

**Research Article**

# Patterns of Information Seeking Behavior among Saudi Board Residents during Clinical Practice, Saudi Arabia

**Mai S Alshammari<sup>1\*</sup>, Ayman Afify<sup>1</sup>, Saad Albattal<sup>1</sup>, Ghada Alarfaj<sup>1</sup>, Hamoud Alshammari<sup>2</sup>, Mostafa Kofi<sup>1</sup>**

<sup>1</sup>Department of Family Medicine, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

<sup>2</sup>Medical Student, Majmaah University, Saudi Arabia

**\*Corresponding author:** Mai S Alshammari, Department of Family Medicine, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

**Citation:** Alshammari MS, Afify A, Albattal S, Alarfaj G, Alshammari H, et al. (2022) Patterns of Information Seeking Behavior among Saudi Board Residents during Clinical Practice, Saudi Arabia. J Family Med Prim Care Open Acc 6: 179. DOI: 10.29011/2688-7460.100079

**Received Date:** 31 March, 2022; **Accepted Date:** 13 April, 2022; **Published Date:** 18 April, 2022

## Abstract

**Background/Purpose:** Saudi Commission for Health Specialties provides multiple residency programs designed to train resident physicians to apply the best available evidence in their clinical decisions. However, while caring for patients during rounds and clinics, many residents encounter clinical questions that they need to answer. In addition, there are motivating factors and barriers that affect their seeking information behavior. The study aims to understand different patterns of information-seeking behavior among Saudi board residents during clinical practice. **Methods:** Our study is a cross-sectional study, and it was conducted between March 2020 and November 2021. A total of 334 Saudi residents from various specialties under the Saudi Commission for Health Specialties supervision were included in the study, and responses were collected by electronic survey. **Results:** Results showed that 97% of residents seek information during clinical practice to answer their clinical questions. Medical websites such as (Medscape, UpToDate) and directly asking supervisors were the most frequent resources used (87% and 67%, respectively). In addition, the most commonly asked questions were related to treatment (76%) and diagnosis or diagnostic test (15%). Among the various motivation factors to seek information, curiosity (66%) and fear of medical errors (62%) were the most reported motives. However, the most related obstacles were lack of time 73% and difficulty finding relevant information (34%). **Conclusion:** Outcomes of this study showed that most of the residents are encouraged to seek information and learn during clinical practice. However, there are multiple motivation factors and barriers that affect their information-seeking behavior. These factors should be recognized to understand residents' uncertainties, improve their learning experience and develop educational recommendations to improve the outcomes of Saudi training programs.

**Keywords:** Information seeking behavior; Medical training; Information needs; Saudi Arabia

## Introduction

Residency programs are designed to train resident physicians in delivering clinical care to patients and learning their chosen specialties at the same time [1]. Many residents, while caring for patients during rounds and clinics, encounter several clinical questions that need to be answered [2]. In addition, resident physicians serve an educator role, and they are able to answer

questions by using their own knowledge and clinical judgment [3]. However, they are encouraged to recognize their information needs and apply the best available evidence in their clinical decisions to fill any gaps in their medical knowledge and improve patients' health outcomes [4,5]. In 1985, Covell, et al. stated in their study that internal medicine residents encounter at least two questions for every three patients at the point of care [4]. Consequently, this finding opened the door for other researchers to study physicians' uncertainties during clinical practice [4]. However, several studies reported that the majority of physicians' questions

are left unanswered, and often non-evidence-based information recourses are practiced [4,5]. In 1983, the concept of information-seeking behavior was introduced for the first time in the medical literature. It is defined as the necessity to acquire information in response to an individual's realization of a gap in his knowledge [1]. Accessibility, availability of information, and organizational factors contribute to health information-seeking behavior. At the point of care, physicians are exposed to many obstacles that prevent them from seeking information, and they experience as well many motivating factors that encourage them to search for answers. All these factors are important to be understood [6]. Thus, various understanding patterns of information-seeking behavior among residents and factors affecting their learning behavior are essential to improve their clinical practice. However, less is known about the information-seeking behavior of resident physicians in the Kingdom of Saudi Arabia. To the best of our knowledge, there is no study that addressed their patterns of information-seeking behavior and factors that contribute to their clinical practice.

## Methodology

### Survey design and administration

In August 2021, a cross-sectional online survey was conducted to understand various patterns of the information-seeking behavior of resident physicians in Saudi Arabia. An electronic survey was completed by a total of 334 Saudi residents who are enrolled in different residency programs under the supervision of the Saudi Commission for Health Specialties (SCFHS).

