

Full Length Research Paper

Information needs and seeking behavior among primary care physicians in Saudi Arabia: Implications for policy and practice

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This is an exploratory study conducted in Riyadh region, Saudi Arabia to determine information needs and information-seeking behavior among rural and urban primary health care physicians. The study employed self-administered questionnaires to collect data on demographic characteristics, types of medical and health information needed, sources sought and barriers encountered by physicians. The questionnaires were distributed to all primary health care physicians in Riyadh region between August and November 2010. The results indicated that physicians in rural areas were less likely to have access to medical and health information than their counterparts in urban areas, particularly for modern sources such as online databases, medical journals and the Internet websites. Physicians in both geographical locations reported similar individual and organizational barriers that hinder using information resources. Acquiring primary care physicians, particularly in rural areas with access to medical and health information is vital in the provision of primary health services. Efforts are needed to facilitate primary health care facilities with necessary information infrastructure that help develop the profession and provide quality of health care to a large segment of the population who use such health facilities.

Key words: Primary health care, rural, urban, information-seeking behavior, Saudi Arabia.

INTRODUCTION

In Kingdom of Saudi Arabia, the concept of Primary Health Care (PHC) recommended by the World Health Organization (WHO) in 1978, was adopted and became as a policy in an attempt to rationalize the use of health resources, relieve overcrowding in hospitals and contain unnecessary costs (Al-Rowais et al., 2000; Al-Yousuf et al., 2002; Al-Qahtani and Al-Qahtani, 2004). Recent official statistics indicate that there are 54,903 physicians in the Kingdom, of which 25,832 (47%) physicians work in the Ministry of Health (MOH) alone (Ministry of Health, 2009). Of these, there are 6,853 (26.5%) physicians that work in 2,073 PHC centers scattered all over the 20 health regions in the country. Riyadh region is the largest and has 377 PHC centers facilitated by 966 physicians, 2,537 nurses and more than 3,000 allied health personnel. PHC physicians in the Saudi health care system have a predominant role in the provision of a wide range of preventive and curative health services to the whole population and have a role in the triaging of

patients needing more expensive specialist or hospital services.

Previous research indicates that supporting primary care physicians with the information they need is critical in enhancing patients' care and that the provision of excellent primary care services requires that physicians in PHC facilities are provided with appropriate sources of information that help them make appropriate health decisions (Andrews et al., 2005; González-González et al., 2007). Moreover, authors indicate that health care providers and decision makers in any health care system are required to acquire knowledge about information needs, information-seeking behavior and information use by primary care physicians as it is crucial to effectively meet the needs of both health care providers and recipients (Davies, 2007).

Studies on health information seeking behavior indicate that such activity is associated with the accessibility and the availability of such information and that individual and

organizational factors play a role in such behavior (Kapiriri and Bondy, 2006). Studies identify that information-seeking behavior involves personal reasons for seeking information, the type of information needed, and the ways sources are being sought (Dutta, 2009). Barriers that prevent individuals from seeking or getting information are also of great importance in understanding the health information-seeking behavior (Younger, 2010).

Most classifications of primary care physicians' information needs reported in previous studies are usually reflections of the tasks associated with clinical care. For example diagnosis, treatment, and drug therapy are commonly identified as categories of information needs. This association of information needs with tasks has been reported in findings from different parts of the world (Cogdill, 2003). The availability of such types of information and its management is particularly acute among primary care physicians, for whom the domain of practice is most broad, and in particular for those practicing in rural areas, for whom geographic isolation may further limit access to such information (Gorman, 2001).

Generally, there appears to be consensus that the provision of high quality of primary care services can be positively affected by better information services. This implies the need for a clearer description of primary care practitioners' information seeking behaviors that may help direct efforts to attain better health care (Andrews et al., 2005). Promoting appropriate decision making in primary care requires an understanding of the information needs, use of information resources and information-seeking behavior among primary care physicians (Cogdill, 2003).

Although several international studies have provided valuable insights on topics such as the adoption of health technology in primary health care facilities (Tomasi et al., 2004) or the use of the Internet for searching health information (Bennett et al., 2006), less attention has been paid to information-seeking behavior among primary care physicians. In Saudi Arabia, a better understanding of such issues could help identify physicians' needs of medical and health information which eventually improves the delivery of quality primary health services. Therefore, the present study aims to achieve the following objectives: 1) to determine the types of information needed by PHC physicians, 2) to determine sources of information used by PHC physicians, 3) to identify barriers that are encountered by PHC physicians when seeking medical and health information, and 4) to determine whether PHC physicians in rural areas differ from their counterparts in urban areas with respect to their needs, sources and barriers of information.

