Knowledge of the Use of Herbal Medicines among Community Pharmacists and Reporting Their Adverse Drug Reactions

Mehak Tahir1, Dinesh Kumar Upadhyay1, Muhammad Zahid Iqbal2, Sawri Rajan2, Muhammad Shahid Iqbal3, Ahmed A. Albassam3

1Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmacy, AIMST University, Bedong, Kedah, Malaysia, 2Head of Family Medicine, Faculty of Medicine, AIMST University, Bedong, Kedah, Malaysia, 3Department of Clinical Pharmacy, College of Pharmacy, Prince Sattam bin Abdulaziz University, Al-kharj, Saudi Arabia

INTRODUCTION

Herbal medicines are intended to be used for medicinal and therapeutic purposes.[1] People have a strong belief in the healing power of natural herbs since ancient times, thus they have been practicing the use of herbs to treat or prevent diseases.[2] The World Health Organization reported that 80% of the total population of Africa uses traditional medicines for primary treatment of ailments. Similarly, in China,

INTRODUCTION

Community pharmacist’s knowledge about the uses of herbal medicines and its adverse drug reactions reporting can contribute in better therapeutic outcomes and patient safety. Objectives: To evaluate community pharmacists’ knowledge about the use of herbal medicines and its adverse drug reactions reporting in Kedah state, Malaysia. Methods: A cross-sectional, questionnaire-based study was conducted among 103 pharmacists from 74 different community pharmacies to assess their knowledge about the use of herbal medicines and its adverse drug reaction reporting by using a pre-validate knowledge questionnaire consisting of 12 questions related to it. The pharmacists’ responses were measured at a 3-point Likert scale (Poor=1, Moderate=2, and Good=3) and data was entered in SPSS version 22. The minimum and maximum possible scores for knowledge questionnaires were 12 and 36 respectively. Quantitative data was analyzed by using One Way ANOVA and Paired t-test whereas Chi-square and Fisher exact test were used for qualitative data analysis. A p-value of less than 0.05 was considered statistically significant for all the analyses. Results: About 92% of the pharmacist had good knowledge regarding the use of herbal medicines and its adverse drug reaction reporting with a mean knowledge score of 32.88±3.16. One-way ANOVA determined a significant difference of employment setting (p<0.043) and years of experience (<0.008) with mean knowledge scores of Pharmacists. Pharmacists’ knowledge was significantly associated with their years of experience with the Chi-square test. Conclusion: Pharmacists exhibit good knowledge regarding the use of herbal medicines and its adverse drug reaction reporting. However, with an increasing trend of herbal medicine use and its adverse drug reaction reporting it recalls the empowerment of experienced pharmacists with training programs in this area for better clinical outcomes.

KEYWORDS: Adverse drug reactions, herbal medicine, knowledge, pharmacists

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Address for correspondence: Dr. Muhammad Shahid Iqbal, Department of Clinical Pharmacy, College of Pharmacy, Prince Sattam Bin Abdulaziz University, Al-Kharj 11942, Riyadh, Saudi Arabia. E-mail: drmmsiqbal@gmail.com

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30–50% of the total therapeutic consumptions belongs to traditional herbal medicines. Additionally, in several industrialized countries, the use of herbal products is rapidly progressing over time.[3]

According to the global industrial analyst, the market of herbal medicines was more than US$107 billion by the year 2017 and is growing steadily because of an increasing number of consumers. For example, among the German population, there is a 90% use of natural remedies in their lifestyle and daily routine. Similarly, in the United States, herbal medicine has remarkably gained popularity in recent years. One national survey reported that due to an extensive use of herbal medicines in the United States, it has become a second most common method of alternative therapy in terms of treating illness of various disorders by one-quarter of the adult population.[4,5]

In the case of Malaysia, the use of herbal medicine is incredibly increasing. It is estimated that during the past few years (2013–2019) in Malaysia, the annual sale of herbal medicines has been rapidly increased from RM10 billion (US$2.44 billion) in 2008 to RM32 billion (US$7.8 billion) by 2020.[6] The majority of the Malaysian population use herbal medicines for treating their primary illnesses without even consulting with the doctor or pharmacist, based on their strong beliefs and personal experiences.[7,8] Currently, herbal medicines are prepared as over-the-counter drugs and in different pharmaceutical dosage forms such as syrups, capsules, and extracts.[1] Commonly available herbal dosage forms include decoctions, teas, tinctures, glycerites, oxymels, soaps, tablets, capsules, creams, and ointments.[9,10]

