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RESEARCH ARTICLE

Attitudes of Herbalists Towards Regulation and Integration of Herbal Medicine into Mainstream Healthcare in Kenya: A Cross-Sectional Study

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ABSTRACT

The practise of herbal medicine in Kenya is not well regulated to date. This has resulted in infiltration by quacks and other malpractices that pose serious health problems to the Kenyan public. Additionally, there is no communication between the medical staff and herbal practitioner's despite managing the same patients in most cases, owing to the popularity of herbal medicine. The study aimed to understand the herbalist's opinions towards regulation and integration of their practice into mainstream healthcare. A cross-sectional study design was adopted, and purposive sampling used to select participants, who included officials from the herbalist's associations from 21 Kenyan counties where herbal practice is still rife. They comprised of the chairman, secretary, treasurer and organizing secretary for each association. A total of 70 officials who were willing to participate in the study were interviewed. Targeted structured questionnaires were used to obtain their views on several issues including regulation, disclosure and integration into mainstay healthcare. Data analysis was implemented using STATA version 13. The findings indicate that majority (51%) of the herbalists are in support of local and national regulation through the Ministry of Health. Additionally, 99% are willing to work together with conventional healthcare workers by way of referrals. They are also willing to disclose their herbal medications to healthcare professionals (47%) and research institutions (87%). We propose an evidence-based model whereby herbalists are regulated under the ministry of health in order to eradicate quacks and malpractice. The herbalists may communicate with doctors by way of referrals and benefit from training from health officials.

Keywords: *Traditional medicine, herbal medicine practice, regulation, integration, disclosure*

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INTRODUCTION

The demand for traditional medicine, especially herbal products, has in recent years increased in Kenya due to emergence of chronic and communicable diseases, some of which do not respond well to conventional medicines (Kigen GK, Ronoh HK, Kipkore WK, & JK, 2013; Ngere et al., 2022). This has led to proliferation of herbalists mainly in urban areas, purporting to offer treatment for various ailments including HIV/AIDs, diabetes, asthma, arthritis and cancer. However, the capacity of herbalists to comprehend and manage these diseases has not been well established. Additionally, research has shown that up to 80% of patients in this region use herbal medicine, often concurrently with conventional medicine (Okaiyeto & Oguntibeju, 2021; WHO, 2023). Moreover, despite managing similar patients, healthcare providers and herbalists/traditional medicine practitioners (TMPs) currently do not communicate in order for doctors to understand the kind of herbal medicines that their patients are using, to avoid herbal drug interactions and other deleterious effects (Kigen GK et al., 2013). Further, there is very little collaboration between the two groups of healthcare practitioners (Jama, Nyembezi, Ngcobo, & Lehmann, 2024; Okaiyeto & Oguntibeju, 2021). Moreover, most herbalists in Kenya are not willing to divulge information about their practice, unless to very close associates (Kigen GK et al., 2013). This is unlike Asia whereby herbal/traditional medicine practise has been standardized and integrated into primary health care (WHO, 2023). Despite there being about 40,000 herbalists in Kenya, researchers have reported that a high number of persons purporting to be herbalists are quacks who are out to make quick financial gains from desperate patients (Kigen GK et al., 2013; NCAPD, 2008). The matter is compounded by the fact that herbal medicine is a cultural practice rather than a healthcare profession. It is therefore difficult to distinguish quack herbalists from genuine practitioners and evaluate the risks that they pose to the patients (Ezekwesili-Ofili Josephine & Okaka Antoinette Nwamaka, 2019; Kigen GK et al., 2013). This has resulted in several public health problems including administration of toxic substances to patients, interaction of herbs with conventional drugs, herbalists retaining the patients for long periods without referring to doctors even as their conditions deteriorate and misguided beliefs that herbalists can treat conditions that are perceived to be untreatable in hospitals such as cancer (Chen et al., 2011; Gakuya et al., 2020; Kigen GK et al., 2013; Okumu et al., 2017; Orwa, 2002). The regulation of herbal practice and potential ways through which herbalists may communicate with mainstay health practitioners may eradicate this menace (Gakuya et al., 2020; Kigen GK et al., 2013; Okumu et al., 2017).

Although the use of traditional medicine is prevalent in Kenya, the current policies do not adequately address the matter (GoK, 2014, 2020). However, the Health Act, 2017, provides for development of policies to guide the integration of traditional and alternative medicines into county health systems. It further directs for the establishment of a regulatory body by an act of parliament to regulate the practice of traditional and alternative medicine (GoK, 2017). In an effort to implement the relevant sections of the act, draft Traditional and Alternative Medicine Policy 2024 and Traditional Health Practitioners Bills, 2024 have been developed by the Ministry Health and are awaiting enactment. Whereas research findings have great potential to deepen and broaden the practice of herbal medicine in Kenya, the platforms to engage the herbalists in order to understand and facilitate their practice are currently unavailable. This largely attributed to their mistrust of researchers in order to protect their interests (Kala, 2017; Mashoto, 2024). Indeed, the challenges regarding the standardization of traditional/herbal products and practice is a worldwide problem. Most of the traditional/herbal products do not meet strict quality, safety and efficacy standards set up by the drug regulatory authorities (Parveen, Parveen, Parveen, & Ahmad, 2015). These challenges include lack of scientific evidence to evaluate safety and efficacy of herbal drugs, as well as failure to meet the good manufacturing standards (Parveen et al., 2015; Wang et al., 2023; Zhou, Li, Chang, & Bensoussan, 2019). Additionally, the practice is in most cases shrouded in secrecy to the extent that even fellow herbalists are not sure of the methods and herbs that their next door neighbours use to treat their clients (Gakuya et al., 2020; Kigen GK et al., 2013; Okumu et al., 2017; Orwa, 2002). Indeed, it is common to find that neighbouring herbalists use different herbs and methods to treat the same condition. Standardization of the practice is therefore of urgent necessity in Kenya.

In our view, the most critical step towards the integration of herbal medicine into the primary health care in Kenya is through registration. Additionally, for herbal medicine practice to be considered a healthcare profession, herbal practitioners/TMPs should be licensed, registered or certified under a relevant law. Further, the registered practitioners should show evidence that they have some knowledge and skills to diagnose, treat, and prevent illness or injury using their traditional/herbal medicine. The evidence may be anecdotal or otherwise including community

identification (GoK, 2017; Okumu et al., 2017). Collaboration across different institutions and actors in both informal and formal sectors around the practice of herbal medicine is also crucial. However, there are challenges related to attitudinal factors which constrain potential collaborations. The collaboration amongst TMPs and with public, research institutions, conventional medicine practitioners, training institutions, regulatory bodies and government department will have a big impact on the success of integration process (Ikhoyameh, Okete, Ogboye, Owoyemi, & Gbadebo, 2024; Jama et al., 2024; Mutola, Pemunta, & Ngo, 2021). The paper documents a critical assessment of the attitudes of officials from the herbal associations regarding the integration of herbal medicine into mainstream healthcare in Kenya. The views of the officials, who are practising herbalists on how best their practice (including herbal products) should be regulated, and potential avenues for integration are discussed.

