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Skills in searching for and using scientific information among physicians in the context of evidence-based practice: A descriptive study

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ABSTRACT

Objective. To identify the skills in searching for and using scientific information among medical professionals in the context of evidence-based practice, analyzing their ability to apply reliable clinical information in their daily practice.

Design/Methodology/Approach. A descriptive cross-sectional study was conducted with 150 San Martín, Peru, health network physicians. A survey was used, including indicators on using information resources, search skills, and verification of reliable sources.

Results/Discussion. A predominant use of non-specialized tools such as Google (69%) and general websites (59%) was reported for clinical information searches. In comparison, specialized resources like Scopus or Clinical Key were used less frequently (25%). Additionally, 86% of physicians did not use advanced search filters, and 89% did not verify the reliability of the sources consulted. These findings reveal deficiencies in the informational competencies necessary for effective evidence-based practice.

Conclusions. Continuous training strategies to enhance physicians' informational skills, including advanced search techniques and critical evaluation of sources, are essential. These interventions will optimize the quality of medical care based on reliable evidence.

Originality/Value. This study provides a regional perspective on informational skills within a public health context, highlighting the gaps that must be addressed to strengthen evidence-based clinical practice

Keywords: scientific information; clinical information; information literacy; evidence-based practice; scientific literacy; information behavior.

INTRODUCTION

Iɴ ᴛʜᴇ ʜᴇᴀʟᴛʜ sector, information is vital for supporting clinical decision-making and helping specialists substantiate their diagnoses and treatments (Mileman & van den Hout, 2009). According to Bate *et al.* (2012), physicians often consult information they cannot immediately recall, seeking the most evidence possible to improve their clinical decision-making. With the advancement of the digital era, the abundance of medical information available across various online sources, formats, and languages presents a significant challenge for medical specialists in identifying and selecting reliable sources. The expansion of information on the web has led to a proliferation of clinical evidence that, while enriching the medical knowledge base, also complicates the task of distinguishing between accurate and unverified information (Fernández-Guzman *et al.,* 2021; Tafur-Puerta, 2022).

The diversification of digital platforms and the constant evolution of medical information require specialists to make considerable efforts to stay updated (Orellana Centeno *et al.,* 2019). The multiplicity of sources, including specialized databases, social media, and medical outreach websites, creates a complex landscape where the quality and accuracy of information vary significantly (Urrea *et al.,* 2020). This dynamic environment demands that healthcare professionals continuously update their knowledge and develop skills to evaluate evidence, differentiate between robust research and less rigorous studies, and filter relevant information for daily clinical practice (Aspinall *et al.,* 2021). An example of this can be found in the application of artificial intelligence-based systems. According to research by Jussupow *et al.* (2021), diagnostic errors often stem from deficiencies in the application of metacognitive processes related to the decision-maker's reasoning (self-regulation) and the monitoring of AI-based systems (system monitoring). These shortcomings sometimes lead physicians to make decisions based on beliefs rather than actual data or to engage in superficial information searches.

Similarly, Aspinall *et al.* (2021) explored the need for and access to evidence-based clinical information among 877 physicians in Minnesota, USA. Their findings revealed high information needs (85.8%) but limited access to resources such as citation databases, systematic reviews, books, and full-text articles. They also highlighted the use of unreliable sources for decision-making and identified workplace affiliation as a key factor exacerbating disparities in access to information. This scenario was also observed by Huaillani Chavez (2020) at the *Instituto Nacional de Salud del Niño San Borja* in Peru. A survey of 200 resident physicians revealed that 76% exhibited a negative attitude toward research, although 98% and 94% showed favorable cognitive and behavioral attitudes, respectively. Regarding evidence-based practice, 36.5% of respondents implemented it, 31% did so moderately, and 32.5% did not apply it. This highlights the need to strengthen the competencies of healthcare personnel to make clinical decisions based on reliable information (Saavedra Grandez, 2021).

In the Peruvian region of San Martín, the practices of healthcare specialists regarding the need to use information for application in clinical diagnoses and treatments are unknown. However, based on the problem's context, it is inferred that they may lack the skills to search for, analyze, and utilize information based on scientific evidence. Therefore, this research aims to identify physicians' skills in searching for and using scientific information within the context of evidence-based practice.

