The use of internet by orthopedic surgeons in Saudi Arabia: a cross-sectional study

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Background
The internet is an important tool for communication, knowledge update, and information transfer for physicians in all subspecialties. E-mails facilitate communications between physicians and improve physician–patient relationship. Smart phones are considered an easy tool to use the internet anywhere and anytime.

Patients and methods
A five-page questionnaire was designed and distributed among 291 attendants of one of the national orthopedic conferences in January 2011. The questionnaire was planned to evaluate the extent of the use of internet by orthopedic surgeons in Saudi Arabia and the effect of internet on their practice and career.

Results
A total of 244 questionnaires were completed. There were 236 male participants (96.5%) and eight female participants (3.5%). The mean age was 34.8 ± 8.93 years. All participants had internet access at home. A total of 208 participants (85%) had internet access at work and 163 (67%) had smart phones. In all, 205 participants (84%) found internet to be a useful tool to obtain information on career opportunities. A total of 219 (90%) participants found it useful in achieving diagnosis and in searching for treatment guidelines. All female orthopedic surgeons received a formal training on how to use PubMed for orthopedic search, whereas only few male surgeons received training ($P < 0.001$).

Conclusion
Most of the orthopedic surgeons in Saudi Arabia use the internet for medical purposes. They need a planned training on electronic search. Availability of internet access and wireless internet is important for improving physician performance and patient care.

Keywords:
e-mail, internet, orthopedic, smart phones, surgeons

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Introduction

The use of the internet has influenced the practice of medicine all over the world. Considerable amount of medical knowledge and information is available now on the web and is easily accessible [1–5]. The communication between the patients and physicians and between physicians themselves has become easier and faster nowadays [5–7], thus strengthening their relationship [8].

The internet is an excellent tool for better information and data transfer, including health data and personal counseling [9–12]. Production of smart phones has made communication and information transfer even easier and better.

The aim of this study was to determine the extent of internet usage among orthopedic surgeons in Saudi Arabia and its influence on their clinical and academic practice.

Patients and methods

A five-page questionnaire was designed to include 42 different questions. The questionnaires were distributed to 291 attendants of a national orthopedic conference in January 2011. Only 244 (84%) forms were completed. The questionnaire was designed to evaluate the use of the internet at home and at work for clinical and academic purposes and to demonstrate the extent of the use of internet for communication and information exchange. It also covered the use of smart phones as a tool to access the internet.

All personal data of the participants, including sex, age, current position, experience, and type of practice, were included in the forms. To identify the relationship between demographic features of the participants and their answers to the questionnaire, the data collected were processed for statistical analysis using the SPSS statistical software package, version 12 (SPSS Inc., Chicago, Illinois, USA). For crude analysis of independent groups of data, the χ^2-test and Fisher's

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exact test were used. A *P* value less than 0.05 was assumed to be significant and a *P* value less than 0.001 as highly significant. Since this study is not relating to the patient information or privacy, the irb was not indicated.

Results

There were 236 male participants (96.5%) and eight female participants (3.5%). The mean age was 34.8 ± 8.93 years (range 25–59 years). Forty participants were consultants (16%), 71 were specialists (30%), and 133 were residents (54%). Nineteen participants (8%) were practicing in private, 200 (82%) in governmental institutes, and 25 (10%) were practicing in both. Fifty-six participants (23%) were academic staff and 188 (77%) were nonacademic staff. The mean number of years after university graduation was 10.34 ± 8.8 years (range 1–35 years).

The results showed that all participants had internet access at home. A total of 208 participants (85%) had internet access at work and 163 (67%) had smart phones. Of them, 139 participants (57%) used electronic books and updated their knowledge by means of their smart phones.

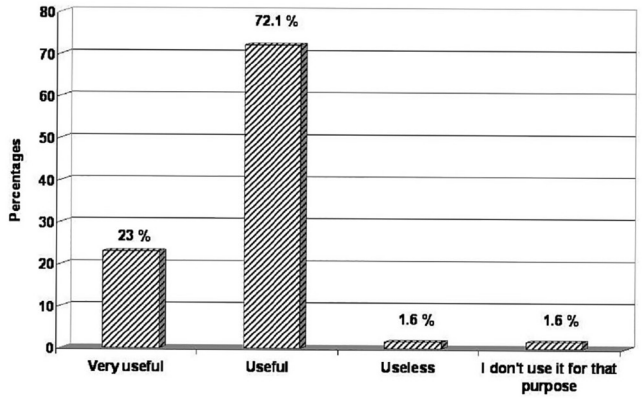
A total of 236 participants (96%) used the internet to update their knowledge and 233 (95%) utilized electronic mail for professional purposes (orthopedic related). The opinion of the participants as regards the value of the internet in orthopedic practice is shown in Fig. 1. The prevalence of using electronic mail for communication with colleagues and patients is shown in Fig. 2.