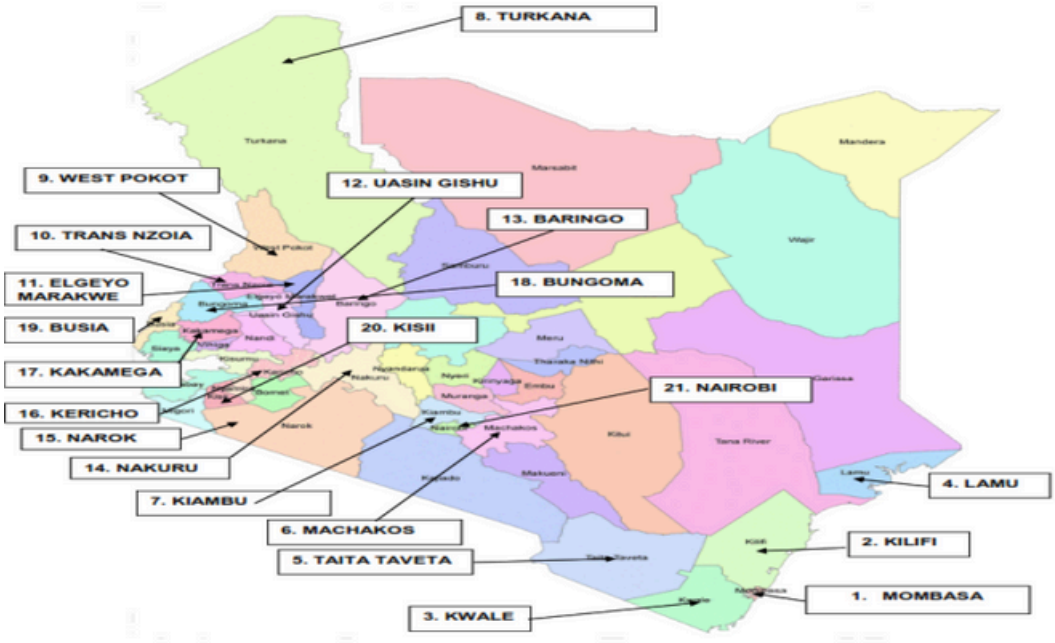
METHODS

Study Area

The study was conducted in 21 counties in Kenya drawn from Coastal region, Rift Valley region, Western region and Nairobi County (Figure 1). The choice was informed by the data of registered herbalists at the state department of culture.

Figure 1:

Map of Kenya Showing the Locations of the 21 Counties



Adopted from https://www.kra.go.ke/images/publications/The-Map-of-Kenya.pdf

Study Population

Target and Sample

The target study population were practicing herbalists registered in the various County Cultural Offices. The sample size comprised of the association officials who included the chairman, secretary, treasurer and organizing secretary for each association. A total of 70 officials who were willing and available to participate in the study were interviewed. The counties whereby four officials enrolled and were interviewed included Turkana, Kilifi, Uasin Gishu, Baringo, Narok, Kwale, and Elgeyo-Marakwet. Three officials were enrolled from the remaining counties respectively which included Lamu, Taita-Taveta, Machakos, Kiambu, West-Pokot, Bungoma, Kisii and Nairobi, Busia, Nakuru, Trans Nzoia, Mombasa, Kericho and Kakamega. Targeted questionnaires and semi structured interviews were used to obtain the relevant information which included their social demographic characteristics, views on regulation of herbal practice, herbal products and integration of herbal medicine into the mainstream healthcare.

Sampling

Purposive sampling was employed. We visited the office of the county cultural officer who provided us with a list of registered herbal associations within the county. An association was randomly chosen from the list and with the help of an interpreter identified by the county cultural officer, and 3-4 association officials were subsequently identified and visited for interview.

Data Collection Tools

Data was collected using paper-based questionnaires which were assessed for completeness and accuracy prior to release of the respondent. A multiple response variable approach was adapted whereby respondents were allowed to choose more than one option in each questionnaire. The physical data was then entered into an electronic database using the Open Data Kit (ODK) platform. The database was created using Microsoft excel and hosted in ONA website. The website has a secure link that required a username and a password to access it. The data was downloaded and cleaned prior to analysis.

Data Analysis

Descriptive statistics for location and dispersion were used to summarize the variables. Continuous variables were assessed for Gaussian assumptions. The tests for normality suggested that distributions for age and years of work experience violated the Gaussian assumptions thus they were summarized using median and inter quartile range (IQR). Categorical variables were summarized using frequencies and the corresponding percentages.
The results were presented using tables and graphs. Data analysis was implemented using STATA version 13 SE (College Station, 77845 Texas USA).

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Ethical Approval

Ethical approval was granted by Kenyatta National Hospital (KNH)-University of Nairobi (UoN) Ethical Review Committee (KNH-UoN ERC) Ref: KNH-ERC/A97 and the research permit by National Science, Technology and Innovation Ref: NACOSTI/P/025/415408.

RESULTS

Socio-Demographic Characteristics of the Association Officials

The median age of the officials was 54.5 (IQR: 44.0, 60.0) years with the youngest and the oldest aged 25.0 and 87.0 years respectively. Up to 71.4% of the association officials were male, 85.7% married and 74.3% were Christians. Analysis of their levels of education revealed that 17.1% had tertiary level of education and 15.7% had no formal education. Additionally, 48.6% had no specific line of training other than being herbalists. The median years of work experience was 20.0 (IQR: 12.0, 35.0) with the minimum and a maximum being 2.0 and 65.0 years respectively.

Regulation of Herbal Medicine Practice

It was noted that there was currently no policy or legislation that prescribes for the formation of a governing body or association designed to regulate the herbalists. All agreed that there was need for such policy and legislative framework. Whereas majority agreed that it was necessary to establish an umbrella national governing body or association, a significant proportion stated that it was also prudent to have county or village committees that would undertake the day-to-day activities of the proposed regulatory body. Table 1 outlines the findings on regulation of herbal medicine practitioners.