METHODOLOGY

We conducted a basic study with a descriptive, cross-sectional design. The population consisted of 244 physicians employed in health centers (hospitals, clinics, and others) within the San Martín health network in Peru. To determine the sample size, we used simple random probabilistic sampling with a 95% confidence level and a 5% error margin, resulting in 150 physicians.

For data collection, we designed a survey based on the study by Aspinall *et al.* (2021), administered as a closed questionnaire in digital format via Microsoft Forms between July and October 2024. The instrument included 10 indicators related to informational competencies: use of information resources, application of basic search filters, application of advanced search filters, verification of source reliability, types of documents consulted, frequency of access to full texts, critical reading of scientific

articles, ability to analyze scientific articles, ability to integrate critical evaluation of studies and barriers to accessing information —the response scale combined dichotomous, nominal, and ordinal options (See appendix 1). The average time to complete the survey was 10 minutes. The research team was available to address the physicians' questions during the response process. Before starting the survey, a consent form was also provided to ensure participants understood the study's purpose. Only those who voluntarily agreed to participate were included.

The collected data were exported to Microsoft Excel 2019 and coded to facilitate analysis. Descriptive statistical techniques, such as frequency and percentage calculations, were used to interpret and summarize the data. The results are presented in figures.

RESULTS

Figure 1 illustrates that physicians in the San Martín region prefer widely used information resources. Google was the most utilized resource, with 69%, followed by Google Scholar and PubMed, at 53% and 50%, respectively, highlighting the importance of these tools in clinical information searches. Wikipedia was the most commonly used general resource, with 38%. In contrast, specialized platforms such as MedLine, Scopus, and Clinical Key were moderately used, with adoption rates ranging from 21% to 25%. More specialized resources like Cochrane Library (14%) and EMBASE (13%) showed limited utilization. Lastly, MedPix was not used, indicating its low relevance to the physicians surveyed.
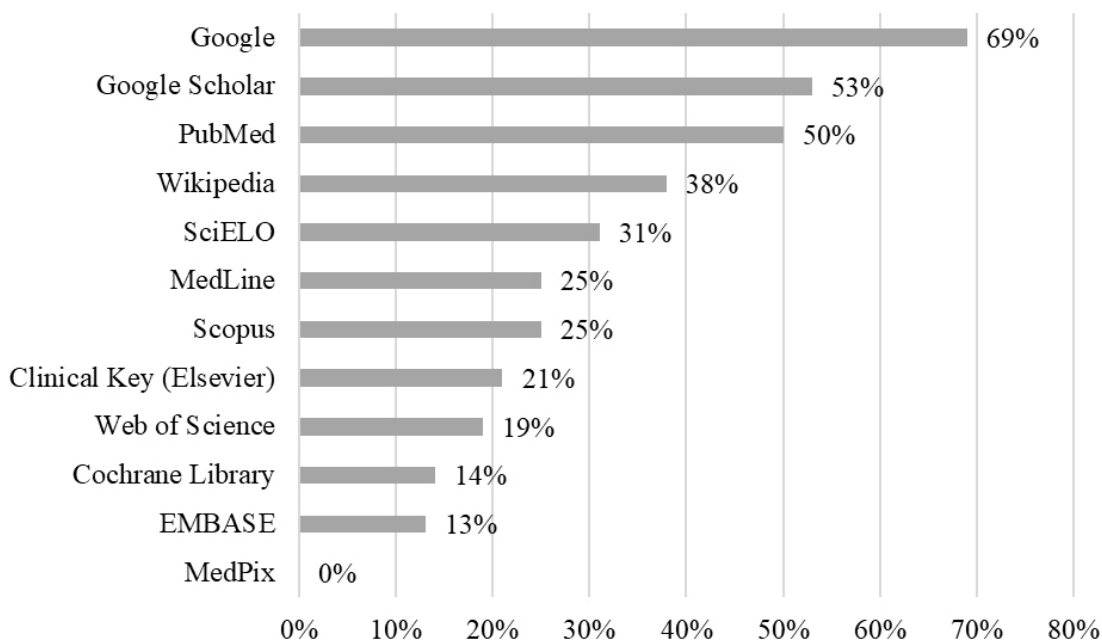

Figure 1. Use of information resources.