A total of 205 participants (84%) found the internet to be a useful tool to obtain information on career opportunities. A total of 219 (90%) participants found it useful in reaching a diagnosis and in identifying treatment guidelines, and 163 (67%) found it useful to gather information on surgical approaches in orthopedics. A total of 239 participants (98%) thought that internet is important for continuing medical education. Male participants had more access to the internet compared with female participants ($P < 0.001$). The results showed that the use of internet to communicate with colleagues was significantly higher in female than in male participants ($P < 0.001$). All female orthopedic surgeons in our study received a formal training on how to use PubMed for orthopedic search, whereas only 25 (11.5%) male participants underwent this training ($P < 0.001$).

All 56 academic staffs had access to the internet at work compared with 188 nonacademic staffs (83%); the difference was significant ($P = 0.001$). The academic staffs were more significantly involved in using the internet for obtaining information on career opportunities ($P = 0.004$), obtaining orthopedic update information ($P < 0.001$), as well as for communicating with their colleagues about patients and orthopedic problems ($P = 0.030$). Nevertheless, nonacademic staffs considered the internet to be of a great help for practicing orthopedics more significantly compared with academic staffs ($P = 0.017$).

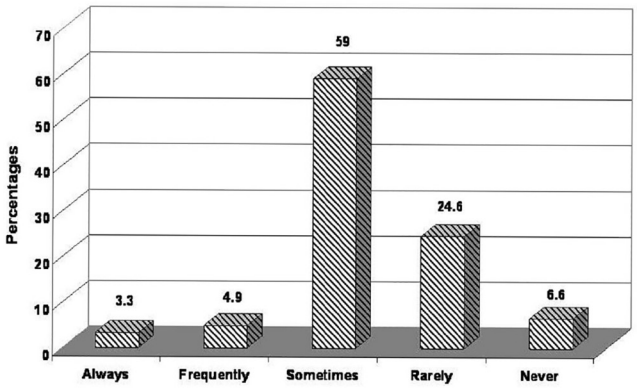
A total of 227 participants (93%) used the internet to read orthopedic journals; however, 159 participants (65%) still preferred using hard copies of orthopedic journals. Participants who underwent training on PubMed search found the internet to be a useful tool for updating their orthopedic knowledge ($P = 0.002$), and they obtained the required information in a much easier way compared with those who did not undergo the training. They were mainly working

Figure 1



The judgment of the participants as regards the internet as a tool for orthopedic updating.

Figure 2



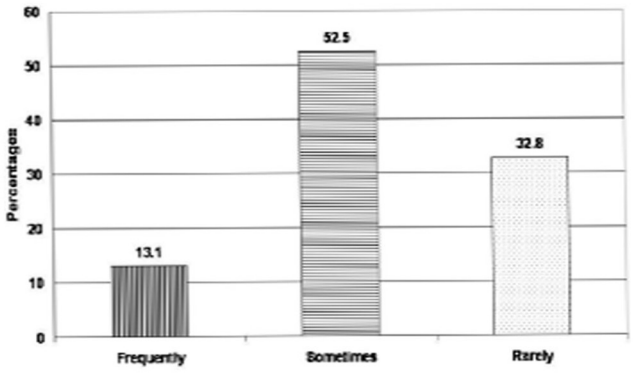
The frequency of using e-mails by participants to communicate with colleagues about patients.

in governmental institutes (P = 0.046). Moreover, they strongly believed that the internet can help in solving most of their daily clinical problems (P = 0.001) and they used PubMed and online journals more compared with others (P < 0.001). Even though the majority of the participants were convinced that attending courses and conferences, as well as meetings, will help in updating their knowledge, 239 participants (98%) agreed that attending orthopedic conferences and courses will help more compared with the internet searches. A total of 212 participants (87%) believed that formal meeting at work can help more, whereas 188 (77%) believed that direct contact with colleagues might help more compared with the internet. Figure 3 shows the distribution of participants based on how frequently they saw patients in the clinic who had previous information about their problems from the internet. Forty-nine participants (20%) found that such previous information had positive effects.

