

## An Evaluation of Information Sources Regarding Drug Use and/or Poisoning Cases of Community Pharmacists in Ankara, Turkey

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### ABSTRACT

**Objective:** Exploring and categorizing the drug and/or poisoning information resources available in community pharmacies in Ankara according to some variables, and revealing common opinions regarding the future of the profession and information resources.

**Materials and Methods:** This study was conducted as an online questionnaire for community pharmacists in Ankara. It had four headings on the pharmacists' demographics, their general information resources, specific resources in specific topics, and 4 suggestions regarding the future of pharmacy and drug information resources.

**Results:** The number of participants was 134 as 17.9% of 746 e-mail addresses. Mean ages  $\pm$  standard deviation were  $40.9 \pm 12.0$  years. The top 3 information sources on poisonings were the internet, colleagues, and physicians with 74.6%, 43.3%, and 30.6%, respectively. Participants in the "colleagues" group in terms of poisoning preferences had a shorter period after graduation ( $p=0.001$ ). In the drug information inquiries package inserts, internet and colleagues were preferred mostly, with 69.4%, 63.4%, and 35.8%, respectively. Age groups and graduation years were statistically different regarding the "package inserts" and "colleagues" groups ( $p=0.012$  and  $p=0.001$ , and  $p=0.019$  and  $p<0.001$ , respectively). The most "totally agreed" suggestion was accepting the pharmacies' being important drug and/or poison information resources for consumers with 68.7%.

**Conclusion:** The pharmacists have been fulfilling their duty of "being an information resource" through rather limited resources. To equip community pharmacists properly, authorities, professional institutions, and universities need to contribute to the process in different ways together with pharmacists being aware of their responsibilities.

**Keywords:** Drug information, poison information, community pharmacy, internet, package insert

## INTRODUCTION

A continuing increase in scientific and technological developments has introduced thousands of drugs and potent dosage forms that have given a wide range of therapeutic choices for prescribers. In the late 1960s and early 1970s, with the advancements in information technology and the invention of modern equipment, the pharmacy profession also gained huge steps besides all other professions. The dramatic change in the philosophy of pharmacy services, gave way for pharmacists to go out of the compounding and dispensing areas closed in pharmacy departments into the wards and clinics of hospitals together with community pharmacy settings. The appearance of pharmacists in clinics facilitated them to take part as team members to prove their competencies and serve as an interface between the clinician and patient with aiming to contribute to rational drug use [1].

Community pharmacies are the easily attainable and cheapest health-related points for people seeking medical advice, and for health care providers asking for information about drugs and poisoning [2]. Nonetheless, fulfilling this responsibility by a given pharmacist is not an easy task, since it necessitates a "management skill". The main aim of this service is not to know the answers for all queries, but to provide qualified, unbiased, reliable, and current information using a comprehensible language through the most proper resources [3]. Pharmacists, especially in developing countries, to overcome this struggle, should adapt their capacities to contemporary and evolving roles. In Turkey, pharmacists have achieved their profession traditionally in hospitals and community pharmacies as small-scale manufacturers of simple formulations in their limited laboratories and dispensers of drug products for many years. Upon regulations of pharmacies and pharmacists' tasks in 1999, providing clinically useful drug information (DI) in both community and hospital pharmacies has been burdened as one of the obligations of pharmacists [4].

The objectives of this study are, firstly to explore and categorize the drug and/or poison information resources available, including usage frequencies of the community pharmacists in Ankara according to some variables. Secondly, to reveal, if any, the common opinions regarding the future of the profession and information resources.