MATERIALS AND METHODS

To serve the purpose of this study, the descriptive research methodology was employed. A survey questionnaire was developed in order to explore information-seeking behavior among PHC physicians. The questionnaire was written in English and

consisted of four sections. The first section was devoted to obtain demographic background of respondents on gender, age, nationality and years of experience. The second section dealt with the information types primary care physicians presently need in their usual practice in the PHC centers. For this purpose, a table was constructed to include a list of information types that are frequently reported in the literature. The third section was designed to reveal the most important information sources of medical and health information that PHC physicians may use frequently to get information about the management of their patients. In this part, respondents were given a list of the most common sources of information and requested to select all that apply. The final section intended to obtain information on barriers that PHC physicians face when seeking medical and health information they usually need for their practice. Respondents were presented with a table containing the most common barriers reported in the literature that primary care physicians usually face when looking for medical and health information. Physicians were instructed to report as many as applied.

In order to increase the content validity of the questionnaire, a review of the relevant literature was carried out, six primary care physicians and two experts in survey design reviewed the draft questionnaire, and it was pilot-tested (Abramson and Abramson, 1999; Fowler, 2001). On the basis of the suggestions of the reviewers and the outcome of the pilot survey, the final questionnaire was reformulated. All analyses were conducted using the Statistical Package for the Social Sciences, version 11.0 for Windows (SPSS Inc., Chicago, IL., USA). Chi-square was used to test significance between categorical variables and the Independent t-test was used to test significance between continuous variables. The significance was considered at the $p < 0.05$ level.

The study population was all PHC physicians who work at the Ministry of Health PHC centers in Riyadh region at the time of the study. All accessible PHC physicians in Riyadh Region were invited to participate in the study. PHC centers in the region share common characteristics. For example, most physicians in these centers are non-Saudis, work for one shift (8 hours a day, 5.5 days a week) and each PHC center is assigned to the nearest hospital in the geographical area for the purpose of referring of patients. For the purpose of data collection, the most recent list of all PHC centers in Riyadh region was obtained from Riyadh Region Health Directorate and all accessible PHC centers were selected.

Given that the number of physicians in each PHC center is relatively low (approximately ranging from 2 to 4 physicians), it was decided to include all physicians in the study sample. Accordingly, in each PHC center, all physicians were approached and invited to participate in the study. The respondents were assured of confidentiality and provided with an explanation regarding the purpose of the study and the importance of their contribution. The respondents gave verbal consent to participate in the study. All questionnaires were distributed by well-trained postgraduate students and were completed by the physicians at their convenience of time. The study was carried out between August and November 2010.

Based on the aforementioned methodology, the total number of participants was 666 physicians, of which 432 physicians completed and returned the questionnaires (66.8% response rate). Of these, 255 (59%) physicians were from the suburbs of Riyadh region (will be referred hereafter as "rural" physicians), and the remaining 177 (41%) physicians were from inside Riyadh city (will be referred hereafter as "urban" physicians).

RESULTS

The demographic characteristics of rural and urban respondents are displayed in Table 1. The table indicates

Table 1. Demographic characteristics of rural and urban physician.

Characteristics	Rural (N=255)	Urban (N=177)	P value
Gender			
Males	169 (66.3%)	101 (57.1%)	0.065
female	86 (33.7%)	76 (42.9%)	
Age			
(Mean \pm SD)	41.4 \pm 7.7	40.2 \pm 9.1	0.888
\leq 45	135 (52.9%)	67 (37.9%)	
> 45	120 (47.1%)	110 (62.1%)	
Years of experience			
(Mean \pm SD)	12.85 \pm 8.8	14.35 \pm 7.3	0.111
\leq 5 years	98 (38.4%)	54 (30.5%)	
> 5 years	157 (61.6%)	123 (69.5%)	
Nationality			
Saudi	16 (6.3%)	19 (10.3%)	0.136
Non-Saudi	239 (93.7%)	158 (89.3%)	

Notes: Chi-square analysis or Independent sample *t*-test were used to calculate the *P* values where applicable. For Age and Experience, the *t*-test was used to test the difference between rural and urban respondents and the Degrees of Freedom (DF) = 430. For other variables, the chi-square was used and the DF = 1.

