Knowledge, attitude and practice of extraction, standardization and formulation among pharmacy students at Dow College of Pharmacy, DUHS.

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Abstract

Natural medicines are in vogue in the current era globally. It has increased the responsibility of Pharmacists to provide authentic information to the concerned stake holders concerning the process of formulation of natural medicines and their standardization.

The present study is designed to determine the knowledge, attitude and practice of natural constituents' extraction, standardization and formulation among pharmacy students at Dow College of Pharmacy, Dow University of Health Sciences.

A two-days' workshop was organized at Dow College of Pharmacy, Faculty of Pharmaceutical Sciences, Dow University of Health Sciences, Karachi entitled "Natural Medicine: Current and Future Perspective" for 2nd professional to 5th professional students. Students were provided hands-on guided experience of extracting herbal constituents by different methods, their phyto-chemical testing, pre-clinical studies and formulating natural medicines using the extracted herbal constituents. Students were provided feedback forms to assess their experience of the workshop and to assess their knowledge and attitude towards the formulation of safe and effective natural medicines. The answers of the students were evaluated using SPSS software.

The result of the study revealed that students had a good learning experience from the workshop arranged. It was assessed that further such strategies need to be planned to enhance the pharmacy students' understanding of the natural medicine's standardization, formulation, prescription, and pharmacovigilance to better serve the community.

Keywords

Extraction procedures, herbals, cosmaceuticals, nutraceuticals, pharmacopeial testing.

1. INTRODUCTION

Pharmacognosy is the study of medicines

derived through different natural sources including plants, animals, insects, birds, marine, micro-organisms, algae, fungus, minerals, toxins, and venoms. It compromises of using crude drug as such or extracting any constituent from the crude source to utilize as a drug. Since ancient times people are using natural source drugs in different forms for healing. Globally, people residing in different regions gradually developed traditional systems of medicines depending on their religious, cultural beliefs and the habitat of those regions (Cahlikova *et al*., 2020). According to the World Health Organization, globally, approximately 80% of the population are using some form of natural medicine (WHO, 2002). The World Health Organization acknowledges the use of natural medicines on the basis that they are standardized according to the same Pharmacopeial standards laid down for conventional medicines. It is estimated that 51.7% population have been utilized the complementary and alternative medicines in Pakistan and people rely on herbal medicines as they are easy to access, affordable and effective (Ameada *et al*., 2015). It is essential to provide sound knowledge of Pharmacognosy at under-graduate pharmacy level to ensure their competency to serve the community (Houghton 1997).

2. MATERIALS AND METHODS

2.1. Study Area and design

This study was performed at Dow College of Pharmacy, Faculty of Pharmaceutical Sciences, Dow University of Health Sciences.

2.2. Target population

Students from second year to final year of Dow College of Pharmacy are the targeted population.

2.3. Inclusion criteria

Undergraduate students of Pharmacy from other Universities who were willing to participate.

2.4. Exclusion criteria

Students from non-medical faculties, non-willing students.

Sample size: 220 students participated in the survey.

2.5. Sampling

The present study design was cross-sectional, and the convenience sampling technique was used. The focus for data collection was on second to final-year students.

2.6. Study Tool

The questionnaire was based on 30 items which determine the knowledge, attitude and practice of natural medicine among pharmacy students. The developed questionnaire was disseminated, and the response was recorded.

2.7. Limitations of the Study

The study was a cross-sectional study, so there is a possibility of respondent biasness. The results of the study were dependent on the response given by the students who participated.

2.8. Statistical Analysis

The results were calculated and analyzed through IBM SPSS statistics version 26.

3. RESULTS AND DISCUSSION

The participant students were generally satisfied by the overall Pharmacognosy workshop facilitation (Figure 1). The students' response concerning the learning experience during the workshop was astounding. The students got the

insight of conducting research in the field of Pharmacognosy. They became aware of the different extraction techniques, chemical testing formulating natural medicines and their pre-clinical studies (Figure 2). Students' knowledge of the use of natural medicines for the treatment of different disease states was also assessed (Table 1).