## MATERIALS and METHODS

This study was conducted as a descriptive, online questionnaire, and data was collected between March-April 2015. A self-administered questionnaire was generated by one of the researchers of the study and was pretested and validated by a panel of ten-pharmacist. The completion of the questionnaire was estimated to take 15-20 minutes. Upon finalizing with minor revisions, the questionnaires were distributed by the Ankara Chamber of Pharmacists through a link inserted in e-mails accompanied by a cover letter explaining the purpose of the study. The study population included all community pharmacists on the mailing list of the Ankara Chamber of Pharmacists (The number of community pharmacies in Ankara was 2075 in 2015). However, although there were 1850 e-mail addresses on the mailing list, only 746 (40.3%) of them were attainable. The pharmacists were asked to complete and return the questionnaires within two weeks. The mailing activity was repeated once more in the same conditions after two weeks following the first e-mail process.

This study was approved by the Hacettepe University Non-Clinical Trials Ethics Committee (GO: 15/144). When the given pharmacist voluntarily accepted filling in the questionnaire at the bottom of the cover letter of the questionnaire, it was accepted that he/she approved to participate in the survey anonymously.

The questionnaire consisted of 23 items in 4 headings of multiple-choice and open-ended questions designed to collect demographic information, general information regarding information resources, specific resources in specific topics, and four suggestions regarding the future of pharmacy and DI resources. Since in some of the queries, there were multiple answers for the participants to choose from; the total percentages were not always 100%. The sources that were questioned in the study were chosen according to the personal experiences of the researchers and published information [5]. In the second heading, respondents were asked to give the names of the books and journals for drug and/or poisoning information available in the pharmacy in an open-ended question, and to prioritize the most frequently used institutions and sources in the handling of DI queries. The topics that were intended as DI queries

were adverse effects, indications, dosage and route, contraindications, interactions with other drugs/herbal products/foods, pregnancy and lactation, availability, equivalency with foreign products, stability, intravenous compatibility, and storage conditions.

In DI queries and poisoning cases related sources were listed and in every source, three main examples were asked to be given as open-ended questions. In the third heading, participants were asked to select the frequency of the abovementioned information sources separately related to drug use and poisonings according to the following scale: 1- In every query, 2- In some queries, 3- Rarely, or 4- Never used.

In the fourth heading, a four-suggestion/statement Likert scale was conducted and asked select the proper option, like 1- Completely agreed (four points), 2- Partly agreed (three points), 3- Not fairly agreed (two points), or 4- Never agreed (one point). The suggestions are as follows: A) Community pharmacists are important information resources in answering consumers' drug and/or poisoning-related queries. B) I believe that I provide proper consultancy in drug-related situations and lead my patients accordingly regarding poisonings in my pharmacy setting. C) No need for any printed material other than internet access in drug-related consultancy and/or poisoning cases in community pharmacies. D) Drug and/or Poison Control Centers (PCCs) will be ranked in the first three worksites of future pharmacy practice.

IBM Statistical Package for the Social Sciences for Windows 21.0 (IBM Corp., Armonk, N.Y., USA) was used for the analysis of data. Percentage, average and standard deviation, median, and minimum-maximum were used for the descriptive data. The Chi-square or Fisher Exact tests were used to compare categorical variables and the Student-t, Mann-Whitney U tests were used to compare continuous variables, where appropriate.  $p < 0.05$  was considered as statistically significant.

## RESULTS

A total of 134 community pharmacists participated in the study. In this study, the response rate to the survey questionnaire was 17.9% (134 participants from 750 e-mails). The mean years  $\pm$  standard

deviation (SD) after graduation from faculty was  $18.0 \pm 12.2$  years. Almost half of the pharmacists evaluated their computer literacy level as "good" or above. While most of the participants (84.2%) stated that they knew the English language, 5.3% of the respondents informed that they knew more than one foreign language. To the question about the language of their mostly applied for the sources in answering the queries regarding drug and/or poisoning information 62.7% of participants expressed that they used only Turkish sources (Table 1).

The frequencies of referring to the institutions of community pharmacists were "never" for the Library of the Turkish Pharmacists Association (84.3%), university libraries (80.6%), Ankara Chamber of Pharmacists (78.1%), and drug manufacturers (56.7%). The frequencies of referring to institutions are listed in Table 2.

