

Research Article

## Knowledge of Herbal Drugs Among Pharm D. Students in Karachi, Pakistan.

Yasin Hina<sup>1\*</sup>, Ghayas Sana<sup>1</sup>, Anjum Fakhsheena<sup>1</sup>, Jahan Noor<sup>1</sup>, Abrar Hina<sup>2</sup>, Masood Muhammad Ali<sup>1</sup>, Alam Ayesha<sup>1</sup>

<sup>1</sup>Faculty of Pharmaceutical Sciences, Dow College of Pharmacy, Dow University of Health Sciences, Karachi, Pakistan.

<sup>2</sup>Baqai Institute of Pharmaceutical Sciences, Baqai Medical University, Karachi, Pakistan.

Available online: 1<sup>st</sup> July, 2015

### Abstract

**Aim:** Herbal drugs are gaining popularity in disease management nowadays and the pharmacists being drug experts should have sound knowledge about them. The present study aims to determine the Pharm. D students' knowledge regarding herbal drugs.

**Methodology:** A questionnaire was distributed among the students of Pharm. D. in four different universities of Karachi, Pakistan. The questionnaire covered major contents about various herbal plants of medicinal value i.e. general descriptions, mode of action, storage and uses etc. The data was analyzed using SPSS version 16.0.

**Results:** Out of 400 questionnaires, 393 were returned after complete filling (response rate = 98.25%). There were 20% male and 80% female student, mean age of responding students were 21.7± 1.05 years. After checking the filled questionnaire the overall success rate of students was <50%. Regarding mode of action of the enquired herbal drugs only 37% students responded correctly; >40% correct results were obtained about their uses and general knowledge and about the extraction, isolation and purification of the herbal drugs. Less than 55% respondents had correct basic knowledge of the herbal drugs whereas 70% responses were correct about their storage.

**Conclusion:** The study reveals low level of knowledge of Pharm D. student regarding herbal drugs. The under graduate pharmacy students with continuing education on herbal medicines should be more knowledgeable about these products as their use is being increased in disease management nowadays. With the increasing use of herbal medications, there is an enormous need for pharmacy training programs.

**Key words:** Herbal drugs, knowledge assessment, Pharm. D students.

### INTRODUCTION

Plants are the primary need to mankind as quality food. They contain variety of components including vitamins, minerals, enzymes, and trace elements in natural balance and harmony. It is our sincere belief that our Creator put herbs on the earth to maintain and restore our health. We believe that herbs get to the cause of health problems, not just the symptoms. Herbs as whole or as part are required for maintaining the nutritional need for body. Most typically plants possess marked pharmacological activity consisting of plant metabolite termed as secondary metabolites. Primary metabolites are significant to the life of the plant containing enzymes and other proteins, lipids, carbohydrates and chlorophyll. In comparison to that, secondary metabolites do not appear to be necessary to sustain life at a fundamental biochemical level<sup>1</sup>.

The field of Pharmacognosy describes the phytochemistry of the natural products which are derived from plant. The application of Pharmacognosy frequently enhances knowledge about the pharmacology of medicinal plants<sup>2</sup>.<sup>3</sup> Trend of using traditional herbs as medicines is gradually increasing day by day and getting popularity throughout the developed and developing world just because of their

safety, effectiveness and minimum side effects<sup>4</sup>. Herbal medicines are referred to as final finished labeled medicinal product that contain active ingredients which may consist of aerial or underground parts of the plant or other plant material or combinations of any of them<sup>5,6</sup>.

Future research to estimate the medicinal value of herbs as effective therapeutic drug will be possible with the sincere collaboration with Natural product research<sup>7-9</sup>. It is estimated that only 5,000 plant species have been studied exhaustively for medical application out of the total of 250,000 to 300,000 species<sup>10</sup>. In addition to that, herbs also contain the highest concentration of micronutrients e.g Cu, Ni, Zn, Pb, Co and Fe which were found in *V. officinalis*, *H. perforatum* etc<sup>11</sup>. Consequently, phytotherapy and herbal medicinal constitute a source of new formulation and the social interest towards herbal medicine is broadening firmly<sup>12</sup>.