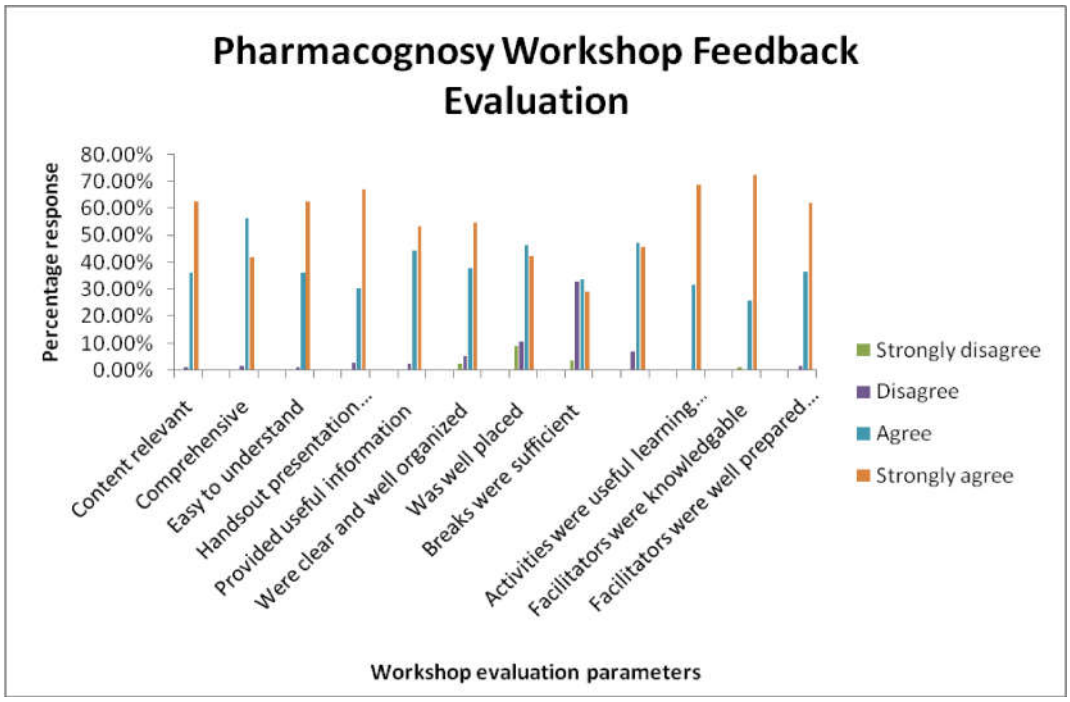

Fig- 1: Pharmacognosy Workshop Feedback

The results of the study revealed and emphasized the significance of basic Pharmacognosy teaching in pharmacy curriculum (Al-Yousef *et al*.,2019). and Patterson and Arthur (2009) suggested the need for the inclusion of herbal medicine course in medical students' curriculum highlighting the need of comprehensive natural medicine knowledge along with the knowledge of conventional medicine for provision of integrated health care to the population. Our study results revealed that under-graduate pharmacy students' comprehensive knowledge and understanding concerning the use of natural medicines for the treatment of variable pathologies needs to be enhanced. Our study findings confirm the observations of other researchers regarding the need of pharmacists' command over herbal medicines was also emphasized (Shaikh *et al*., 2009; Arumugam 2019; Jantan 1998; Sheng 2001; Zimmerman and Kadiah 2012; Suleiman 2014; Awad and al- Shaye 2014; Jatan 2006 ; Ashraf *et al*., 2019) explored the Pharmacists and non-pharmacists graduate and post-graduate knowledge, attitude and practice of the natural medicines systems classified under complementary and alternative medicine.

A positive attitude towards the use of natural medicines amongst both the students was observed. Students did exhibit the knowledge of natural medicines, but advanced level knowledge

of natural medicines needs to be included in Pharmacy and other medicine curriculum (Hussain *et al*., 2012; Raza *et al.*, 2018 ; Kwak *et al*., 2021) studied Jamaican Health-care professio-nals including doctors, nurses, pharmacists, dietitian knowledge, training, and use of natural medicines.

The study results endorse the need for training programs to enhance the knowledge and proper use of natural origin medicine with safety and for obtaining maximum beneficial effects (Abudalo *et al*., 2022) focused on the need for a sound knowledge natural and conventional medicines interactions especially in the case of patients with co morbidities (Aina *et al*., 2015) emphasized the significance of Herbal Pharmacovigilance and suggested that Pharmacist should have sound knowledge of natural origin medicines for better counselling of patients and providing updated scientific information to other health care providers/ physicians/ consultants.Phutrakool and Pongpirul (2022) explored the acceptance of medical practitioners specialized in various fields for the use of natural medicine and its efficacy.

