Available online on 15.12.2024 at http://jddtonline.info

Journal of Drug Delivery and Therapeutics

Open Access to Pharmaceutical and Medical Research

Open Access Full Text Article

Research Article

Community Pharmacist Perception and Practice of Herbal product in Eastern Nepal: A Cross-Sectional Study

Prasanna Dahal *, Rahi Bikram Thapa, Sushil Regmi, Nabin Thapa Magar

Purbanchal University School of Health Sciences, Gothgaun, Morang, Nepal

Article Info:

Article History:

Received 23 Sep 2024
Reviewed 05 Nov 2024
Accepted 29 Nov 2024
Published 15 Dec 2024

Cite this article as:

Dahal P, Thapa RB, Regmi S, Magar NT, Community Pharmacist Perception and Practice of Herbal product in Eastern Nepal: A Cross-Sectional Study, Journal of Drug Delivery and Therapeutics. 2024; 14(12):60-68 *DOI: http://dx.doi.org/10.22270/jddt.v14i12.6916*

*Address for Correspondence:

Dr. Prasanna Dahal, Purbanchal University School of Health Sciences, Gothgaun, Morang, Nepal

Abstract

Objectives: Herbal Products (HP) are commonly utilized for both medicinal and preventative purposes, however, there is a rising concern about their efficacy and safety in contemporary medical practice. The study aims to determine the perception and practice regarding HP among community pharmacists in Eastern Nepal.

Methods: A cross-sectional, quantitative study was conducted in the Jhapa, Morang, and Sunsari districts of Eastern Nepal. Data were collected using a structured questionnaire to assess pharmacists' perceptions and practices regarding herbal remedies.

Results: Pharmacy personnel from 246 community pharmacies participated in the study, in which the majority were male (78.9%), and had more than 3 years of experience (57.7%). 47.2% of respondents had shown a positive perception towards HP, whereas only 25.6% of respondents demonstrated good practices regarding herbal items at their pharmacy. Cough preparations (45.9%) and general health tonics (26.4%) were the most sold HP. Most participants (69.5%) believed HP is safe and effective, with 76% recommending the need for proper regulation. A significant number (84.1%) reinforced incorporating HP subjects in the pharmacy curriculum. In terms of practice, over half (51.2%) of pharmacy personnel sometimes dispensed HP, with 87.4% advising consumers on their use. A pharmacist perception was associated with pharmacy practice experience ($p=0.020$), and practice was linked with age, with better practices seen in those with age ≤30 years ($p<0.001$).

Conclusion: The study concludes that most community pharmacy personnel had poor perception and infrequent practice of herbal products in their pharmacy. The study recommends strict quality control, education, and regulation of herbal products to safely and effectively integrate HP in community pharmacy settings.

Keywords: Herbal products, Ayurvedic product, Community Pharmacist, Complementary and alternative medicine, attitudes, Practice

INTRODUCTION

Traditional medicine, as per the World Health Organization (WHO) definition, includes all the information, skills, and practices derived from various cultures' theories, beliefs, and experiences. These methods, whether justifiable or not, are employed in the preservation of well-being and the prevention, diagnosis, mitigation, or treatment of bodily and mental ailments. [1] Traditional and complementary medicinal products encompass herbs, herbal materials, herbal preparations, and finished herbal medicines that incorporate parts of plants, other plant materials, or combinations thereof as their active constituents. These formulations may also include natural organic or inorganic active substances that are derived from sources other than plants, such as animal and mineral components [1,].

Herbal medications are extensively utilized for preventative and curative intentions, with studies suggesting that around 80% of the population in Asian and African nations depend on traditional medicine to fulfill their healthcare requirements [3]. Moreover, it is approximated that 30% to 50% of the public in developed nations utilize complementary and alternative medicine (CAM) products, with an expenditure of roughly US $4 billion per year on herbal products [4]. The potential advantages of herbal medications stem from their widespread acceptability among patients, effectiveness, relative safety, and comparatively affordable expenses [5]. Survey data from the United Kingdom indicate that around 30% of the British population has experimented with herbal medicine. This has resulted in out-of-pocket expenses of approximately £31 million in the United Kingdom and £1.3 billion in Germany [4, 5].

Herbal preparations are being used widely, but there is a rising concern about their safety. This is because there are not enough quality controls in place, the labeling is not enough, and there is a lack of appropriate patient

information in phytomedicinal preparations [6]. While many individuals believe that products labelled as "natural" are automatically safe and pose no risk to health, this assumption is not always accurate. Certain herbs have the potential to interact with both prescription and over-the-counter medications, while certain herbal items may be contaminated, adulterated, or misidentified [7]. From 1968 to 1997, the World Health Organization's monitoring department gathered 8,985 reports of negative incidents linked to herbal medications from 55 different nations [6].

