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Original Article

Evaluating orthopedic robotic surgery information resources: A European web-based study using DISCERN instrument.

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Abstract

Background
Orthopedic robotic surgery is having constant development in Italy. It was implemented in several centres the past decade. This has contributed to the creation of multiple information online resources regarding this practice. However, due to the lack of evidence-based resources and the multiplicity of individual initiatives, the available data is still heterogenous and non-consensual. The purpose of this study was to rate the quality of web-written information materials regarding robotic orthopedic surgery in different European countries websites.

Methods
A Google search using the keyword "orthopedic" ,"robotic" and "surgery" was performed in Italian for Italy-based websites, Spanish for Spanish-based websites, English for England-based and French for French-based websites to analyse the quality of the first fifty records using the DISCERN instrument.

Results
A total of 270 websites were visited and analysed. Seventy sites were discarded for duplicate or irrelevant content. Among the 200 examined sites, 26 belonged to individual surgeons (13%), 49 to private hospitals (24.5%), 81 to information sites (40.5%), 12 were connected to public hospitals (6%), 17 to universities (8.5%) and 15 to scientific journals (7.5%). Thirty-seven-point five percent of materials collected were related to lucrative companies sites.
According to the DISCERN scale ASSESSMENT, only 35 sites (17.5%) were scored fair or above (39-50), while the remaining 82.5% were classified as "poor" or "very poor".

Conclusions
The quality of information on robotic surgery is low for several countries. Orthopedic surgeons and hospitals interested in promoting this technique should refer their patients to valuable resources to improve the quality of the service according to scientific evidence.

Key words
Orthopaedics; robotic surgery; internet; patient information; DISCERN instrument.

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Introduction

Orthopedic robotic surgical techniques are constantly progressing worldwide especially for primary knee and hip arthroplasty [1-3]. Recently a direct web-based information system was developed to healthcare consumers. The aim of this system implementation is basically to highlight the potential advantages of the robotic procedure to the patients. However, web-based information is rarely peer-reviewed and usually generating confusion [4]. The lack of the competing interest disclosure and the use of search engine optimization tools constituted another bias reducing the scientific integrity of the delivered information [5-7].

The aim of the study was to evaluate objectively the quality of available written health information regarding robotic orthopedic surgery in four different languages with a focus on the reliability and effectiveness.

Material and Methods

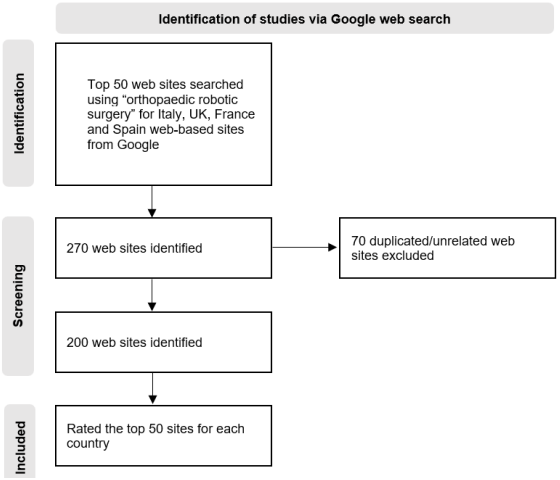
Four countries were included in this study to assess the quality of written health information in Europe. The selected specimen was representative and homogenous regarding the number of total and robotic orthopedic procedures performed yearly.

Google search engine was used in Italian ,Spanish, French and English versions. Keywords "orthopedic"; "robotic" and "surgery" were used in single query.

The fifty top cited pages were assessed for each studied country. Duplicated sites were discarded.

Two hundred websites were selected for the DISCERN instrument evaluation. The scale includes 15 questions with rating between 1 (minimum) and 5 (maximum). The aim was to assess the validity, reliability and reproducibility of the written information. The partial scores were calculated. Items were assessed as "very poor" (less than 27), "poor" (27-38), "fair" (39-50), "good "(51-62)," excellent "(63-75).

Statistical descriptive analysis was performed using IBM SPSS 26.0. Comparative study was performed accordingly to confront resources according to the DISCERN instrument scores. The study was conducted according to the guidelines of the declaration of Helsinki (1964) and was approved by ethical committee of "Polo Sanitario San Feliciano" (Rome, Italy).



Results

Among the included 200 websites, 37.5% belonged to the private healthcare sector and 6% to national public health sector. Health sciences and medical related websites represented 42% of the total of studied pages. All sites distribution is detailed in figure 1.