After a comprehensive review of the literature, a survey questionnaire was developed into an electronic survey using the google docs website (<https://docs.google.com/>). The survey was reviewed, modified, and validated by three experts in medical education. In addition, it was piloted on ten residents, and their feedback on the clarity of the survey questions was obtained before sending the final version to all residents. The questionnaire consists of three main sections: demographic data of participants, medical school and residency training, patterns, motives, and barriers to information-seeking behavior.

The study was officially approved by the Institutional Review Board of Prince Sultan Military Medical City, Riyadh, Saudi Arabia.

The survey was sent out by Saudi Commission for Health Specialties to all registered residents in October 2021 in their database to engage approximately 334 residents from different regions in Saudi Arabia. The criteria for inclusion involve all Saudi residents who are currently enrolled in residency programs under SCFHS supervision. Participants voluntarily enrolled in this study, and their responses were kept confidential.

### Statistical methods and data analysis

Survey responses were tabulated on an excel sheet, then imported to SPSS to get the descriptive statistics, such as frequencies, proportions for categorical variables, means, and standard deviation for continuous variables. In addition, analytic statistics were used to get the significant difference of groups if they exist by using the p-value of 0.05 as statistically significant. The tests used are the student's t-test to compare qualitative variables and chi-square test to compare qualitative variables. Hence all statistical analyses using SPSS software, V. 23.

## Results

### Survey participants

Demographic characteristics in table 1 showed that the age of participants ranged from 25 to above 36 years. In addition, 181 (54%) were females, and 153 (46%) were males. In the first year of residency, the number of participants was one hundred thirty-five (40%), were 42 (13%) were in their second year, 96 (29%) were in their third year, and 64 (18%) were in their fourth year or higher.

Age				
	Frequency	Percent	Valid Percent	Valid Percent
21-25	72	21.6	21.6	21.6
26-30	231	69.2	69.2	90.7
31-35	31	9.3	9.3	100.0
Total	334	100.0	100.0	

  

Gender				
	Female	Percent	Valid Percent	Valid Percent
Female	181	54.2	54.2	54.2
Male	153	45.8	45.8	100.0

  

Residency Level				
	R1	Percent	Valid Percent	Valid Percent
R1	135	40.4	40.4	40.4
R2	42	12.6	12.6	53.0
R3	96	28.7	28.7	81.7
R4	57	17.1	17.1	98.8
>R5	4	1.2	1.2	100.0
Total	334	100.0	100.0	

**Table 1:** Demographic characteristics of Participants.

### Patterns of Information Seeking Behavior

Table 2 results showed that 96% of residents seek information to answer their clinical questions during clinical practice, and 4 % do not search.

	Frequency	Percent	Valid Percent	Valid Percent
1	321	96.1	96.1	96.1
2	13	3.9	3.9	100.0
Total	334	100.0	100.0	

1: Data represent participants who seek information; 2: Data represent participants who do not seek information

**Table 2:** Frequency and Percentage of participants who seek information during clinical practice.

In table 3: Medical websites such as (Medscape, UpToDate) and directly asking supervisors were the most frequent resources that were used (287; 86% and 225; 67%, respectively). In addition, Search engines account for (155; 46%), and the other resources such as databases (e.g., MEDLINE, Embase) (95; 28%) were less frequently used recourses among the participants.

Medical websites such as (Medscape, UpToDate)				
	Frequency	Percent	Valid Percent	Valid Percent
Valid	47	14.1	14.1	14.1
4	287	85.9	85.9	100.0
Total	334	100.0	100.0	
Directly Asking Supervisor				
Valid	97	29.0	29.0	29.0
	12	3.6	3.6	32.6
1	225	67.4	67.4	100.0
Total	334	100.0	100.0	
Databases (MEDLINE, Embase)				
Valid	239	71.6	71.6	71.6
3	95	28.4	28.4	100.0
Search engines				
Valid	179	53.6	53.6	53.6
6	155	46.4	46.4	100.0
Total	334	100.0	100.0	

**Table 3:** Most Common Resources Used by Participants to Answer Questions.

Our results showed significant findings of variation of residents' seeking information behaviors and how it is changing with residency levels and specialty. Table 4, showed a substantial variation among junior and senior residents' responses when they were asked about their preferred information sources during clinical practice, as (63%) of junior participants prefer to ask a colleague or other health professional around them, (62%) search in databases and search engines. On the other hand, (44%) of senior participants prefer to ask their supervisor directly, (44%) use medical websites and search engines.

