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REGULAR FEATURE: DISSERTATIONS INTO PRACTICE

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# Information retrieval at the point of care of community family physicians in Arab countries

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**Abstract**

This study is based on Jumana Antoun's PhD thesis at Walden University, USA examining the information retrieval behaviour of 72 community family physicians' at the point of care in eight Arab countries in the Eastern Mediterranean. The key findings were that participants looked for digital clinical information at the point of care on average 14.0 times per week with the majority (80.3%) using a mobile phone. Clinical information about medication dosage and side effects was the most sought clinical question, and patient education was the least. Almost half of the participants considered that they often found relevant (55.6%), useful (56.9%) and unbiased (58.3%) information. Whilst none of the factors examined predicted the physicians' self-reported effectiveness and efficiency at information retrieval, the implication for practice points clearly to the barriers and the need for curricula to focus on search strategies using free resources at the point of care.

**KEYWORDS**

evidence-based practice; health professionals; information retrieval

## INTRODUCTION

Efficient information retrieval among practicing physicians is essential to gather evidence-based healthrelated information to clinical questions that frequently arise during patientphysician encounters (Brassil et al., 2017). Electronic knowledge resources are commonly used among physicians at the point of care (Aakre et al., 2018) to answer clinical questions and improve patient outcomes (Maggio et al., 2019). But significant barriers to pursuing an unanswered question include time, lack of skills and efficiency of information retrieval (Aakre et al., 2019; Barzkar et al., 2018; Brassil et al., 2017). Cost and accessibility of the knowledge resource (Aakre et al., 2019) could be key barriers in developing countries.

The types of resources and search strategies used by physicians and the factors affecting resource selection and search strategies are well studied (Daei et al., 2020). Yet, there is a lack of in-depth understanding of the phenomena regarding how, when and why they use the resources on their mobile devices at the point of care (Patocka et al., 2018). Furthermore, researchers have not explored community physicians' digital information retrieval behaviour in contrast to academic attending physicians at the point of care in developing countries where resources and access to information may be limited.

## LITERATURE REVIEW

Current digital resources that provide point-of-care information summaries are of moderate quality and require a subscription (Andrews et al., 2017; Kwag et al., 2016). Along the same vein, physicians' affiliation with an institution is associated with the use of reliable resources (Aspinall et al., 2021). Consequently, community physicians may rely on free resources that may not be equally effective or efficient (de Fernelmont et al., 2018; Morshed & Hayden, 2020). Additionally, physicians in developing countries may not have computers in their clinics, and a good portion of patients may not accept digital devices during the clinical encounter (Shaarani et al., 2019).

Recent systematic literature reviews addressed the informationretrieval behaviour of physicians (Daei et al., 2020), the online health information needs of family physicians (van der Vaart & Drossaert, 2017) and the barriers to clinical information retrieval (Aakre et al., 2019). Yet, most research was published before 2017, and mostly among academic or hospital settings. Fewer studies have been conducted in Arab countries compared with North America, Europe and Canada, and those that exist have been mainly from Saudi Arabia.

## RESEARCH METHODS

With the expansion in medical information, increasing digitalization and availability of digital resources at the point of care, the purpose of this study was to examine the characteristics of the community physicians' digital information retrieval at the point of care in eight Arab countries in the Eastern Mediterranean and whether a set of factors predicted the digital information retrieval. The target population was family physicians who were members of the scientific/professional societies of family medicine in the developing countries that belong to the World Organization of Family Doctors-Eastern Mediterranean Region (WONCA EMR), and who were unaffiliated with an academic institution. The study was approved by the institutional review board (IRB) of Walden University and the American University of Beirut.

The anonymous online survey included demographics (sex, age, years of practice, scope of practice, country of practice and the number of patients seen weekly), point-of-care information behaviour, digital information resources, information and computer literacy and selfreported information retrieval efficiency. Two scales were used: the Information Literacy Self-Efficacy-M-scale (De Meulemeester et al., 2018) and the General Confidence With Computer Use Scale (Fogarty et al., 2001) to measure information literacy and computer literacy, respectively. The total score of each scale is the sum of the various item responses, with higher scores indicating higher information or computer literacy.

**Key Messages**

- Family physicians looked for digital clinical information at the point of care at a lower rate than Western countries.
- Almost half of the family physicians often found relevant, useful and unbiased information at the point of care.