Table 1:

Regulation and Registration of Herbal Medicine Practice

Characteristic	N	n (%)
Government department through which the association prefers herbalist/TMP practice to be regulated, n (%)	70	
Whether members of the association are registered as herbalists, n (%)		63 (90.0%)
Department/Ministry of Health		36 (51.4%)
Department/Ministry of Culture		34 (48.6%)
Preferred way through which the association would like the herbalists to be regulated to weed out quacks or malpractice	70	
By forming a national professional regulatory body, n (%)		58 (82.9%)
By forming a village/county committee, n (%)		52 (74.3%)
Other ways of regulating the herbalists, n (%)	19	
Establish regulatory body managed by TMP		14 (73.7%)
Ensure that all TMPs are licensed to get rid of quack practitioners		4 (21.1%)
Create liaison with government		1 (5.3%)
Composition of village/county committee	52	
Renowned herbalist as Chairman, n (%)		43 (82.7%)
TMPs as Member/s, n (%)		42 (80.8%)
Chiefs or administration as Member/s, n (%)		38 (73.1%)
MOH representation (as a Member), n (%)		36 (69.2%)
MCA representation (as a Member), n (%)		16 (30.8%)
Powers that the association would like regulatory body to exercise	52	
Regulate and discipline in case of malpractice, n (%)		50 (96.2%)
Promote continuity of professional development for herbalists, n (%)		44 (84.6%)
Establish a code of conduct for the herbalists, n (%)		44 (84.6%)
Prescribe minimum requirements for registration, n (%)		42 (80.8%)
Register herbalists, n (%)		42 (80.8%)
Prescribe standards of herbal medicine practice, n (%)		39 (75.0%)
License private practice, n (%)		33 (63.5%)

N – Number of respondents with valid data for analysis

From our results, 36(51%) of the 70 respondents who were interviewed prefer the TMPs to be registered under the ministry of health (MOH), whereas 34(49%) preferred registration at the ministry of culture. With regards to the establishment of a national regulatory body, 58(83%) would like the herbalists to be regulated by a national professional regulatory body whereas 52(74%) would in addition like to be regulated by village/county committees. Nineteen officials responded to the option of other potential regulatory ways, including 14(74%) who preferred an establishment of regulatory body to be managed by TMPs, 4 (21%) who stated that all TMPs should be licensed to get rid of quack practitioners and 1 (5%) who informed that TMPs should create a liaison with government. Majority of the 52 respondents who proposed regulation through village/county committees preferred a renowned herbalist to be the chairperson 43(83%). With regards to the composition of the committee membership, 42(81%) proposed that TMPs should constitute membership, 38(73%) responded that chiefs or local administration should be part of the membership, whereas 36(69%) would like a ministry of health representative to be a member. A small number 16(31%) responded that the local politician, a member of county assembly (MCA), should be a member of the committee. The other options in the questionnaire included having a consumer representative as well as establishment of a regional regulatory body which were each proposed by one association official respectively. On the powers that the regulatory body should exercise, 50(96%) of the 52 interviewed officials responded that the village/county committee should regulate and discipline malpractice cases,

44(84.6%) reported that they should promote continuity of professional development for herbalists an a further 44(84.6%) averred that they should establish code of conduct for the herbalists. Additionally, 42(81%) responded that the committee should be able to prescribe the minimum requirements for registration, with a further 42(81%) reporting that they should register herbalists. Further, 39(75%) of the officials responded that the committee should prescribe standards of herbal medicine practice, while 33(64%) informed that they should license private practice. On the question of registration, 63(90.0%) of the 70 interviewed association officials agreed that their members should be registered as herbalists.

Regulation of Herbal Preparations

Disclosure of content of herbal medicine preparations to third parties

Table 2 presents data on the role of the association in encouraging its members to disclose contents of their preparations. The results show that 74% of the association officials reported that their members had preparations that involved some level of secrecy. Asked whether the associations were willing to encourage their members to reveal the contents of their preparations, 64% reported that they were willing to encourage their members to disclose the contents of their preparations to other herbal practitioners whereas 47% were willing to disclose to conventional healthcare professionals respectively. Of those willing to encourage disclosure to other herbal practitioners, 63% reported that they would do so to promote sharing of knowledge and skills among themselves, whereas 27% reported that this would facilitate networking and referrals. Among those willing to encourage disclosure to conventional healthcare professionals, 46% reported that this would promote testing and approval of alternative medicine so as to complement conventional medicine. Conversely, 36% and 53% were not willing to encourage their members to disclose the contents of their preparations to fellow/other herbal practitioners and conventional healthcare professionals respectively. Those who declined to disclose to their fellow herbal practitioners feared that their knowledge would be stolen, which would disadvantage them. Among those unwilling to disclose to conventional healthcare professionals, 71% were scared of theft of their information for personal gains, whereas 29% believed that conventional healthcare workers look down upon them.

Table 2:

Role of the Association in Encouraging its members to Disclose Contents of Their Preparations

Characteristics	N	n (%)
Members of the association have preparations that involve secrecy, n (%)	70	52 (74.3%)
∘ Association willing to encourage its members to disclose the contents of preparations to the following		
Other herbal practitioners, n (%)	70	
Willing		45 (64.3%)
Not willing		25 (35.7%)
Reasons for disclosure to other herbal practitioners, n (%)	49	
Share knowledge/skills with other TMPs to enhanced services		31 (63.3%)
Facilitate networking and referrals		13 (26.5%)
Standardize the practice and create trust among clients		2 (4.1%)
Other reasons		3 (6.1%)
Reasons for non-disclosure to other TMP	25	
Protection of knowledge for continued business and to avoid misuse		25 (100%)
Conventional healthcare professionals, n (%)	70	
Willing		33 (47.1%)
Not willing		37 (52.9%)

Reasons for disclosure to conventional health professionals, n (%)	33	
Test and approve alternative medicine to complement conventional medicine		15 (45.5%)
Disinterest in alternative medicine by conventional medicine practitioners		1 (3.0%)
To create buy-in and facilitate networking and exchange of knowledge/expertise		2 (6.1%)
To facilitate licensing and patenting		2 (6.1%)
Other reasons		13 (39.4%)
Reasons for not willing to disclose to conventional health professionals	37	
Fear/mistrust/theft of herbalist's traditional knowledge		28 (70.8%)
Conventional healthcare professionals look down/underrate/report herbalists		9 (29.2%)

N – Number of respondents with valid data for analysis

The results on willingness of the association officials to encourage their members to disclose the contents of their preparations to the to the national regulator, the Pharmacy and Poisons Board (PPB), major research institutions specifically Kenya Medical Research Institute (KEMRI)) and public universities are depicted in Table 3.