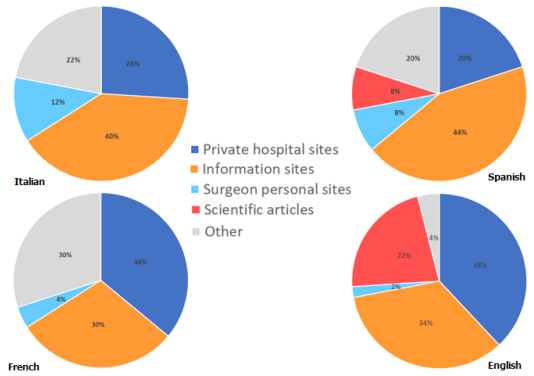


Figure1 :affiliation of the studied websites according to different literature languages.

Among the parameters considered for the reliability of the Italian web-based information, only three sites provided adequately cited bibliographic references. Referencing and citation were noted in 17 English sites, 10 Spanish sites and 8 French sites. One Italian, three Spanish, one French and four English websites detailed at least one time the advantages of the robotic orthopedic surgery compared to the conventional surgery technique. Only 11 sites provided sufficient information about the risks of the procedure and its specific morbidity. Using the DISCERN instrument, 35 websites were classified "fair" or above mostly from English literature. A total of 139 sites were considered "very poor" (table 1).

Table1 : DISCERN scores.

	Italian sites	English sites	Spanish sites	French sites
Very Poor	46	23	33	37
Poor	2	12	7	5
Fair	2	5	4	4
Good	0	2	4	4
Excellent	0	8	2	0

Statistical descriptive analysis showed highest average DISCERN score for indexed scientific articles and personal surgeon websites. The lowest average score is recoded by sites of private health institutions(table2).

Table2: Discern score listed according to written information resources.

	Informational	Private hospital	Scientific articles	Personal
Mean	25.81	23.37	61.64	27.3
Standard error	1.36	1.79	3.64	5.93
Standard deviation	2.72	3.59	5.14	11.86
Sample variance	7.37	12.86	26.45	140.76

Discussion

Searching for medical information on the internet and different social networks has experienced exponential growth the past years [8,9]. This has considerably influenced the choice, patients decision and doctor-patient relationship [10,11]. The implementation of new surgical technique is widely based on the online resources for the advertisement of different materials, education and training of the health practitioners [12].

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Regarding major innovative procedures implemented in orthopedic practice over the past two decades, the presentation of written health information was usually highlighting the procedure real or presumed benefits more than its specific risk [13]. That was the example of computer-assisted arthroplasty, different techniques of partial knee arthroplasty, hip resurfacing and direct anterior approach [14,15].

Totally robotic or robot-assisted knee orthopedic procedures had quick implementation. This could be due to simplified online appointment booking and check-in widely used in most of health facilities proposing these procedures [16]. More than ninety percent of robotic orthopedic surgery and robotic surgeons provide more options to facilitate the access for this health service. However, academic medical journal websites are presenting medical evidence and did not add to the link patients-service providers [17].

Up to date, no systems are provided to control the quality of written medical information on almost all search engines. Available resources allow only brute presentation of the information with poor editing and minimally reviewed statements. Among these topics, we noted written information regarding most of the elective orthopedic procedures such as knee and hip arthroplasty. An overall higher quality of presentation were noted in cancer related sites and oncological orthopedics [18,19]. Written information of non-commercial sites was significantly more reliable than lucrative sites. Confrontation and comparative tools are usually not available. This give less options to patients in their decision making [20].

Several studies were performed to assess reliability of the online health consumer written resources [20,21]. Some non-official independent organizations such Health on the Net (HON) tried do provide a peer reviewed assessments testing the impartiality and reliability of the medical information dissemination. The aim was to provide information seekers with an objective guidance to the most reliable resources [22].Only one of the sites included in our analysis was HON certified.

Healthcare practitioners are constantly present and posting written information on alternative resources such as social media networks. The written information in this case is delivered as brief communication for self-promotion and advertisement and rarely detail all sides of the procedure [23]. The wide variation in the quality of written information available to patients regarding their conditions best treatment justifies the need for assessment scales such as "Patient education Materials Assessment Tool" and " the suitability assessment of materials for evaluation of health-related information". Primary instruments were in English and only few were translated [24,25].

DISCERN is an instrument for judging the quality of written consumer health information on treatment choices. It was objective assessment tool of information regarding several diseases. However, its use was initially limited to specialists.

Our study might have highlighted the heterogeneity of online health consumer written information European resources regarding affiliation of the information delivering websites , the difference of languages studied, and the bias imposed by the commercial factor.

Conclusions

The implementation of robotics in orthopedic surgery represents an innovation of indisputable value and an objective potential in future applications. The best health consumer information resources are the academic and research journals websites. However, the quality of the delivered information might not be suitable for the patients due to sophisticated scientific dialect. The use of DISCERN score is still not accessible to a large part of health consumers due to English editing and several variably precepted items. Translation of this instrument in other languages spoken in Europe and centered patient education on its use may enhance the assessment accuracy.

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Conflict of interest: None

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