Table 2. Types of information needed as reported by rural and urban physicians.

Types of information	Rural (N=255(%))	Urban (N=177(%))	P value
Clinical information	208 (81.6)	143 (80.8)	0.938
Keeping medical knowledge up-to-date	135 (52.9)	128 (72.3)	0.000
Pharmacological information	129 (50.6)	91 (51.4)	0.944
Other information*	164 (64.3)	128 (72.3)	0.100

Notes: - Chi-square analysis was used to calculate the *P* values. The DF = 1. * Includes management, procedures, epidemiology, etc.

that rural and urban physicians did not differ with respect to gender, age, years of experience and nationality.

The types of information needed or "wanted" by rural and urban physicians are presented in Table 2. No differences existed between rural and urban physicians with respect to the need of clinical information (81.6% vs 80.8%; $p = 0.938$) or with the need of pharmaceutical information (50.6, 51.4%; $p = 0.944$). Moreover, no differences existed with the need of "other" information (such as information related to the epidemiology and management) (64.3% vs 72.3%; $p = 0.100$) between rural and urban physicians. However, urban physicians had a significantly higher percentage of need of information that keeps their knowledge up-to-date than their counterparts in rural area (72.3% vs 52.9%; $p < 0.001$).

In this study, physicians were presented with an array of printed, electronic, human and "other" sources of information and asked to identify their use of these sources (Table 3). When specifically examining the difference in the use of printed sources by rural and urban physicians, very little differences existed. For

example, no differences were noted between rural and urban physicians with respect to using medical textbooks, clinical manuals and "other" printed materials. However, rural physicians were less likely to use medical journals as a source for their medical and health information than their counterparts in urban areas (47.8% vs 67.2%; $p < 0.001$).

With respect to electronic sources, respondents in rural areas were less likely to use any of the electronic resources. Specifically, they were less likely to use online databases (50.2% vs 71.2%; $p < 0.001$), were less likely to use the Internet (52.5% vs 84.2%; $p < 0.001$) and were less likely to use "other" electronic sources than their counterparts in urban areas when searching for medical or health information. Compared to their urban counterparts, rural physicians were less likely to consult specialists (52.9% vs 80.8%; $p < 0.001$) or consult "other" colleagues (59.7% vs 78.5%; $p < 0.001$) for seeking medical or health information. However, rural physicians did not differ significantly from their urban counterparts with respect to GP's consultation as sources of medical

Table 3. Sources used for medical and health information as reported by rural and urban physicians.

Sources of information	Rural (N=255(%))	Urban (N=177(%))	P value
Printed sources			
Medical journals	122 (47.8)	119 (67.2)	0.000
Medical textbooks	139 (54.5)	99 (55.9)	0.846
Clinical manuals	125 (49.0)	99 (55.9)	0.188
Other (reference material ...etc.)	127 (49.8)	76 (42.9)	0.191
Electronic sources			
Online databases	128 (50.2)	126 (71.2)	0.000
Internet general websites	134 (52.5)	149 (84.2)	0.000
Other (CD-ROM, Stand-alone computers, etc.)	99 (38.8)	87 (49.2)	0.042
Human sources			
Specialist consultation	135 (52.9)	143 (80.8)	0.000
GP consultation	177 (69.4)	115 (65.0)	0.387
Other colleagues (pharmacists, paramedical)	146 (57.9)	139 (78.5)	0.000
Other sources			
Symposia/conferences	99 (38.8)	91 (51.4)	0.013
Continuing Medical Education (CME)	135 (52.9)	128 (72.3)	0.000
Personal collections	163 (63.9)	92 (52.0)	0.017

Notes: Chi-square analysis was used to calculate the *P* values. The DF =1.

and health information.

With respect to the use of "other" sources of information, physicians in rural areas differed from their counterparts in urban (Table 3). Specifically, rural physicians were less likely to indicate the use of symposia (or conferences) than their counterparts in urban areas as a source of obtaining health information (38.8% vs 51.4%; $p < 0.05$) and less likely to use Continuing Medical Education (CME) (52.9% vs 72.3%; $p < 0.001$). However, physicians in rural areas were more likely to use their personal collections as a source of other information than their counterparts in urban areas (63.9% vs 52.0%; $p < 0.05$).