It has been well observed that patients consider herbal medicines are safer than conventional medicines.[11] This misconception is very common among patients who are hesitant to discuss the matter with their doctors or pharmacists. They ignore the fact that there is a great variation in the concentration of active ingredients within the raw plants and their species.[12] However, globally, there are some untested or unapproved drugs available in the market as herbal medicines, thus leading to adverse drug reactions (ADRs).[13] Medicines have been known to produce a preferred therapeutic outcome but also have the likelihood of causing unwanted adverse effects. According to the WHO, ADR is an unnecessary, unintended effect of any medicine that occurs during clinical use of the drug. ADRs affect the quality of life of a patient and considered as the leading cause of morbidity and mortality worldwide.[14]

In a healthcare system, the pharmacist is considered as the last member of the healthcare team who dispenses the medicine(s) and also responsible for the safety of the patients.[15] Herbal medicine is mostly received by the patient from the pharmacist.[16] It could be on-demand and in adjunct with other medicines. The pharmacist must know the interactions between allopathic medicines and herbal medicines, contraindication of a drug during the use of another drug, adverse reaction of herbal medicines, and its contraindication in certain medical conditions.[17] It is the moral duty of pharmacists to provide care and safety to patients taking medicines.

Because of the large and growing use of naturally derived substances all over the world, the assessment of community pharmacists’ knowledge about the use of herbal medicines and its adverse reactions is much needed. Therefore, the present study has been conducted to assess the community pharmacists’ knowledge about the use of herbal medicines and its ADRs reported in Kedah, Malaysia where none of the studies has been focused on this aspect.

**Materials and Methods**

**Study design, location, and time frame**
A cross-sectional, questionnaire-based study was conducted among 103 community pharmacists working at 74 community pharmacies to evaluate their knowledge about the use of herbal medicines and its ADRs reported in Kedah, Malaysia. Data were collected for 3 months (March 2018–May 2018).

**Study population, sample size, sampling technique, and ethical approval**
The current study was conducted among pharmacists practicing at different community pharmacies in Kedah. The study intended to recruit all pharmacists practicing at community pharmacies. The sample size for the present study was calculated based on the number of community pharmacies outlets available in the state of Kedah by using modified Cochran formula for sample size calculation at 95% confidence level, 5% margin of error, and response distribution of 50%. The final targeted sample size of the present study was 74 pharmacies located in Kedah, Malaysia.

\[
n = \frac{n_0}{1 + (n_0 - 1)/N}
\]

where \(n_0 = (Z^2 \times pq/e^2)\), \(e\) is the desired level of precision (i.e., the margin of error 0.05), \(p\) is the proportion of the population, \(q\) is \(1 - p\), and \(N\) is the population size. Ethical approval was obtained from the AIMST University Human Ethics Committee (Ref No: AUHEC/FOP/2018/33) to conduct the study.
Consent from study participants
The consent form was prepared and distributed to the study population by the researcher and written permission was obtained from them before participating in this study. The participants of this study were assured about the confidentiality of their personal data and identity throughout the research.

Inclusion and exclusion criteria
Registered pharmacists working at community pharmacies located in various districts of Kedah were included in this study. However, hospital pharmacists, provisional registered pharmacists, and pharmacists who have provided the incomplete survey forms were excluded from the study.

Formulation of knowledge questionnaire about the use of herbal medicines and its ADRs
The study was conducted by using a prevalidated and well-structured questionnaire to evaluate the knowledge of pharmacists regarding the use of herbal medicine and its ADRs reported. An extensive literature review was conducted targeting the area of research interest, and key areas were identified to formulate the questionnaire related to the use of herbal medicines and its ADRs reported by pharmacists[18,19]. The structured questionnaire was then validated by the experts in the field of clinical research and herbal medicines. Mostly questions were related to indications, side effects, contraindication, and reporting of ADR of herbal medicines. A total of 12 questions were formulated for evaluating the knowledge of pharmacists about the use of herbal medicines and its ADRs.

Scoring of knowledge questions
Questions related to knowledge were measured on a three-point Likert scale and further classified based on Bloom’s cutoff point criteria into poor, moderate, and good knowledge. Score 01 was given to poor knowledge, 02 was given to moderate knowledge, and 03 was given to good knowledge. The minimum and maximum scores in the knowledge domain were 12 and 36, respectively.