Table 3:

Willingness of the Members to Disclose Contents of Their Preparations to Research Institutions, Universities and PPB

	N	KEMRI	N	Universities	N	PPB
Willingness to disclose	**70**		**70**		**70**	
• Willing		61 (87.1%)		51 (72.9%)		38 (54.3%)
• Not willing		9 (12.9%)		19 (27.1%)		32 (45.7%)
Reasons for disclosure	**31**		**25**		**38**	
• To facilitate research, training and quality improvement		30 (96.8%)		23 (92.0%)		-
• To promote and protect intellectual property right		-		1 (4.0%)		-
• Already working with universities		-		1 (4.0%)		-
• For regulation, standardization and quality control		-		-		27 (71.1%)
• To enhance provision of health services		-		-		9 (23.7%)
• Other reasons		1 (3.2%)		-		2 (5.2%)
Reasons for non-disclosure to KEMRI, universities & PPB	**9**		**20**		**32**	
• Lack of trust and fear that their knowledge may be stolen and used by unauthorized persons.		9 (100.0%)		20 (100.0%)		15 (46.9%)
• Fear of strict regulations		-		-		2(6.3%)
• Fear information may be used against them in courts		-		-		12 (37.5%)
• PPB shouldn't regulate TM products		-		-		3 (9.4%)

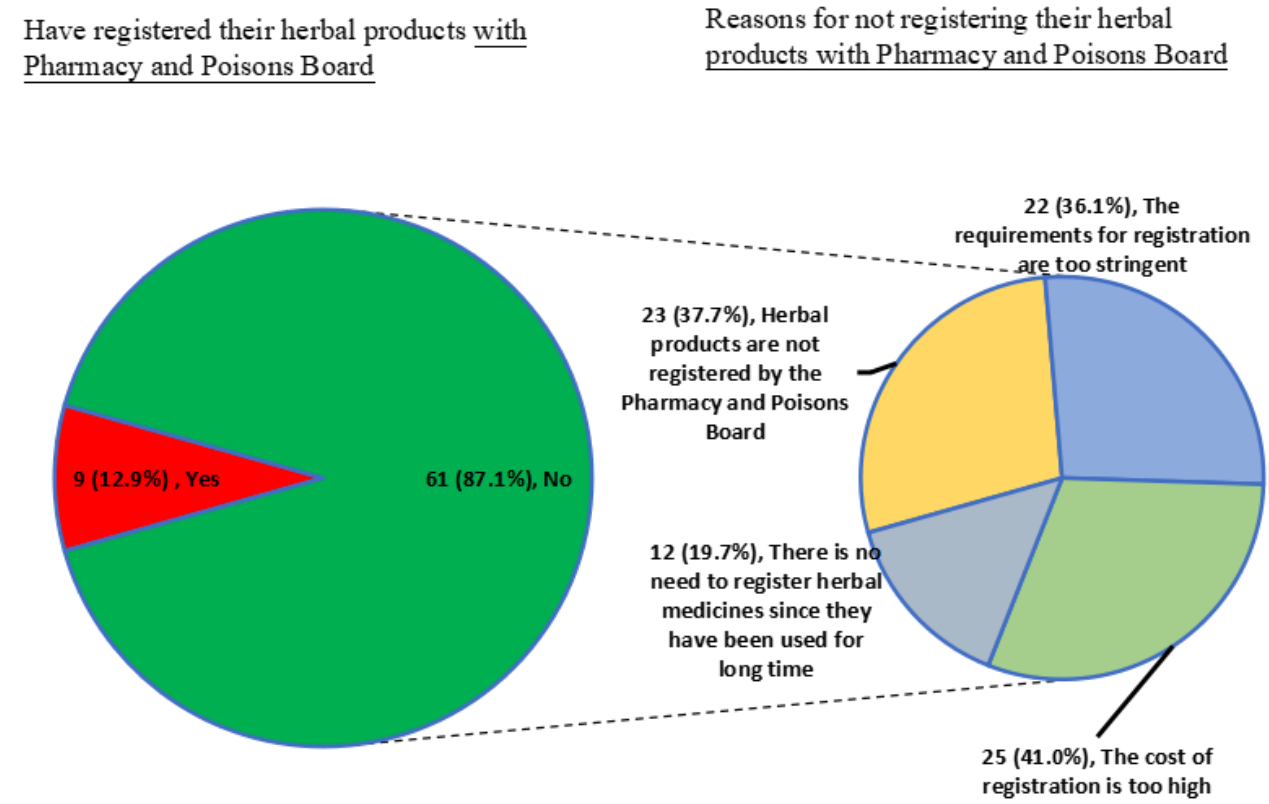
N – Number of respondents with valid data for analysis

The findings indicate that 61(87%) of the association members were willing to disclose the contents of their preparations to KEMRI, and the major reason for disclosure was to facilitate testing, research and certification 30 (97%). The data also indicate that 51(73%) of the association members were in addition willing to disclose the contents to public universities, for training, research, partnership and quality improvement23 (92%). The findings further showed that 9 (13%) and 20(29%) reported that they were not willing to encourage their members to disclose the contents of their preparations to both KEMRI and universities respectively, mainly due to lack of trust and fear that their knowledge may be stolen and used by unauthorised persons. Additionally, 38 (54%) of the association officials were willing to disclose the contents to PPB, mainly to allow for regulation, standardization and quality control of their herbal products (55%). Of those unwilling to disclose to PPB, 47% reported that they feared that their information would be stolen for personal gains, 38% feared that their information may be used against them in court, or as an avenue for harassment by the regulator, whereas 15% felt that PPB had no mandate to regulate herbal preparations. In their opinion, herbal preparations should be regulated together with herbal practitioners.

With regards to registration, only 9 (13%) of the officials reported that PPB had registered their members' products. Figure 2 summarizes the registration status and reasons for declining to register their products. The officials informed that those who had not registered believed that their products are ordinarily not registered by the PPB 23(38%), that requirements for registration are too stringent 22(36%), or that the cost of registration is too high 25(41%). A fifth reported that in their view, there was no need to register herbal products since they have been in use for as long as they have been in existence. Other reasons for declining to register the herbal products included lack of knowledge of PPB as a regulatory authority for traditional medical practitioners (3%), lack of awareness (5%) and preference to have Department of Culture register them (2%).

Figure 2:

Reasons Herbalists Have Not Registered Their Herbal Products with Pharmacy and Poisons Board



Integration of Herbal Medicine Practice into Mainstream Healthcare

The views of the association officials regarding integration of herbal and conventional medicine are illustrated in Table 4. It is noteworthy, that 69 (99%) of the officials reported that they support cooperation between the herbalists and the conventional medical practitioners and a further 68 (97%) of the officials were willing to work together with the hospitals. The proposed areas of collaboration included diagnosis of disease as suggested by 59 (87%) of the respondents and record keeping which was reported by 24 (35%). Also noteworthy, 68 (97%) of officials were willing to encourage their members to refer patients to hospitals. Of those willing to encourage hospital referrals, 36 (68%) reported that this would offer advanced diagnosis and specialized treatment,15(25%) informed that the referral can be done for laboratory services, while 7% thought that the referral may help to enhance complimentary relationship. On the association members' advice to their members in case of poor client response, 77% of the officials informed that they encourage their members to advice their clients to visit a hospital or clinic, 63% informed that they encourage their members to try other medicines or provide additional doses, 66% encourage their members to refer to other herbalists, whereas 1.4% of the officials reported that their association does not provide any advice. Other reported advisories were to ask the members to mix various herbs within a dose to improve efficacy. It is noteworthy that 93% of the officials reported that whereas their members do not receive referrals from medical doctors or hospitals, 97% receive patients who visit them after hospital visits; especially in patients with chronic conditions such as diabetes, arthritis, hypertension, HIV/AIDS. It is also notable that 89% officials would prefer their members to work in government hospitals. The reasons were to foster integration and complement each other, to encourage sharing of skills and knowledge (68%) and to enhance healthcare service delivery to the public (32%). From the results, about 20% of the officials admitted that some of their members use modern medicine together with herbal medicine. On the acceptance of herbal medicine, 99% of the officials believe that herbal medicine is not well accepted by the community.