The practice of pharmacy is being forced towards the use of natural products. Studies display that pharmacists are intermittently investigated about natural products. Pharmacists abundantly suggest different products comprising of plant source to patients and/or members of the society. Unfortunately in Pakistan inadequate

Table: Knowledge regarding basic, mode of action and use of herbal drug

Basic knowledge about	Wrong answer	Correct answer	Don't know
The term Pharmacognosy	27.99%	58.52%	13.49%
Classification of crude drugs	41.22%	55.47%	3.31%
Mode of collection	63.87%	31.81%	4.33%
Evaluation of herbs	16.79%	80.15%	3.05%
Family of:			
<i>Atropa belladonna</i>	33.84%	61.32%	4.83%
<i>Digitalis purpureae</i>	41.73%	52.16%	5.60%
Precursor of:			
<i>Papaver somniferum</i>	55.47%	25.19%	18.83%
Constituents of:			
<i>Atropa belladonna</i>	84.73%	12.72%	2.54%
<i>Datura stramonium</i>	41.98%	50.13%	7.38%
Mode of action of:			
<i>Rauwolfia surpentina</i>	59.54%	30.53%	9.92%
<i>Claviceps purpureae</i> (ergotamine)	47.07%	39.44%	13.49%
<i>Digitalis purpureae</i>	44.53%	47.07%	8.14%
<i>Podophyllum peltatum</i>	47.33%	29.77%	22.65%
<i>Taxus baccata</i>	34.35%	31.04%	34.35%
<i>Datura stramonium</i>	49.11%	39.95%	10.69%
Use of :			
<i>Rauwolfia surpentina</i>	45.29%	42.49%	12.21%
Morphine	80.66%	17.05%	2.29%
Codeine	16.54%	80.92%	2.54%
<i>Claviceps purpureae</i>	29.01%	55.22%	15.78%
Vinblastine	46.06%	45.04%	8.91%
Etoposides	15.78%	63.87%	20.10%
<i>Taxus baccata</i>	50.13%	18.83%	30.79%

information is available on the subject and Pharmacists are required to have skillful training on that<sup>13-15</sup>. Students also feel that pharmacists have a responsibility to provide information on herbal supplements, but few feel to have adequate knowledge to provide that information<sup>16</sup>.

The use and sales of herbal medications have increased dramatically over the past several years. Pharmacists are in an ideal position to educate patients about herbal medicines. Pharmacists are increasingly identified as the most suitable health care professional to counsel consumers about natural health products by offering evidence-based information to ensure safe product selection<sup>17, 18</sup>.

The main purpose of this study is to analyze the knowledge regarding herbs, herbal drug and Pharmacognosy among the Pharm. D students. Herbal medicine was chosen as the topic of focus because as mentioned earlier, herbs are commonly being used and frequently identified as a key area where pharmacists' knowledge is lacking. Study also intends to address the existing potential of pharmacists to fill the role as information provider for patients who consume herbal products. In addition, the provided information from this study may be useful in the design of educational objectives and continuing education programs in pharmacy schools and also may serve as a pilot for a national survey<sup>19-25</sup>.

## METHODS

A multiple choice questionnaire was designed and distributed among the students of Pharm. D. in four

different universities of Karachi. The questionnaire covered contents regarding the herbal plant possessing medicinal value including the back ground knowledge and general description, mode of action, pharmacological activity etc. The study was conducted by the researchers in the year 2014 from September to November. The data was analyzed using SPSS 16.0 and the frequency distributions with percentage were obtained.

## RESULTS AND DISCUSSIONS

Out of 400, n=393 completed questionnaires were collected and the results showed that the overall success rate of the students was <50%. The mean age of the students was 21.7±1.05 years with 80% female students. More than 40% correct results were obtained regarding their basic knowledge and their uses (table) and about the extraction, isolation and purification of the drugs (figure 1). Only 37% students responded correctly regarding the mode of action of enquired herbal drugs (Table) whereas 70% responded correctly regarding herbal drug storage (figure 2).

According to a research study in 2008, more than 70% of the population took natural health products such as herbs, vitamins or homeopathic remedies<sup>26</sup>. Demand of herbal drug has been increasing because it is cheap and accessible and has shown minimal side effects. Many of them have been found to have major effect on the living organisms, various plants having curative properties in several diseases. Pharmacognostic studies are essential not only for the basic information about the plants but also for the

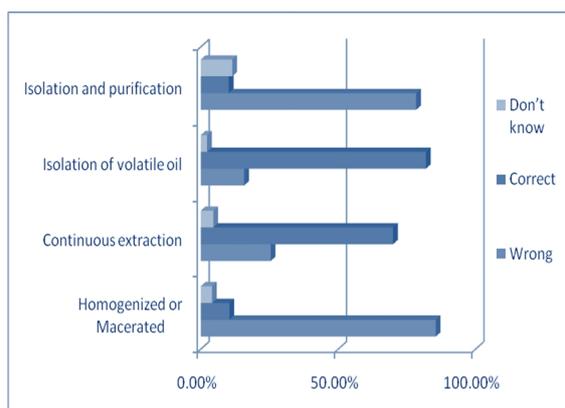


Figure 1: Knowledge regarding extraction, isolation and purification of herbal drugs