Validation of knowledge questionnaire
The face and content validity of the questionnaire was performed by different healthcare professionals and experts from the medical center and specialist center of International Medical University, Kuala Lumpur, Malaysia and academic clinical pharmacists of Faculty of Pharmacy, AIMST University. A pilot study was conducted among 10 community pharmacists from different pharmacies to identify the questions suitability and its better understanding of the participants. The data obtained from the pilot study were entered into SPSS is Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. in the United States and Cronbach α value was determined to check the questionnaire reliability. The Cronbach α value for the knowledge questionnaire was 0.703.

Data collection and statistical analysis
A prevalidated questionnaire was distributed to the pharmacists practicing at community pharmacies.

| Table 1: Demographic information of the pharmacists |
|---------------------------------------------------|
| Demographic variables | Category | n (%) |
| Gender | Male | 44 (42.7) |
| | Female | 59 (57.3) |
| Ethnicity | Malay | 35 (34) |
| | Chinese | 52 (50.5) |
| | Indian | 15 (14.6) |
| | Others | 1 (1.0) |
| Age group | 20–25 | 38 (36.9) |
| | 26–30 | 26 (25.2) |
| | 31–35 | 11 (10.7) |
| | >36 | 28 (27.2) |
| Religion | Islam | 32 (31.1) |
| | Buddhism | 20 (19.4) |
| | Hinduism | 6 (5.8) |
| | Christians | 35 (34.0) |
| | Others | 10 (9.7) |
| Marital status | Unmarried | 67 (65) |
| | Married | 32 (31.1) |
| | Divorced | 4 (3.9) |
| Educational level | Bachelor of Pharmacy | 90 (87.4) |
| | Master | 13 (12.6) |
| Employment status of pharmacist | Owner | 28 (27.2) |
| | Employee | 75 (72.8) |
| Employment setting | Independent | 86 (83.5) |
| | Chain | 13 (12.6) |
| | Franchise | 4 (3.9) |
| Years of experience as community pharmacists | 1–5 years | 91 (88.3) |
| | 6–10 years | 7 (6.8) |
| | 10–15 years | 2 (1.9) |
| | >15 years | 3 (2.9) |
| Types of job | Part time | 16 (15.5) |
| | Full time | 87 (84.5) |
| Percentage of herbal products available in the pharmacy? | <10% | 3 (2.9) |
| | 10–20% | 62 (60.2) |
| | 21–30% | 14 (13.6) |
| | 31–40% | 11 (10.7) |
| | >40% | 13 (12.6) |
| Number of pharmacists working in the pharmacy | 1 | 50 (48.5) |
| | 2 | 45 (43.7) |
| | 3 | 8 (7.8) |
| Location of pharmacy | Urban | 86 (83.5) |
| | Suburban | 14 (13.6) |
| | Rural | 3 (2.9) |

(N=103)
in Kedah, Malaysia and their responses were taken on the spot in order to avoid response biasness. Data obtained from the respondents were entered into SPSS version 22, and descriptive analysis was performed to determine the frequency, percentages, mean, and standard deviation of quantitative data. The data distribution pattern was determined on the basis of the assumptions to find whether the data were normally distributed. In case of normally distributed data, parametric tests, such as independent t-test and one-way analysis of variance (ANOVA) test, were used, whereas not normally distributed data were analyzed using nonparametric tests such as χ² test and Fisher’s exact test. A P value of less than 0.05 was considered to be statistically significant for all the analyses.

Table 2: Comparison of overall pharmacists' knowledge with their demographic variables

