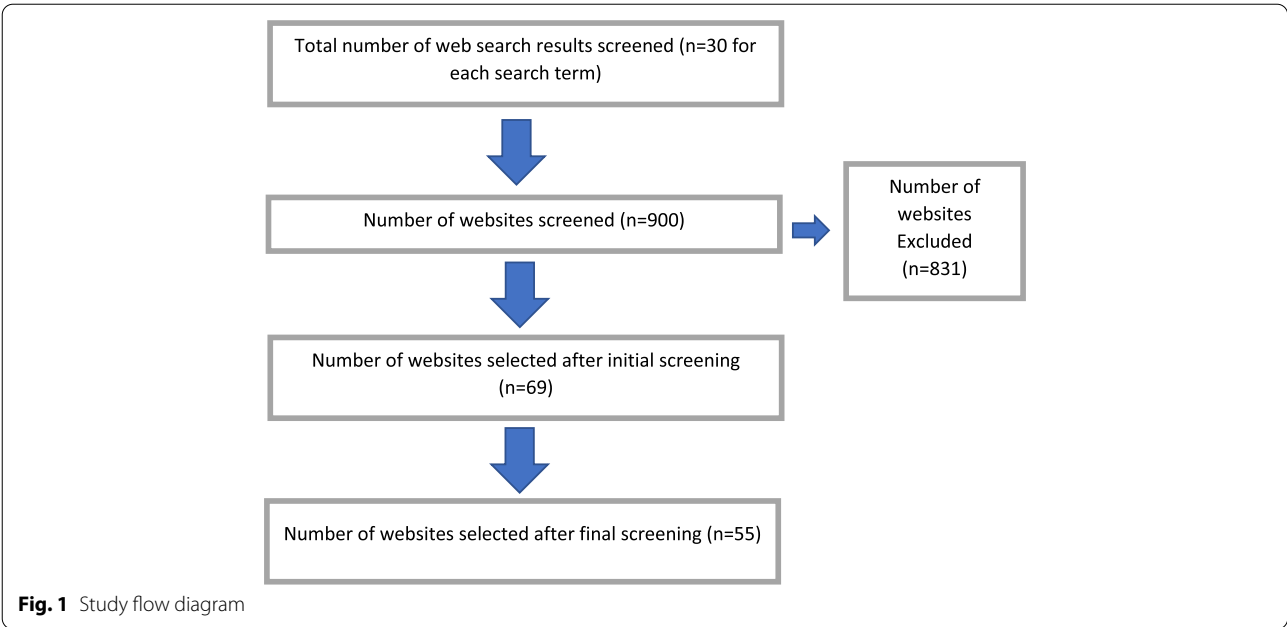
A total of 69 websites were shortlisted for evaluation of content. After the initial screening 55 websites were included after removing duplicates ( $n = 14$ ) for final analysis (Fig. 1). Nearly all (50) websites were written and reviewed by medical professionals. Only 3 websites were written by journalists.

### Extracted themes from websites

Most of the websites discussed the pain and its causes; the other major themes are highlighted in Fig. 2. Discs, nerves, muscles, bones, and joints were identified as the primary source of pain in the screened websites, and fewer described the non-structural causes of LBP. Some described the chronicity, severity, and types of LBP. Degenerative disc disease and herniated disc problems were most commonly recognized causes of LBP. Non-structural causes of LBP were mostly inaccurately organized as risk factors rather illustrating direct causal relationship. A word cloud displaying most occurring words on the searched websites was generated and is highlighted as Fig. 3. The frequent words were like posture, stress, cancer, and treatment including exercises as well as surgery. We have highlighted common excerpts that were not according to the recent evidence (myths) in Tables 1 and 2. Treatment strategies were also directed at the pathological structures.

### Causes mentioned on the websites

Approximately all websites screened mentioned the causes of LBP among which structural causes were described majorly. They also describe seldom seen





infectious causes like Shingles, some biomechanical causes like postural issues, heavy backpack carrying in children, complex disorders like fibromyalgia, and rarely occurring spinal tumors. Bones and nerve-related issues are common to see and coexist with different conditions

like osteoporosis or arthritis. Figure 4 highlights the various causes identified through the web pages. Lifting technique and posture was common cause across all the websites. It is evident from identified causes that disc-related disorders dominate the websites.

