Drug Information Resources Used by Chain Community Pharmacists in Tennessee

Journal of Pharmacy Technology
2016, Vol. 32(5) 185–190
© The Author(s) 2016
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/8755122516653611
pharmatech.sagepub.com

Nancy L. Borja-Hart, PharmD, BCPS¹, and Bethany G. Leachman¹

Abstract

Background: Community pharmacists are a highly utilized drug information resource for patients and health care providers. Good retrieval skills and the availability of credible references are key to providing necessary information. **Objective:** This study aimed to identify the types of drug information resources used by chain community pharmacists in Tennessee. **Methods:** A phone survey was conducted by a trained pharmacy student to 39 pharmacists working at chain community pharmacies. Demographic questions, types of drug information resources available, Internet availability, smartphone applications (apps) used, and most common drug information questions received were identified. **Results:** Electronic tertiary drug resources were used by the majority of pharmacists, with the top 2 resources being Clinical Pharmacology and Facts and Comparisons. Seventy-four percent of pharmacists surveyed used smartphone apps to access information more quickly. Few pharmacists stated access to primary literature, while 4 pharmacists cited using the secondary resource PubMed. The 2 most commonly asked questions were concerning adverse drug reactions and side effects. **Conclusions:** Electronic drug information resources are widely available and utilized. In order to comply with all of the demands that a pharmacist comes across, these resources need to be very familiar and easy to operate from an efficiency stand-point.

Keywords

drug information, community pharmacists, electronic resources, Tennessee

Introduction

Traditionally, pharmacists in the community setting process prescriptions; monitor drug, disease, and food interactions; compound medications as needed; provide medical advice; and counsel patients on their medication use.¹ Sleath et al identified that pharmacists employed at community pharmacies are more accessible health care providers than physicians.² This convenience allows patients to interact with a pharmacist regularly and ask drug-related questions. The ability to provide drug information appropriately requires the combination of didactic teaching from pharmacy school curriculum along with the skill of using these tools regularly.

Being confident in one's ability to know where to look for the best drug and medical information is key in providing quality information to patients.³ With the expansion of the Internet and smartphone applications (apps), medical sites and free apps have become the basis for patient misconstruction of drug-related information and should be addressed.^{4,5} Pharmacists are important professionals, along with physicians, to inhibit this false spread of information, and they counsel patients on the correct way to utilize various Internet sites and smartphone apps and to encourage conversation between health care professionals and patients.

Although printed references still exist, electronic resources, in the form of databases or Internet resources, have been the mainstay of medical information for health care providers.^{6,7} Bates notes in his review article of the use of information technology in health care that the entire body of medical knowledge doubles every 2 years, and thus advocates for computer-based drug information resources to the forefront of the health care field for their value in enhancing safety and improving patient outcomes.⁸ A survey questionnaire conducted by Carvajal et al showed that 70% of pharmacists, in both hospital and community settings, responded that the drug information resource most frequently used in their pharmacy was electronic.⁹ This finding supported the commonly held platitude that, since technology is rapidly advancing and electronic resources offer timely and readily accessible information, they are increasingly being substituted for print resources.⁸ Electronic resources expedite

¹University of Tennessee Health Science Center, Nashville, TN, USA

Corresponding Author:

Nancy L. Borja-Hart, University of Tennessee Health Science Center, College of Pharmacy, Department of Clinical Pharmacy, 193 Polk Avenue, Suite 2D, Nashville, TN 37210, USA.
Email: nhart9@uthsc.edu

Table 1. Phone Survey Tool.

Domain	Questions (?)	Probe
Demographics	Age Gender Highest degree Years practicing pharmacy Current position and years held	PharmD or BPharm?
Training	Where did you graduate from Are you an APPE/IPPE preceptor Did you receive formal training on the DI resources available from your employer	If so, which school?
Available resources	Primary (eg, clinical trials, poster abstracts) Secondary (eg, indexing sources [PubMed]) Tertiary (eg, Epocrates, Micromedex) Do you have Internet and/ or Intranet access at work? Do you use your smartphone to access apps at work?	Electronic or print Electronic or print Electronic or print Which apps?
DI questions	What are the most common DI questions you receive?	Adverse drug reactions Side effects Compatibility and stability Dietary supplements Dosing Indications Other

Abbreviations: APPE, Advanced Pharmacy Practice Experience; IPPE, Introductory Pharmacy Practice Experience; DI, drug information.

information gathering and decision-making, which can improve patient care.