The most mentioned resource was the "internet" both in poison and drug information inquiries with 74.6% and 63.4%, respectively. The general distribution of the sources to provide information related to drug use and poisoning cases is given in Table 3.

More than half (55.2%) of the pharmacists informed that their consumers had asked them for advice in poisoning cases. The top three of the accused agents in those cases were listed as drugs (86.5%), household products (58.1%), and caustics and/or corrosives (16.2%). Respondents stated that the first 3 information sources in poisoning cases were the internet, colleagues, and physicians with 74.6%, 43.3%, and 30.6%, respectively. The ratios of the top 3 resources that referred to "in every query" were the internet with 36.2%, colleagues with 8.4%, and physicians with 3.1%.

When the years after graduation were evaluated separately, the internet was found ranked first in all year groups and reached the highest percentage in the  $\geq 26$  years group (80.7%). In the  $\leq 15$  years group, "consulting colleagues" was the highest and in the  $\geq 26$  years group, the "physicians" choice was higher than the other groups. There was a statistically significant difference in the length of time after graduation in the "consulting to colleagues" group ( $p = 0.001$ ). There was not a statistically significant difference between the groups in the preferred resources regarding academic degrees. The

**Table 1.** Demographics of Participants (n=134), %

Age, mean±SD		40.9 ± 12.0
Years after graduation from pharmacy school, mean±SD		18.0 ± 12.2
Gender, %	Female	50.0
	Male	50.0
Academic degree, %	BSc/MP	87.2
	MSc	12.0
	PhD	0.8
	None	82.1
Areas of specialties, %	Pharmacy management	2.2
	Pharmaceutical toxicology	2.2
	Clinical pharmacy	2.2
	Others	11.3
Computer literacy level, %	Very good	18.0
	Good	38.3
	Intermediate-little	42.0
	None	1.7
Foreign language level, %	Very good	6.7
	Good	21.6
	Intermediate-little	63.1
	None	8.6

**Table 2.** The frequency of the institutions applied in poisonings and drug usage (n=134), (%)

Institution	Once a week	Monthly	A few times in a year	Never
Ankara Chamber of Pharmacists	1.5	2.2	16.4	78.1
Drug manufacturers	-	7.5	35.1	56.7
Turkish Pharmacists Association	0.7	4.5	9.7	84.3
University libraries	0.7	2.2	15.7	80.6

**Table 3.** Information Sources for Poisoning Cases and Drug Usage (n=134), n (%)

Source	Poisoning	Drug usage
Digital media	15 (11.2)	22 (16.4)
Representatives of drug manufacturers	N/A	24 (17.9)
Physician	41 (30.6)	29 (21.6)
HIZBIB*	34 (25.4)	19 (14.2)
Related books/Journals	39 (29.1)	45 (33.6)
Internet	100 (74.6)	85 (63.4)
Courses/Conferences/Seminars	6 (4.5)	12 (9.0)
Colleague	58 (43.3)	48 (35.8)
Package inserts	N/A	93 (69.4)
UZEM**	35 (26.1)	N/A

\*Hacettepe Drug and Poison Information Unit

\*\*National Poison Information Center

N/A: Not assigned

distribution of the preferences of the top 3 sources in queries in poisoning cases according to academic degrees and the distribution of the preference sorting of the top 3 sources in the queries related to

poisoning cases according to time after graduation is shown in Table 4.