		Level		
		Juniors	Seniors	Total
Types of information sources	Directly asking a supervisor	55.6%	44.4%	100.0%
	Asking a colleague or other health professional	63.2%	36.8%	63.2%
	Search in databases (ex. MEDLINE, Embase)	62.1%	37.9%	100.0%
	Medical websites such as (e.g., Medscape, UpToDate)	56.1%	43.9%	100.0%
	Resident's own study collection	61.7%	38.3%	100.0%
	Search engines (e.g., google)	56.1%	43.9%	100.0%
	Specialty			
		Surgical	Non-surgical	Total
	Directly asking a supervisor	24.0%	76.0%	100.0%
	Ask a colleague or other health professional around	20.6%	79.4%	100.0%
	Search in databases (ex. MEDLINE, Embase)	33.0%	67.0%	100.0%
	Medical websites (e.g., Medscape, UpToDate)	15.8%	84.2%	100.0%
	Resident's own study collection	27.2%	72.8%	100.0%
	Search engines (e.g., google, yahoo, Wikipedia, etc.)	31.1%	68.9%	100.0%

**Table 4:** Correlation between Residency Levels and Specialty with the Preferred Types of Information Sources as Reported by Participants.

Moreover, our results showed a difference between preferred information sources among surgical and non-surgical specialties. In table 4, (33%) of participants in surgical specialties favored searching databases, and (31%) favored using search engines. Conversely, the most common information sources selected by participants in non-surgical specialties were medical websites and asking a colleague or other health professional (84% and 79.4%, respectively).

There are various motivation factors to seek information. Table 5 showed that curiosity accounts for (211; 63%) and fear of medical errors (202; 60%) were the most reported motives that encourage residents to seek information. However, table 6 showed that the most related obstacles among participants were lack of time (235;70%) and difficulty finding relevant information (105;31%).

	Curiosity			
	Frequency	Percent	Valid Percent	Valid Percent
Valid	123	36.8	36.8	36.8
4	211	63.2	63.2	100.0
Total	334	100.0	100.0	
	Fear of Medical Errors			
Valid	132	39.5	39.5	39.5
6	202	60.5	60.5	100.0
Total	334	100.0	100.0	

**Table 5:** Most Common Motivation Factors to Seek Information.

	Frequency	Percent	Valid Percent	Valid Percent
No obstacles	83	24.9	100.0	100.0
Lack of time	235	70.4	100.0	100.0
Difficulty finding relevant information	105	31.4	31.4	100.0
Do not know how to deal with information resources	48	14.4	14.4	100.0

**Table 6:** Most Common Barriers to Seek Information.

Furthermore, in table 7, the most common questions were related to treatment (248; 74%) and diagnosis or diagnostic test (56; 16%). Table 8 showed that electronic or digital resources such as (websites, databases, etc.) were (293; 87%) used by respondents, were (19; 6%) preferred to use printed resources such as (books, journals, etc.).

	Subject			
	Frequency	Percent	Valid Percent	Valid Percent
Treatment	248	74.3	74.3	74.3
Diagnosis	56	16.8	16.8	91.0
Prognosis	4	1.2	1.2	92.2
Etiology	18	5.4	5.4	97.6
Epidemiology	4	1.2	1.2	98.8
Prevention	4	1.2	1.2	100.0
Total	334	100.0	100.0	

**Table 7:** Most Common Asked Questions by Participants.

	Frequency	Percent	Valid Percent	Valid Percent
Electronic sources	293	87.7	87.7	87.7
Printed sources	19	5.7	5.7	93.4
Other sources (e.g., Personal collections)	22	6.6	6.6	100.0
Total	334	100.0	100.0	

**Table 8:** Types of Sources Used by Participants to seek Information.

Table 9 showed that (44.6%) always find what they need, (27.2%) of participants take time to locate what they need, and (8%) believed that they need to learn more about search strategies. Table 10 displayed the immediate impact of the information obtained by participants. (66%) stated that it refreshed their memory of details or facts they may have forgotten, (46%) found new information, (33.5%) could use at least some of the information immediately, and (30%) of participants reported that it stimulated their interest in further exploration of the question.