Table 4:

Opinion of the association officials on integration of herbal and conventional medicine

Characteristics	N	n (%)
Associations support the cooperation of herbal and conventional healthcare professionals, n (%)	**70**	**69 (98.6%)**
• Association willing to work hand-in-hand with local hospitals, n (%)	70	68 (97.1%)
• Areas where the association is willing to work hand-in-hand with hospitals		
Diagnosis, n (%)	**68**	**59 (86.8%)**
• Record keeping, n (%)	68	24 (35.3%)
• Association encourages its members to refer patients to hospitals, n (%)	70	68 (97.1%)
Reasons for referral, n (%)	**59**	
• For advance diagnosis and specialized treatment		36 (67.8%)
• For laboratory services		15 (25.4%)
• To enhance complimentary relationship		4 (6.8%)
Association's advice to its members in case of client's poor response		
• Give advice to visit hospital/clinic, n (%)	70	54 (77.1%)
• Attempt other medicines or provide additional dose, n (%)	70	44 (62.9%)
• Refer to other herbal practitioners, n (%)	70	46 (65.7%)
• Nothing, n (%)	70	1 (1.4%)
• Other, state, n (%)	47	
◦ Mix herbs for a dose		1 (2.1%)
◦ None		46 (97.9%)
Members of the association do not receive referrals from medical doctor or hospital, n (%)	70	65 (92.9%)
Members of the association come across patient(s) who visit them after visiting the hospital, n (%)	70	68 (97.1%)
Association prefers to have its members work in a government hospital, n (%)	70	62 (88.6%)

Reasons for preference to work with the government hospitals, n (%)	**57**	
• Integration/complimentary purposes and sharing of knowledge and skills		39 (68.4%)
• To enhance healthcare service provision to the public		18 (31.6%)
Association has members prescribing modern medicine alongside herbal, n (%)	**70**	
• Yes, always		6 (8.6%)
• Yes, sometimes		10 (14.3%)
• Not at all		54 (77.1%)
Association believes herbal medicine is well accepted by the community, n (%)	**70**	
• Strongly disagree		55 (78.6%)
• Disagree		14 (20.0%)
• Neutral		1 (1.4%)

N – Number of respondents with valid data for analysis

The opinions of the officials on the use of conventional medicine are presented in Table 5. The data shows that 64% of the officials agree with the use of conventional medicine, whereas 9% disagree. Among those who agreed with the use of conventional medicine, 62% informed that conventional and alternative medicine are complementary, with 20% reporting that conventional medicine have been tested and found to be effective. Among those who disagreed a sixth informed that conventional medicine cannot treat some medical conditions whereas a third thought that conventional medicine have side effects and may cause harm.

Table 5:

Opinion on the Use of Conventional Medicine by the Officials of the Association of Herbalists

Characteristics	N	n (%)
Opinion of the association on the extent to which they agree with the use of conventional medicine, n (%)	**70**	
• Strongly disagree		5 (7.1%)
• Disagree		1 (1.4%)
• Neutral		19 (27.1%)
• Agree		23 (32.9%)
• Strongly agree		22 (31.4%)
Reasons for agreeing, n (%)	**42**	
• Alternative and conventional medicines are complimentary		28 (66.7%)
• Conventional medicines are tested and very effective		9 (21.4%)
• Conventional medicine cannot treat some medical conditions		2 (4.8%)
• Conventional medicines have side effects and can cause harm		3 (7.1%)
Reasons for disagreeing, n (%)	**6**	
• Alternative and conventional medicines are complimentary		2 (33.3%)
• Conventional medicines are tested and very effective		1 (16.7%)
• Conventional medicine cannot treat some medical conditions		1 (16.7%)
• Conventional medicines have side effects and can cause harm		2 (33.3%)

N – Number of respondents with valid data for analysis

Table 6 Outlines the analysis of the officials' recommended solutions towards achievement of improved herbal medicinal practice. The herbalists highly recommend scientific research into the safety and efficacy of their herbal medicines, sustainable utilization of medicinal plants, provision of licenses to herbal practitioners and clinical testing of herbal medicines before use. The officials support the training of herbal practitioners in order to improve their practice. The specific areas of training include dosage and side effects recommended by 90.0%, branding and packaging by 94%, hygienic preparation and administration of herbal medicine (98.6%), revelation of indigenous knowledge (64%) and sustainable utilization of medicinal plants which was recommended by 90% of the officials. The other areas of training recommended by the officials included protection of intellectual rights and independency each mentioned by one official.

Table 6:

Recommended Solutions for Improvement of Herbal Medicinal Practice by the Association

Characteristics	N	n (%)
Recommended solutions for improvement of herbal medicinal practice		
• Scientific research into the safety and efficacy of herbal medicines, n (%)	70	55 (78.6%)
• Sustainable utilization of medicinal plants, n (%)	70	67 (95.7%)
• Provision of license to herbal practitioners, n (%)	70	67 (95.7%)
• Clinical testing of herbal medicines before use, n (%)	70	47 (67.1%)
• Other (please specify), n (%)	7	
◦ Pharmacy owners for herbal medicine		1 (14.3%)
◦ Protection of special medicines.		1 (14.3%)
◦ Training and workshops to herbalist will approved their activities; KEBS and other government machinery to assist and approve herbal products/materials		1 (14.3%)
◦ Value addition.		2 (28.6%)
◦ Association's self-regulation.		1 (14.3%)
Associations support the training of herbal practitioners for the improvement of their practices, n (%)	**70**	**70 (100.0%)**
Areas where the association wants the training to focus		
• Dosage of and side effects of herbal medicines, n (%)	70	63 (90.0%)
• Branding and packaging of herbal medicine, n (%)	70	66 (94.3%)
• Hygienic preparation and administration of herbal medicine, n (%)	70	69 (98.6%)
• Revelation of indigenous knowledge	70	45 (64.3%)
• Sustainable utilization of medicinal plants, n (%)	70	65 (92.9%)

N – Number of respondents with valid data for analysis

The data on harmonization of herbal and conventional medicine as well as the health constraints experienced in the counties are presented in Table 7. The officials believe that harmonization of herbal and conventional medicine can be achieved through cross-referral of patients (88.6%), documentation of herbal medicines and their uses (61%), registration and provision of license to herbal practitioners (97%) and training of herbal practitioners on modern healthcare practices; and on clinical efficacy and safety of the herbal medicines (87%). Others include self-regulation and capacity building. The health constraints experienced in counties include health facilities that are not easily accessible reported by 87%, long queues within the health facilities/hospitals by 93%, poor road infrastructure by 84%, inadequate health professionals by 91% and low health education by 53%. Other reported constraints include inadequacy of health facilities, mistreatment of patients and mismanagement and low uptake of the services in the health facilities. Up to 99% of the officials believe that harmonization of conventional and traditional medicine will help to address the health constraints, with 78% convinced that this will help create options and more access to affordable health care services.