When the graduation years were evaluated separately according to the choices of drug usage

**Table 4.** Preferences in Poisonings According to Years after Graduation from Faculty of Pharmacy and Academic Degrees, n (%)

Sources	Preferences in Poisonings According To...							
	Years after Graduation from Faculty of Pharmacy				Academic Degrees			
	≤15 years (n=60)	16-25 years (n=36)	≥26 years (n=33)	p value	BSc/MP (n=116)	MSc (n=16)	PhD (n=1)*	p value
Internet	47 (78.3)	26 (72.2)	25 (69.4)	0.684	87 (75.0)	13 (81.3)	-	0.760
Colleague	35 (58.3)	14 (38.9)	6 (16.7)	0.001	45 (38.8)	10 (62.5)	1 (100.0)	0.125
Physician	19 (31.7)	10 (27.8)	11 (30.6)	0.795	33 (28.5)	2 (12.5)	-	0.235

\*This column was not taken into consideration in comparisons

**Table 5.** Preferences in Drug Usage Enquiries According to Years after Graduation from Faculty of Pharmacy and Academic Degrees, n (%)

Sources	Preferences in Drug Usage Enquiries According To...							
	Years after Graduation from Faculty of Pharmacy				Academic Degrees			
	≤15 years (n=60)	16-25 years (n=36)	≥26 years (n=33)	p value	BSc/MP (n=116)	MSc (n=16)	PhD (n=1)*	p value
Package inserts	37 (61.7)	22 (61.1)	29 (87.9)	0.019	80 (69.0)	12 (75.0)	1 (100.0)	0.775
Internet	42 (70.0)	21 (58.3)	17 (51.5)	0.185	72 (62.1)	13 (81.3)	-	0.221
Colleague	31 (51.2)	12 (33.3)	2 (6.1)	<0.001	39 (33.6)	6 (37.5)	-	0.980

\*This column was not taken into consideration in comparisons

inquiries, it was seen that "package inserts" were preferred mostly in the  $\geq 26$  years group (87.9%), the internet was preferred mostly (70.0%) and colleagues were consulted mainly (51.2%) by the pharmacists who had graduated  $\leq 15$  years ago. There was a statistically significant difference in the length of time in the "reading of package inserts" group and "consulting with colleagues" group ( $p=0.019$  and  $p<0.001$ , respectively). The distribution of the preference ranking of the top 3 sources in the DI queries according to time after graduation is shown in Table 5.

The highest percentage (68.7%) of "totally agreed" between suggestions was "A-Community pharmacies are important information resources in answering the consumers' drug and/or poisoning

related queries". Nonetheless, it was seen that the highest ratio (35.9%) of "Never agreed" between suggestions was: C-"No need for any printed material except internet access in drug-related consultancy or poisoning cases in community pharmacies". There was a statistically significant difference in the A and C suggestions regarding age groups ( $\leq 45$  vs  $>46$  years,  $p=0.034$  and  $p=0.047$ , respectively) (Table 6).

## DISCUSSION

Providing proper and adequate pharmaceutical and toxicological counseling to consumers, together with monitoring and providing care for their health, is one of the most helpful roles of

**Table 6.** The suggestions about community pharmacies and pharmacists, median (Inter Quartile Range)

Suggestions	According to age groups			According to academic degrees		
	Ages $\leq 45$	Ages $\geq 46$	p value	BSc/MP	MSc	p value
Suggestion A	4	4	0.034	4	4	0.574
	(3,8-4,0)	(3,0-4,0)		(3,0-4,0)	(3,0-4,0)	
Suggestion B	3	3	0.553	3	3	0.688
	(3,0-4,0)	(3,0-4,0)		(3,0-4,0)	(3,0-4,0)	
Suggestion C	2	2	0.047	2	2	0.407
	(1,0-2,0)	(1,0-3,0)		(1,0-3,0)	(1,0-2,0)	
Suggestion D	3	3	0.900	3	3	0.930
	(3,0-4,0)	(3,0-4,0)		(3,0-4,0)	(3,0-4,0)	

community pharmacists [6]. It was shown that the provision of acceptable DI to consumers being in an ideal position leads to increase luminary of a given community pharmacy besides enhancing satisfaction through medication management of consumers [7]. In the studies from various countries, it was noted that generally similar types of drug-related inquiries of consumers were referred to community pharmacists, such as adverse effects, drug and food interactions, other treatment choices including nonmedicinal ones, indications, and basic instructions and duration of treatment [8, 9]. Therefore, the key point for a community pharmacist to be a trustworthy, up-to-date, and user-friendly "information source" for people. Providing efficient information through the most qualified resources for inquiries can reduce the possibility of medication errors, and contribute to rational drug use [10].