Like other alternative therapies, there is insufficient information available about the frequency of negative effects caused by herbal remedies. The dissemination of unfounded assertions or promotional messages by manufacturers via different mass media platforms has significantly led to the extensive utilization of herbal medications among the overall populace in emerging nations [7]. These products may be contaminated and have the potential to cause harmful effects and toxicity [8]. Producers of these items are not obligated to provide evidence of their safety and effectiveness prior to selling them, leading to a significant lack of knowledge regarding the negative effects linked to these treatments. In addition, herbal products lack regulation for their purity and potency, which increases the risk of harmful effects caused by contaminants or variations between batches [7, 9].

Research indicates a concerning pattern in the usage of herbal products by individuals, as they are being consumed without the guidance or endorsement of healthcare professionals. Many members of the general public tend to place trust in the effectiveness of these products without considerable empirical data and evidence. Hence, it is vital to comprehend the impact of these items on customers' well-being and provide suggestions to mitigate the escalation of these problems [10]. Community pharmacists, who are primary providers of complementary herbal medicines, have a crucial role in the utilization of herbal medicines obtained by their clients, as these products are predominantly supplied as over-the-counter (OTC) medicines in numerous countries. Patients typically rely on pharmacists for guidance and knowledge regarding medications, including herbal medicines. [6, 8, 10-14]

Prior research conducted in Nigeria, Saudi Arabia, Qatar, and Palestine has indicated that the majority of community pharmacists lack sufficient information regarding the potential interaction patterns and side effects associated with the herbal medicines they dispense [4, 11, 15, 16]. Moreover, there is compelling data indicating that community pharmacists possess insufficient understanding when it comes to advising patients on the use of herbal medicines. Herbal medicines are a fundamental component of complementary medicines (CMs). Research conducted in Australia, the United Kingdom, the United States of America, and Singapore has consistently shown that pharmacists consider their knowledge and skills in advising consumers on complementary medicines (CMs) to be insufficient [15]. Several studies have shown that courses in the curriculum alone are considered insufficient in equipping pharmacists with the necessary expertise in herbal medicines [15, 17, 18].

Ayurvedic medicine has been extensively practiced in Nepal's ancient medical system since at least 500 AD, incorporating the use of medicinal herbs. The national healthcare system is predominantly based on traditional medicine, specifically the Ayurvedic system, which is utilized by over 75% of the population [19]. Nepal lacks formal regulations to govern the safety, effectiveness, quality, sale, distribution, promotion, and application of traditional herbal medicines. Significant endeavors have been undertaken to develop rules and recommendations for herbal medicines, particularly in their integration with basic healthcare services within the national healthcare system. Herbal remedies, including those that may contain modern medical chemicals, pests, germs, and heavy metals, are frequently promoted without adequate oversight. Health practitioners from various traditional systems, including traditional healers and quacks, are engaging in a growing trend of prescribing medications without considering the specific practice and selling them illegally [19, 20].

There has not yet been a study conducted to assess the existing level of knowledge on herbal medicine among community pharmacists in Nepal. The main objective of this study is to examine the expertise and implementation of pharmacists in dispensing herbal products, as well as evaluate their perspective on the utilization of such items. The study also seeks to explore the capacity of pharmacy personnel to serve as information providers for patients who use herbal medications. Furthermore, this study aims to provide valuable insights for pharmacy regulators and educators to make informed decisions regarding this subject. The results are expected to endorse the development of educational programs and goals by pharmacy schools and professional organizations.

METHODOLOGY

Study Design

It was a cross-sectional and quantitative study design.

Study Site or area

The study was conducted among pharmacy personnel of community pharmacies operating in Jhapa, Morang, and Sunsari district of Koshi, province of Nepal. This area consists of highly occupied and major cities of Eastern, Nepal.

Study period

The study was conducted for six months, from December 2021 to May 2022.

Study Population

The study population consists of community pharmacy personnel working in the community pharmacy located in the study area.

The inclusion criteria for this study consisted of pharmacy personnel engaged in retail community

pharmacy practice within Eastern Nepal. Exclusion criteria included those pharmacies which are not open during the study visit, those not providing written informed consent, or those who declined to participate.

Operational definition

In this Study, Community pharmacist refers to those community pharmacy personnel working in retail community pharmacies and engaged in drug dispensing activities, including dispensing of HP.

