

Quality and Reliability of Online Resources on Lisfranc Injuries

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ABSTRACT

Introduction: There is an abundance of information available online on Lisfranc injuries; however, the quality and reliability of available information remains to be unclear. To our knowledge, this is the first study that evaluates the quality of information available online on Lisfranc injuries.

Methods: Seventy websites were identified for assessment using the term "Lisfranc injury." Google, Yahoo! and Bing were the search engines employed. Websites were classified by type and assessed by means of DISCERN score, Journal of the Medical Association (JAMA) benchmark criteria and the presence or absence of HONcode certification.

Results: Majority of resources were academic ($n = 23$) followed by commercial ($n = 18$). Mean DISCERN and JAMA score was 47.4 and 2.2, respectively. A total of 21 websites had a HONcode certification present. Websites that bore the HONcode were associated with higher mean DISCERN and JAMA scores ($p = 0.01$).

Conclusion: The authors of this study conclude that it is challenging to predict with certainty which resources are of superior quality. Clinicians must educate patients on quality of information available in order to help them make informed decisions.

Keywords: HONcode, Lisfranc injuries, Lisfranc injury, Online resources, Orthopaedics, Patient education.

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INTRODUCTION

Lisfranc injuries are relatively uncommon, accounting for 0.2% of all workload encountered in the practice of Trauma and Orthopaedic Surgery.¹ However, 20% of cases either present late or are undiagnosed and are associated with high morbidity and disability if maltreated.² These injuries are common in the third decade of life and frequently seen in athletes.³

Because of the age-group and cohort of patients in which these injuries happen, it is likely that these patients would seek information online to help them understand their injury and guide them with their decision-making process regarding treatment.⁴ There is an abundance of information available online on Lisfranc injuries; however, the quality and reliability of available information remain to be unclear. The purpose of this study is to analyze the quality and reliability of information available online on Lisfranc injuries and their management.

METHODS

An internet search was done using the three top search engines (1) Google, (2) Bing, and (3) Yahoo! for the keywords "Lisfranc Injury." Google is the dominant search engine (71% on desktop and 93.7% on mobile) followed by Bing (12.76% on desktop and 0.75% on mobile) and then Yahoo! (2.36% on desktop and 0.95% on mobile).⁵ Our searches were performed on 1st June 2020. All unique URLs were analyzed. Because of the discrepancy in the market share of each of the search engines used, the first 40 resources from Google were used and 15 from both Bing and Yahoo! Duplicate websites and URLs that were subsections of previously analyzed websites were excluded. Websites requiring payment for access to information were excluded. As conducted in previous studies.⁶⁻⁸

Online resources were assessed by two Orthopedic senior residents. Online resources were firstly classified broadly into

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(1) academic, (2) commercial, (3) physician and (4) nonphysician (allied health professionals) written resources, (5) media-related, and (6) government and Non-Profit Organizations (NPO). Thereon, online resources were evaluated using the validated DISCERN score, JAMA benchmarks criteria, and the Lisfranc Specific Content Score. Where there was a discrepancy between the scores, discussion between the assessors took place to reach a consensus.

DISCERN is a 16-point questionnaire that allows for the evaluation of the quality of healthcare-related information on the internet.⁹ The first eight questions address reliability, the subsequent seven questions refer to details of treatments discussed and the 16th question is a subjective global rating of the quality of information. Each question is rated on a 5-point scale with 80 being the maximum score a website can attain. This tool was developed in 1998 by an expert panel including information experts, healthcare professionals, laymen, and self-help group representatives. The Journal of the American Medical Association (JAMA) benchmark criteria assesses four components: (1) authorship, (2) attributions,

(3) disclosure, and (4) currency. One point is awarded for a clear presentation of each of the components.

The presence or absence of the Health-On-Net Foundation Code (HONcode) was also recorded. The Health-On-the Net Foundation is a non-profit organization with the aim of identifying and reporting reliable, trustworthy, and comprehensive sources of online health information.¹⁰ Websites that comply with the Health on the Net (HON) eight-point code of conduct are permitted to display the seal and are subject to random verification audits for compliance.

To assess the content of each of the websites included for analysis, we designed a Lisfranc injury-specific content score (Table 1) in consultation with a number of Foot & Ankle specialized Orthopedic Consultants and by referencing current peer-reviewed studies.^{11–13} One point was given for the mention of each of the terms that related to the predefined aspects of the injury, diagnostic modalities, and treatment options. Sites were then scored from 0–25 with 25 indicating maximum content quality.

RESULTS

A total of 70 websites were included in this study. Excluded from this study were 21 websites that were duplicates or subsections of previously reviewed online resources and two websites that required payment. The nature of online resources is summarized in Figure 1. The majority of resources were academic [$n = 23$ (32.9%)] followed by commercial [$n = 18$ (25.7%)].