Internet was the most consulted information source for poison. The following sources were colleagues and physicians with 43.3% and 30.6%, respectively. There were not any statistically significant differences regarding gender, compatible with Wazaify's study [11]. When the choices of references were evaluated in another study according to genders, it was found that females were dominant in retrieving DI from textbooks, the internet, and DI centers [12]. However, the smaller sample size than this study, and male dominance in the number of respondents in the most of other studies, may have affected those results.

Although the preferences according to age groups as an intragroup were not changed regarding poisoning inquiries, the  $\geq 56$  years group was the most prominent with 89.5% in favor of the internet. Since there was not a statistically significant difference between the groups, this result deserves to be viewed more closely. The reason for this surprising datum could be grounded from two causes. Firstly, since the size of the sample was small, namely 31 participants, the results did not represent the whole population; and secondly, since more reliable and updated sources in the pharmacy setting were not available, those participants may have considered an easier and more private method of referring to the internet than other choices. When the age groups were compared according to the options, the results were as anticipated, namely, the  $\leq 35$  years group

ranked first in internet usage as being the most computer literate group as well.

When the preferences regarding the sources in drug-related queries were distributed according to age groups as an intragroup it was found that package inserts were referred mostly by the youngest and oldest participants, while the internet was preferred by ages from 36 to 55 years. The list of the age groups according to options showed that statistically significant differences in terms of the "package inserts" and "consulting with colleagues" groups, namely "package inserts" were scored mostly by ages  $\geq 56$  and "consulting with colleagues" were selected by ages  $\leq 35$  years. In Udezi's and Wazaify's studies, which were the only ones compared for the age groups, age did not have any influence on the choice of references [11, 13].

The analysis of the top three choices in answering the poison queries according to academic degrees did not have a statistically significant difference between the respondents who had no academic degree other than an MP/BSc and the pharmacists who had MSc degree, both choosing the internet as a source. Nevertheless, since the majority (86.6%) of the participants were composed of pharmacists with an MP/BSc degree in this study, the situation could be considered as a limitation in terms of evaluating this item accurately. On the other hand, academic degrees did not have any impact on the choice of the source in DI inquiries, namely both the MP/BSc and MSc groups ranked package inserts first, and internet and colleagues followed it. Any information regarding if there was any influence of academic degrees on the choice of references was not available in the literature review. Nonetheless, the BSc ratios in other studies were reported as 44.0% [14], 56.6% [12], and 97.3% [15]. In Gelayee's study, the percentage of pharmacists with an MSc degree was reported as 2.1% [12]. The discrepancies with other studies were considered as the results of the selection criteria of participants and the legislation of pharmacy schools regarding graduation.

Package inserts were preferred mostly in the  $\geq 26$  years group (87.9%), the internet was preferred mostly (70.0%) and colleagues were consulted mainly (51.2%) by the pharmacists who graduated  $\leq 15$  years ago, and these consequences were statistically significant about the length of time

( $p=0.019$ ). Similar to this survey, in Gelayee's study, experienced participants preferred drug package inserts more than the less experienced ones. Other dominant choices in the same group were reported as national treatment guidelines [12]. Al Tabakha showed that DI sources as a course or as a topic were not among the references of older graduates [16].