Sample Size and Sampling Technique

As per the data obtained from the Department of Drug Administration website, Purbanchal regional office, Biratnagar, the total number of registered pharmacies in the study district was 2138 [21]. Using the Raosoft sample–size calculation, a 90 % confidence interval and a 5% margin of error were taken with a 50% response rate. The estimated sample size for this study was 241 pharmacies [22]. However, 10% additional samples were added making the total sample size, of 265 in our study. In our study, 265 pharmacies were selected using random sampling techniques. However, out of the total pharmacies, pharmacies personnel from 246 (93%) pharmacies participated in the survey with response rate of 93%.

Tools of data collection:

Data were collected using a modified structured questionnaire adapted and designed based on the literature review of similar studies [16, 23-25]. The questionnaire consists of 4 parts:

Part 1 included questions related to sociodemographic details and a few close-ended questions related to qualifications, years of experience, commonly dispensed herbal drugs, and sources of information on herbal products. Part 2 consisted of questionnaires related to perception (12 items, ten positive and two negative questions) and practice (4 items). All questionnaires to assess perception and practice had 5-point Likert scale responses (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree for questionnaires related to perception), whereas practice-related questions had 5 Likert scale response (1= Never, 2= rarely 3=Sometimes, 4=Often, 5= Always)

Validity and reliability of tools:

The initial version of the questionnaire was subjected to content and face validation. The content was modified and validated based on the opinions of experts. The questionnaire was then translated into the local language (Nepali) in consultation with a language expert. A pilot study was conducted in 10 pharmacies to ensure the reliability and clarity of content before the survey was conducted. The reliability of questionnaires was tested by Cronbach alpha and found to be 0.753 from a pilot study.

Data Collection Procedure:

One pharmacy personnel from each randomly selected community pharmacy was allowed to participate in the study during the study visit. In case of multiple personnel were engaged, those with higher qualifications and experiences were selected for participation. Pharmacy dispensers who were not willing to participate in the survey or those reluctant to give consent freely were exempted from the study. The dispenser/pharmacists were asked to fill and sign the questionnaire after completing the entire questionnaire under study. There was no external assistance to answer the questions.

Data processing and analysis:

Data was entered into the Statistical Package for Social Sciences (SPSS), and descriptive analysis was conducted. The respective score of 1 to 5 was provided based on the response of the Likert scale related to 12-item perception and 4-item practice, respectively. The reverse score was provided for negative item questionnaires. The maximum total sum score for perception was 60, and for practice-related questions was 20. We considered a 70% cut-off value for the total mean score of each respondent for categorizing perception and practice into good or poor perception and practice. Associations were tested using the Chi-square test. P value <0.05 was considered statistically significant.

Ethical consideration:

The ethical approval was obtained from the Institutional Review Committee of Purbanchal University School College of Medical and Allied Sciences (PUCMAS-IRC). Written consent was obtained from the study participants. The participants' confidentiality of the information and rights to autonomy was assured during the study.

RESULTS

Demographic characteristics of Participants.

A total of 246 community pharmacy personnel were surveyed, of which majority are male (78.9%), with females constituting 21.1%. The majority of pharmacy personnel working in pharmacy were licensed professionals (byabasahi) or other paramedics 50.8%, followed by certificate level qualification in pharmacy (42.7%), while only 6.5% of pharmacy personnel hold graduate level pharmacy degrees. Age-wise, 58.1% are 30 years or younger, and 41.9% are older than 30 years. The mean age of the respondents was 31.93±9.33 years.

Cough preparations are the most commonly sold product (45.9%), followed by general health tonics (26.4%) and other products (27.2%). The primary sources of information about HP include product market representatives (37%), formal pharmacy education (32.9%), product package instructions (16.3%), and the internet (13.8%). These demographic details highlight the varied backgrounds and experiences of the participants, providing a comprehensive overview of the sample population as shown in **Table 1**

Table 1: Demographic Characteristics of Participants (n=246)

Variables	Category	Frequency	Percentage (%)
District	Jhapa	85	34.6
	Morang	93	37.8
	Sunsari	68	27.6
Gender	Male	194	78.9
	Female	52	21.1
Education Qualification	Graduate pharmacist	16	6.5
	Certificate level pharmacist	105	42.7
	Others (Pharmacy Professionalist or paramedics)	125	50.8
Experience (in Years)	≤ 3	104	42.3
	>3	142	57.7
Age group (Years)	≤30	143	58.1
	>30	103	41.9
Maximum sell product	Cough preparation	113	45.9
	General health tonic	65	26.4
	Others	68	27.6
Source of Information	Product package instruction	40	16.3
	Product market representatives	91	37
	Formal pharmacy education	81	32.9
	Using the internet	34	13.8

Participants' Perception towards Herbal Products.