	Frequency	Percent	Valid Percent	Valid Percent
Always you find quickly what you need	149	44.6	44.6	44.6
You take time to find what you need	91	27.2	27.2	71.9
Results are very broad and most are not relevant to your question	16	4.8	4.8	76.6
You don't know if the search was completed	22	6.6	6.6	83.2

You notice that you need to learn more about search strategies	29	8.7	8.7	91.9
You never find what you need	5	1.5	1.5	93.4

**Table 9:** Participants Perception about the Answers of Questions Pursued.

	Frequency	Percent	Valid Percent	Valid Percent
It refreshed your memory of details or facts you may have forgotten	223	66.8	66.8	100.0
It proved what you already knew or suspected	169	50.6	50.6	100.0
You could at least some of the information immediately	112	33.5	33.5	100.0
You found new information	156	46.7	46.7	100.0
It stimulated your interest in further exploration of the theme	102	30.5	100.0	100.0

**Table 10:** Participants' perception about the immediate impact and the reflection of the results they obtained while seeking information on their clinical practice.

## Discussion

During clinical practice, many physicians encounter uncertainty about information related to a specific patient problem as well as questions from patients and their families. Previous studies have demonstrated that residents' ability to evaluate the quality of the information found is narrow, and their information-seeking behavior is varied [7]. In our study, we found that most of the residents acknowledge their information needs and use different modalities to locate answers to questions that were raised at the point of care from a reliable information source. In addition, our results showed that medical websites such as (Medscape, UpToDate) and directly asking supervisors were the most frequent resources that are used among participants. Likewise, similar studies in the literature have reported that Medline, UpToDate, and consult a colleague were the most utilized resources by residents [8,9]. However, the majority of the studies in the literature focused on primary care physicians in outpatient settings and lacked information about the other clinicians' learning behavior in the clinical setting, and further research is needed to fill these gaps [10]. In our study, results investigated these gaps and showed important findings of variation of residents' information-seeking behaviors. It is also shown that their learning behavior is changing with residency levels and their specialty. Hence when participants were asked to select their preferred information sources during clinical practice, (63%) of junior participants stated that they preferred to ask a colleague or other health professional around them, while (62%) of them preferred to search in databases and search engines. On the other hand, (44%) of senior participants reported that they prefer to ask their supervisor directly, (43%) use medical websites and search engines. These findings showed a major shift in information-seeking behaviors between junior and senior residents, which can be explained by the effect of

acquiring more knowledge and training that necessitates different information sources to fulfill their information needs with each residency level. That being said, our outcomes also demonstrate that residents in both levels share a common preferred information source which is seeking information by using search engines (e.g., Google). Moreover, our results showed that there is a difference between preferred information sources among surgical and non-surgical specialties. In table 4, (33%) of participants in surgical specialties favored searching databases, and (31%) of them favored using search engines. Conversely, the most common type of information sources selected by participants in non-surgical specialties were medical websites and asking a colleague or other health professional (84% and 79.4%, respectively). These findings reflect the popularity of electronic resources as they are commonly used and preferred methods by trainees and clinicians at the point of care. However, during clinical practice knowing the proper resources and how to access them are essential to support physicians' abilities to locate information in the clinical setting [8]. Moreover, it is not enough to find accurate information but also to know how to appraise and apply it correctly in their clinical practice [11]. Hence patient care can be negatively affected by physicians' ability to manage clinical information [12]. Consistent with prior studies, lack of time (73%) and difficulty finding relevant information (68%) were the most commonly reported obstacles that cause frustration among precipitants. Cogdill, et al. found in their study that lack of time has a strong impact on percipients as 40% of questions were ignored and not pursued due to lack of time [13]. Nevertheless, the time needed to search, especially in the presence of a patient, is difficult to be estimated [4]. Despite the availability of reliable databases and integration of Evidence-based medicine courses in undergraduate, postgraduate, and continuing medical education, residents believe that they need an efficient system to manage their unanswered questions, keep themselves updated,