DISCERN Score

The mean DISCERN Score was 47.4 (SD = 15.4 range, 21–76). The mean highest content score was achieved by Academic websites ($p = 0.02$) and Media type websites received the lowest mean score ($p = 0.005$) as summarized in (Table 2). Only two websites (2.86%) scored 63 or above representing excellent quality with minimal shortcomings

Table 1: Lisfranc content-specific score

Disease summary	Diagnosis	Treatment
1. Anatomy of Lisfranc joint	11. Clinical examination	Nonsurgical management
Mechanism of injury	12. X-rays	16. Cast immobilization
2. Hyperplantarflexion injury	13. Weight-bearing X-rays	17. Nonweight bearing
3. Usually during sports / RTAs	14. CT scan	Surgical management
4. Age-group-specific	15. MRI scan	18. Fusion
Symptoms		19. Open reduction and fixation
5. Pain		20. Removal of hardware
6. Swelling		Postoperative complications
7. Difficult weight-bearing		21. Infection
Classification		22. Wound complications
8. Bony Lisfranc		23. Pain
9. Ligamentous Lisfranc		24. Failure of fusion
10. Fracture dislocation		25. Revision surgery

but 15 websites (21.4%) scored 38 or below representing poor or very poor quality. There was a statistically significant difference in the DISCERN score achieved by HONcode-approved websites [61.8 (SD = 6.5)] and those that were not [41.2 (SD = 18.7)] ($p = 0.01$) (Fig. 2).

Lisfranc Specific Content Score

Mean Lisfranc Specific Content Score (LSCS) was 16.3 (SD = 6.7; range, 5–25). The mean highest content score was achieved by Physician-written websites ($p = 0.004$) and Media type websites received the lowest mean score ($p = 0.001$) as summarized in (Table 2). There was a statistically significant difference in the mean LSCS achieved by HONcode approved websites [18.1 (SD = 2.3)] and those that were not [15.5 (SD = 17.3)] ($p = 0.05$).

DISCUSSION

With the revolution of health informatics and easy accessibility of health-related information online, it has been noted that many patients seek the internet rather than a physician for their first source of information.¹⁴ About 72% of adult internet users in the United States go online to search for health-related information.¹⁵ To our knowledge, this is the first study that evaluates the quality of information available online on Lisfranc injuries.

It has been demonstrated by Van der Marel and associates that patients are likely to access information from websites listed on the first page of a search on their preferred search engine.¹⁶ For this reason, we have included the first 40 results from Google and 15 from both Bing and Yahoo! as reflected by their search-engine market share.

In this study, the Academic category websites had the highest mean DISCERN and highest mean JAMA benchmark score. Likewise, Devitt et al.¹⁷ reported that the academic websites produced the highest quality information on anterolateral ligament reconstruction and anterior cruciate ligament reconstruction. Government and NPO websites also yielded some of the highest DISCERN and mean JAMA benchmark scores, and this is once again supported by the literature.¹⁸

Similar to the finding of other similar studies, this study shows that HONcode certification was associated with higher DISCERN and JAMA benchmark scores.^{19,20} Yet, only a minority of online resources are HONcode certified- 30% in the case of the topic being investigated by this study.

It should also be noted that HONcode-certified websites did in fact predict a higher Lisfranc Specific Content Score, which is a novel