The average perception score was 42.82±5.37, with maximum and minimum scores of 58 and 19, respectively. In our study, 116 (47.2%) of respondents had good perception regarding herbal medicines. A significant majority (69.5%) believe HP is safe and efficacious, and 76% agree on the need for proper standardization, quality control, and regulation. More than half (62.6%) feel HP has fewer side effects than conventional medicines. Likewise, the majority (84.1%) support including HP-related subjects in the pharmacy curriculum, and 76% agree that HP should be sold only in retail or ayurvedic pharmacies. However, opinions are divided regarding HP interactions with allopathic medication and their research adequacy, with 35.3% and 46.4% agreeing or strongly agreeing, respectively. Contamination concerns are evident, with 51.2% agreeing HP may contain heavy metals and bacteria. While 46.8% believe HP can be safely used in special populations, 37% see their potential in treating chronic diseases, while (82.2%) support mandatory continuing education on HP for community pharmacists. These results underscore the need for regulation, research, and education to optimize the use of herbal products. The detailed response towards perception is shown in Table 2.

Table 2: Participants response towards Perception Questions

Questions	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)
Herbal products (HP) are safe and efficacious	11 (4.5)	11 (4.5)	53 (21.5)	151 (61.4)	20 (8.1)
HP needs proper standardization, Quality control, and regulation	6 (2.4)	17 (6.9)	36 (14.6)	91 (37)	96 (39)
HP has fewer side effects than conventional medicines	5 (2)	34 (13.8)	53 (21.5)	134 (54.5)	20 (8.1)
HP-related subjects should be mandatory in the pharmacy curriculum	4 (1.6)	15 (6.1)	20 (8.1)	123 (50)	84 (34.1)
HP does not interact with or modify the effects of other allopathic medication	7 (2.8)	73 (29.7)	79 (32.1)	81 (32.9)	6 (2.4)
HPs are sufficiently studied and well-researched	9 (3.7)	63 (25.6)	60 (24.4)	87 (35.4)	27 (11)
HP should be sold only in retail or ayurvedic pharmacy	6 (2.4)	27 (11)	26 (10.6)	95 (38.6)	92 (37.4)
The use of HP should be limited only to patients who have failed allopathic/conventional prescription therapy	21 (8.5)	104 (42.3)	72 (29.3)	40 (16.3)	9 (3.7)
HP may be contaminated and may contain heavy metals and bacteria	8 (3.3)	39 (15.9)	73 (29.7)	115 (46.7)	11 (4.5)
HP can be safely used in special populations like children, elderly and pregnancy	5 (2)	47 (19.1)	79 (32.1)	102 (41.5)	13 (5.3)
HP have great potential role in the treatment of chronic diseases	11 (4.5)	45 (18.3)	99 (40.2)	79 (32.1)	12 (4.9)
HP continuing education should be mandatory	4 (1.6)	16 (6.5)	24 (9.8)	100 (40.7)	102 (41.5)

Participants Practice related to Herbal Products.

Over half (51.2%) of the respondents revealed that they sometimes dispense HP from pharmacies. Advising consumers on the safe use of HP is also common, with 52.4% revealing that they often or always provide counselling about herbal products to customers. 56.7 % of participants disclosed that they sometimes receive inquiries from consumers about HP usage are frequent. Regarding personal use of HP for self-treatment, 52.4% of participants sometimes use them, while 14.2% and 5.7% of answered often and regular use of HP for self-treatment. These findings suggest that HPs are commonly dispensed and recommended by pharmacy professionals, who also frequently receive consumer inquiries about their use, indicating a significant role of HP in their practice and personal health management. In our study, the average practice score was 12.78±2.9, with maximum and minimum scores of 20 and 4, respectively. We found 63 (25.6%) participants had good practice towards herbal medicine while 183 (74.4%) had poor practice. Participants' response to practice questions is shown in **Table 3**.

Table 3: Participants' Response Toward Practice Questions

Questions	Never n (%)	Rarely n (%)	Sometimes n (%)	Often n (%)	Always n (%)
Dispense HP from a pharmacy	8 (3.3)	45 (18.3)	126 (51.2)	31 (12.6)	36 (14.6)
Advice consumers on the safe use of HP	6 (2.4)	25 (10.2)	86 (35)	76 (30.9)	53 (21.5)
Get inquiries from consumers regarding the use of HP	7 (2.8)	41 (16.7)	140 (56.9)	35 (14.2)	23 (9.3)
Ever used HP for self-treatment before	15 (6.1)	53 (21.5)	129 (52.4)	35 (14.2)	14 (5.7)

Association between socio-demographic characteristics with Perception and Practice towards HP

In this study, pharmacist perceptions were significantly associated with their experience (p=0.020), reflecting good practice by participants having >3 years of experience. In contrast, Perception was not statistically significant in terms of Gender (p= 0.539), age group (p=0.702), and education level (p= 0.083). Detailed information is shown in Table 4.