**Table 1** Posture and lifting statements from the websites

*Pay attention to the way you hold your back when you sit, stand, walk, sleep, or do day-to-day activities. . . . . Don't sit up in your bed hunched over your laptop. That's a surefire recipe for back pain over time*

*Many people with back pain find it hard to stand up straight. You may stand "crooked" or bent, with your torso off to the side rather than aligned with your spine. Your lower back may look flat instead of curved*

*A common reason your back may hurt is from bad posture while seated. Sitting in a slouched or hunched over position can put strain on the discs — the fluid-filled cushions that protect the vertebrae from rubbing together*

*Don't try to lift objects that are too heavy. Lift from the knees, pull the stomach muscles in, and keep the head down and in line with a straight back. When lifting, keep objects close to the body. Do not twist when lifting*

*Lifting and pushing heavy objects can cause injuries. Sedentary desk jobs can trigger back pain due to poor posture or back support*

*If you sit a lot, you may have adopted poor posture, such as slouched shoulders, a protruding neck, and an arched lower back. These posture problems can all lead to back pain*

*Heavy backpacks can strain younger children's back muscles. Backpacks shouldn't weigh more than 20 percent of the child's body weight*

*Learning to lift correctly helps prevent back injury. The hips should be aligned with the shoulders (that is, not rotated to one side or the other). People should not bend over with their legs nearly straight and reach out with their arms to pick up an object.*

*Chronic mechanical back pain results from bad habits, such as poor posture, poorly designed seating, and incorrect bending and lifting motion*

*Do not slouch while standing. . . . . Lift a heavy weight in forward bent position*

*Our posture should be straight and upright with little to no slouching. . . .*

**Table 2** Description of disc given on the websites

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<i>Discs are pads that serve as cushions between the individual; vertebral bodies. .... a jelly donut with a central softer component and a surrounding firm outer ring.</i>
<i>Discs are fluid filled cushions that protects the vertebra from rubbing together.</i>
<i>Discs are round and flat with a tough outer layer that surrounds the jelly like material called the nucleus.</i>
<i>Spongy sac of cartilage called discs.... That acts as a cushion and provides range of motion to the spine</i>
<i>Fibrous cushions between the vertebra.... That prevents the vertebra to collapse.</i>
<i>Disc acts as cushions between the bones in your spine</i>
<i>Discs are rubbery substances resembling jelly donuts...</i>
<i>The intervertebral discs are fibrocartilaginous cushions serving as the spine's shock absorbing system, which protect the vertebrae, brain, and other structures (i.e., nerves).</i>
<i>When the covering of the disc is torn – known as an annular tear – a soft “jelly” like substance can leak out, called a herniation. The hole in a jelly donut represents the annular tear, and the jelly that leaks out of the donut represents a herniated disc.</i>
<i>A disc is a ring of cartilage filled with jelly-like material - similar to a jelly donut! There are discs between almost all of the bones in your spine. Together, the discs work like shock absorbers to help decrease the impact on your back.</i>

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Discs are described as “*Jelly (jam) donut or a rubber washer*”; they are considered to be soft jelly like substances that prevent the vertebra from rubbing each other. “Slip disc” is also used by websites to describe the disc pathologies. Poor posture, wrong sleeping position and improper lifting techniques are highlighted as risk factors to develop LBP. “Slouching” is deemed as a threatening position and highlighted to be a cause of disc injuries.

#### Diagnostic tools recommendations on the websites

Evidently, the websites recommend imaging techniques to diagnose the LBP with or without physically examining the patient. Some websites mentioned about wait and watch method and proceed to imaging methods in case of no improvement. Websites describe about EMG, NCV and even myelogram to specify the cause of LBP. Few websites refer to the use of specific nerve blocks to identify disorders causing back pain.

#### Treatment options mentioned on the websites

There are various identified non-surgical and surgical treatment options on the websites (Fig. 5). The non-surgical method of treatment has high variability ranging from bed rest to exercises to spinal cord stimulation. Numerous choices linked to ergonomics and posture correction have been advised on all websites. Treatment options like massage, acupuncture, osteopathy, chiropractic techniques, and relaxation techniques are described. Medical management included over the counter pain killers, muscle relaxants, and injections. Fewer websites focused more on importance of mobility and lesser on bed rest. Many websites explored choices like Yoga and behavioral therapy to help the

back pain patients. It is evident that websites rely on surgical management when conservative options fail, especially in the cases of disc problems irrespective of duration of exercise management tried.