| Demographic Variables                      | Category          | Poor n (%) | Moderate n (%) | Good n (%) | P*     |
|-------------------------------------------|-------------------|------------|----------------|------------|--------|
| Gender                                    | Male              | -          | 3 (6.8)        | 41 (93.2)  | 0.686  |
|                                           | Female            | 1 (1.7)    | 4 (6.8)        | 54 (91.5)  |        |
| Ethnicity                                 | Malay             | -          | 3 (8.6)        | 32 (91.4)  |        |
|                                           | Chinese           | 1 (1.9)    | 2 (3.8)        | 49 (94.2)  | 0.821  |
|                                           | Indian            | -          | 2 (13.3)       | 13 (86.7)  |        |
|                                           | Others            | -          | -              | 1 (100)    |        |
| Age group                                 | 20–25             | -          | 1 (2.6)        | 37 (97.4)  |        |
|                                           | 26–30             | -          | 3 (11.5)       | 23 (88.5)  | 0.293  |
|                                           | 31–35             | -          | 2 (18.2)       | 9 (81.8)   |        |
|                                           | >36               | 1 (3.6)    | 1 (3.6)        | 26 (92.9)  |        |
| Religion                                  | Islam             | -          | 2 (6.2)        | 30 (93.8)  |        |
|                                           | Buddhism          | 1 (2.9)    | 3 (8.6)        | 31 (88.6)  | 0.885  |
|                                           | Hinduism          | -          | 2 (10)         | 18 (90)    |        |
|                                           | Christians        | -          | -              | 6 (100)    |        |
|                                           | Others            | -          | -              | 10 (100)   |        |
| Marital status                            | Unmarried         | -          | 4 (6)          | 63 (94)    |        |
|                                           | Married           | 1 (3.1)    | 2 (6.2)        | 29 (90.6)  | 0.353  |
|                                           | Divorced          | -          | 1 (25)         | 3 (75)     |        |
| Educational level                         | Bachelor of Pharmacy | 1 (1.1)    | 6 (6.7)        | 83 (92.2)  | 0.922  |
|                                           | Master            | -          | 1 (7.7)        | 12 (92.3)  |        |
| Employment status of pharmacist           | Owner             | 1 (3.6)    | 3 (10.7)       | 24 (85.7)  | 0.155  |
|                                           | Employee          | -          | 4 (5.3)        | 71 (94.7)  |        |
| Employment setting                        | Independent       | 1 (1.2)    | 7 (8.1)        | 78 (90.7)  | 0.788  |
|                                           | Chain             | -          | -              | 13 (100)   |        |
|                                           | Franchise         | -          | -              | 4 (100)    |        |
| Years of experience as community          | 1–5 years         | -          | 5 (5.5)        | 86 (94.5)  |        |
| pharmacists                               | 6–10 years        | -          | 2 (28.6)       | 5 (71.4)   | <0.001*|
|                                           | >10 years         | 1 (33.3)   | -              | 2 (66.7)   |        |
| Employing pharmacist                       | Part time         | -          | 1 (6.2)        | 15 (93.8)  | 0.906  |
|                                           | Full time         | 1 (1.1)    | 6 (6.9)        | 80 (92)    |        |
| Percentage of herbal products available in| <10%              | -          | 1 (33.3)       | 2 (66.7)   |        |
| the pharmacy?                             | 10–20%            | 1 (1.6)    | 3 (4.8)        | 58 (93.5)  |        |
|                                           | 21–30%            | -          | 1 (7.1)        | 13 (92.9)  | 0.479  |
|                                           | 31–40%            | -          | 2 (18.2)       | 9 (81.8)   |        |
|                                           | >40%              | -          | -              | 13 (100)   |        |
| Number of pharmacists working in the      | 1                 | -          | 4 (8)          | 46 (92)    |        |
| pharmacy                                  | 2                 | 1 (2.2)    | 3 (6.7)        | 41 (91.1)  | 0.736  |
|                                           | 3                 | -          | -              | 8 (100)    |        |
| Location of pharmacy                      | Urban             | 1 (1.2)    | 7 (8.1)        | 78 (90.7)  | 0.788  |
|                                           | Sub Urban         | -          | -              | 14 (100)   |        |
|                                           | Rural             | -          | -              | 3 (100)    |        |

*χ²/Fisher’s exact test
All the statistically significant (<0.05) p-values were kept bold, to differentiate statistically significant values from non-significant p-values
(N=103)
RESULTS

Of 103 pharmacist participants, female (59 [57.3%]) participants were more in number than male (44 [42.7%]). The majority of them were in the age group of 20–25 years (38 [36.9%]) with a minimum education level of Bachelor of Pharmacy (90 [87.4%]). Most of the respondents were having a work experience of 1–5 years (91 [88.3%]) with a full-time job (87 [84.5%]). The majority of the community pharmacies (62 [60.2%]) had 10–20% of herbal products. Other demographic characteristics of the pharmacists have been mentioned in Table 1.