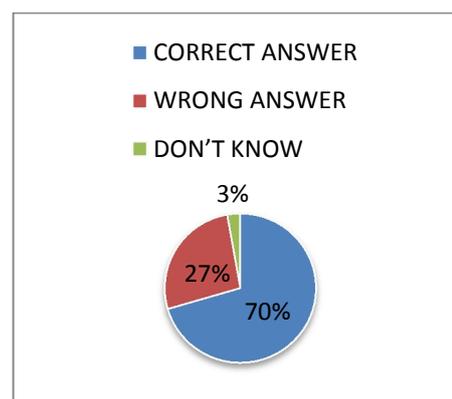


Figure 2: Knowledge regarding storage of herbal drug

quality and purity profile of the crude drugs<sup>27</sup>. Plants have been deliberated as main source for the development and discovery of pharmaceutical products<sup>28</sup>. The medicinally valuable herbal plants contain one or more active principles that show their effectiveness in the treatment of many ailments<sup>29</sup>.

In this survey based study, some questions were related to the basic knowledge of crude drugs as in the question: who introduced the term Pharmacognosy, is very basic and simple and most of the students answered it correctly. The question related to the classification and evaluation of herbs were responded correctly by most of the students (Table) but only about 32% students could reply about their mode of collection. Only one third of the students responded correctly regarding the mode of actions of enquired drugs (Table). It means that students must be further trained as the trend of using herbal drugs is increasing day by day<sup>30</sup>.

Regarding the use of some common herbal drugs, the knowledge of the students was just average (Table) although this is included in the curriculum of the Pharm. D. course. In addition to this, students were asked about general methods used for the extraction, isolation and purification of herbal drugs; most of the students answered this question correctly (figure 1). More than 70% students have sufficient knowledge related to the storage of crude drugs. A previous research revealed that the currently passed out Pharm. D graduates had more knowledge about herbal medicines than older pharmacy graduates and generally pharmacy teachers have more knowledge than the students<sup>31</sup>.

The students of Pharm. D believe that they are more knowledgeable regarding the valuable herbal medicines than others<sup>19</sup>. Other questions regarding basic knowledge about some common drugs like *Atropa belladonna*, *Digitalis purpurea* etc. was not responded correctly by the students (Table) which must be checked upon properly, although the present curriculum of Pharm. D (especially Pharmacognosy) has enough coverage of herbal drugs. Besides this, training regarding the herbal drugs to improve further knowledge of students will be highly fruitful, which is considered insufficient by most of the pharmacists. It was found that the pharmacists wanted to

know more about herbal medicines as they are considered as the expert of allopathic medicines<sup>32</sup>.

The present study reveals that pharm. D student require more information and need to develop more interest towards herbal drugs as Pharmacognosy has good scope in research and practice as well. According to some evaluation Pharmacists are more knowledgeable about herbal medicines than other professionals who have no idea about herbal medicines<sup>19, 33, 34</sup>. Knowledge regarding the herbal drugs is essential for the pharmacists to enhance their information and skills, to help patients for better therapy and provide consultancies to the society<sup>35-37</sup>.

## CONCLUSION

Pharm. D students need to acquire more knowledge and develop more awareness towards herbal drugs as the field of Pharmacognosy in practice is emerging. The use of valuable herbal treatments to cure different diseases has been enhanced due to their safety and minimal adverse effects.

## REFERENCES

1. Evans WC. 'Trease and Evans' Pharmacognosy. Edn 16, Saunders Elsevier, London, 2009.
2. Bruneton J. Pharmacognosy, Phytochemistry, Medicinal Plant. Edn 2, Lavoisier Publishing, Paris, 2008.
3. Upton R. Classical bontanical pharmacognosy: from Dioscorides to modern herbal medicines. Journal of American Herbalists Guild 2010; 9(2):47-52.
4. Jia W, Zhang L. Challenges and Opportunities in the Chinese Herbal Drug Industry. Natural Products, Springer, 2005, 229-250.
5. Chaudhari RD. Herbal drug industry. Vol. 1, Eastern Publisher, New Delhi, 1996, 498-499.
6. Ritch R. Tential role for Ginkgo biloba extract in the treatment of glaucoma. Medical Hypothesis 2000; 54(2):221-235.
7. Clark AM. Natural products as a resource for new drugs. Pharmaceutical Research 1996; 13:1133-1141.
8. Speedie MK. Trends in scholarship in medicinal chemistry/pharmacognosy: Adventures in drug design