Physicians in rural and urban areas were asked to report barriers that may hinder them from using medical or health information resources. Table 4 presents these barriers. Generally, rural and urban PHC physicians reported similar barriers and did not differ significantly on most reported barriers. These barriers include lack of library in the PHC centers, lack of training on the use of information, lack of inter-library loan services, lack of uniform data standards, lack of up-to-date medical books, lack of access to medical databases and lack of information support services. However, rural physicians rated several barriers more frequently than their urban counterparts. For example, rural physicians were more likely to indicate the lack of up-to-date medical journals (79.6% vs 65.0%; $p < 0.001$), the lack of modern information equipment (85.1% vs 76.3%; $p < 0.05$) and the lack of Internet connections in the PHC center (81.2% vs 71.8%;

$p < 0.05$) as information-seeking barriers.

It is worth mentioning that further analysis indicated that respondents did not differ significantly according to any of their demographic characteristics (age, gender, experience and nationality) and the types of information needed for medical or health information. However, younger respondents (≤ 45 years old) were more likely to use online databases ($p < 0.05$), the Internet ($p < 0.001$) and the symposia/ conferences ($p < 0.001$) than older respondents. In addition, younger respondents were more likely to report barriers such as lack of up-to-date medical journals ($p < 0.005$), lack of modern information equipment ($p < 0.001$) and lack of the Internet connections ($p < 0.001$) than older respondents. Similarly, respondents with lower years of experience (≤ 5 years) were more likely to use medical journals ($p < 0.005$), the Internet ($p < 0.001$) and consult specialists ($p < 0.001$) for medical and health information than their counterparts with higher level of experience. Finally, respondents did not differ significantly according to the reported barriers encountered when searching for medical and health information according to their gender, level of experience or nationality.

DISCUSSION

The results of this study demonstrated that physicians in rural areas were less likely to have access to health and medical information than their counterparts in urban areas.

Table 4. Health Information seeking barriers as perceived by rural and urban physicians.

Barriers	Rural (N=255)	Urban (N=177)	P value
Lack of library in the PHC center	68.2	65.0	0.545
Lack of training on the use of information resources	72.2	70.1	0.714
Lack of up-to-date medical journals	79.6	65.0	0.001
Lack of up-to-date medical textbooks	71.4	74.0	0.621
Lack of Inter-library loan services	76.5	79.7	0.505
Shortage of staff helping in finding information	77.6	76.8	0.935
Lack of modern information equipment	85.1	76.3	0.028
Lack of uniform data standards within the PHC center	72.2	80.8	0.052
Poor management of patient data	74.1	71.2	0.573
Lack of the Internet connections in the PHC center	81.2	71.8	0.029
Poor documentation system	72.9	76.8	0.423
Poor infrastructure of the PHC center	77.3	75.1	0.694
Lack of access to medical databases	74.5	74.0	0.996
Lack of information support services	67.5	74.6	0.137
Lack of time to update professional knowledge	65.5	80.8	0.001

Notes: Chi-square analysis was used to calculate the *P* values. The DF =1.

Urban physicians used disproportionately more health information resources than rural physicians did, particularly modern sources such as online databases, medical journals and the Internet websites. These findings are consistent with previous research which finds that urban health professionals have greater access and use of health information sources and technologies that help them make their daily practice decisions (Menachemi et al., 2007). However, it should be noted that studies on the use of medical and health information among health professionals are numerous and that comparisons between the results of these studies cannot be drawn as there are differences in the methodologies used and the type of population investigated.

Despite the substantial differences in the availability to, and the accessibility of information resources between rural and urban physicians, the results of this study indicate that the majority of physicians, regardless of their geographical location, needed information that enables them achieve their work activities and to obtain the necessary information for the development of their profession. Previous research indicates that primary care physicians, compared to hospital physicians, lack much of necessary health and medical information (Callen et al., 2008; Maxson et al., 2010). Rigorous studies are needed to determine whether increasing the availability of and the accessibility to information resources which are less used by either group will have an impact on primary care physicians' information management, their clinical practices, or their patients' outcomes.

The present study identified several differences between rural and urban physicians with respect to the sources of medical and health information. Rural primary care physicians do, in fact, report significantly less

access to nearly all sources of medical and health information than urban physicians. Of importance, rural primary care physicians reported less use of the electronic sources of information such as online databases and internet websites. These results were expected since rural primary care physicians have greater geographic, technological isolation and probably work far from the referral hospitals where sophisticated technology and information resources might be available. These findings are in line with the results identified in other countries (Twose et al., 2008; Younger, 2010).