Table 4: Association of sociodemographic characteristics with Perception

Participant Characteristics	Category	Poor Perception n (%)	Good Perception n (%)	Total n (%)	P-value*
Gender	Male	80 (32.5)	114 (46.3)	194 (78.9	0.539
	Female	19 (7.7)	33 (13.4)	52 (21.1)	
Age group	≤30	59 (24)	84 (34.1)	143 (58.1)	0.702
	>30	40 (16.3)	63 (25.6)	103 (41.9)	
Experience	≤3	51 (20.7)	53 (21.5)	104 (42.3)	**0.016***
	>3	48 (19.5)	94 (38.2)	142 (57.7)	
Education level	Graduate pharmacist	3 (1.2)	13 (5.3)	16 (6.5)	
	Assistant pharmacist	39 (15.9)	66 (26.8)	105 (42.7)	
	Professional or Others	57 (23.2)	68 (27.6)	125 (50.8)	0.083

**Chi square test (χ2): P value ≤0.05 indicates statistically significant, P value <0.001 indicates highly significant association.*

Similarly, a statistically significant relationship between Practice with age group (p=<0.001) and location (p=0.005) was seen; the age group ≤30 years had better practice than the age group more than 30 years. The relationship between Practice and demographic characteristics like Gender, Experience, and education level was not significant non-significant, (p= 0.807, 0.851, 0.096).

Table 5: Association of sociodemographic characteristics with Practice

Participant Characteristics	Category	Poor Practice n (%)	Good Practice n (%)	Total n (%)	P-value*
Gender	Male	145 (58.9)	49 (19.9)	194 (78.9)	0.807
	Female	38 (15.4)	14 (5.7)	52 (21.1)	
Age group	≤30	95 (38.6)	48 (19.5)	143 (58.1)	**<0.001****
	>30	88 (35.8)	15 (6.1)	103 (41.9)	
Experience	≤3	78 (31.7)	26 (10.6)	104 (42.3)	0.851
	>3	105 (42.7)	37 (15)	142 (57.7)	
Education level	Graduate pharmacist	14 (5.7)	2 (0.8)	16 (6.5)	0.096
	Assistant pharmacist	83 (33.7)	22 (8.9)	105 (42.7)	
	Professional or Others	86 (35)	39 (15.9)	125 (50.8)	
District	Jhapa	72 (29.3)	13 (5.3)	85 (34.6)	**0.005***
	Morang	59 (24)	34 (13.8)	93 (37.8)	
	Sunsari	52 (21.1)	16 (6.5)	68 (27.6)	

**Chi square test (χ2): P value ≤0.05 indicates statistically significant, P value <0.001 indicates highly significant association.*

DISCUSSION

The study included pharmacy personnel from 246 community pharmacies from the Jhapa, Morang, and Sunsari regions of Nepal, with a higher proportion of male participants (78.9%) compared to female participants. A similar survey conducted in Nepal found that the majority (89.4%) of community pharmacists were male [26]. The variations in gender might be attributed to cultural norms, educational barriers, societal expectations, and employment challenges that hinder women in developing countries from pursuing professional careers. The majority of Participants in our study were aged 30 or below, held certificate-level degrees, and had less than 3 years of professional experience. This finding aligns with previous studies conducted in eastern Nepal [27], which show an increased engagement of young pharmacists with a certificate-level qualification in a community pharmacy, as pharmacists with higher qualifications and expertise often prefer employment in education, hospital pharmacy, and industrial sectors in a more competitive manner.

The findings from our study revealed that only 47.2% of community pharmacy personnel in Eastern Nepal had a good perception of herbal medicines and 25.6% demonstrated good practice. These variations in perception and practice are evident in many previous studies aboard. For instance, a study conducted in Qatar [11] found that the majority of participants had average to poor knowledge of natural health products (NHPs), with only around 7% showing good knowledge, aligning with our findings of limited perception among pharmacists. In contrast, a study in Saudi Arabia [23] reported that pharmacists generally exhibited good knowledge, a positive attitude, and effective practice towards herbal products, highlighting a stark difference in regional knowledge and engagement levels. Similarly, research in Northwest Ethiopia [28] indicated that while pharmacists commonly used and had a good attitude toward herbal medicines, they were less involved in dispensing these products and faced challenges due to limited knowledge and access to information. This reflects a common trend of good personal attitudes not necessarily translating into professional practice, as seen in our study. Furthermore, the study in West Bank Palestine [16] also highlighted knowledge gaps, particularly in awareness of interactions, contraindications, and adverse effects, echoing the incomplete understanding seen among our respondents. These contrasts underscore the need for improved education and resources to enhance pharmacists' perception and practice of herbal remedies across various regions.