Regarding the ability to apply manual filters in specialized databases to refine clinical information searches based on criteria such as date ranges, document types, and others, 86% of surveyed physicians reported not using them. Similarly, 91% indicated they do not use advanced search techniques, such as Boolean operators, truncations, and other tools to achieve more precise results. Finally, concerning the verification of source reliability —ensuring that the information is not from predatory sources

or retracted documents— 89% of respondents stated they do not perform this procedure.

Figure 3 shows that websites are the most frequently used source among surveyed physicians (59%), followed by review articles (51%) and internet images (50%), reflecting a clear preference for accessible and easy-to-consult resources. In contrast, more specialized sources, such as research articles (44%) and health organization reports (37%), are less frequently utilized, indicating a tendency toward
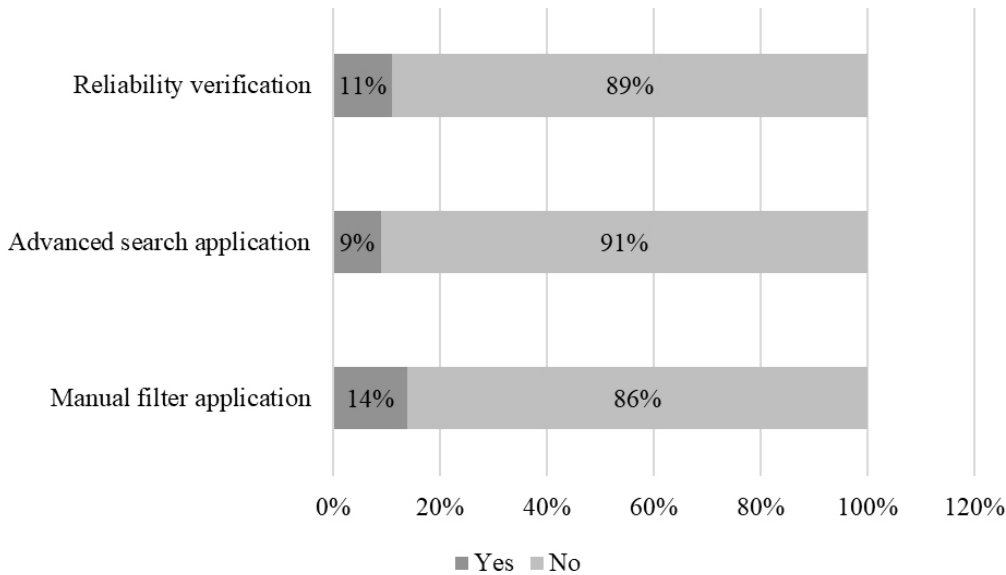
Figure 2. Use of search and information verification tools.

practicality in accessing clinical information quickly. Additionally, 38% of physicians reported accessing the full text of documents only occasionally, while 25% indicated doing so rarely.

These limitations in information access are attributed to current access models for scientific documents, which are often restricted by paywalls or subscription requirements.
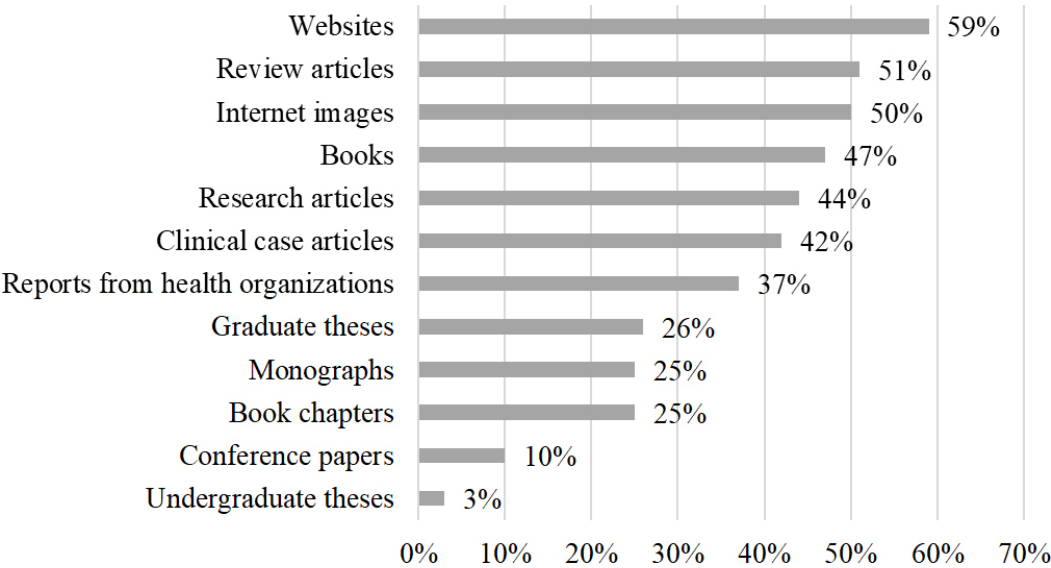
Figure 3. Types of documents consulted.