Table 7:

Recommended Solutions for Improvement of Herbal Medicinal Practice by the Association

Characteristics	N	n (%)
Ways to achieve harmonization of herbal and conventional medicine		
• Cross-referral of patients, n (%)	70	62 (88.6%)
• Documentation of herbal medicines and their uses, n (%)	70	43 (61.4%)
• Registration and provision of license to herbal practitioners, n (%)	70	68 (97.1%)
• Training of herbal practitioners in modern healthcare practices, n (%)	70	68 (97.1%)
• Clinical testing of the efficacy and safety of herbal medicines, n (%)	70	61 (87.1%)
• Ways to achieve harmonization of herbal and conventional medicine		

• Other ways in which harmonization of herbal and conventional medicine can be achieved, n (%)	2	
◦ Self-regulation		1 (50.0%)
◦ Capacity building		1 (50.0%)
• Health constraints being experienced in county		
• Health facilities are located far away from home, n (%)	70	62 (88.6%)
• There are long queues at the hospitals/clinics, n (%)	70	65 (92.9%)
• Roads leading to hospital/clinics are unmotorable, n (%)	70	59 (84.3%)
• Health care professionals are inadequate, n (%)	70	64 (91.4%)
• Health education is low, n (%)	70	37 (52.9%)
• **Other constraints, n (%)**	**7**	
◦ Inadequate facilities and medicine		3 (42.9%)
◦ Mismanagement		1 (14.3%)
◦ Mistreatment of patients and low service uptake		3 (42.9%)
The association think that harmonization of conventional and traditional medicine will help address the constraints in the county, n (%)	70	69 (98.6%)
Ways it can help reduce the constraints, n (%)	64	
• It will create harmony between conventional and alternative medicine practitioners		4 (6.3%)
• It will create options and more access to affordable health care services		50 (78.1%)
• It will create platform for sharing and enhancing knowledge and skill in the health sector		6 (9.4%)
• It will streamline and regulate the practice of alternative medicine and enhance buy-in		2 (3.1%)
• Other reasons		2 (3.1%)

N – Number of respondents with valid data for analysis

DISCUSSION

The study aimed to obtain views of the herbal medicine practitioners on how best their practice should be regulated, and potential ways through which their practise and products can be incorporated into mainstay healthcare in Kenya. Other issues pertinent to the practice were also addressed including their willingness to disclose the contents of their preparations to third parties. A total of 70 officials representing the herbal associations from 21 counties whereby herbal practice is still predominant were interviewed. Our findings indicate that the herbalists are willing to be regulated and work together with conventional health workers. They are additionally willing to disclose details of their preparations to regulatory and research bodies. From literature review, this was the first attempt in Kenya to address this critical public health issue, and the results may provide some crucial information towards the development of legislative policies to regulate the sector.

One of the issues that has been of concern is the lack of regulation of the traditional medicine practise, despite 80% of patients, especially with chronic conditions in sub-Saharan Africa using herbal medicine, and infiltration by quacks (Kigen GK et al., 2013; Okaiyeto & Oguntibeju, 2021). All the officials we interviewed agreed that there was need for regulation of herbal practice through a regulatory framework or policy in order to weed out quacks or malpractice. On preference of the regulating government body, half of the participants (51%) prefer to be regulated under MOH, while (49%) would like to be under the department of culture within the respective ministry. It is noteworthy that herbalists are currently registered under the department of culture, and indeed 90% of the officials averred that they were already registered as herbalists. The assertion that they would prefer to be registered under MOH, though marginally, fits well into the legal and policy matrix, whereby traditional herbalists will have their knowledge and skills preserved and protected under the ministry of culture, whereas those desiring to practice as healthcare professionals will be registered under MOH. Those who opt not to, may remain as traditional herbalists but will not be able to practice as healthcare professionals (TheKingsFund, 2008; Xiong et al., 2021). The role of the department of culture is to protect and preserve traditional and alternative medicine as cultural knowledge/heritage, whereas the MOH is well adapted to regulate the practice (Boateng, Danso-Appiah, Turkson, & Tersbol, 2016;

Ogirima, Arulogun, Baale, & Oyeleye, 2021). With regards to the preferred mode through which the association would like the herbalists to be regulated, 83% would like to be regulated by a national professional regulatory body whereas 74% would in addition like to be regulated through village/county committees. Fourteen (74%) of the nineteen officials who opted for other potential regulatory ways, preferred an establishment of a regulatory body to be managed by TMPs, whereas 21% thought that all TMPs should be licensed to get rid of quack practitioners and 5% informed that TMPs should create a liaison with government. It is important to note there is currently no single unitary association for herbalists in Kenya, and the officials we interviewed were from different counties. However, an association titled "The National Traditional Health Practitioners Association (NATHEPA)" was present in 10 out of the 21 counties that we visited. This is because there is currently no law or policy at National level that prescribes the formation of such professional association. A brief examination of the mission and vision statements of NATHEPA informed that they were formed by herbalists to promote and provide quality alternative medicine to improve human health. It is also encouraging that majority (97.1%) of the officials recommended licensure for herbalists wishing to practice as healthcare professionals, and training that would include modern healthcare practices such as diagnosis, records management, dose and side effects of herbal medicines; hygienic preparation, branding, packaging of herbal medicine and revelation of indigenous knowledge as well as sustainable utilization of medicinal plants. Previous studies have reported that countries which have integrated traditional medicine into mainstay healthcare have policies on traditional and alternative medicine, carry out training and research on traditional medicine practice, and regulate practitioners and products (Ampomah, Malau-Aduli, Seidu, Malau-Aduli, & Emeto, 2023; GoK, 2017; Xiong et al., 2021).

Kenya has to date not developed policies on regulation of the practice of traditional and alternative medicine, including registration of health practitioners. The main purpose of the regulation is to assure quality and safety of care and protect community intellectual rights (Gakuya et al., 2020; Ijaz, Boon, Welsh, & Meads, 2015; Krah, de Kruijf, & Ragno, 2018). Previous studies have shown that it is difficult to have a universal regulatory system for traditional medicine practice, especially in Africa since the practice is not uniform, even within herbalists from similar locations (Kigen GK et al., 2013; Kipkore, Wanjohi, Rono, & Kigen, 2014). A model that is suitable for each country is therefore recommended.