One of the interesting results of the present study is that although the majority of the participants (84.2%) indicated that they knew English, they stated that almost 63% of them preferred to refer to sources solely in Turkish in answering inquiries. This implied that the sources in their native language were the primary resource. However, if the information sought had not been found or was inadequate in those sources, the respondents did not report whether they went to English sources as the second step or finished searching. Knowing a foreign language provides a great contribution in fulfilling this function in countries like Turkey if the official language is other than English, or other global languages. It seemed that the language barrier might have hardened to attain the relevant information as quickly as needed. In some other studies also, this problem was emphasized [17, 18].

In the present study, 56.3% of the participants indicated their computer literacy level as "good" and "very good". In studying the relationship between computer literacy level and the time after graduation, it was found that the ratio of higher levels of computer literacy decreased in the >21 years after graduation group ( $p=0.005$ ). This could be the consequence of the tendency of education-related computer use through formal education or private efforts of the younger generations.

When the institution referrals in answering the inquiries were listed, only the pharmaceutical manufacturers and representatives become prominent (56.7%) as "mostly preferred to consult" as compared to other institutions including pharmaceutical societies and university libraries. This finding was supported by the comparisons of the most referred DI resources section. From this result, it could be inferred that the representatives who make contact frequently with the pharmacist, could bridge between the pharmacy and the company easily. Therefore, the pharmacists could have saved time without additional effort in attaining relevant information. The logic of

this choice is explained as if those reliable and independent resources were unavailable, outdated, or unreachable for a given pharmacist, he/she was obliged to take advice from representatives of pharmaceutical companies or colleagues by Zehnder [14]. Nonetheless, the reliability, accuracy, currency, and objectivity can be highly questionable under these circumstances regarding information obtained through commercial sources despite the presumption that the commercial information can be more current than that of outdated printed materials [19]. There are some related results in the literature exceeding the percentage that was obtained in the present study or dropping back [11, 19-21]. Other institutions referred were addressed in only Hennigen's study [22], where 52.3% of the pharmacists accessed the homepages of professional bodies. In the present study, on the other hand, the percentages of consulting "at least a few times a year" of the Turkish Pharmaceutical Association, Ankara Chamber of Pharmacists, or university libraries were 14.9%, 20.1%, and 18.6%, respectively.

One of the most referred 3 DI resources were package inserts with a high preference (69.4%) in this report. In general, package inserts were used "in every query" almost by half of the participants. In other studies, only Diobi's study exceeded this rate with 98.4%, while in Gelayee's and Al Tabakha's studies disagreeing with 39% and 13.9%, respectively [12, 16, 23]. Although those sources are always available in the pharmacy setting, the currency, appropriateness, and responsiveness are controversial since some changes might have been realized during the elapsed time from releasing to the market and the given time to reach the pharmacy [24]. Therefore, there is a risk that the pharmacist might have misdirected the consumer. Instead, the recent online websites containing the information in the package inserts in Turkish can fill in the deficiency of the printed forms by including the most recent approved information. On the other hand, as a compilation of FDA-approved package inserts Physicians' Desk Reference®, can also be accepted in this class. The reference ratio in this study was 0.7%. The preferences were in decreasing percentages from 44.2 to 2.0 in other studies [5, 11, 25-28].

Although the internet is accepted as a comprehensive source where one can rapidly

attain the latest health information, which enables it to contribute to ameliorating healthcare, it is under the user's responsibility to search critically and scientifically and make the best choice through an abundance of websites. Seeking and evaluating a scientific issue through websites needs prior knowledge and training about the techniques and related professional websites according to accepted criteria and quality labels such as the Health on the Net Foundation Code of Conduct (HONcode) [24] or the Utilization Review Accreditation Commission (URAC) [26]. Without any pre-education about website usage at least double-checking the information obtained through various websites should be recommended and some addresses should be publicized by the professional societies or local authorities that would be of help for community pharmacists in answering poisoning or drug-related queries they encountered.