#### What rings the bell to visit a doctor?

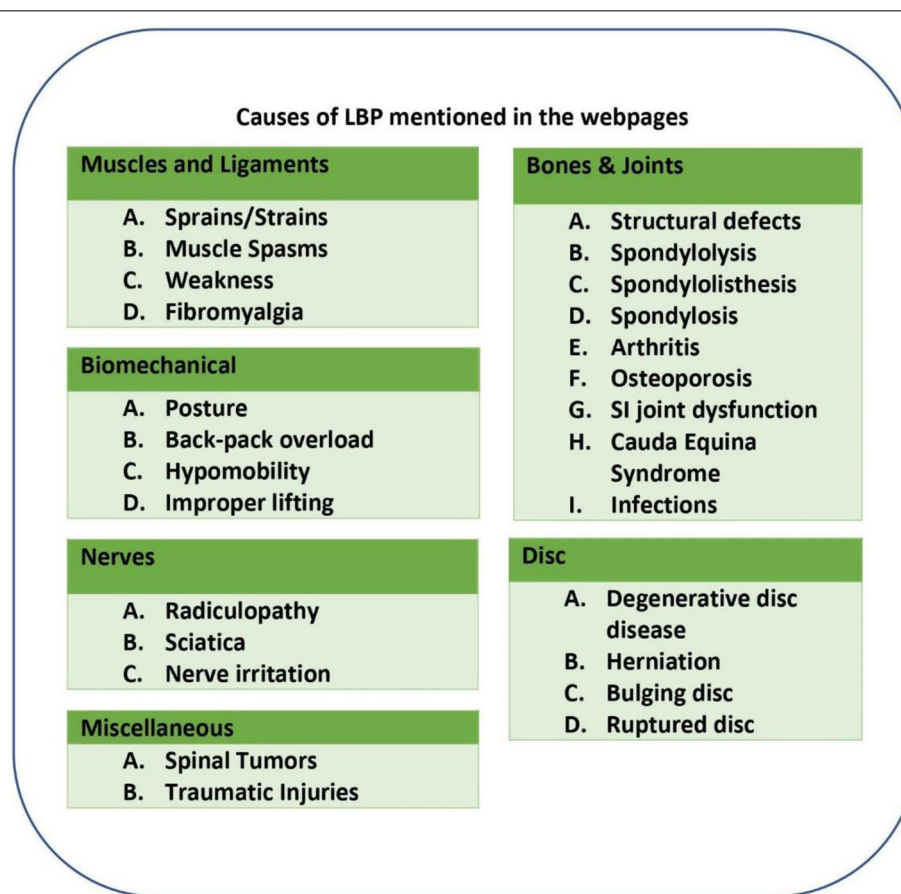
This section was common to the majority of web pages. Many of them said that LBP resolves within weeks with rest and pain relievers. Pain experienced by the patients that does not go away, sharp pain more than a dull ache, radiating pain towards the extremities, increasing or sudden weakness in legs, bowel, and bladder incontinence can be signs of serious illness. Few web pages concentrated that a doctor should also be consulted when there is a recurrence with worsened symptoms and neurological symptoms.

#### Discussion

The main finding of our analysis was that the content on most of the websites were ambiguous and not in concordance with current research. There is a lot of nocebic information presented on most of the websites explored. Information presented on websites are biomedically oriented with back pain being depicted as a structural problem with disc related injuries as the most common cause. Bulk of the information highlights pathoanatomical causes of LBP and biomechanical influences on lumbar anatomy.

The causes varied a lot with information showing reliance on disc, posture, and lifting mechanics as the source of LBP. The disc was discussed by almost all the websites and the descriptors used for it were vague and imprecise. All of the websites specifically refer to lumbar intervertebral disc and arthritis-related disorders as possible causes of LBP. Very few of the websites acknowledged





**Fig. 4** Various causes of LBP categorized into different subsections based on tissues

the impact of a person's beliefs, feelings, and behaviors on their LBP experience, and even fewer discussed social determinants. The obvious focus on pathoanatomical info as a cause of LBP suggests a widespread belief in the importance of educating the masses about the wide range of illness processes that may influence LBP.