Among the physicians who consult scientific articles in their clinical practice for information and decision-making (51%), 52% reported finding it difficult to read, interpret, and critically analyze the full text of a scientific study. Furthermore, 75% stated they are not confident in evaluating whether the methodological design employed in a study is appropriate to address its questions or objectives. Additionally, 67% indicated they cannot integrate the study's critical assessment with the patient's characteristics and their own clinical experience to decide whether to apply the study's results in practice (Figure 4).
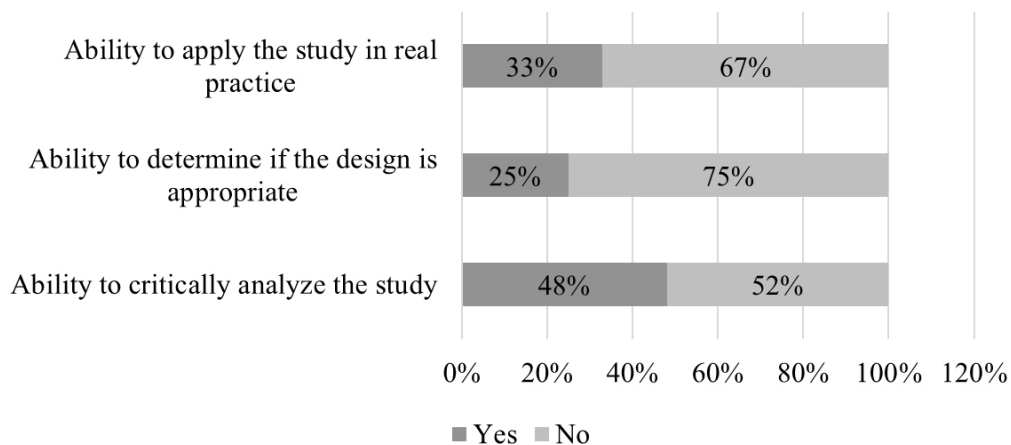
Figure 4. Perception of skills for analyzing, evaluating, and applying scientific studies in clinical practice.

Finally, when investigating the barriers that limit access to online information resources for addressing clinical questions, the main difficulty identified was the inability to recognize scientific information or evidence online, reported by 46% of respondents. This highlights a gap in search and critical evaluation skills. Additionally, 39% indicated that the lack of internet access in their workplace was a barrier, followed by the absence of computer equipment (31%). Moreover, 25% of physicians believe that searching for information online could undermine their perceived expertise in patients' eyes. In comparison, 13% expressed distrust in the reliability of information available on the Internet (Figure 5).
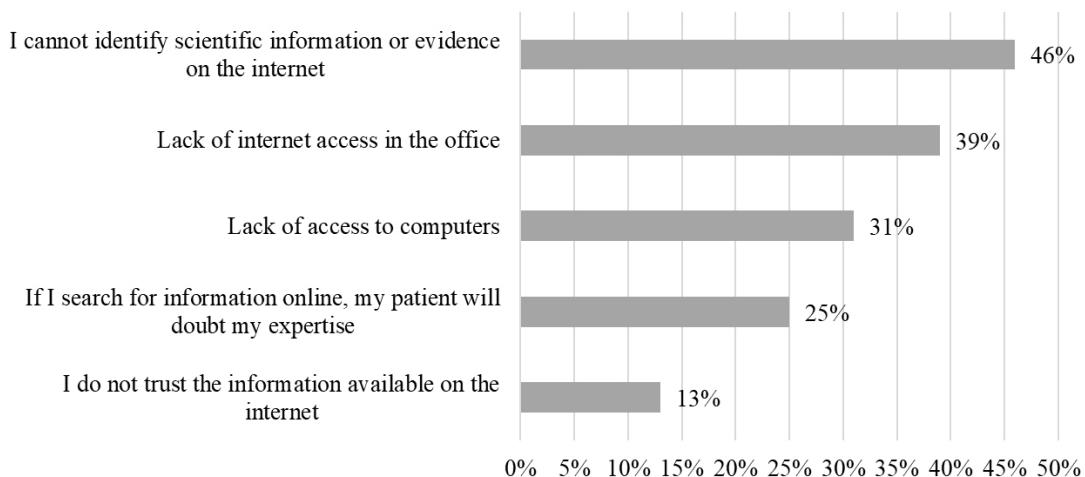
Figure 5. Barriers to accessing online information resources in clinical practice.

