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A Cross-Sectional Survey of Iraqi Herbalist Practicing in the Middle Euphrates Area with a Recognition of their Knowledge, Practice and Attitude(Conference Paper)#

Suhad S. Humadi*,[1], Saif M. Hassan*, Salam W. Ahjel *

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*Department of Pharmacy , Al-Zahrawi University College , Karbala ,Iraq.

Abstract

High percentage of the Iraqi population profoundly rely on folk medicine to meet their health needs which makes their safety questionable. This study aims to evaluate Iraqi herbalists' knowledge and practice to ensure the public's safety.

This study was conducted in a cross-sectional design between October 2021 and March 2022, using a pretested questionnaire administered to Iraqi herbalists practicing in Middle Euphrates Area. Through face-to-face meetings, participants completed a multicomponent questionnaire comprising 15 items in four sections. The data obtained were analyzed using a statistical package for social sciences; Chi-square was used to correlate some variables, and P-values of <0.05 were considered significant.

A total of 54 male herbalists from five Iraqi provinces joined this survey, the majority practicing in Kabala. Most herbalists had 10- 20 years of experience, and more than 50% had a university degree. Data showed that 72.2% of herbalists identify their herbal items using their own experience, and 35.2% use this experience as their sole source of knowledge. Only 35.1% use herbal books in conjugation with their experiences, and a few (1.9%(use multiple sources of information. Herbalists with more years of experience (79.6%(evaluate patient conditions properly, follow up (40.7%(, and refer patients to their physicians when needed (42.6%(. Although fifty percent of herbalists educate their patients regarding the storage condition of remedies, most of them refrain from writing the complete ingredients on their final product regardless of their experience. Results also showed that most herbalists do not have a record tracking adverse reaction.

Most Iraqi herbalists lack the proper system for prescribing and dispensing their remedies and adequately identifying the sold herbs. The study showed a variation in practice among herbalists using approaches based mainly on their experience.

Keywords: Herbalism, Herbalists, Herbal remedies, Practice Survey, Clients

دراسة المسح المقطعي للعشابين العراقيين في منطقة الفرات الاوسط والتعرف على مهاراتهم المعرفية والسلوكية (بحث مؤتمر)#

سهاد سامي حمادي*[1]، سيف حسن* وسلام عاجل*

 # المؤتمر العلمي العاشر لكلية الصيدلة، جامعة بغداد ٢ – ٣ حزيران٢٠٢٢

*كلية الزهراوي الجامعة، قسم الصيدلة، كربلاء، العراق.

الخلاصة

تعتمد نسبة عالية من سكان العراق اعتمادا كبيرا على الطب الشعبي لتلبية احتياجاتهم الصحية مما يجعل سلامتهم في محل تساؤل عن مدى اهلية العشابين. ومن هنا تأتي أهمية هذه الدراسة لتقييم معرفة واداء العشابين لضمان سلامة الجمهور.أجريت هذه الدراسة بتصميم مقطعي في الفترة ما بين تشرين الاول ٢٠٢١ الى شهر آذار ٢٠٢٢, باستخدام استبيان شامل ومتعدد الفقرات, مؤلف من خمسة عشر سؤالا مبوبا في أربعة أقسام .تم اعطاء هذا الاستبيان لممارسي الطب العشبي في منطقة الفرات الأوسط ومن ثم تحليل البيانات المستحصلة احصائيا باستخدام النظام الاحصائي SPSS. بالإضافة الى ذلك تم استخدام مربع كاي لربط بعض المتغيرات، واعتبرت القيمة الاحتمالية البالغة اقل من ٠,٠٥ مهمة وذات دلالة احصائية .نتائج الاستبيان استحصلت من ٥٤ عشابا في خمس محافظات عراقية مختلفة و أظهرت النتائج فيها ان العشابين هم من الذكور واغلبهم يمارسون العمل في كربلاء وخبرتهم المهنية تتراوح بين ١٠ و ٢٠ عاما علما ان أكثر من ٥٠ بالمئة منهم حاصلين على شهادة جامعية. كما واظهرت البيانات ان ٧٢.٢ بالمئة من العشابين يستدلون على اعشابهم الطبية من خلال الخبرة المهنية الذاتية دون الاعتماد على المصادر العلمية الموثوقة حيث ان ٣٥.٢ بالمئة يعتمدون على هذه الخبرة كمنبع اساسي للمعرفة. واثبتت هذه الدراسة ايضا ان ٣٥.١ بالمئة يستخدمون المراجع العلمية الخاصة بالأعشاب بالإضافة الى الخبرة المهنية في ممارساتهم التطبيقية و١.٩ بالمئة فقط هم الذين يستخدمون المصادر المختلفة للمعرفة. ومن الجدير بالذكر أن العشابين ذوي أعوام الخبرة الطويلة (٧٩,٦ ٪) يقومون بالتقييم الصحيح لحالات المرضى وان (٤٠,٧ ٪) يقومون بمتابعة تطور أوضاعهم الصحية ونسبة (٤٢.٦٪) من العشابين يقومون بإحالة الحالات المستعصية للأطباء الاختصاص. واوضحت الدراسة ايضا انه على الرغم من أن خمسين بالمئة من العشابين يقومون بتثقيف زبائنهم فيما يتعلق بطرق خزن المواد العشبية واستخدامها الصحيح، الا ان معظمهم يمتنعون عن كتابة المكونات الكاملة على منتجهم العشبي النهائي بغض النظر عن سنوات الخبرة و أظهرت النتائج أيضا أن معظم العشابين ليس لديهم سجل تتبع خاص للأعراض الجانبية للمنتجات العشبية المعطاة.