The drug information resources used within community pharmacies in Tennessee are unknown at this time. Legal requirements do exist regarding the necessity of these references.¹⁰ According to the Tennessee Board of Pharmacy,

Each pharmacy practice site shall maintain an adequate reference library (printed or electronic) consistent with its scope of practice. The reference library shall include a current edition of the Tennessee Pharmacy Laws issued by the Tennessee Board of Pharmacy and may include current material regarding the technical, clinical, and professional components of the practice of pharmacy, with particular emphasis in the area in which the pharmacy specializes.¹¹

Overall, this initiative toward providing quality drug information has many contingent factors to consider and explore. These could include, but are not limited to, (1) implementing necessary changes in the curriculum and standards for Advanced Pharmacy Practice Experience (APPE) community pharmacy rotations to learn about properly researching patient questions within the time restraints of a retail pharmacy setting; (2) endeavoring community pharmacy employers to offer training modules and courses for new-hire pharmacists to learn which credible, evidence-based resources are available to them and how to navigate through each of the sites; (3) and providing patients with the

necessary skill set and framework to distinguish between accurate and inaccurate drug information.

Objectives

This study aims to determine what databases or other resources pharmacists use in chain community pharmacies across the state of Tennessee.

Methodology

All licensed chain community pharmacies within the state of Tennessee that were listed on the Tennessee Department of Health website were eligible for this study. By definition, a chain community pharmacy consists of 4 or more stores.¹² There are 13 chain community pharmacy companies in the state of Tennessee. Three stores of each chain were chosen at random to participate. If a pharmacist did not want to answer the survey, another pharmacy within that company was randomly selected to represent the chain. A trained research student contacted the pharmacies and administered the survey in October and November of 2015. The phone survey instrument (Table 1) included demographic information, information on resources used (electronic, print, or apps), and gathered the type of questions these pharmacists commonly received. The second column of the instrument lists probe questions the student would use if the pharmacist did not understand what was being

Table 2. Chain Community Pharmacies Surveyed and Most Cited Pharmacy Resources.

Pharmacy #	Pharmacy Type	Most Cited Tertiary Resource
1	Stand-alone	Clinical pharmacology
2	Wholesaler	Clinical pharmacology
3	Mass merchandiser	Clinical pharmacology
4	Supermarket	Facts and comparisons
5	Supermarket	Facts and comparisons
6	Mass merchandiser	Facts and comparisons
7	Supermarket	Facts and comparisons
8	Supermarket	Clinical pharmacology
9	Stand-alone	Clinical pharmacology
10	Wholesaler	Facts and comparisons
11	Mass merchandiser	Facts and comparisons and Pharmacist's letter
12	Stand-alone	Clinical pharmacology and Facts and comparisons
13	Mass merchandiser	Facts and comparisons

asked. Pharmacists were told that the survey would take about 5 minutes of their time.

The instrument was limited to chain pharmacies since the authors assumed they were more likely to pay for these fee-based references. Also, by choosing chain pharmacies a statewide representation was more likely. This project was institutional review board exempt due to the minimal risk posed to the pharmacists surveyed. Informed consent was obtained from each participant. Descriptive statistics were analyzed using Microsoft Excel 2013.

Results

Table 2 lists chain community pharmacies surveyed and the most cited tertiary pharmacy references. A total of 13 chain pharmacy companies were targeted: 3 stand-alone (traditional chain stores), 4 supermarket (pharmacies located within a supermarket), 4 mass-merchandiser (pharmacies located within a massive retail store), and 2 warehouse club (pharmacies located within a warehouse club) companies. Since 3 stores of each chain were chosen, a total of 39 pharmacists participated in the study.

Demographics

Table 3 lists demographic information for the 39 survey responders. The average age was 42 years, and the majority (62%) were females. The average number of years of practicing pharmacy was 16 years.

Training

Pharmacists were trained from a variety of pharmacy programs, and 2 were from international programs. Six pharmacists served as pharmacy school preceptors. One mass merchandiser pharmacy was the only community chain

Table 3. Demographic Data for Pharmacists Surveyed (N = 39).

Age (mean)	42 years
Gender	Males = 15 Females = 24
Highest degree	BPharm = 9 pharmacists PharmD = 30 pharmacists
Years practicing pharmacy (mean)	16 years
Current position/years held (mean)	PIC = 15 pharmacists Assistant PIC = 2 pharmacists Staff pharmacist = 15 pharmacists Floater pharmacist = 7 pharmacists 6.75 years

Abbreviation: PIC, pharmacist in charge.

where all 3 pharmacists answered that training was offered to them at the start of their careers with the company. Another mass merchandiser pharmacy and one stand-alone pharmacy were the only companies where all 3 pharmacists surveyed answered that training was not offered to them at the start of employment. All other companies gave a mixture of answers to this question.