DISCUSSION

Information is a critical asset for decision-making across various sectors, and its significance is even greater in the healthcare field, as it enables the application of scientific research findings to real-life cases (Navarro-Cabrera, 2023; Navarro-Vega *et al.,* 2022). This approach, framed within evidence-based practice, involves integrating the best available evidence with the medical professional's knowledge, clinical experience, and the patient's values and unique circumstances (Chloros *et al.,* 2023; Peng *et al.,* 2023). The process involves transforming an information need (related to prevention, diagnosis, prognosis, therapy, among others) into a clear and specific clinical question; searching for the best

available evidence through a bibliographic review; critically evaluating the validity, impact, and applicability of that evidence; and, finally, integrating it into clinical practice while considering both the professional's expertise and the unique characteristics of each patient (Dusin *et al.,* 2023; Ratnani *et al.,* 2023; Subbiah, 2023).

Thus, the information-seeking process is an informational competency that medical professionals must develop and strengthen. This entails identifying reliable sources and reading, critically analyzing, and assigning practical value to the information obtained (Parlakkılıç, 2024; Wu *et al.,* 2023). However, as noted in the introduction, the digital era's advances and the abundance of medical information available across multiple online sources, formats, and languages pose a significant challenge for specialists. The proliferation of web-based content has generated a surge in clinical evidence that, while enriching medical knowledge, also complicates differentiating between accurate and unverified information (Fernández-Guzman *et al.,* 2021).

Overall, this study's findings reveal deficiencies in physicians' informational competencies. The predominant use of tools like Google (69%) and general websites (59%) suggests that healthcare professionals primarily rely on non-specialized and scientific sources to obtain information. This scenario reflects a concerning trend: Physicians seeking to complement their immediate knowledge tend to rely on potentially unreliable information, which, as noted by Bate *et al.* (2012), could compromise the quality of clinical care. The findings align with the study by Aspinall *et al.* (2021), which identified that although physicians report a high level of information needs (85.8%), their access to specialized resources such as databases, systematic reviews, and scientific full-text articles is limited. This restricted access and unreliable sources like non-specialized tools increase the risk of medical errors. The authors also highlighted that workplace affiliation influences disparities in access, which may be relevant to explore in similar contexts. This is evident in this research, as the surveyed physicians came from urban and rural areas.

The findings of Urrea *et al.* (2020) underscore how the exponential growth of medical information in recent decades has complicated the search and selection of reliable sources —a challenge observed in this study. The preference for easily accessible but less reliable sources reflects a lack of skills to manage this influx of information effectively, limiting physicians' ability to practice evidence-based medicine effectively. Moreover, Jussupow *et al.* (2021) noted that medical decision-making relies not only on information access but also on the effective use of metacognitive processes, such as monitoring and reasoning control. The critical skill gaps observed in this study, such as the low capacity to critically analyze a study (52%) or assess the validity of its methodological design (75%), highlight the need to strengthen these metacognitive abilities, especially in contexts where the available information may be inaccurate or incomplete.