Comparison of overall pharmacists’ knowledge about the use of herbal medicines and its ADRs reported

Overall pharmacists’ knowledge was categorized based on Bloom’s cutoff point into poor, moderate, and good.

| Demographic variables | Category | n   | Mean ± SD | P*     |
|-----------------------|----------|-----|-----------|--------|
| Gender                | Male     | 44  | 32.56 ± 3.287 |        |
|                       | Female   | 59  | 33.11 ± 3.07  | 0.384  |
| Ethnicity             | Malay    | 35  | 32.85 ± 3.06  |        |
|                       | Chinese  | 52  | 33.28 ± 2.91  | 0.312  |
|                       | Indian   | 15  | 31.53 ± 4.06  |        |
|                       | Others   | 1   |            |        |
| Age group             | 20–25    | 38  | 33.18 ± 2.87  |        |
|                       | 26–30    | 26  | 32.46 ± 3.69  | 1.599  |
|                       | 31–35    | 11  | 31.18 ± 3.42  |        |
|                       | >36      | 28  | 33.53 ± 2.76  |        |
| Religion              | Islam    | 32  | 33.09 ± 2.92  |        |
|                       | Buddhism | 35  | 33.00 ± 3.19  | 0.922  |
|                       | Hinduism | 20  | 32.45 ± 3.91  |        |
|                       | Christians | 6 | 32.16 ± 2.63  |        |
|                       | Others   | 10  | 33.10 ± 2.88  |        |
| Marital status        | Unmarried| 67  | 33.16 ± 3.18  |        |
|                       | Married  | 32  | 32.59 ± 3.11  | 0.211  |
|                       | Divorced | 4   | 30.50 ± 2.51  |        |
| Educational level     | Bachelor of Pharmacy | 90 | 33.10 ± 2.95 |        |
|                       | Master   | 13  | 31.38 ± 4.19  | 0.066  |
|                       | Owner    | 28  | 32.57 ± 3.29  | 0.544  |
|                       | Employee | 75  | 33.00 ± 3.13  |        |
| Employment status of pharmacist | Independent | 86 | 33.12 ± 2.75 |        |
|                       | Chain    | 13  | 32.38 ± 2.75  | 0.043* |
|                       | Franchise | 4  | 29.25 ± 1.25  |        |
| Employment setting    | Independent | 86 | 33.12 ± 2.75 |        |
|                       | Chain    | 13  | 32.38 ± 2.75  | 0.043* |
|                       | Franchise | 4  | 29.25 ± 1.25  |        |
| Years of experience as community pharmacists | 1–5 years | 91 | 33.24 ± 3.04 |        |
|                       | 6–10 years | 7 | 30.57 ± 3.40 | 0.008* |
|                       | 10–15 years | 2 | 31.50 ± 0.70 |        |
|                       | >15 years  | 3   | 28.33 ± 0.57  |        |
| Types of job          | Part time | 16 | 33.56 ± 3.94  | 0.351  |
|                       | Full time | 87 | 32.75 ± 3.01  |        |
| Percentage of herbal products available in the pharmacy? | <10% | 3 | 32.33 ± 4.72 |        |
|                       | 10–20%   | 62  | 33.43 ± 3.14  |        |
|                       | 21–30%   | 14  | 31.92 ± 3.42  | 0.162  |
|                       | 31–40%   | 11  | 31.18 ± 2.96  |        |
|                       | >40%     | 13  | 32.84 ± 2.37  |        |
| Number of pharmacists working in the pharmacy | 1 | 50 | 33.20 ± 3.42 |        |
|                       | 2        | 45  | 32.33 ± 2.92  | 0.242  |
|                       | 3        | 8   | 34.00 ± 2.44  |        |
| Location of pharmacy  | Urban    | 86  | 33.02 ± 3.22  |        |
|                       | Suburban | 14  | 32.64 ± 2.70  | 0.252  |
|                       | Rural    | 3   | 30.00 ± 2.64  |        |

*One-way ANOVA/t-test was used to find the p-values of significant at <0.05 (two-tailed).
(N=103)
A significant difference was found between the years of experience of pharmacists and their knowledge about the use of herbal medicines and its ADRs reported [Table 2].

**Pharmacists’ knowledge mean scores about the use of herbal medicines and its ADRs reported**

Descriptive analysis was used to determine the pharmacists’ knowledge mean scores and standard deviation. One-way ANOVA test identified a significant difference in pharmacists’ knowledge scores with their employment setting and the years of experience as community pharmacists [Table 3].