Available Resources

Two pharmacists stated that they have access to primary literature references, and only 4 pharmacists acknowledged access to a secondary resource. This is an odd finding since secondary references connect to primary literature. The 2 most utilized tertiary resources were Facts and Comparisons (67%) and Clinical Pharmacology (49%). Approximately 54% of the pharmacists surveyed had Internet access on their work computers, while the other 46% had access to

Table 4. Commonly Used Apps.

App Used	Number of Pharmacists
CDC Vaccine	2
Chain Pharmacy App	1
Clinical Pharmacology	1
Epocrates	12
Google	3
Lexicomp	10
Medical Spanish	1
Medline Plus	1
Medscape	3
Micromedex	3
Pharmacist's Letter	3
Shots	2
WebMD	2

Table 5. Commonly Asked Questions.

Drug Information Question	Number of Pharmacists
Adverse drug reactions	26
Dosing	10
Formulary	1
Herbals	2
Infectious disease	3
Indications	2
New medications	2
Over the counter	11
Pregnancy	2
Side effects	25
Supplements	6
Vaccines	2

intranet within their respective companies. Table 4 lists apps used by the surveyed pharmacists. The 2 most utilized drug information smartphone apps were Epocrates (31%) and Lexicomp (26%). A large number of pharmacists surveyed replied that they did not use their smartphone to access apps while at work (34%). The majority of pharmacies have electronic resources available. Only one pharmacy stated they have The Pharmacist's Letter in print, and one pharmacy stated they have Facts and Comparisons in print.

Drug Information Questions

Table 5 lists commonly asked questions. Pharmacists reported that the 2 most often asked questions received in the community setting are adverse drug reactions and side effects.

Discussion

Electronic resources have made drug information access simple and are widely available. Our results support the publication by Carvajal et al, who found that electronic resources are being utilized more often than print resources within pharmacy practice.⁹ The Tennessee Board of Pharmacy has allowed that electronic resources satisfy the mandates of Tennessee Law as long as each pharmacy research category listed on the regulation is represented, acknowledging the need for timely and easily accessible information.¹² Overall, electronic resources present a more efficient means for pharmacists to look up information in contrast to print (textbook-type) sources as they are updated often, can be easily navigated, and are easily distributed through a chain pharmacy's network, so it is not surprising that 94% of the pharmacists surveyed stated the utilization of solely electronic resources. The most commonly used electronic tertiary resource overall was Facts and Comparisons, and in a similar study conducted in Louisiana community pharmacies nearly 2 decades ago, it was the most popular desk textbook reference at that time.¹³

Regardless of the tertiary resource used, it is expected that all pharmacists treat drug information-based databases with the same level of care and expertise, and pass this education on to student pharmacists as well as patients. The Internet is a vast well of information, but it must be interpreted carefully. Iwanowicz et al identified 4 criteria to assist in contemplating the validity of any form of medical or drug-related information: authorship (Is the author credible?), attribution (Are the references cited credible?), disclosure (Are there any conflicts of interest or bias?), and currency (Is this information the most up to date?).³ This progression of questions is necessary for patients to receive the correct information while inside or outside of the pharmacy. And more importantly student pharmacists, especially those in APPE community pharmacy settings, should be expected to practice evidence-based pharmacy research when appropriate through evaluating primary literature.¹⁴

Ease and efficiency has also brought smartphone applications to the forefront of pharmacy practice, as 72% of pharmacists stated that they utilized their smartphone pharmacy applications along with other electronic resources in the pharmacy. For the 11 pharmacists who did not use their smartphone at work, one of the main reasons cited was that the pharmacy manager or store manager did not allow usage of phones while in the pharmacy. It can be expected that over time, more pharmacists all around the world will opt for the quick handheld pharmacy app. Davies et al found that many pharmacists not only use their smartphones in practice, but that they are confident that using them will support health care education.¹⁵ As apps gain more and

more novelty while maintaining their integrity as up-to-date and accurate information, perhaps with proper training and continuing education offered, pharmacists will be required to use these devices in the workplace.

Although most pharmacists in the study stated that they do not have primary literature resources, they must not realize that secondary literature connects them to primary literature, insinuating a general lack of knowledge about the differences between resources. Even though most pharmacists opt for more immediate tertiary resources, randomized control trial data and other primary literature data should not be ruled out. The use of primary literature through searching secondary resources should be acknowledged to community pharmacists as another viable option to obtain information.