[1]Corresponding author E-mail: Suhadsami04@yahoo.com
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يستخلص من هذه الدراسة افتقار أغلب العشابين العراقيين إلى النظام المناسب لوصف وصرف علاجاتهم العشبية وتحديد الأعشاب المباعة بشكل صحيح ودقيق. أظهرت الدراسة ايضا الحالية تباينا واضحا في الممارسة بين العشابين في ممارساتهم التطبيقية والمبنية بشكل اساسي على الخبرة الذاتية المكتسبة

الكلمات المفتاحية: الطب الشعبي ، العشابين ، استبيان شامل ، زبائن

Introduction

Herbalism is a folk medicine practice using plants and plant extracts to treat ailments [1] .The use of herbal medicine maintains to grow globally, with an estimated 80% of the population relying on these products to treat different health disorders in various national healthcare settings [2-5].In the Mediterranean region, consumers highly utilize herbal medicine, with many studies stating high percentages [6] .In the Gulf region, 43.2-76.0% of the population claims to use herbal medicine regularly [7] .Studies in Iraq show a 71.6-76.4% use of herbal products among patients [8-10] .The widespread use of herbal products may be due to cultural acceptability, accessibility, or cost affordability [11-13] .

Historically, herbalists have been the source of supplying herbal remedies. Several ethnobotanical studies have been performed in Iraq to investigate medicinal plants used by local herbalists in managing different diseases [14-17] .However, limited studies were conducted to evaluate herbalists' practice and knowledge in this field [16] .Researchers observed that most traditional herbalists practice their healthcare services illegally and are not officially identified by the authorities in many countries [18,19] .The incorrect use of traditional practices can lead to severe consequences; thus, an investigation needs to determine the efficacy and safety of such practices. Our analysis is the first survey performed in southern Iraq to investigate herbalists' knowledge and practices.

The primary aim of this study is to evaluate Iraqi herbalists' knowledge and practice to ensure their client's safety, performed through a cross-sectional structured interviewer-administered questionnaire using Bloom's cut-off categories to measure the knowledge and practice scores [20-22] .Questions were chosen after reviewing studies in this field and modified to serve the aim of this study [16,32] .The secondary aim is to provide the baseline data for researchers for further investigations regarding herbalist practice, thus generating a proper model for herbalist practice.

Materials and Methods

Study design

The study is a cross-sectional question-based survey of herbalists practicing in the Iraqi Southern Area. The survey took place between October 2021 to March 2022.

The chosen area for this study is the Middle Euphrates Area, denoted by five governorates: Karbala, Al-Najaf, Babylon (Hilla), Al-Muthanna, and Al-Qadisiya. This area is recognized for its cultural and religious contributions that nourished herbalist knowledge , especially during religious rituals. For the two governorates, Al-Muthanna and Al-Qadisiya, we chose the biggest cities represented by Al-Samawah and Al- Diwaniyah, respectively.