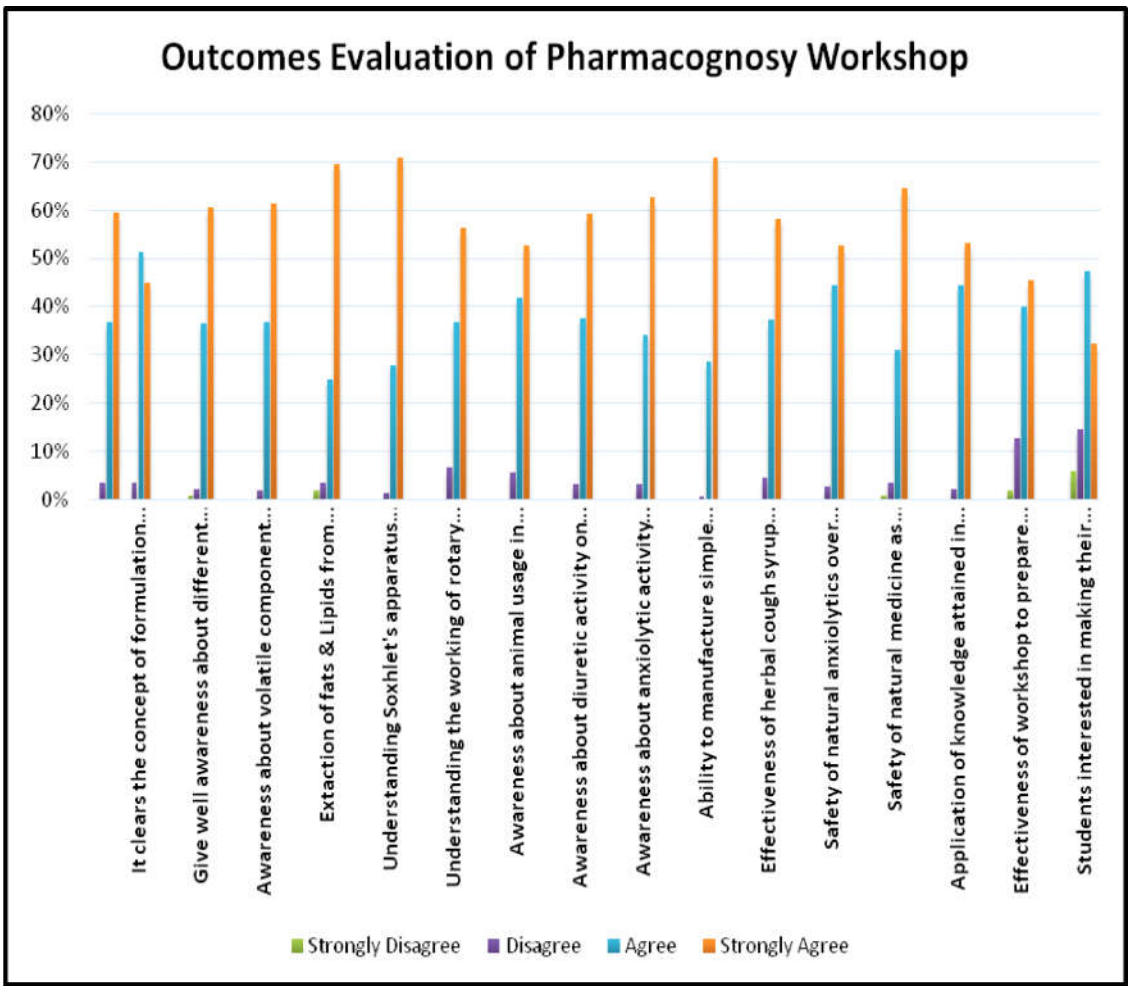

Fig- 2: Outcomes Evaluation of Pharmacognosy Workshop

Table 1. Knowledge of students about the use of natural medicines for the treatment of different diseases.

Knowledge about medicines	Second Year		Third Year		Fourth Year		Fifth Year	
	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree
Arthritis	60%	36.75%	25.71%	43.24%	14.28%	11.89%	0%	8.10%
Hypertension	55%	37.22%	40%	40.55%	2.5%	14.44%	2.5%	7.77%
Diabetes	48%	39.48%	48%	39.48%	4%	13.33%	0%	7.69%
Gastro-intestinal disorders	62.5%	39.62%	37.5%	40.56%	0%	12.73%	0%	7.07%
Headaches	55.55%	38.34%	40.74%	40.41%	3.70%	13.47%	0%	7.77%
Anxiety/ stress	43.90%	39.66%	46.34%	39.10%	9.75%	12.84%	0%	8.37%
Female rep. system	62%	34.11%	38%	41.17%	0%	15.88%	0%	8.82%
Male rep. system	62.5%	32.92%	32.14%	43.29%	1.78%	15.85%	3.57%	7.92%
Immune disorders	54.28%	37.5%	45.71%	39.67%	0%	14.67%	0%	8.15%
Respiratory disorders	37.93%	40.21%	37.96%	41.26%	24.13%	10.58%	0%	7.93%
Kidney stone	54.76%	6.36%	45.23%	39.77%	0%	15.34%	0%	8.52%
Liver diseases	47.61%	38.41%	45.23%	39.54%	7.14%	13.55%	0%	8.47%

4. CONCLUSION

Pharmacognosy is one of the oldest, basic, and essential pillars of the Doctor of Pharmacy curriculum. The curriculum content may be upgraded to provide comprehensive and practical insight concerning all aspects of natural medicines to provide correct information and guidance to allied health care professionals and the patients in the time of ever-increasing use of natural medicines.

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