and care for their patients at the same time [7,11]. Results of a systemic review that was conducted by Van Dijk N, et al. showed more specific barriers such as effects of other staff members and lack of EBM skills. These barriers can be integrated into the EBM training program to improve residents' searching skills [14]. Bhandari M, et al. performed focus group discussions and semi-structured interviews among 28 surgical residents from various subspecialties in Ontario, Canada, in order to explore barriers that surgical trainees encounter while implementing evidence-based medicine in their practice. Outcomes of this paper showed some barriers such as lack of training in applying EBM, time, priority, fear of disagreement from other staff, and lack of access to surgical EBM resources are considered the major challenges among surgical trainees. In addition, several strategies were proposed by residents to overcome these barriers, such as offering priority to surgeons with EBM training to be hired in the institutions, providing critical appraisal courses for all surgeons, improving communication skills between departments, and restructuring the training curriculum [15]. Furthermore, in our study, we found that curiosity (63%) and fear of medical errors (60%) were the most reported motives among the various motivation factors that encourage residents to seek information. Dhaliwal G stated that physicians with well-distinguished performance work with an intention to improve themselves and learn from their patients during practice [16]. These results are crucial for improving medical training and improving patient care services. Del Fiol G, et al. published a systematic review of studies that analyzed medical professionals' questions that were raised at the point of care. Results showed that the mean of questions raised by clinicians after each patient visit was 0.57, and 51% of questions were pursued, but clinicians found answers to 78% of them. In addition, 34% of questions were related to treatment, and 24% related to causes of the patient's symptoms, physical signs, or diagnostic tests [10]. Similarly, our results showed that the most commonly asked questions were related to treatment (74%) and diagnosis or diagnostic test (16%). These findings suggest that residents tend to pursue questions that are directly affecting their clinical decision while less likely to search for less relevant information, such as the cost of medication or the prognosis of the disease [17].

One of the important targets of our study is to identify whether residents prefer to use electronic or printed resources to locate information. Definition of electronic resources, as reported in the literature, has been defined as "electronic (computer-based) resources comprising distilled (synthesized) or curated information that allows clinicians to select content germane to a specific patient to facilitate medical decision making" [17]. In the past, studies showed that answering clinical questions by reviewing printed medical journals was the preferred method among residents [18]. In 2000, Interviews with residents were conducted by Green

ML, et al. after each patient visit to explore the characteristics of residents' clinical questions and their frequency. They found that the preferred method was checking textbooks and original articles [19]. On the other hand, our results showed that currently, (87%) of respondents prefer to use electronic or digital resources such as (websites, databases, etc.), were (6%) of participants prefer to use printed resources such as (books, journals, etc.). These results showed the effect of the revolution of electronic resources and the internet in medical practice and training. In Systematic Review and Meta-Analysis conducted by Maggio LA, et al. in 2019 to study the effect of electronic resources on physicians' clinical decisions and learning outcomes. The results of their study highlighted some of the important features that encourage physicians to prefer electronic resources. For example, the ability to access reliable and updated recourses in a short period of time which they found, encouraged residents to answer more questions rabidly. Moreover, when they compared electronic resources with other information resources, it was found that success in answering questions was associated with electronic resources. They concluded that physicians' use of electronic resources has a positive effect on their behaviors and patient care in general [2]. It is worth mentioning that when participants were asked about the main features of electronic articles or documents that attract them, they reported that the most important features were the popularity and/or innovation of the information, Full text, PDF format, brief article rather than longer article. In 2018, Alhaddad MS, et al. performed a study to evaluate the extent of residents' use of social media applications as a source of health information in Saudi Arabia. Results revealed that WhatsApp is the most frequent application used among residents. However, most of the respondents prefer to seek health information from official medical resources [20]. These findings highlighted the importance that clinicians should be aware that the availability of electronic resources with their enormous and tremendous information necessities the skills and understanding of search strategies to be able to identify, appraise, apply information and utilize it effectively.

Ramos K, et al. reported in their study that residents' satisfactions with their answers are significantly high and accounts for 87% [21]. Moreover, a clinical decision in 78% of cases was affected by the information found [9]. When participants in our study were asked about the immediate impact of the information they obtained, (69%) indicated that it stimulated their interest in further exploration of the question, and (67%) stated that it refreshed their memory of details or facts they may have forgotten. Despite the quick improvement in educational systems and the power of the current residency programs to train physicians, these results showed that information-seeking behavior is also essential and required to improve residents' knowledge and clinical practice.

## Conclusion

Our study has demonstrated insight into the information-seeking behavior of Saudi residents who are currently enrolled in residency programs under SCFHS supervision. Outcomes of this study showed that most residents are encouraged to seek information and learn during clinical practice. In addition, one of the important findings of our study is the variation of residents' seeking information behaviors with residency levels and specialty. There is a major variation in the preferred information sources during clinical practice among junior and senior residents as well as between surgical and non-surgical specialties. This study also demonstrates multiple motivation factors and barriers that may affect the information-seeking behavior of residents during their training. These outcomes and factors should be recognized and appreciated in order to understand residents' uncertainties, improve their learning experience and develop educational recommendations to improve the outcomes of Saudi training programs.