Data collection

Data collection took place in the selected herbalist's shops through face-to-face interviews with the herbalist. Each interview lasted about 20-30 minutes, and consent was implied upon agreement to complete the questionnaire. Ethical approval for the study was achieved through the Ethical Board at Al Zahrawi University College (AZUC Ref No.174/09/2021).

The sample size was estimated according to the following formula

$$n=(Z_{1-\alpha})^2\times P(1-P)/d^2$$

Where n=number to sample.

Z1-α is a standard normal variation (at $p<0.05$ = 1.96), P is the excepted proportion of herbalists in the population depending on previous studies set to 50% as no available data in the literature for the actual proportion of herbalists or registered herbalists shop [23,24,32]

d is the maximum tolerable error for the prevalence estimate (e.g., ±0.05).

Questionnaire

The form used in this study was created following a complete revision of relevant literature and modified to fit the aim of this study [6,14,16]. It mainly contained closed-ended questions of 15 items and was divided into four parts. The questions were formulated to detect the system followed by herbalists prescribing and dispensing herbal remedies to their patients and the source of information used in their practice.

Part A consisted of five questions about demographic data (Gender, Age, level of education, Years of experience, and the location of the herbalist's shop).

Part B of the questionnaire consisted of 2 questions to identify the sources of used herbs and identity recognition of these plants.

Part C of the questionnaire had 7-questions to detect the herbalist's practices concerning herbal remedies. It includes evaluating the patient's chronic disease and allergies before dispensing remedies, advising the patient on the safe use and storage conditions for the product, listing all ingredients on the final product administered, reporting any adverse effects, referring to their physician or pharmacist whenever necessary, and monitoring the progress of the given treatment.

Part D of the survey addressed the herbalists' knowledge used in their job with questions of multiple choices about their source of information. They were advised to choose from the

three to four answer options listed in the form and to add other sources if not mentioned.

Bloom's cut-off categories were used to measure the knowledge and practice scores.

For the knowledge score component, two questions with multiple choice options were asked, identifying the source of information used to assess patient condition and identifying herbs given to clients. Several answer statement options were used, a positive statement was given one point, whereas a negative statement was given zero. Total points were added and calculated to measure the total score value. The original Bloom's cut-off points represented as 80.0%–100.0%, 60.0%–79.0%, and <59.0% were modified from the KAP study conducted on thalassemia among Indonesian youth [(21)] They were applied to categorize KP (Knowledge and Practice(into three levels. The scores for knowledge varied from 0 to 7 points and were grouped into three levels as follows: high knowledge level: 6 to 7 scores; moderate level: 4-5 scores; and low level: 0 to 3.

For the practice component, a total score based on the answers to seven questions on a five-point Likert scale (5=always; 4=usually; 3=often; 2=rarely,1= never (was calculated. The total points given corresponded to practice were 35. A practice score from 28 to 35 indicated good practice, whereas a score from 21 to 27 indicated fair practice. Furthermore, a score of less than 20 indicated poor practice [(21,23)]

The inclusion criteria were adults aged 20 years or older practicing traditional medicine in a herbalist shop, and the exclusion criteria were the incomplete form and younger ages.

The questionnaire form was validated regarding content rationality by three specialists in the pharmacognosy field and translated to Arabic with the aid of 2 native speakers with English linguistic specialty and a Ph.D. in Pharmaceutical Science. The translation process involved several steps [(25)]:

- preparation of the original form by authors who had different fields of experience
- forward translation to the target language by a native speaker with a Ph.D. in English Linguistics
    - back translation with a different translator to investigate any discrepancies
    - harmonization to prevent any deviations of meaning
    - Cognitive debriefing, and testing on two herbalists to ensure clearance and understandability, then the final approval of the form

One of the obstacles faced in the pilot study was the translation of adverbs of frequencies used to determine herbalist practice utilizing the 5-point Likert rating scale (Always, usually, often, rarely, never). This problem was overcome using percent numbers to determine the difference between the used adverbs and to ease the herbalist's understanding of the meaning of these words.

Statistical analysis

Statistical software for social sciences was used to analyze the studied data (SPSS Version 26, Chicago US). Age, education, and experience proportions were estimated using descriptive statistics. The Chi-square test was utilized to estimate the statistical significance of differences in proportion types between the groups, and a P-value of less than 0.05 was considered significant.