Lastly, Charles Uy *et al.* (2014) emphasized the importance of confidence in clinical decision-making and its relationship with accuracy. While online information access can improve decision-making precision, as demonstrated in their study, excessive or insufficient confidence can lead to errors in interpreting and applying information. This is particularly relevant in light of our findings, where 67% of physicians reported being unable to critically integrate scientific evidence, patient characteristics, and clinical experience into their decision-making. This deficit underscores the need for training interventions that combine the development of informational, metacognitive, and clinical confidence skills to optimize information use and decision-making accuracy in the healthcare sector.

CONCLUSIONS

There are significant deficiencies in the informational skills of physicians in the San Martín region of Peru, evidenced by their reliance on non-specialized sources for clinical information searches. This underscores the need to develop skills in information searching, critical analysis, and the use of reliable sources among healthcare professionals. Despite advancements in the digital era and the availability of specialized tools and scientific databases, their

adoption remains limited, revealing a gap in training informational competencies and access to specialized resources.

From a practical perspective, it is essential to implement educational strategies and continuous training programs to improve physicians' informational skills. These should include competencies such as analyzing scientific studies, evaluating methodological validity, and applying results to clinical practice. Theoretically, this study highlights the need to expand the framework of evidence-based practice by integrating informational and scientific literacy components that enable physicians to address the challenges of the current digital environment. Furthermore, it emphasizes the importance of addressing disparities in information access through institutional policies that facilitate access to specialized resources and foster a culture of evidence-based decision-making.

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Conflict of interests

The author has no competing interests to declare relevant to this article's content.

Contribution statement

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Investigation: All authors.

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Writing – Original Draft Preparation: All authors.

Writing – Review & Editing: All authors. ●

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APPENDIX 1
Survey on skills in searching for and using scientific information by physicians.

1. Indicate which of the following online information resources you use to obtain clinical information: Select all that apply.
   ( ) Google
   ( ) Google Scholar
   ( ) Wikipedia
   ( ) Scopus
   ( ) Web of Science
   ( ) PubMed
   ( ) Cochrane Library
   ( ) Clinical Key (Elsevier)
   ( ) MedPix
   ( ) MedLine
   ( ) EMBASE
   ( ) SciELO

2. When accessing online information resources to answer your clinical questions, do you apply manual filters to refine search results by year range, document type, source type, or others?
   ( ) Yes   ( ) No

3. When accessing online information resources to answer your clinical questions, do you use advanced or strategic searches employing Boolean operators (AND, OR, etc.), truncations, or other methods to better delimit the results?
( ) Yes   ( ) No

4. When accessing online information resources to answer your clinical questions, do you verify if the source is reliable? For instance, ensuring it is not from predatory journals or publishers, cloned journals, retracted documents, or similar?
( ) Yes   ( ) No

5. Indicate which of the following types of documents you access to answer your clinical questions: Select all that apply.
( ) Websites
( ) Internet images
( ) Books
( ) Book chapters
( ) Research articles
( ) Review articles (systematic reviews, meta-analyses, etc.)
( ) Clinical case articles or case reports
( ) Conference papers
( ) Undergraduate theses
( ) Graduate theses
( ) Monographs
( ) Reports from health organizations

6. When you find a document to answer your clinical questions:
How often can you access the full text?
( ) Never
( ) Rarely

( ) Occasionally
( ) Frequently

7 . Answer items 7, 8, and 9 if you access scientific articles to answer your clinical questions. Otherwise, proceed to question 10.
When accessing scientific articles to answer your clinical questions, do you find it easy to read, interpret, and critically analyze the full text?
( ) Yes   ( ) No

8. When accessing scientific articles to answer your clinical questions, are you able to determine if the methodological design used in the study is appropriate to address its questions or objectives?
( ) Yes   ( ) No

9. When accessing scientific articles to answer your clinical questions, are you able to integrate the critical assessment of the study, patient characteristics, and your own experience to decide whether to apply the study's results?
( ) Yes   ( ) No

10. Indicate which barriers limit your access to online information resources to answer your clinical questions: Select all that apply.
( ) Lack of internet access in the office
( ) Lack of computer equipment (laptop, desktop, or tablet)
( ) I do not trust the information available on the internet
( ) I cannot identify scientific information or evidence on the internet
( ) If I search for information online, my patient will doubt my expertise