Only 24 participants (10%) had internet access in the consultation room, and 19 participants (8%) used it to find clinical information when seeing patients. The study revealed that 212 participants (87%) used the internet search to solve orthopedic problems encountered during daily patient care, whereas 51 participants (21%) asked colleagues, 34 participants (14%) searched in textbook, and 3% referred the patient to another surgeon. In general, the participants of the current study spent an average of 30 min weekly on the internet to search for answers of clinical problems that they faced in daily situations.

A total of 207 participants (85%) used Google as their preferred search engine, whereas only 34 participants (14%) use PubMed. Nevertheless, 167 participants (72%) were not aware of the existence of other search engines.

Figure 3



The frequency of participants seeing patients with useful information of their problems from the internet.

Discussion

The transfer of medical knowledge is greatly enhanced by the widespread use of the internet. The internet enables physicians to gain and update information. Limitations to internet access hinders the access to online sources of health information [13]. In 2006, Podichetty *et al.* [14] reported that 98% of US clinicians had internet access at home, whereas 72% had access at work. Our results showed a slight increase in internet access among Saudi orthopedic surgeons. This could be attributed to the fact that our study is more recent and that the internet has become more prevalent and has invaded the life of most people all over the world. Gjersvik *et al.* [5] emphasized on having an internet access at work, and in their opinion they considered having the internet access compulsory in the hospital and research setting.

Many reports emphasized on the importance of the internet on medical knowledge update and other professional purposes, particularly communication through electronic mail [13–15]. Our results support this concept in that 96% of the participants reported their use of the internet as a primary tool to update their knowledge.

It was stated that the internet could help physicians answer queries or find solutions to difficult cases [15,16]. Moreover, the internet could provide updated information on standard patient care [14]. Although 85% of the participants have internet access at their workplace, only 10% of them have access in the consultation room. Most of the participants (92%) expressed that they used to retrieve the required and necessary information outside the patient consultation time.

Major progress should be considered toward training physicians on how to perform effective electronic searches and simplifying retrieval and management of information. The use of the internet must remain equally easier and routine in the office and consultation rooms [15]. Very limited number of our participants underwent training on professional search on the internet, although most of them believe in its importance. In the current study, the PubMed was the most popular medical search engine; however, it was utilized by only 14% of our participants and only 6% underwent training for its use. Surprisingly, 72% of our participants could not identify other search engines.

Despite the great role of the internet in updated medical knowledge and its substantial use among physicians [5], our results agreed with Koller *et al.* [15], who stated that using the textbooks to update medical knowledge is still the preferred method by most physicians. In the current

study, 75% of the participants approved that reading the journals' hard copies and attending conferences and courses, as well as formal meetings at work, are the preferred methods for professional improvement.

The impact of using the internet by the patients on medical practice is well established. Gjersvik *et al.* [5] in their study reported that 95% of European patients presented to the clinic with former information gained from the internet about their condition and 25% of European patients requested the appointments with their doctors through e-mails. Our participants affirmed that only 65% of their patients had former information from the internet about their condition and 11% of the patients communicated with them through e-mail to get appointments in the clinic. This difference could be attributed to the limited use of the internet among ordinary people in developing countries. Nevertheless, our results showed that 21% of the participants agreed for the limited positive effect of using the internet by the patients on the physician–patient relationship; this is in agreement with the findings reported by Gjersvik *et al.* [5]. Alternatively, Podichetty *et al.* [14] concluded that physician–patient communication through e-mails about the test result and other medical issues leads to avoidance of the difficult scheduling patterns seen in most hospitals. Moreover, communication between physicians about their patients could be facilitated by using e-mails; this is in agreement with our results.

Comparison of our results with those of previous reports [5] showed that, unexpectedly, our participants used the internet more to search career opportunities (84 vs. 18%), review drugs and orthopedic equipments (90 vs. 24%), and receive information about courses and meetings (93 vs.47%).

Conclusion

Most of the orthopedic surgeons in Saudi Arabia use the internet in their practice and they believe in its importance in updating their information and improving their performance. Training programs must be established to improve utilization of the internet by orthopedic surgeons and allow easy and quick access to the right information. Internet access is very important to be available at workplace, particularly in the clinic, and free access for physicians to wireless internet is beneficial where most of them have smart phones. Residency training programs should include special training for the residents on how to use the PubMed for proper search.

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Conflicts of interest
There are no conflicts of interest.

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