- and discovery. American Journal of Pharmaceutical Education 1992; 56:414-417.
9. Farnsworth NR. Present and future of Pharmacognosy. Ibid 1979; 43:239-243.
  10. Abelson PH. Medicine from plants. Science 1990; 247(4942):513.
  11. Hussain J, Bahader A, Ullah F, Rehman NU, Khan AL, Ullah W, Shinwari ZK. Proximate and Nutrient Analysis of the Locally Manufactured Herbal Medicines and its Raw Material. Journal of American Science 2009; 5(6):1-5.
  12. Eisenberg D, Kessler RC, Foster C, Norlock FE, Calkins D, Delbanco TL. Unconventional medicine in the United States: Prevalence, costs and patterns of use. New England Journal of Medicine 1993; 328:246-252.
  13. Dolder C, Lacro J, Dolder N, Gregory P. Pharmacists' use of and attitudes and beliefs about alternative medicine. American Journal of Health-System Pharmacy 2003; 60:1352-1357.
  14. Welna EM, Hadsall RS, Schommer JC. Pharmacists' personal use, professional practice behaviors, and perceptions regarding herbal and other natural products. Journal of American Pharmacy Association 2003; 43:602-611.
  15. Howard N, Tsorurounis C, Kapusnik-Uner J. Dietary supplement survey of pharmacists: personal and professional practices. Journal of Alternative and Complementary Medicine 2001; 7:667-680.
  16. Shah B, Singanga W, Mallya U, Shah S. Pharmacy student perspectives on classroom education about herbal supplements. American Journal of Pharmaceutical Education 2005; 69(5):1-6.
  17. Boon H, Hirschhorn K, Griener G, Cali M. The ethics of natural health products in pharmacies and pharmacy practice: a systematic documentary analysis. American Journal of Health-System Pharmacy 2009; 17(1): 31-38.
  18. Kwan D, Hirschhorn K, Boon H. Canadian pharmacists' attitudes, knowledge and professional practice behaviours toward dietary supplements: A systematic review. BMC Complementary and Alternative Medicine. 2006; 6:31.
  19. Chang ZG, Kennedy DT, Holdford DA, Small RE. Pharmacists' knowledge and attitudes toward herbal medicine. Annals of Pharmacotherapy 2000; 34:710-715.
  20. Rickert K, Martinez RR, Martinez TT. Pharmacist knowledge of common herbal preparations. Proceedings of the Western Pharmacology Society Journal 1999; 42:1-2.
  21. Dvorkin L, Gardiner P, Whelan JS. Herbal medicine course within pharmacy curriculum. Journal of Herbal Pharmacotherapy 2004; 4:47-58.
  22. Natural Health Products Directorate. Baseline natural health products survey among consumers: final report 2005.
  23. Bouldin AS, Smith MC, Garner DD, Szeinbach SL, Frate DA, Croom EM. Pharmacy and herbal medicine in the US. Social Science and Medicine 1999; 49:279-289.
  24. Miller LG, Hume A, Harris IM, Jackson EA, Kanmaz TJ, Cauffield JS, Chin TWF, Knell M. White Paper on Herbal Products. Pharmacotherapy 2000; 20:877-891.
  25. Smolinske SC. Herbal product contamination and toxicity. Journal of Pharmacy Practice 2005; 18:188-208.
  26. Farrell J, Ries NM, Boon H. Pharmacists and natural health products: a systematic analysis of professional responsibilities in Canada. Pharmacy practice. 2008; 6(1):33.
  27. Dhanabal SP, Suresh B, Sheeja E, Edwin E. Pharmacognostical studies on *Passiflora quadrangularis*. Indian Journal of Natural Products 2005; 21:9-11.
  28. Akerele O. Nature's medicinal bounty: do not throw it away. World Health Forum 1994; 14:390-395.
  29. Fabricant DS, Farnsworth NR. The value of plants used in traditional medicine for drug discovery. Environment Health Perspectives 2001; 109:69-75.
  30. Vaidyasala A, Kottakkal, Longman O. Quality control methods for medicinal plant material. Geneva, WHO, Switzerland, 2002; 4:315-317.
  31. Chang ZA, Kennedy DT, Holdford DA, Small RE. Pharmacists' knowledge and attitude towards herbal medicines. Journal of Pharmaceutical Sciences 1999; 12:11-17.
  32. Annual report of the Eastern Mediterranean Region. WHO, 2005, 45-49.
  33. Suchard JR, Suchard MA, Steinfeldt JL. Physician knowledge of herbal toxicities and adverse herb-drug interactions. Journal of Pharmacy Practice 2006; 34:121-124.
  34. Murtaza G, Abbasi SI, Irum H, Jadoon MK, Hussain I. Assessment of breast cancer literacy among female students in a Pakistani University. Wspolczesna Onkologia 2011; 15(6):381-384.
  35. McIntyre M. A review of the benefits, adverse events, drug interactions and safety of St. John's Wort. Journal of Alternative Complementary Medicine 2000; 6:115-124.
  36. Brinker F. Herb Contraindications and Drug Interactions. Edn 3, Eclectic Medical Publishers, 2001.
  37. Henney JE. Risk of drug interactions with St. John's wort. Journal of American Medical Association 2000; 283:1679.