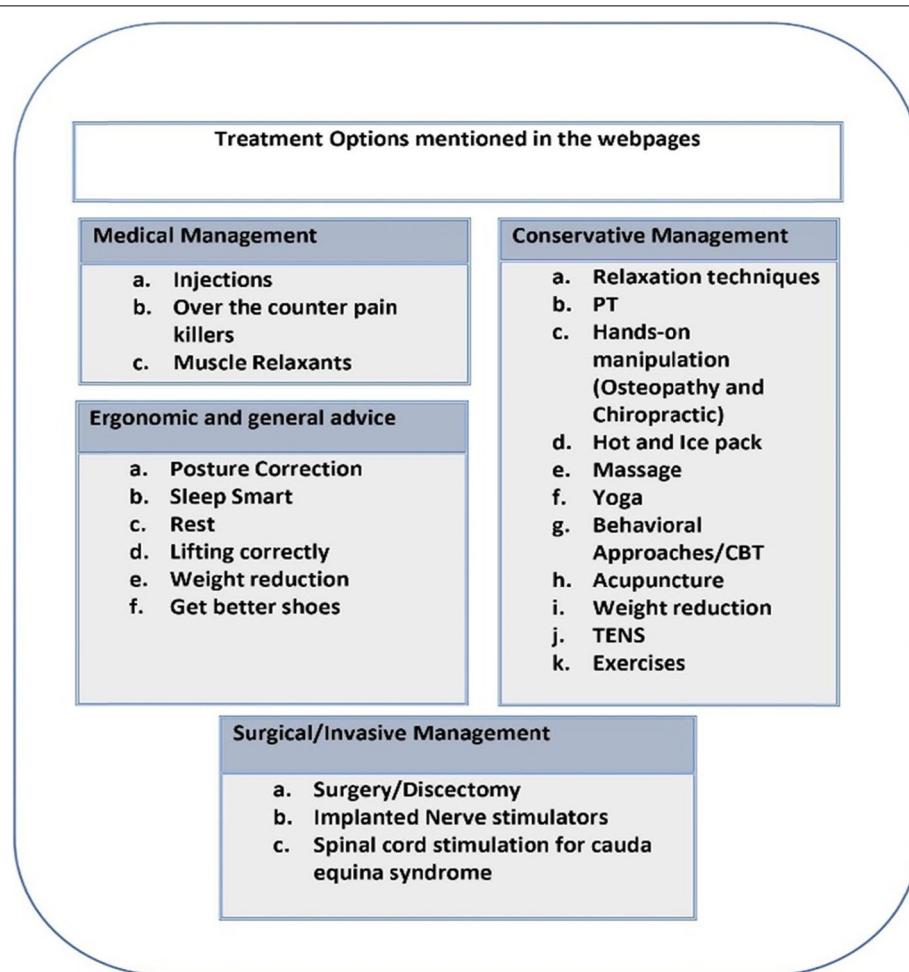
Intervertebral discs and lumbar pathologies may be a source of nociception in some individuals with LBP [18]. The majority of LBP clinical diagnoses, on the other hand, are non-specific, and the evidence suggest that there is no link between lumbar structural abnormalities and pain [4, 19, 20]. This suggests that focus on biomechanical or structural abnormalities alone may be misleading. The limited psychosocial representation found by us emphasizes similar findings by 'International forum for primary care research on low back pain' that the biopsychosocial model has not been adequately adopted in investigating LBP [21].

Despite the lack of representation for biopsychosocial factors, the therapeutic use of openly stating within public information that fear and catastrophizing are contributors to LBP is unknown [22]. However, it is shown that

a focus on tissue pathology may promote the maladaptive attitudes, emotions and behaviors that contribute to pain and disability [23]. Encouragingly, LBP is described as a natural and common phenomenon by majority of websites, this approach has been suggested to help prevent the development of maladaptive reactions contributing to LBP [24]. Concisely, the information presented is unidirectional for such a complex problem.

A variety of diagnostic tools were mentioned on the websites. We found that sites recommended diagnostic imaging specifically for those individuals who presents with red flags or those who failed to respond to the conservative care, as suggested by the NICE guidelines [25]. Despite this imaging is presented as a prime solution to find the cause which may result in clients perceived need for imaging during their consultations with Health care providers (HCPs) [26].

With regard to the treatment options a wide variety of strategies were mentioned on the websites (Fig. 4). All of the web pages suggested physiotherapy, osteopathy, and chiropractic (musculoskeletal practitioners) as a treatment option. Encouragingly conservative approach was



**Fig. 5** Management strategies highlighted by the websites

suggested as first line of care followed by surgical options. This recommendation is as per the recent CPGs [25, 27]. In terms of pharmacological advice, drugs like acetaminophen, NSAIDs, opioids, and muscle relaxants were recommended for management of LBP. The suggestion of acetaminophen as drug is contrary to the published literature which suggests that it is no better than placebo for people with LBP [28]. Selective serotonin reuptake inhibitors (SSRIs) and anti-convulsant were also mentioned by few websites which is again against the NICE recommendations [25].