## References

1. Oussalah A, Fournier JP, Guéant JL, Braun M (2015) Information-seeking behavior during residency is associated with quality of theoretical learning, academic career achievements, and evidence-based medical practice: a strobe-compliant article. *Medicine (Baltimore)* 94: e535.
2. Maggio LA, Aakre CA, Del Fiol G, Shellum J, Cook DA (2019) Impact of Clinicians' Use of Electronic Knowledge Resources on Clinical and Learning Outcomes: Systematic Review and Meta-Analysis. *J Med Internet Res* 21: e13315.
3. Bass EJ, DeVoge JM, Waggoner-Fountain LA, Borowitz SM (2013) Resident physicians as human information systems: sources yet seekers. *J Am Med Inform Assoc* 20: 736-742.
4. Davies K, Harrison J (2007) The information-seeking behavior of doctors: a review of the evidence. *Health Info Libr J* 24: 78-94.
5. Ely JW, Osheroff JA, Chambliss ML, Ebell MH, Rosenbaum ME (2005) Answering physicians' clinical questions: obstacles and potential solutions. *J Am Med Inform Assoc* 12: 217-224.
6. Alghanim SA (2011) Information needs and seeking behavior among primary care physicians in Saudi Arabia: implications for policy and practice. *Sci Res Essays* 6: 1849-1855.
7. Schuers M, Griffon N, Kerdelhue G, Foubert Q, Mercier A, et al. (2016) Behavior and attitudes of residents and general practitioners in searching for health information: From intention to practice. *Int J Med Inform* 89: 9-14.
8. Bennett NL, Casebeer LL, Zheng S, Kristofco R (2006) Information seeking behaviors and reflective practice. *J Contin Educ Health Prof* 26: 120-127.
9. Schilling LM, Steiner JF, Lundahl K, Anderson RJ (2005) Residents' patient-specific clinical questions: opportunities for evidence-based learning. *Acad Med* 80: 51-56.
10. Del Fiol G, Workman TE, Gorman PN (2014) Clinical questions raised by clinicians at the point of care: a systematic review. *JAMA Intern Med* 174: 710-718.
11. Green ML, Ruff TR (2005) Why do residents fail to answer their clinical questions? A qualitative study of barriers to practicing evidence-based medicine. *Acad Med* 80: 176-182.
12. Osheroff JA, Forsythe DE, Buchanan BG, Bankowitz RA, Blumenfeld BH, et al. (1991) Physicians' information needs: analysis of questions posed during clinical teaching. *Ann Intern Med* 114: 576-581.
13. Cogdill KW, Friedman CP, Jenkins CG, Mays BE, Sharp MC (2000) Information needs and information seeking in community medical education. *Academic Medicine* 75: 484-486.
14. van Dijk N, Hooft L, Wieringa-de Waard M (2010) What are the barriers to residents' practicing evidence-based medicine? A systematic review. *Acad Med* 85: 1163-1170.
15. Bhandari M, Montori V, Devereaux PJ, Dosanjh S, Sprague S, et al. (2003) Challenges to the practice of evidence-based medicine during residents' surgical training: a qualitative study using grounded theory. *Acad Med* 78: 1183-1190.
16. Dhaliwal G (2013) Known unknowns and unknown unknowns at the point of care. *JAMA Intern Med* 173: 1959-1961.
17. Aakre CA, Pencille LJ, Sorensen KJ, Shellum JL, Del Fiol G, et al. (2018) Electronic knowledge resources and point-of-care learning: A scoping review. *Acad Med* 93: S60-S67.
18. Duran-Nelson A, Gladding S, Beattie J, Nixon LJ (2013) Should we Google it? Resource use by internal medicine residents for point-of-care clinical decision making. *Acad Med* 88: 788-794.
19. Green ML, Ciampi MA, Ellis PJ (2000) Residents' medical information needs in clinic: are they being met? *Am J Med* 109: 218-223.
20. Alhaddad MS (2018) The use of social media among Saudi residents for medicines related information. *Saudi Pharm J* 26: 1106-1111.
21. Ramos K, Linscheid R, Schafer S (2003) Real-time information-seeking behavior of residency physicians. *Fam Med* 35: 257-260.