Previous research indicates that the Internet and the online medical databases have the potential to offer physicians with quick and up-to-date knowledge and they can become more informed about new advancement in their medical practice (Dutta, 2009). In fact, much of the health information in the Internet is primarily designed for health professionals which may help them diagnose, treat and fulfill patients' health needs (Benigeri and Pluye, 2003). Recent research indicates that making sound and evidence-based decisions require access to information resources as well as an understanding of how to use them effectively (McInerney and Suleman, 2010; Novak et al., 2010). Therefore, the findings of the present study should prompt health decision makers to provide primary care physicians, particularly those who work in rural areas, with access to the electronic resources that facilitate their patients' needs. Such efforts are expected to enhance the quality of healthcare, promote health prevention initiatives, improve practice management and provide continuity of information transfer between primary and hospital services (Revere et al., 2007; Bradley et al., 2010).

The results of this study highlighted some of the

potential barriers that may impede primary care physicians, particularly younger and less experienced physicians, from seeking or using medical and health information, most of which were organization-related barriers. It is interesting to note that the presence of these barriers is reported by the majority of PHC physicians, regardless of their geographic location. These findings are in line with the results reported earlier (Andrews et al., 2005; Davies, 2007; Eley et al., 2009) which report similar barriers, such as: lack of time, isolation, inadequate library access, lack of equipment, lack of skills, costs, and inadequate Internet infrastructure.

Given their isolation, rural physicians in this study were more likely than their urban counterparts to consider the lack of access to medical journals, the lack of Internet connections and the lack of modern information equipment as major barriers. More work directed to alleviate these barriers, which appear to disproportionately affect rural physicians is needed. However, some of the available literature notes that although the Internet is playing an increasingly important role in physicians' continuing education and the delivery of health care, barriers of time, information-seeking skills, and information overload remain key challenges (Andrews et al., 2005; Eley et al., 2009). Given the importance of the electronic sources in providing health care professionals with recent and quick information, efforts by decision makers are needed to enable PHC physicians to use resources.

Conclusion

This study has provided insight into the information-seeking behavior among two distinctive populations, rural and urban physicians, in Riyadh region. In particular, the medical and health information needs and seeking behavior among health professionals was examined in the context of their work at primary health care centers, the first level of care for most of the Saudi population. Results were compared with regard to the types, sources and barriers of health information among primary health care physicians. The results of the study confirm the expectation that rural primary care physicians have significantly less accessibility to, and availability of most sources of medical and health information than urban physicians. Absence of effective efforts to facilitate the Saudi primary health care facilities with medical and health information sources and infrastructure is presumably responsible for such a situation.

Therefore, acquiring rural PHC physicians with necessary medical and health information is expected to play a vital role in narrowing the gap between rural and urban physicians and in meeting their profession needs. This consequently is expected to have an impact on health care provided to their clients. The results of this study should inform future efforts to equip primary care facilities with necessary medical and information infra-

structure and to remove information seeking barriers which may hinder health professionals from accessing valuable information sources. Finally, the findings of this study should encourage further research on the topic of medical and health information seeking among other primary health care personnel in both rural and urban locations. Such efforts may rationalize and promote health care decisions about a large segment of the Saudi population using primary health care facilities.

This study has its own limitations which deserve mention: First, the study was conducted in Riyadh region of Saudi Arabia only. Therefore, the generalizability of our study to other geographic locations should be done with caution. Further research should include other geographical regions. Secondly, the respondents of the study included only physicians who were accessible and could be approached. Those who did not participate in the study may have different responses to the study questionnaire which may have influenced the results reported here. Thirdly, the study design, the available data and the few variables included in the study may have influenced the results as well. Probably including other geographical regions and additional study variables (individual and organizational variables) may give better explanations about the differences in health information needs and seeking behavior among rural and urban PHC physicians. Despite these limitations, the results of this study provide a valuable insight into information-seeking behavior among rural and urban physicians in Saudi Arabia and pave the way for further research. It is anticipated that the findings of this study will provide health policy makers and researchers with an understanding about information-seeking behavior in rural and urban areas and, therefore, will be of importance to inform future efforts in promoting the availability of, and the accessibility to up-to-date health information among primary care physicians. This may help the Saudi health care system to achieve positive outcomes for the sake of the population who use primary health care facilities.

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