Results

A sum of 85 herbalists was approached; There wasn't official statistical data available on the number of registered herbalists' shops in the studied area and this was also noted in other studies [(32)], only 54 responded to the survey giving a response rate of 63.5 %. Most herbalists did not agree to release information due to competition and safety issues that brought this participation rate.

A total of 54 male herbalists from five different Iraqi provinces participated in this study. Interestingly, womenfolk medicine was not noticed or observed during this survey.

For the score of KP (Knowledge and Practice), it was noted that the majority of herbalists (94.4%) had poor knowledge, and 35.1% had poor practice as shown in Tables 2 and 3.

Table 2. Distribution of knowledge scores using Bloom's cut-off categories.

Level	N (54)	Percentage
High Knowledge level (6-7)	Zero	Zero
Moderate Level Knowledge (4-5)	3	5.5 %
Poor Level Knowledge (0-3)	51	94.4%

The minimum scores point zero, Maximum score point 7

Table 3. Distribution of practice scores using Bloom's cut-off categories

Level	N (54)	Percentage
Good Practice (28-35)	18	33.3%
Fair Practice (22-27)	17	31.4%
Poor Practice (0-21)	19	35.1%

Minimum scores point 11, Maximum score points 35

Data showed that most herbalists (38.9%) were recorded in Karbala, followed by Babylon province (29.6%) and other provinces with the lowest percentage. Nearly half were young adults (48.1%)and middle-aged (42.6%).

Amusingly, it was found that more than half of the respondents (57.5 % collectively graduated and postgraduate (have university degrees as their level of education, and only 11.1 % were

illiterate. Data showed that less than half of the participants (42.6%) have more than ten years of experience and about one-third (35.2%) have more than 20 years of experience.

A comprehensive demographic data of the study respondents is demonstrated in Table 4.

Table 4 . Demographic characteristics of the study population

Variants	Type	*n*	%	Chi-squire	P-value
Herbalist residence	Babylon	16	29.6	**19.519**	**0.001**
	Al-Qadisiya	6	11.1		
	Al-Muthanna	5	9.3		
	Karbala	21	38.9		
	Najaf	6	11.1		
	Total	54	100.0		
Herbalist age/year	20-39	26	48.1	**14.333**	**0.001**
	40-59	23	42.6		
	60-79	5	9.3		
	Total	54	100.0		
Herbalist education degree	Illiteracy	6	11.1	**38.407**	**0.000**
	Primary	5	9.3		
	Secondary	12	22.2		
	University	28	51.9		
	Post-graduate	3	5.6		
	Total	54	100.0		
Herbalist experience/year	<5	4	7.4	**17.852**	**0.000**
	5-10	8	14.8		
	10-20	23	42.6		
	>20	19	35.2		

*($p<0.05$)

Part B of the survey addresses the herbalist's plant source and identification method; data demonstrated that 81.5 % of herbs were imported, while only 18.5 % came from the local market. The method used for the identification process depended mainly on the herbalist's experience (72.2%), and only a minority (14.8%) of herbalists bought their herbs from authenticated places.

Statistical analysis showed a significant difference ($p<0.05$) between herbalists' years of experience and the method of herbal identification. Results are demonstrated in Figure 1