**DISCUSSION**

In a healthcare system, a pharmacist is the first person accessible to patients during the dispensing of medicine.[13] Based on ethnicity, the current study showed a nonsignificant difference and the results from different ethnic groups were almost similar. Earlier performed studies in Asian countries have also exhibited the same results that no significant difference was found based on ethnicity.[1,18] Asian countries always showed great acceptance of using herbal medicines for their minor to major illnesses than the Western countries.[19,20] The current study showed that age does not affect pharmacists’ knowledge about the use of herbal medicines and their ADRs. The concepts of knowledge will remain the same in older ages as well. Studies conducted in the past are also indicative of the same results and found no significant difference based on the age group.[1,21]

The impact of religion has always been one of the most contrasting parameters to evaluate the knowledge of the participants.[22] In the current study, no significant difference was found in knowledge based on religion. In accordance with the current study, Muslims were found to be more knowledgeable about herbal and complementary medicines among the similar religious groups.[6] Educational background plays an important role in the estimation of knowledge of any population, and it is a well-known fact that an increase in educational level will bring a deeper knowledge; but unfortunately in the present study, no significant difference was found among respondents with the increase in their educational background. A similar study reported that pharmacists with previous continuing education were found to be more knowledgeable about herbal medicines.[17] There is a gap in postgraduate training of pharmacist in the field of herbal medicine which is supported by the study conducted in Southwest Nigeria, which reported that 72% of community pharmacists did not receive any postgraduate training about herbal medicine which proved that there is no impact of the increase in their educational level on their knowledge.[23] Due to an incredible increase in the use of herbal medicines, it is noted that there is a greater need for reliable resources and education training programs in this area. Years of working experience and knowledge of pharmacists related to herbal medicines were found significant in the present study. On the basis of years of experience, the current study highlighted that pharmacists with an increase in the years of experience 1–5 years (n = 86, 94.5%), 6–10 years (n = 5, 71.4%), 11–15 years (n = 2, 71.4%), and more than 15 years (n = 2, 66.7%) were having a corresponding increase in the knowledge. It seems pharmacists gain more exposure to herbal medicines over time. Previous studies conducted in different parts of the world also highlighted a significant association of years of experience with the knowledge, where knowledge increased with an increase in the years of working experience.[1,24,25] In contrast, a study conducted in northwest Ethiopia showed the opposite results where less experienced pharmacists were found to be more knowledgeable than the more experienced pharmacists.

The current study also evaluated the knowledge of pharmacists on the basis of the location of pharmacy in areas such as urban, suburban, and rural. No significant association was observed between the location of the pharmacy and the knowledge of pharmacists. Pharmacists working in rural areas were found to have more knowledge than those working in urban areas, and it is maybe due to the high use of herbal medicines in such areas. In accordance with the present study, other studies highlighted the use of herbal medicine in rural areas due to cultural factor that promotes the use of herbs because people living in rural areas have a strong belief in herbal medicines to cure their diseases.[20,27] A study conducted in India also supported the use of herbal medicines by the rural population due to the nonavailability of modern medicines in a vast section of the population. Also due to lack of staff, medical facilities, and inadequate supply of medicines, rural populations are mostly dependent on natural products.[11]

The present study demonstrated that herbal medicines are greatly used by the local population as well as by community pharmacists in Kedah, Malaysia. This describes an increasing trend of using herbal medicines by the community to treat their minor to major illnesses. However, due to this massive practice without proper evidence, negligence is being observed with the reporting of ADRs caused by herbal medicines. Most of the respondents assumed that herbal medicines are
safer to use and have less or no side effects. The majority of the pharmacists did not receive any additional training about the use of herbal medicines despite having an incredibly increasing amount of use by the community in Malaysia. Because herbal medicines are not properly regulated by the Drug Control Authority Malaysia, there is a great concern for its evaluation regarding quality, efficacy, and safety of using herbal medicines.  

The majority of the respondents in the present study claimed to have good knowledge about the use of herbal medicines and its ADRs and did not show any significant association between gender, age group, employment status, location of the pharmacy, and percentages of known herbal products available in the pharmacy. A significant difference was found only within the years of experience in the present study. Previous studies also showed similar results with years of experience and knowledge of pharmacists.

Conclusions

The present study identified the massive utilization of herbal medicines by community pharmacists in Malaysia and the established good knowledge about the use of herbal medicines and its ADRs reported. Thus, the findings of the present study concluded that pharmacists are responsible in providing optimal care and counseling to the patients who use herbal medicines as well as responsible for reporting ADRs caused by herbal products, and this can be achieved by the development of educational and training programs for practicing pharmacists paying attention to safety, efficacy, reporting, and rational use of herbal medicines.

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Conflict of interest

There are no conflicts of interest.

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