The majority of drug dispensers rely on product market representatives to obtain information on the safety and efficacy of HP, which is not appropriate practice as the efficacy and safety information provided may be inaccurate or inadequate. This finding contrasts with the study done in Lagos, Nigeria, where most of the participants consulted product insert leaflets and internet sources for HP information [15]. This might be due to the unavailability of product insert leaflets in Nepali herbal products, poor regulation, and the perception that herbal medicines are safe and efficacious. In our study, cough preparation and general tonic are the herbal products that are sold the most, which is similar to the findings in Palestine [16]. This implies that people use herbal products for curative and rejuvenation purposes.

A substantial majority of the participants in our study (69.5%) believe that HP is safe and efficacious, which is consistent with the findings from Alsayari et al. (2018), where community pharmacists in the Asir Region of

Saudi Arabia also exhibited positive attitudes towards the safety and efficacy of herbal medicines [23]. Similarly, Kheir et al. (2014) reported that pharmacists in Qatar had a favorable perception of natural health products, emphasizing the need for proper education and training [11].

Only about 32% of the respondents believed that HP interacts with or modifies the effects of other allopathic medications, which is in contrast with the study done in Lagos, Nigeria, which found that more than 80% agreed on the herb-herb and herb-drug interactions [15]. However, numerous studies have documented adverse interactions of herbal medicines with other herbal products or conventional medicines [9]. Much evidence-based information has also established safety concerns for herbal medicines [12]. So, Nepali pharmacists need training and improved access to reliable sources of information about herbal products.

Our study participants also expressed significant concerns regarding the standardization, quality control, and potential contamination of HP, with 76% agreeing on the necessity of proper regulation and 51.2% acknowledging the risk of contamination. This concern mirrors the findings from Gelayee et al. (2017) in Ethiopia, where pharmacists recognized the lack of sufficient research and regulation as barriers to the effective use of herbal medicines [24].

The Department of Drug Administration and Regulations has clearly mentioned that Ayurvedic and allopathic drugs should be sold and distributed from Ayurvedic and Allopathic pharmacies separately, respectively [29]. Few participants also believe that ayurvedic products can be sold from allopathic pharmacies. Many pharmacists favor HP-related subjects that should be mandatory in the pharmacy curriculum, signifying their interest in ayurvedic and herbal products, as the consumption of Herbal products for treating different ailments is rising [24].

Furthermore, the willingness of our participants to support mandatory continuing education on HP (82.2%) aligns with the findings from Noureldin et al. (2013) in the United States, where pharmacy students advocated for the inclusion of complementary and alternative medicine in the curriculum [18]. This underscores a global recognition of the importance of education in enhancing the safe use of herbal products.

In terms of practice, 51.2% of pharmacists sometimes dispense herbal products and 35% occasionally advise on their safe use, highlighting the prevalent but cautious engagement with HP in pharmacy practice. A study in West Bank, Palestine, where Khdour et al. (2016) noted that while pharmacists had a good knowledge of herbal remedies, they were careful in their dispensing practices due to concerns over safety and efficacy [16]. According to this report, only 21.5% of participants consistently offer patient counseling. This could be attributed to various causes, such as limited time availability, insufficient knowledge regarding the safety and effectiveness of herbal treatments, and the belief that herbal goods are inherently safe, etc. This finding is similar to the study conducted in Saudi Arabia, where only 36% consistently offer counseling on Herbal products [23]. It is important to promote patient counseling in order to ensure the safe utilization of herbal products. Pharmacists must take on the duty of becoming lifelong learners update their knowledge and skills, and consistently engage in self-reflection and development within their field of practice.

Our study revealed that 50% of participants reported occasional use and 25% reported frequent or consistent use of HP. This finding aligns with other studies that have observed a widespread prevalence of herbal therapy usage among pharmacists [16, 30]. This indicates a growing recognition of herbal treatments among healthcare professionals.

When comparing our findings with the international literature, certain similarities and differences are evident. For instance, the generally positive perception of HP across various regions—Saudi Arabia, Ethiopia, Palestine, and the US indicates a common belief in the benefits of herbal medicines [16, 18, 23, 24]. However, the degree of practice and the emphasis on regulation vary. Our study participants' significant concern about contamination and the necessity for stringent quality control highlight a more thoughtful attitude compared to the relatively higher confidence in regions like Qatar [11].

Moreover, the demographic characteristics and experience levels of pharmacists also play a role in shaping their perception and practice. In our study, participants with more than three years of experience showed better practices regarding HP, which is significant ($p<0.05$); a trend was also observed in the Asir Region study by Alsayari et al. (2018), where experienced pharmacists demonstrated higher engagement with herbal medicines [23].