The pharmacists that answered affirmative to their respective company providing formal training on the drug information resources available to them responded that the training was in the form of a module. It is unknown whether this module was hands-on, including pharmacist interaction with the material in the form of small quizzes during the time or mostly in the form of a listing of information. Pharmacists were asked if they were preceptors for schools of pharmacy since these programs usually offer library access as part of their incentive package.

Limitations

Since conversations were completed by phone, we are not able to prove what actual resources pharmacies have. Pharmacists were asked if they received training by their company, many could not recall their initial training especially if they have been at the company for a while. This study only surveyed chain community pharmacies in Tennessee, which limits generalizability across the nation. Ideally, all community chain pharmacy programs nationwide would have been surveyed to see available references. Also, the short survey time frame limited pharmacist responses. The survey instrument was kept to a minimum knowing that community pharmacists tend to have limited availability during the work day.

Conclusions

In all, electronic drug information resources are an invaluable resource to all pharmacists in the community setting and in other pharmacy practice settings (hospital, ambulatory care, etc). In order to comply with all of the demands that a pharmacist comes across, these resources need to be very familiar and easy to operate from an efficiency standpoint. Chain community pharmacy management should not assume that all pharmacists have the necessary training on drug information resources or the skills to use these

resources in the community setting. A training module should be supplied to all new-hire pharmacists to better prepare pharmacists for their career and to solidify their skills of looking up information when required as more new and upcoming medications are getting approved by the Food and Drug Administration daily. Smartphone applications are on the rise within pharmacy practice, and it is only estimated to increase exponentially when company policy relinquishes the right to use smartphones in the pharmacy and as pharmacists learn more about the applications available.

Acknowledgments

The authors thank Dr James Wheeler, BCPS, for his careful review of this article.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Both authors work in chain community pharmacies on an as needed basis.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

1. World Health Organization. The role of the pharmacist in the health care system: 4.2—Community pharmacy. <http://apps.who.int/medicinedocs/en/d/Jh2995e/1.6.2.html#Jh2995e.1.6.2>. Published 1994. Accessed January 19, 2016.
2. Sleath B, Wurst K, Lowery T. Drug information resources and antidepressant adherence. *Community Ment Health J*. 2003;39:359-368.
3. Iwanowicz S, Maciniak M, Zeolla M. Obtaining and providing health information in community pharmacy setting. *Am J Pharm Educ*. 2006;70(3):57.
4. Silberg WM, Lundberg GD, Musacchio RA. Assessing, controlling, and assuring the quality of medical information on the Internet: Caveant lector et viewor—let the reader and viewer beware. *JAMA*. 1997;277:1244-1245.
5. Cortez NG, Cohen IG, Kesselheim AS. FDA regulation of mobile health technologies. *N Engl J Med*. 2014;371:372-379.
6. Parekh N, Mayer J, Rojowsky N. Connecting with physicians online: searching for answers. <http://www.vidqt.com/sb/Jd0WF9nP4LA?lang=en>. Published November 2009. Accessed September 23, 2015.
7. Peterson-Clark G, Aslani P, Williams KA. Pharmacists' online information literacy: an assessment of their use of Internet-based medicines information. *Health Info Libr J*. 2010;27:208-216.
8. Bates DW. The quality case for information technology in healthcare. *BMC Med Inform Decis Mak*. 2002;2:7.

9. Carvajal MJ, Clauson KA, Gershman J, Polen HH. Associations of gender and age groups on the knowledge and use of drug information resources by American pharmacists. *Pharm Pract (Granada)*. 2013;11(2): 71-80.
10. Clauson KA, Fass JA, Seamon MJ. Legal requirements for drug information resources maintained by pharmacies. *Drug Inf J*. 2008;42:569-582.
11. Rules of the Tennessee Board of Pharmacy. Chapter 1140-03—Standards of Practice. <http://share.tn.gov/sos/rules/1140/1140-03.20090207.pdf>. Published February 2009. Accessed September 23, 2015.
12. Chain community pharmacy. http://www.pharmacist.com/sites/default/files/files/Profile_06%20Chain%20pharmacy%20Final%20071713.pdf. Accessed December 4, 2015.
13. Rae CE, Rappaport HM, Mahajan P. Drug information sources used by community pharmacists in Louisiana: a preliminary study. *J Pharm Technol*. 1992;8:30-35.
14. Lauderdale SA, Kendrach MG, Freeman MK. Preparing students for community pharmacy practice during a drug information advanced practice experience. *Am J Pharm Educ*. 2007;71(2):25.
15. Davies MJ, Collings M, Fletcher W, Mujtaba H. Pharmacy apps: a new frontier on the digital landscape? *Pharm Pract (Granada)*. 2014;12:453.