**TABLE 1** Demographics of the surveyed family physicians ($N = 72$)

| Demographic | *M* | *SD* |
|---|---|---|
| Age | 39.6 | 9.5 |
| Years of practice | 9.8 | 9.7 |
| Number of patients seen weekly at the clinic | 79.0 | 82.5 |
| Information literacy | 59.8 | 11.4 |
| Computer literacy | 29.3 | 5.6 |
| | ***n*** | **Percentage** |
| Sex | | |
| Females | 41 | 61.2 |
| Males | 26 | 38.8 |
| Country of practice | | |
| Bahrain | 3 | 4.5 |
| Egypt | 3 | 4.5 |
| Iraq | 21 | 31.8 |
| Jordan | 4 | 6.1 |
| Kuwait | 4 | 6.1 |
| Lebanon | 17 | 25.8 |
| Saudi Arabia | 9 | 12.5 |
| United Arab Emirates | 5 | 6.9 |
| Location of Practice | | |
| City | 65 | 95.5 |
| Suburban | 2 | 2.9 |
| Rural | 1 | 1.5 |

*Note*: Missing values exist.

The predictors of the digital practice were selected based on Smith et al. (2020) for integrating technology in a professional educational context, highlighting the alignment of three essential elements: professional competencies, the three domains of digital literacy (technical, cognitive and sociocultural) and technological affordances.

A pilot study was conducted among 13 attending and resident family physicians at the department of family medicine at the American University of Beirut, which did not lead

**TABLE 2** Digital information practice at point of care of surveyed family physicians ($N = 72$)

| | *n* | Percentage |
|---|---|---|
| Ability to find the information required to answer clinical questions | | |
| Very good | 30 | 42.9 |
| Good | 27 | *38.6* |
| Average | 13 | *18.6* |
| The device of information retrieval[a] | | |
| Computer | 28 | 39.4 |
| Mobile phone | 57 | 80.3 |
| Tablet | 9 | 12.7 |
| Access to the internet at point of care | | |
| Always | 45 | 59.2 |
| Often | 14 | 19.7 |
| Sometimes | 10 | 14.1 |
| Rarely | 3 | 4.2 |
| Never | 2 | 2.8 |
| Ownership of one or more mobile apps | | |
| Yes | 56 | 80.0 |
| No | 14 | 20.0 |
| Ownership of medical databases/apps that require a subscription | | |
| Yes | 32 | 61.5 |
| No | 20 | 38.5 |

*Note*: Missing values exist.
[a]More than one answer was allowed.

to any modifications of the main study methodology or survey items, and were excluded from the final analysis.

## Statistical analysis

Descriptive analysis was performed for demographics and digital information practice using means for continuous variables and proportions for categorical variables. Multiple linear regression was performed to measure to what extent the various factors predicted the digital information practice. The dependent variable was the digital information retrieval practice at the point of care operationalized by the question: "On average, how many times per week do you look for digital clinical information at the point of care?." The following independent variables were explored: information and computer literacy, age, sex, location of practice, EBM training, access to the internet at point of care and the use of subscribed versus free or no electronic resources. If participants skipped a question, questionnaires with missing data for the predictor variables were removed from the regression analysis, except for missing data in the information literacy scale, where each participant's mean across available items on the information literacy scale represented the missing items for the information literacy variable (Newman, 2014). All analysis was done using IBM SPSS Statistics (Version 27), and the significance level, $\alpha$, was set at 0.05.

Using G*Power 3.1.9.7 software, a sample size of 52 was needed for multiple linear regression with eight predictors and an effect size measured by Cohen's $f^2$ of 0.35 with an alpha level of 0.05 and power of 80%.

## RESULTS

A total of 178 responded that they are not affiliated with an academic institution. After removing incomplete responses, a total of 72 participants were included in the analysis.

Table 1 shows the demographics of the participants. The mean age of the participants was 39.6 ($SD = 9.5$), with most being female physicians (41/67, 61.2%). There were heterogeneous representations from all the countries, where most respondents practiced in Iraq (31.8%), Lebanon (25.8%) and Saudi Arabia (12.5%). The physicians had an average of 9.8 ($SD = 9.7$) years of practice, practice in a city (65, 95.5%) and taking care of an average of 79.0 ($SD = 82.5$) patients per week. Almost three-quarters of the participants (53/72, 73.6%) received formal training in EBM during their residency training. Almost two-thirds (44/72, 61.1%) attended a course or workshop on EBM.