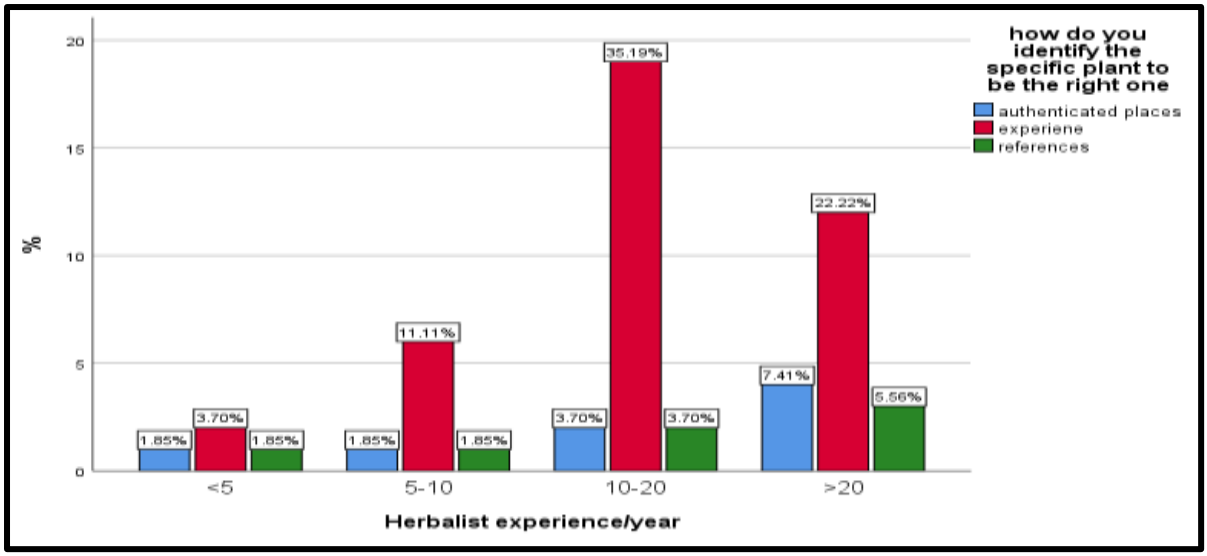

Figure 1 Herbalist's method of plant identification and years of experience.

Part C of the survey discussed the herbalist's practice in dispensing their remedies to patients. Results showed that more than three-quarters of herbalists (79.6%) constantly assess patients and follow up (40.7%) with their clients on the progress of given treatment. Only a minority of herbalists never evaluate patient conditions nor monitor their treatment, with a low percentage of 7.4% and 13.0 %, respectively. Our findings showed a significant correlation ($p<0.05$) between both patient disease assessment & follow-ups and herbalists' years of experience.

It was shown that herbalists rarely (29.6 %(or never (25.9%) keep a record of side effects that occur with remedies given, but most of them (42.6%) direct their clients to their health care providers when such side effects occur. There was a significant difference ($p < 0.05$) correlating years of experience of herbalists who always refer their patients in case of remedy's side effects.

Other observations from the analysis showed a comparable proportion of herbalists write expiration on their given products (40.7%) compared to those who never (29.6%) write expiration.

For the consultation on storage conditions, about half of the respondents (50.0%) always advised patients about the proper storage conditions of the given remedy. A further note about herbalist practice was writing the complete ingredients on the final remedy package. Data showed that 40.7% of them never, and 14.8% rarely put this information on the product given, as compared to 22.2% who always do so; it was also found that there was a significant correlation to years of experience as it was a part of their practice.

The detailed information analyzing practice is shown in Table 5

Table 5 .Herbalist's practice and years of experience

Type	<5		5-10		10-20		>20		Total		Chi-Square	p-value
	n	***%***	***n***	***%***	***n***	***%***	***n***	***%***	***n***	***%***		
Patient disease assessment												
Always	4	9.3%	6	14.0%	16	37.2%	17	39.5%	43	79.6%	**9.64**	**0.00**
Never	0	0.0%	1	25.0%	1	25.0%	2	50.0%	4	7.4%		
Often	0	0.0%	0	0.0%	2	100.0%	0	0.0%	2	3.7%		
Rarely	0	0.0%	0	0.0%	2	100.0%	0	0.0%	2	3.7%		
Usually,	0	0.0%	1	33.3%	2	66.7%	0	0.0%	3	5.6%		
Herbalist follows up and monitor												
Always	4	18.2%	3	13.6%	7	31.8%	8	36.4%	22	40.7%	**21.93**	**0.00**
Never	0	0.0%	1	14.3%	3	42.9%	3	42.9%	7	13.0%		
Often	0	0.0%	2	22.2%	5	55.6%	2	22.2%	9	16.7%		
Rarely	0	0.0%	1	9.1%	8	72.7%	2	18.2%	11	20.4%		
Usually	0	0.0%	1	20.0%	0	0.0%	4	80.0%	5	9.3%		

Continued table 5.