Limitations

The study has several limitations. The cross-sectional study design limits the evaluation of changes in perception over time. Furthermore, the generalizability and profundity of the findings are limited to areas of eastern Nepal.

CONCLUSION

The study concludes that most community pharmacies had poor practices and perceptions about herbal products. Despite having a positive attitude toward the efficacy and safety of HP, pharmacists have shown significant concerns about regulation and quality control of products. The study emphasizes the need for strengthening herbal medicine education in pharmacy curricula, establishing stringent quality control, and better regulation of herbal products to optimize the safe and effective integration of HP into the healthcare system.

Acknowledgment: Our sincere gratitude goes to community pharmacy proprietors and staff's for their cooperation and support during the research.

Funding: This research was funded by the faculty of medical and allied sciences, office of Dean, Purbanchal University.

Conflicts of interest: No conflicts of interest to declare.

Ethical approval: The ethical approval was obtained from the Institutional review committee of purbanchal university school college of medical and allied sciences (PUCMAS-IRC). Written consent was obtained from the study participants. The participants' confidentiality of the information and rights to autonomy were assured during the study.

Authors Contributions: All the authors have contributed equally.

Source of Support: Nil

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

REFERENCES

1. Organization WH. Traditional, Complementary and Integrative Medicine Geneva, Switzerland: WHO; 2023. Available from: https://www.who.int/health-topics/traditional-complementary-and-integrative-medicine#tab=tab_1 .
2. Organization. WH. "Front Matter." A Global Brief on HYPERTENSION: Silent Killer, Global Public Health Crisis. World Health Organization, 2013.
3. Oyebode O, Kandala N-B, Chilton PJ, Lilford RJ. Use of traditional medicine in middle-income countries: a WHO-SAGE study. Health Policy and Planning. 2016;31(8):984-91. PMid:27033366 PMCid:PMC5013777 https://doi.org/10.1093/heapol/czw022
4. Alkharfy K. Community pharmacists' knowledge, attitudes and practices towards herbal remedies in Riyadh, Saudi Arabia. EMHJ-Eastern Mediterranean Health Journal, 2010;16(9):988-993. https://doi.org/10.26719/2010.16.9.988
5. Ernst E. Herbal medicines put into context. British Medical Journal Publishing Group; 2003. p. 881-2. PMid:14563719 PMCid:PMC218802 https://doi.org/10.1136/bmj.327.7420.881
6. Raynor DK, Dickinson R, Knapp P, Long AF, Nicolson DJ. Buyer beware? Does the information provided with herbal products available over the counter enable safe use? BMC Medicine. 2011;9(1):94. https://doi.org/10.1186/1741-7015-9-94 PMid:21827684 PMCid:PMC3180693
7. Abdel-Aziz S, Aeron A, Kahil T. Health Benefits and Possible Risks of Herbal Medicine. 2016. https://doi.org/10.1007/978-3-319-25277-3_6
8. Firenzuoli F, Gori L. Herbal medicine today: clinical and research issues. Evid Based Complement Alternat Med. 2007;4(Suppl 1):37-40. https://doi.org/10.1093/ecam/nem096 PMid:18227931 PMCid:PMC2206236
9. Farah MH, Edwards R, Lindquist M, Leon C, Shaw D. International monitoring of adverse health effects associated with herbal medicines. Pharmacoepidemiology and Drug Safety. 2000;9(2):105-12. https://doi.org/10.1002/(SICI)1099-1557(200003/04)9:2<105::AID-PDS486>3.0.CO;2-2
10. Ming LC. Use of herbal products in Southeast Asian countries. Archives of Pharmacy Practice. 2016;7. https://doi.org/10.4103/2045-080X.183039
11. Kheir N, Gad HY, Abu-Yousef SE. Pharmacists' knowledge and attitudes about natural health products: a mixed-methods study. Drug Healthc Patient Saf. 2014;6:7-14. https://doi.org/10.2147/DHPS.S57756 PMid:24501547 PMCid:PMC3912048
12. Mahajan A, Kaur J, Kaur S. Herbal Medicines: Possible Risks and Benefits. American Journal of Phytomedicine and Clinical Therapeutics. 2013;1:226-39.