The participants looked for digital clinical information at the point of care on average 14.0 times ($SD = 34.4$) times per week with a median of 5.0 [min = 0, max = 270], resulting in 0.1 questions per patient. Table 2 describes the digital information practice of the surveyed family physicians. Only 42.6% of the participants rated their ability to find the information required to answer the clinical questions as very good; the rest considered it good (38.6%) or average (18.6%). The majority (80.3%) searched for digital clinical information at the point of care using a mobile phone, owned one or more mobile apps for information retrieval (80.0%) and always/often had access to the internet (78.9%). On average, they owned a 3.2 mobile application ($SD = 3.0$) irrespective of whether it was subscribed or free with a median of 2 [min = 1, max = 20].

Table 3 shows the characteristics of information retrieval at point of care regarding the types of information they looked for and the information resources they used. Clinical information about medication dosage and side effects was the most sought clinical question, and

**TABLE 3** Types and sources of digital information at point of care of survey family physicians ($N = 72$)

| | *Always/often* | | Sometimes | | Rarely/never | |
|---|---|---|---|---|---|---|
| | ***n*** | **Percentage** | ***n*** | **Percentage** | ***n*** | **Percentage** |
| *Type of clinical question* | | | | | | |
| Making diagnosis/workup plan | 28 | 39.4 | 34 | 47.9 | 9 | 12.7 |
| Making a clinical decision about treatment | 29 | 40.8 | 35 | 49.3 | 7 | 9.9 |
| Medication dosage/side effect | 46 | 64.8 | 19 | 26.8 | 6 | 8.5 |
| Patient education | 20 | 28.2 | 34 | 47.9 | 17 | 23.9 |
| *Type of information resource* | | | | | | |
| Textbooks | 18 | 25.4 | 13 | 18.3 | 40 | 56.3 |
| Clinical practice guidelines | 49 | 79.0 | 16 | 22.9 | 5 | 7.1 |
| Online databases like Medline or Pubmed | 42 | 59.2 | 18 | 25.4 | 11 | 15.5 |
| Subscribed online databases like Uptodate, Dynamed, Clinical Key | 43 | 60.6 | 15 | 12.1 | 13 | 18.3 |
| Medical websites (e.g., Medscape) | 56 | 78.9 | 8 | 11.3 | 7 | 9.9 |
| General databases (e.g., Google) | 32 | 45.1 | 23 | 32.4 | 16 | 22.5 |
| Medical apps like Epocrates, Medical calculator | 19 | 26.8 | 22 | 31.0 | 30 | 42.3 |
| Peers/colleagues | 8 | 11.4 | 40 | 57.1 | 22 | 31.4 |
| Pharmaceutical representatives | 3 | 4.2 | 10 | 14.1 | 58 | 81.7 |

*Note*: Missing values exist.

**TABLE 4** Effectiveness and efficiency of information retrieval at point of care of survey family physicians

| | *Always* | | *Often* | | *Sometimes* | | *Rarely* | |
|---|---|---|---|---|---|---|---|---|
| | ***n*** | **%** | ***n*** | **%** | ***n*** | **%** | ***n*** | **%** |
| I find relevant information | 27 | 37.5 | 40 | 55.6 | 5 | 6.9 | | |
| I find useful information | 28 | 38.9 | 41 | 56.9 | 3 | 4.2 | | |
| I find reliable, unbiased information | 14 | 19.4 | 42 | 58.3 | 16 | 22.2 | | |
| It is easy to find the information | 15 | 20.8 | 40 | 55.6 | 17 | 23.6 | | |
| I find the information in less than 5 min | 19 | 26.4 | 31 | 43.1 | 20 | 27.8 | 2 | 2.8 |
| I find the information in less than 2 min | 5 | 6.0.9 | 24 | 33.3 | 31 | 43.1 | 12 | 16.7 |
| I am confident about the information that I find | 18 | 25.0 | 43 | 59.7 | 10 | 13.9 | 1 | 1.4 |

*Note*: $N = 72$.

patient education was the least. The participants used various online information resources, with textbooks, peers, and medical pharmaceuticals being the least used. Participants were asked to list the top three digital information resources they consult most often at the point of care. The following were most reported: Medscape ($n = 41$), Uptodate ($n = 30$), Google/Google Scholar ($n = 21$), American Academy of Family Physicians (AAFP) ($n = 21$) and Pubmed ($n = 11$).