Apart from the pharmacologic management, websites also recommended ergonomic options like posture corrections, sleeping in a particular position, and lifting in a particular way, and these treatment advice are not in line with the recent evidence [29]. These findings suggest that treatment recommendations made by websites were either incorrect or ambiguous, putting the public at danger of being misled. It also reflects that people cannot get

accurate information regarding LBP on the internet [30]. Furthermore, research conducted among the common people indicates that looking for health-related information on the internet is linked to higher health-care utilization [31, 32]. Considering the fact that individual seeks health information on the Internet for LBP. This added to the current findings that the enormous amount of erroneous and unclear content available on these websites, may be leading them to seek unneeded or ineffective treatment [33].

Given that this is the current state of affairs, one may ask what the solution is to the spread of unhelpful information? How may we better suit the needs of the general population searching for accurate evidence-based information on back pain and its treatment. We are living in an age where “Dr Google” is the main initial source of medical information for the common people. As clinicians, this can be a challenge when the information is at best out of date and at worst out of step with the

evidence and the guidelines on best management. It is a daily struggle to re-educate our patients when they arrive to our clinics with preconceived notions gleaned from Google that cause loss of self-efficacy, fear avoidance, and catastrophizing. The findings highlight the need for development of online content that is more in adherence with the research. The content must also be easy, comprehensive and avoid overt medical jargons.

### Comparison with previous work

Our results extend previous research which highlighted that back pain-related online content lacks credibility, accuracy and is not as per the recently published literature [33–37]. Hendrick and colleagues showed that current back pain management content accessible on the Internet is not always aligned with existing evidence. They had only looked into the veracity of information for one type of LBP (acute LBP) [37]. Samanci et al. only observed online content related to “lumbar disc herniation (LDH) treatment”, “lumbar spinal stenosis (LSS) treatment,” and “lumbar spondylolisthesis (LSL) treatment” [35]. The other similar studies only used a limited number of websites and were conducted almost a decade back [34, 36]. Ferreira et al. in their study only looked at web pages from government agencies, health care organizations, and universities [33].

Our study extends the scope of previously published literature providing an overview of the content presented on different web pages and recognizing the broad themes around which these websites are developed. In contrast to the previous studies, the authors of the present study made sure that the search strategies reflected the real-life searches conducted by the common people. The content analysis was also done according to the information needs of people with low back pain from the online resources [17].

### Strengths and limitations

The strength of this study was that we replicated the search process as it would have been done by a layperson. We used a comprehensive search process and screening which ensured we do not miss any potential websites. Inclusion of websites available in only English language could be one of the limitations of the study.

### Conclusion

The content available on the websites is outdated and not in accordance with CPGs and recently published literature. Websites that are readily accessible on Google can be a source of misinformation. Information available shows a reliance on conventional biomedical models

that focus on the pathoanatomical and biomechanical contributions to LBP. There is a dearth of content that explores psychosocial information. The findings of the study suggest that future development of websites must include information that is more sensitive to the psychosocial contributors to pain and disability. Lived experiences of back pain patients may be added to the information presented on websites. The findings suggest that there is a need that websites refine their content in the light of evidence.

### Abbreviations

LBP: Low back pain; CA: Content analysis; SSRIs: Selective serotonin reuptake inhibitors; NSAIDs: Non-steroidal anti-inflammatory drugs.

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s43161-022-00081-z>.

**Additional file 1.** List of websites included in the study.

### Acknowledgements

We would like to thank David C Poulter, B.Sc. Special Hon, Dip MDT, Physical Therapist, USA for his help in finalizing the paper.

### Authors' contributions

AS drafted the research idea, helped in data collection, analyzed and interpreted the data, and drafted the manuscript. SQ helped in the data collection and analysis and drafted the manuscript. Final version of the manuscript is read and approved by both the authors.

### Funding

The authors confirm that there is no financial support.

### Availability of data and materials

NA

### Declarations

### Ethics approval and consent to participate

NA

### Consent for publication

N/A

### Competing interests

The authors declare that they have no competing interests.

Received: 15 January 2022 Accepted: 29 March 2022

Published online: 08 June 2022

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