13. Olatunde S, Boon H, Hirschkorn K, Welsh S, Bajcar J. Roles and responsibilities of pharmacists with respect to natural health products: key informant interviews. Res Social Adm Pharm. 2010;6(1):63-9. https://doi.org/10.1016/j.sapharm.2009.02.004 PMid:20188329 PMCid:PMC2923149
14. Organization WH. National policy on traditional medicine and regulation of herbal medicines : report of a WHO global survey 2005. Available from: https://iris.who.int/bitstream/handle/10665/43229/9241593237.pdf?sequence=1 .
15. Oshikoya KA, Oreagba IA, Ogunleye OO, Oluwa R, Senbanjo IO, Olayemi SO. Herbal medicines supplied by community pharmacies in Lagos, Nigeria: pharmacists' knowledge. Pharmacy Practice. 2013;11(4):219. https://doi.org/10.4321/S1886-36552013000400007 PMid:24367462 PMCid:PMC3869638
16. Khdour M, Kurdi M, Hallak H, Jarab A, Dweib M, Al-Shahed Q. Pharmacists' Knowledge, Attitudes and Practices Towards Herbal Remedies In West Bank, Palestine. International Archives of Medicine. 2016;9. https://doi.org/10.3823/1974
17. Kouzi SA. Herbal remedies: the design of a new course in pharmacy. American Journal of Pharmaceutical Education. 1996;60(4):358-64. https://doi.org/10.1016/S0002-9459(24)04673-4
18. Noureldin M, Murawski MM, Mason HL, Plake KS. Student pharmacists' attitudes toward complementary and alternative medicine. J Am Pharm Assoc (2003). 2013;53(6):618-25. https://doi.org/10.1331/JAPhA.2013.12212 PMid:24141360
19. Khakurel B, Prasad R, Bhattarai D, Sheak A. In the name of herbal medicine. Journal of Institute of Medicine Nepal. 1998;20(1 & 2). https://doi.org/10.59779/jiomnepal.24
20. World Health Organization. Programme on Traditional M. Legal status of traditional medicine and complementary/alternative medicine : a worldwide review. Geneva: World Health Organization; 2001.
21. Administration DoD. Pharmacy List Biratnagar 2023. Available from: https://dams.dda.gov.np/manLogin/searchPharmacy .
22. Inc. R. Raosoft Sample Size Calculator 1996-2011 [cited 2023 22]. Available from: http://www.raosoft.com/ .
23. Alsayari A, Almghaslah D, Khaled A, Annadurai S, Alkhairy MA, Alqahtani HA, et al. Community Pharmacists' Knowledge, Attitudes, and Practice of Herbal Medicines in Asir Region, Kingdom of Saudi Arabia. Evidence-Based Complementary and Alternative Medicine. 2018;2018(1):1568139. PMid:30228824 PMCid:PMC6136488 https://doi.org/10.1155/2018/1568139
24. Gelayee D, Mekonnen G, Atnafie S, Birarra M, Asrie A. Herbal Medicines: Personal Use, Knowledge, Attitude, Dispensing Practice, and the Barriers among Community Pharmacists in Gondar, Northwest Ethiopia. Evidence-Based Complementary and Alternative Medicine. 2017;2017. PMid:28904558 PMCid:PMC5585575 https://doi.org/10.1155/2017/6480142
25. Mirkovi S, Janković S, Džudovi J, Gužvi V. Development and Validation of the Questionnaire for the Evaluation of Knowledge about Herbal Preparations (QEK-HP). 2017. https://doi.org/10.1515/afmnai-2017-0012
26. Ansari M. Evaluation of community pharmacies regarding dispensing practices of antibiotics in two districts of central Nepal. PLoS One. 2017;12(9):e0183907. PMid:28949990 PMCid:PMC5614431 https://doi.org/10.1371/journal.pone.0183907
27. Baral SR, Parajuli DR, Shrestha S, Acharya SR, Dahal P, Poudel P, et al. Undergraduate pharmacy students' attitudes and perceived barriers toward provision of pharmaceutical care: a multi-institutional study in Nepal. Integr Pharm Res Pract. 2019;8:47-59. https://doi.org/10.2147/IPRP.S203240 PMid:31240200 PMCid:PMC6556473

28. Asmelashe Gelayee D, Binega Mekonnen G, Asrade Atnafe S, Birarra MK, Asrie AB. Herbal Medicines: Personal Use, Knowledge, Attitude, Dispensing Practice, and the Barriers among Community Pharmacists in Gondar, Northwest Ethiopia. Evidence-Based Complementary and Alternative Medicine. 2017; 2017(1):6480142. https://doi.org/10.1155/2017/6480142 PMid:28904558 PMCid:PMC5585575

29. Administration DoD. Drug Registration Regulation 2038 Nepal: Government of Nepal; 1981 [cited 2024]. Available from: https://www.dda.gov.np/ .

30. Naidu S, Wilkinson JM, Simpson MD. Attitudes of Australian pharmacists toward complementary and alternative medicines. Ann Pharmacother. 2005;39(9):1456-61. PMid:15972324 https://doi.org/10.1345/aph.1G089