In DI queries 35.8% and in poisoning queries 43.3% of respondents specified "colleagues" as one of the top three references in the present study. This finding suggested that there were more information sources attainable in DI inquiries despite poisoning cases. Therefore, consulting colleagues were more feasible for the pharmacists who did not have specific sources in poisoning cases. In other studies, higher percentages were encountered from 94% to 37% [12, 21, 25, 28]. The rank of "colleagues" between all references was found as  $1.29 \pm 0.77$  in Udezi's study [13].

As one of the other drug or poison information resources, DI centers or PCCs in the present study were underutilized. The ratios for two different PCCs (UZEM and HIZBIB) were almost  $\frac{1}{4}$  of the participants, while for DI center (HIZBIB) was only used by 14.2%. The usage of institutions in this survey supported this outcome, namely UZEM and HIZBIB were "never" consulted by more than half of the respondents. This worrisome result could be attributed to inadequate publicity of those specific resources. Gelayee et al. reported that DI centers were "never" consulted by 70.8% of the respondents [12]. Some of the results of foreign studies were compatible with outcomes for DI centers from 14.8% to 29.2% [12, 23] however higher preferences were also pronounced by Hennigen and Chan [22, 25]. In Rae's study, DI centers were in the 6th rank [5]. The popularity of PCCs was less than DI centers in another study [22]. The authors drew attention

to develop and activate them through promotions [5, 25].

A Likert scale was performed in a 4-item suggestion list, to see whether the participants agree or not. The highest positive ratio (68%) was regarding accepting community pharmacies as information resources for consumers (Suggestion A). The most (36%) "Never agreed" suggestion, on the other hand, was regarding needing no source but the internet at the community pharmacy setting (Suggestion C); while the "totally agreed" answer was almost 7% for this suggestion. Nevertheless in Zehnder's study, the percentage for a suggestion almost reminiscent of ("A-The focus of community pharmacy transforms more and more from products to patients as it is becoming an information center") was only 4% [17]. More than  $\frac{1}{3}$  of respondents of the present study "totally agreed" with suggestion C ("I believe that I provide proper consultancy in drug-related situations and lead accordingly my patients in poisonings in my pharmacy setting"). Those participants might have been apt in using drug or poisoning information resources more efficiently. On the other hand, since this survey was conducted through self-administered questionnaires, working conditions could not be observed.

When a comparison was performed between age groups and the suggestions, significant differences were found. For suggestion A, the younger group agreed more than the older respondents. This was considered that older participants were more accustomed to working in an old way. However, for suggestion C older pharmacists agreed more than the younger ones. This might have been derived from a concern about the future. The comparison of A and C suggestions with academic degrees and computer literacy levels did not show any statistically significant difference between the groups. Any other study related to these suggestions was not encountered.

There are several noteworthy limitations in this study. Firstly the population was rather small, so the outcomes cannot be generalized and the respondents cannot be considered as the representatives of all community pharmacists. Ankara is the capital city of Turkey, so a larger scaled survey including the pharmacies in less facilitated regions is under consideration at the moment. Some answers could be exaggerated by the respondents because of social desirability



bias. In the questionnaire the general manner was investigated, so recalling the problem of the participants could have influenced the results. Internet use as a drug or poison information reference by the respondents might have been overestimated due to the electronic form of the survey because the participants would already be more technologically well informed.

In conclusion, although electronic sources have been used by most of the participants, relevant websites being distinguished from the "information garbage" using scientific criteria seems questionable. Although it is a valuable opportunity to have internet connections throughout the community pharmacy settings in Ankara, the knowledge on how to use it scientifically seems

to be the main difficulty at the moment. To equip community pharmacists in the best manner, regularly updated national hard copy and online references containing accurate, unbiased, and reliable drug and poisoning information along with organizing continuing education courses must be implemented by official authorities, including ministries and related bodies, professional institutions and universities. Additionally, drug information centers or PCCs should promote their activities through professional meetings, individual services, and training during formal education.

## CONFLICT of INTEREST STATEMENT

Authors declare no conflicts of interest.

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