In general, almost half of the participants considered that they often found relevant (40/67, 55.6%), useful (41/72, 56.9%) and unbiased (42/72, 58.3%) information (see Table 4). A small portion (12/72, 16.7%) were rarely able to find the information in less than 2 min as compared with none were rarely able to find the information in less than 5 min. Almost two-thirds (42/72, 59.7%) were often confident about the information found.

## Predictors of digital information retrieval

Multiple linear regression was conducted to examine to what extent does age, sex, internet access, access to mobile apps with subscriptions, information and computer literacy predicted digital practice of information retrieval at point of care in eight Arab countries in the Eastern Mediterranean region. A non-significant regression equation was found ($F\,[8, 49] = 0.767$, $p = 0.633$, $R^2 = 0.111$). None of the seven

variables were significant predictors of digital information retrieval at point of care; $p$ was >0.05 for the respective coefficients of the predictors.

## DISCUSSION

It is essential to understand the characteristics and predictors of community physicians in developing countries due to unique barriers such as internet access and the cost of resources. Most physicians rated their ability to find the information as good or very good and were often confident that they found the required information. There was no significant prediction of digital information retrieval practice among community family physicians at the point of care by sex, age, internet access, subscribed apps, previous EMB training, information and computer literacy.

In this study, community physicians in eight Arab countries did not often look for digital information at point care. They looked for information around 0.1 questions per patient, below what is reported in the literature, where physicians may pose 0.4–0.8 questions per patient (Daei et al., 2020). Physicians' common barriers include time, internet access and access to non-free databases (Altemani & Altemani, 2018; Hisham et al., 2018; Worku et al., 2019), which may be more pronounced in rural settings with more patient load and consequent lack of time (Hisham et al., 2018; Worku et al., 2019). This could partly explain the low use of information retrieval behaviour of community family physicians in this study. They were primarily located in the city, and the majority of the physicians used a mobile phone to access the information, owned a mobile app and always/often had access to the internet. However, other reasons reported in related studies may also explain the low adoption of information retrieval at the point of care. For example, Curran et al. (2019) reported a concern among physicians about being unprofessional. Shaarani et al. (2019) found that in Lebanon, 40% of patients reported that they would be bothered by a physician who uses digital devices to retrieve information at the point of care. Another possible explanation could be the lack of training in point-of-care search strategies. Allen et al. (2017) found that family physicians expressed their need to practice EBM with real-time bedside searches when asked for a one-day EBM workshop. Further research has reported that critical appraisal (Step 3 in the evidence-based practice) was the most frequently taught skill, and there was less focus on teaching search strategies and information retrieval skills (Albarqouni et al., 2018; Horntvedt et al., 2018).

### Limitations of the study

One of the strengths of this study is that it targeted community family physicians in eight Arab countries. Nevertheless, there are three limitations. The first limitation is the small sample size. A larger sample size may have detected a significantly weaker effect. Physicians may have suffered from burnout at the current COVID pandemic and thus were not enthusiastic about participating, thus lowering the number of respondents. Another explanation could be their lack of interest in the topic, especially since the study's findings showed low use of information retrieval at the point of care. The second limitation is the convenience sample that threatens external validity and limits the generalizability of the results to other physicians and other developing countries, especially that the sample was mainly in cities and was not homogenous among the countries.

## IMPLICATIONS FOR PRACTICE

The resources used were similar to those reported in the literature (Brassil et al., 2017), such as online databases (Medscape, UptoDate and PubMed), internet search and guidelines. The most common resources used were free except for UpToDate. Future curricula should include dedicated content on information retrieval using non-subscription databases such as Google Scholar and Pubmed and the use of free medical apps that could help in their information needs at the point of care. Although community physicians in this study used mobile applications and online databases for information retrieval at the point of care. Their self-reported effectiveness of conducting searches and finding relevant information was moderate, with less than half were able to frequently find the information efficiently within 2 min. Therefore, continued medical education should target more training in information retrieval skills and practice and the industry work on better design and efficiency of point-of-care resources.

It is also worth exploring the reasons of the low implementation of information retrieval at point of care in Arab countries, for example using qualitative studies or clinical vignettes.

## CONCLUSIONS

Community physicians in Arab countries have low adoption of information retrieval at point of care despite their access to digital resources and the internet. The scientific body must focus on community

physicians' needs and explore the barriers to information retrieval behaviours. The academic body must focus more on information search strategies at the point of care in the curricula.

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