Herbalist records any side effects from the preparation												
Type	<5		5-10		10-20		>20		Total		Chi-Square	p-value
	n		***%***		***n***		***%***		***n***			
Always	2	14.3%	4	28.6%	4	28.6%	4	28.6%	14	25.9%	**23.22**	**0.12**
Never	0	0.0%	1	7.1%	8	57.1%	5	35.7%	14	25.9%		
Often	1	11.1%	1	11.1%	4	44.4%	3	33.3%	9	16.7%		
Rarely	1	6.3%	2	12.5%	6	37.5%	7	43.8%	16	29.6%		
Usually	0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	1.9%		
Herbalist refers patient with side effect to physician or pharmacist												
Always	2	8.7%	3	13.0%	10	43.5%	8	34.8%	23	42.6%	**9.00**	**0.00**
Never	1	7.7%	0	0.0%	6	46.2%	6	46.2%	13	24.1%		
Often	1	14.3%	2	28.6%	2	28.6%	2	28.6%	7	13.0%		
Rarely	0	0.0%	0	0.0%	2	66.7%	1	33.3%	3	5.6%		
Usually	0	0.0%	3	37.5%	3	37.5%	2	25.0%	8	14.8%		
Herbalists put expirations on the product sold												
Always	3	13.6%	5	22.7%	7	31.8%	7	31.8%	22	40.7%	**32.85**	**0.00**
Never	0	0.0%	0	0.0%	7	43.8%	9	56.3%	16	29.6%		
Often	0	0.0%	0	0.0%	3	100.0%	0	0.0%	3	5.6%		
Rarely	0	0.0%	1	16.7%	4	66.7%	1	16.7%	6	11.1%		
Usually	1	14.3%	2	28.6%	2	28.6%	2	28.6%	7	13.0%		
Herbalist gives information to clients about the storage condition												
Always	2	7.4%	5	18.5%	10	37.0%	10	37.0%	27	50.0%	**15.92**	**0.002**
Never	0	0.0%	0	0.0%	4	40.0%	6	60.0%	10	18.5%		
Often	1	12.5%	0	0.0%	5	62.5%	2	25.0%	8	14.8%		
Rarely	0	0.0%	0	0.0%	2	66.7%	1	33.3%	3	5.6%		
Usually	1	16.7%	3	50.0%	2	33.3%	0	0.0%	6	11.1%		
Herbalist records information of all ingredients on the package sold												
Always	3	25.0%	2	16.7%	3	25.0%	4	33.3%	12	22.2%	**16.926**	**0.003**
Never	0	0.0%	0	0.0%	11	50.0%	11	50.0%	22	40.7%		
Often	0	0.0%	2	28.6%	4	57.1%	1	14.3%	7	13.0%		
Rarely	1	12.5%	2	25.0%	3	37.5%	2	25.0%	8	14.8%		
Usually	0	0.0%	2	40.0%	2	40.0%	1	20.0%	5	9.3%		

*($p<0.05$)

The last part of the survey addresses the herbalist's knowledge and source of information.
It was found that most herbalists (35.2%) rely on their gained experience as their sole source of information needed in their practice, compared to (31.5 %) who use herbal books as an additional source of information. The herbalist who uses multiple sources represented a low percentage of 1.9%. The obtained data also showed that herbalists with higher years of experience tend to use fewer sources of information and depend on their acquired knowledge. (Table6)

Table 6 .Herbalists Information source and years of experience

Years of experience	<5		5-10		10-20		>20			Total		Chi-square	P-value
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*mean ±SD*	*%*		
Knowledge Answers: Herbalist information source													
experience	0	0.00%	1	12.50%	10	43.50%	8	42.10%	19	4.75± 35.20	35.20%	**19.66**	**0.186**
experience + internet	1	25.00%	1	12.50%	2	8.70%	1	5.30%	5	1.25± 9.30	9.30%		
herbal medicine book + experience	1	25.00%	4	50.00%	8	34.80%	4	21.10%	17	4.25± 31.50	31.50%		
herbal medicine books	1	25.00%	0	0.00%	3	13.00%	4	21.10%	8	2± 14.80	14.80%		
herbal medicine book + experience + internet	1	25.00%	1	12.50%	0	0.00%	2	10.50%	4	1± 7.40	7.40%		
herbal medicine book + experience + study	0	0.00%	1	12.50%	0	0.00%	0	0.00%	1	0.25± 1.90	1.90%		

*($p<0.05$)

Discussion

There have been continuing arguments about the likelihood of regulating practitioners of herbal and traditional medicine globally since they met vital criteria that included risk to the public through poor practice [26-28]**.** The World Health Organization (WHO) recommends that countries take action to regulate traditional and complementary medicine practices and practitioners. According to WHO reports, no more than 25 of the 191 member nations have a federal policy on traditional herbal medicine, and only 64 countries control herbal practices [16,26]**.** In light of these facts, it is crucial to detect the current herbalist practices to reveal the steps needed to design a general system for herbalist practice.