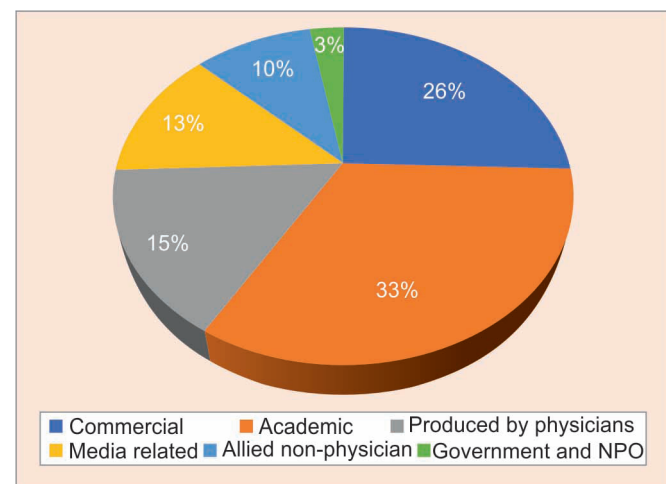
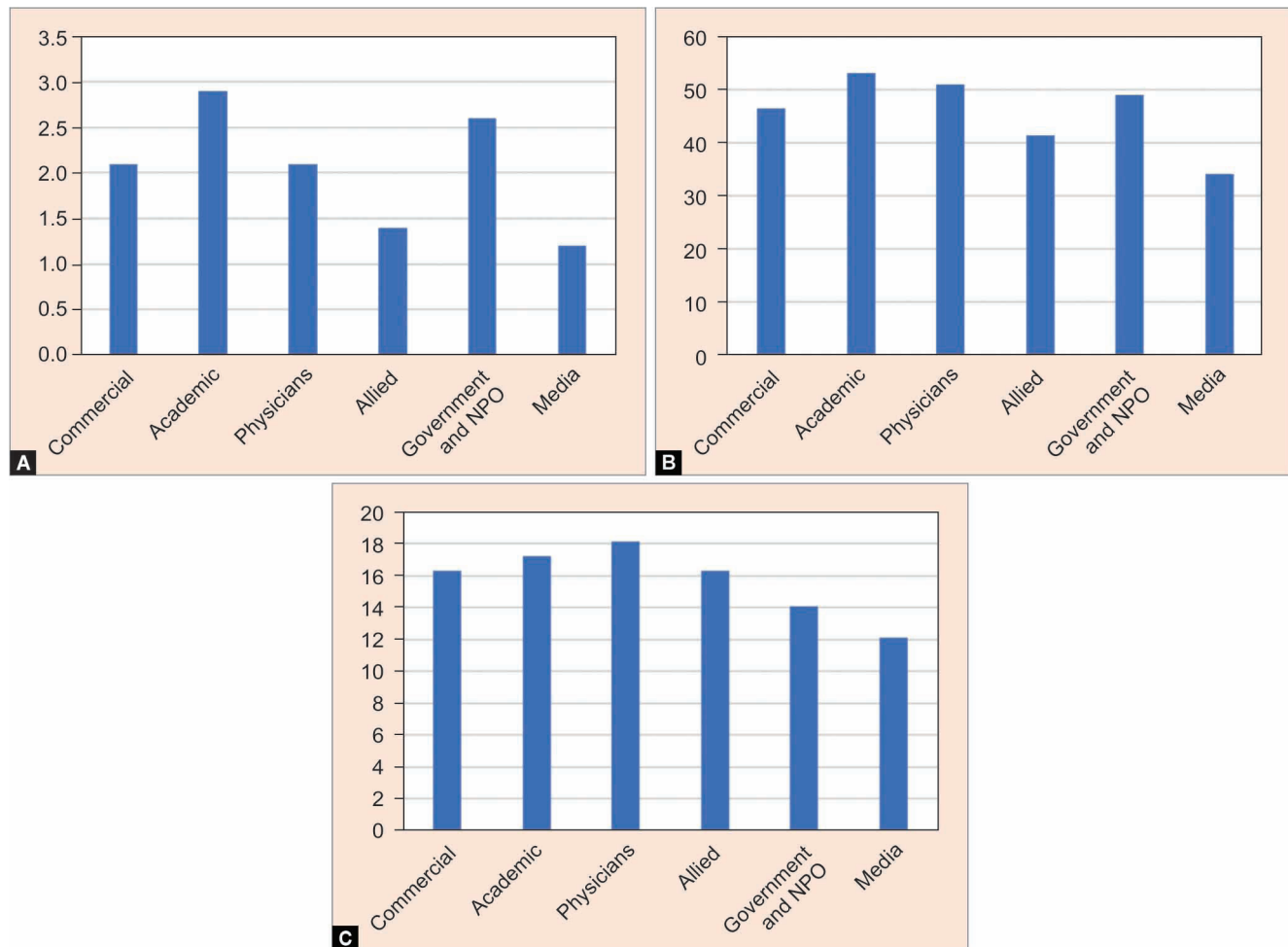


Fig. 1: Breakdown of websites by their nature

Table 2: Summary of website scores

Type of website	JAMA			DISCRN		LSCS	
	No.	Mean	SD	Mean	SD	Mean	SD
Overall	70	2.2	1.3	47.4	15.4	16.3	6.7
Commercial	18	2.1	0.9	46.6	11.2	16.3	4.1
Academic	23	2.9	1.5	53.3	12.2	17.2	3.7
Physician	11	2.1	0.8	51.1	10.2	18.1	2.6
Allied (Non-Physician)	7	1.4	0.7	41.5	7.8	16.3	4.4
Governmental & NPO	2	2.6	1.1	49.0	13.5	14.1	5.1
Media	9	1.2	0.4	34.1	21.3	12.1	8.6
HONcode present	21			61.8	6.5	18.1	2.3
HONcode absent	49			41.2	18.7	15.5	7.3


Figs 2A to C: Graphical demonstration of website scores

scoring system that has not been used previously. This statistically significant finding can further confirm the validity of this new content-specific score. Various online information reliability studies have found a positive correlation between HONcode certification and content-specific scores.^{6,7}

The authors of this study acknowledge some limitations. Firstly, this study only evaluated online resources in English as we used the search term 'Lisfranc injury'. We also made assumptions on the best available resources based on the results of the most popular search engines—namely Google, Yahoo!, and Bing based on their market

share of search engines. Other search strategies could have led to different results. In addition to this, two websites were excluded as they required payment.

We conclude that, overall, good information is available online on the nature and management of Lisfranc injuries. Yet, the quality of resources within the first few results on search engines is variable ranging from excellent to poor. Orthopedic Surgeons and other healthcare professionals dealing with these injuries should recommend resources that display the HONcode seal and guide patients to reliable online sources and better yet

direct patients to reliable websites that they have personally reviewed. This could help eliminate any unnecessary confusion caused to the patient by poor quality online resources on Lisfranc injuries.

DECLARATIONS

All named authors hereby declare that they have no conflicts of interest to disclose.

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