In our view, and as agreed by majority of herbalists, a hybrid regulatory model involving direct government administered regulation through the MOH and village/county committees is desirable. This proposed model includes both government sanctioned and self-regulation approaches at both national and regional levels (Ijaz & Boon, 2018; TheKingsFund, 2008). The regulation under the MOH is important as it will address both practice and integration issues. Herbalists can work under the supervision of a health worker, presumably a pharmacist or medical officer. This health officer will maintain a list of registered herbalists under his jurisdiction, who will have been independently identified by fellow herbalists, and prosecute the quacks. The health officer will routinely inspect and train herbalists and recommend transfer to medical health facilities where patients may benefit from timely intervention, unlike the current practice whereby the herbalists remain with the patients for long periods without referring to medical personnel. In this model, the county committees will be appropriate to regulate the traditional herbalists who would like to practise herbal medicine as a cultural activity, and those who wish to transit to healthcare. The latter group would require to be enrolled into a national professional regulatory body for the same functions, but with more stringent regulations (Ijaz & Boon, 2018; TheKingsFund, 2008). This model will also provide for "independent self-regulation" without government involvement at the county level. The village committees will carry out activities at this level, in liaison with the health worker. This includes identification of genuine herbalists and dealing with malpractice issues.

The other issue that has been of major public concern is the secretive ways in which traditional medical practitioners operate. From our results majority (74%) of the officials agreed that their members operated in secrecy, but 64% reported that they were willing to encourage their members to reveal the contents of their preparations to third parties. Noteworthy, a good proportion are willing to encourage their members disclose to either Kenya Medical Research Institute (87%), universities (73%) or PPB, the national regulatory authority (54%) respectively. Those willing to disclose reported that they would do so to either promote knowledge sharing and skills among themselves, facilitate networking and referrals or promote testing and approval of alternative medicine so as to complement conventional medicine. Those unwilling mainly feared that their traditional knowledge would be misappropriated. These results are contrary to various reports from previous studies which concluded that herbalists are reluctant to disclose the contents of their

preparations to third parties, and may provide a highway to initiate research on traditional medicine and integration into mainstay healthcare which has long been considered a major hindrance. However, this should be corroborated at lower levels as rural herbalists may not be that willing. The high approval by the association officials may have been due to their higher exposure compared to rural herbalists. It could also have been influenced by their quest for commercial interests as earlier reported. Authors from previous studies have reported that herbalists who have inherited the art from their relatives are less likely to disclose their practice compared to those who have learnt from other herbalists (Kigen GK et al., 2013; TheKingsFund, 2008). Many herbal medicine practitioners are reluctant to share their knowledge with third parties, or even among themselves for fear that their knowledge may be stolen, adopted and even patented, thereby losing their intellectual rights (Ijaz et al., 2015; Kasilo, Wambebe, Nikiema, & Nabyonga-Orem, 2019). As an attempt to protect these rights, the Kenya government has developed legislation that guarantees owners and holders of traditional knowledge the right to protection in conformity with Nagoya Protocol (GOK, 2016). Under this act, traditional practitioners have a right to authorize exploitation of their traditional knowledge; and prevent any person from exploiting their traditional knowledge without their prior consent. This ensures equitable sharing of benefits arising from research and development of the traditional medical knowledge (GOK, 2016). It is crucial that herbal practitioners are trained on the various aspects of this Act, to facilitate documentation, research and exploitation of traditional knowledge.

Another aspect that has been a worldwide challenge is the standardization of herbal products and practice, especially in Kenya. It is notable that the officials highly recommend scientific research into the safety and efficacy of their herbal medicines, sustainable utilization of medicinal plants, provision of licenses to herbal practitioners and clinical testing of their medicines. Major challenges still exist regarding standardization of the preparation processes and dose determination (Ampomah, Malau-Aduli, Seidu, Malau-Aduli, & Emeto, 2021; Krah et al., 2018; Okumu et al., 2017). This calls for involvement of research institutions and universities to undertake the necessary studies, now that the herbalists are willing to disclose. This involves studies to determine the safety, pharmacological activities, stability/shelf life, dose and manufacturing conditions (Ampomah et al., 2021, 2023; Wang et al., 2023). A database of the Kenyan herbal medicine should also be developed for current and future research (Kigen GK et al., 2013).

It was encouraging that the practitioners support integration herbal medicine into mainstay healthcare. From our results, 99% of the officials indicated that they support cooperation between herbalists and conventional medical practitioners, with a further 97% willing to directly work with hospitals, and an equal number (97%) stating that they were willing to refer their clients to hospitals. Importantly, a further 77% informed that they would encourage their members to refer their clients to hospitals when they notice poor responses from their therapies. It is also noteworthy that whereas the medical doctors do not refer their clients to the TMPs, 97% of TMPs receive patients after hospital visits; especially patients with chronic conditions such as diabetes, arthritis, hypertension and HIV/AIDS. Interestingly, 68% would like to work in government hospitals, and 20% admitted that their members were already using modern medicine together with their herbal preparations. Strangely, 99% believe that herbal medicine is not well accepted by the community. The integration of herbal medicine into mainstay healthcare has been a contentious issue, largely because up to 80% of patients concurrently use herbal medicine concurrently with conventional drugs in sub-Saharan Africa, including Kenya. This is of major concern as the herbs and drugs may interact, and some herbs may even be contraindicated in some conditions owing to toxicity. Additionally, herbalists may delay referring the patients to hospital, even as their conditions deteriorate. It is important therefore in our view that doctors treating such patients should have some information regarding the kind of herbs that their patients are currently on. The doctor may then quickly search for any potential toxicities using the available online references, and manage the patient accordingly. Currently, there is no platform through which the two groups of health practitioners interact.

The evidence-based results from our study may provide some impetus to encourage this integration. Results from previous studies have suggested that majority of herbal medicine practitioners support the use of modern-day medicines and believe that traditional/herbal medicine play a complementary role. They in addition support the integration of herbal medicine into healthcare (Asase, 2023; Ekor, 2014; Wachtel-Galor & Benzie, 2011). However, TMPs often feel that conventional health workers look down upon them, as evinced the findings from our study whereby a number of officials stated that they declined to encourage members to disclose their preparations to conventional healthcare workers since they look down upon TMPs. It is also noteworthy that 93% of the

officials from our study reported that their members did not receive referrals from mainstay healthcare practitioners. Indeed, previous research has shown that most of the conventional health practitioners do not support integration of herbal medicine into mainstay healthcare system. Rather, a model has been proposed whereby conventional medicine and traditional medicine are recognized as independent healthcare systems with cross referrals; in other words, a patient driven tolerant healthcare system with parallel (between conventional health practitioners and herbalists) healthcare delivery models (Ampomah et al., 2021, 2023; Green & Colucci, 2020; Krah et al., 2018). But we believe that the model we have suggested would suit Kenya better, for both regulation and integration purposes. It would allow for internal regulation between the TMPs, supervised by a health officer and integration mainly through referrals by TMPs to medical officers with disclosure of herbs that the patients are on. The health officer will maintain the records of genuine herbalists, prevents referral delays in case of poor response and provide some basic training for the TMPs without directly interfering with their work. Other relevant areas of cooperation include diagnosis and specialized treatment, record keeping by herbalists and sharing of knowledge and skills. The development of collaborative management methods, including disclosure of patients with chronic diseases is crucial for better outcomes.