The study revealed several important observations regarding herbalist practice and knowledge. The first observation noted was the method used to identify the herbal products dispensed in herbalist shops. This is an essential initial step in managing the patient condition on the one hand and their safety on the other hand. Depending on experience rather than references is a part of the concern, being a source of error since many species may look the same and necessitate using references and documentation for complete identification. Our findings matched the observation noted by Nedhal A. Al – Douri study in Iraq, performed between 2009 and 2011 [16]**,** highlighted this vital step in patient care. Mislabeling of herbal products and its impact on patient safety has been extensively studied [36,37]**.** Therefore, it is important to impose regulations on imported herbal products and to be sold only in licensed and registered stores under the supervision of the Ministry of Health. These products should be fully labeled with the correct botanical name in addition to their local name in the market to avoid any mislabelling in dispensing herbs to patients.

For the practice part, our findings showed that most herbalists perform patient assessments before dispensing their remedies, and most follow up with their clients on the treatment progress. The above approach was noted with more experienced herbalists. This result showed that herbalists acquire their knowledge mainly through their actual practice or with what we call "trial and error" in patient management; accordingly, herbalists with fewer years of experience practice differently and impose higher risks on their patients. This finding was also confirmed by other studies performed in other countries [32-34]**.** The inconsistency in practice among herbalists is another concern in patient safety, which necessitates regulating the practice with general standards.

Another helpful note extracted from our data showed that herbalists only sometimes track records of adverse effects from the herbal remedies given. This recording is crucial to the safety of patients and essential in generalizing the pool of data for herbs **[12,29,30]** as most of our data regarding adverse effects generally depend on the feedback and prognosis from patients.

Interestingly, most herbalists refer clients to their physicians in case of unwanted side effects which is a part of a collaboration between some herbalists and health care providers. This practice was also noted in other studies [32,35].

A further note about herbalist practice was to refrain from writing the complete ingredients on the final remedy package. Herbalists believe such information may impact their success, being their profession's secret. This finding brings us to a significant safety issue for the patients, especially in case of toxicity, allergy, and possible drug interaction with an unknown product, as most herbalists use a combination of herbs and rarely prescribe a single herb entity [31]

The study also revealed that herbalists use their acquired experience as their primary source of information; a Similar observation was noted by Reem A. Issa's study, which was performed in Jordan in 2017 **[32].** This practice can impose some risk on clients as information is not up to date through references and education programs [32-34]**.** Herbs can produce a broad scale of unwanted or adverse reactions, some of which can trigger severe damage, life-threatening conditions, and even death. Various and undeniable cases of poisoning have been stated in the literature [38-40]**.**

Limitations of the study

Study participants' recruitment was based on their interest in the survey; thus, an unequal number of herbalists were joining from different provinces. Herbalists' rejection to participate in the study was due to illegal practice, limited time, fear of releasing information about their practice, and competition issues. Another limitation was the difficulty in obtaining the official number of registered herbalists' shops. Moreover, no studies have been performed to estimate the proportion of herbalists in the population. Further studies are required to investigate herbalist practice in other parts of Iraq and recruit more significant numbers to generate national data.

Conclusion

The study showed that Iraqi herbalists practicing in the studied area use different approaches in prescribing and dispensing their remedies to clients and identifying their herbal plants. Herbalists with higher experience tend to practice differently than those less trained. This variation in practice may impose health risks on the public which necessitates creating a standard of practice followed by all herbalists. The regulation should start from the initial step of importing herbal products down to the final step of dispensing these products to patients**.**

Recommendations

It is recommended to schedule continuous education programs for updated information regarding herbal product consumption, safety, and effectiveness for herbalists to ensure safety.

The Ministry of health can enforce this as a program needed to renew their license periodically. It is essential to set a system for the correct identification and verification of the different medicinal plants and their various species and to train herbalists on this system.

It is also recommended to have frequent follow-ups and visits scheduled by the Ministry of Health to check on different herbalist shops and their practice, focusing on the importance of writing the complete list of ingredients, storage, and expiration on the package of herbal remedies.

Moreover, there is a need for an advanced system for reporting unwanted side effects and reactions from different sold herbal products to create a database on the safe use of such products and their possible adverse reactions.

Conflict of Interest

In this study, there was no conflict of interest

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