Conclusion

The findings from the study provide crucial information regarding the views of the officials of the herbal medicine practitioners on how best their practice should be regulated, and potential ways through which herbal medicine can be incorporated into mainstay healthcare in Kenya. They, for the first time, provide evidence based practical solutions to address regulation and integration of herbal medicine into the mainstay healthcare, which has been of major public health concern, not only in Kenya, but in other African countries whereby herbal medicine is still practised. We believe that the suggested model of regulation and integration may work well in Kenyan settings as it appears to be fully supported by the herbal practitioners. The implementation of this model may eradicate quacks, and provide better patient outcomes as it provides a framework for collaboration between the herbalists and medical doctors. The herbalists may also benefit through training with an overall aim to improve the patient outcomes. The willingness for disclosure by herbalists may also open up avenues for documentation and research on herbal medicine in Kenya.

Recommendations

We recommend that herbal practice in Kenya should be integrated into mainstay healthcare under health ministry through a model whereby they are regulated by both ministry and TMP representatives who will identify the genuine practitioners.

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Conflict of Interest

The authors declare no conflict of interest.

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Data Availability

The data used for this study will be available upon reasonable request from the corresponding author.

REFERENCES

Ampomah, I. G., Malau-Aduli, B. S., Seidu, A. A., Malau-Aduli, A. E. O., & Emeto, T. I. (2021). Perceptions and Experiences of Orthodox Health Practitioners and Hospital Administrators towards Integrating Traditional Medicine into the Ghanaian Health System. Int J Environ Res Public Health, 18(21). https://doi.org/10.3390/ijerph182111200

Ampomah, I. G., Malau-Aduli, B. S., Seidu, A. A., Malau-Aduli, A. E. O., & Emeto, T. I. (2023). Integrating traditional medicine into the Ghanaian health system: perceptions and experiences of traditional medicine practitioners in the Ashanti region. Int Health, 15(4), 414-427. https://doi.org/10.1093/inthealth/ihac059

Asase, A. (2023). Ghana's herbal medicine industry: prospects, challenges and ways forward from a developing country perspective. Front Pharmacol, 14, 1267398. https://doi.org/10.3389/fphar.2023.1267398

Boateng, M. A., Danso-Appiah, A., Turkson, B. K., & Tersbol, B. P. (2016). Integrating biomedical and herbal medicine in Ghana - experiences from the Kumasi South Hospital: a qualitative study. BMC Complement Altern Med, 16, 189. https://doi.org/10.1186/s12906-016-1163-4

Chen, X. W., Serag, E. S., Sneed, K. B., Liang, J., Chew, H., Pan, S. Y., & Zhou, S. F. (2011). Clinical herbal interactions with conventional drugs: from molecules to maladies. Curr Med Chem, 18(31), 4836-4850. doi:BSP/CMC/E-Pub/2011/357 [pii]

Ekor, M. (2014). The growing use of herbal medicines: issues relating to adverse reactions and challenges in monitoring safety. Front Pharmacol, 4, 177. https://doi.org/10.3389/fphar.2013.00177

Ezekwesili-Ofili Josephine, O., & Okaka Antoinette Nwamaka, C. (2019). Herbal Medicines in African Traditional Medicine. In F. B. Philip (Ed.), Herbal Medicine (pp. Ch. 10). Rijeka: IntechOpen.

Gakuya, D. W., Okumu, M. O., Kiama, S. G., Mbaria, J. M., Gathumbi, P. K., Mathiu, P. M., & Nguta, J. M. (2020). Traditional medicine in Kenya: Past and current status, challenges, and the way forward. Scientific African, 8, e00360. https://doi.org/10.1016/j.sciaf.2020.e00360

GoK. (2014). Government of the Republic of Kenya: Ministry of Health; Kenya Health Policy 2014–2030: Towards attaining the highest standard of health, Available at: https://publications.universalhealth2030.org/uploads/kenya_health_policy_2014_to_2030.pdf

GoK. (2020, 13th August, 2020). Govenment of the Republic of Kenya; Kenya Health Sector Strategic Plan July 2018–June 2023: "Transforming Health Systems - Achieving Universal Health; Available at: http://guidelines.health.go.ke/#/category/12/443/meta. Guidelines, Standards & Policies Portal.

Goverment of the Republic of Kenya: Health Act, 2017 (No. 21 of 2017), Accessed on 22/09/24; Available at: https://www.fao.org/faolex/results/details/en/c/LEX-FAOC169966/, 21 C.F.R. (2017).

Green, B., & Colucci, E. (2020). Traditional healers' and biomedical practitioners' perceptions of collaborative mental healthcare in low- and middle-income countries: A systematic review. Transcult Psychiatry, 57(1), 94-107. https://doi.org/10.1177/1363461519894396

Ijaz, N., & Boon, H. (2018). Statutory Regulation of Traditional Medicine Practitioners and Practices: The Need for Distinct Policy Making Guidelines. J Altern Complement Med, 24(4), 307-313. https://doi.org/10.1089/acm.2017.0346

Ijaz, N., Boon, H., Welsh, S., & Meads, A. (2015). Supportive but "worried": perceptions of naturopaths, homeopaths and Chinese medicine practitioners through a regulatory transition in Ontario, Canada. BMC Complement Altern Med, 15, 312. https://doi.org/10.1186/s12906-015-0846-6

Ikhoyameh, M., Okete, W. E., Ogboye, R. M., Owoyemi, O. K., & Gbadebo, O. S. (2024). Integrating traditional medicine into the African healthcare system post-Traditional Medicine Global Summit: challenges and recommendations. Pan Afr Med J, 47, 146. https://doi.org/10.11604/pamj.2024.47.146.43011

Jama, N. A., Nyembezi, A., Ngcobo, S., & Lehmann, U. (2024). Collaboration between traditional health practitioners and biomedical health practitioners: Scoping review. Afr J Prim Health Care Fam Med, 16(1), e1-e11. https://doi.org/10.4102/phcfm.v16i1.4430

Kala, C. P. (2017). Traditional Health Care Systems and Herbal Medicines. European Journal of Environment and Public Health, 1(1). https://doi.org/10.20897/ejeph.201703

Kasilo, O. M. J., Wambebe, C., Nikiema, J.-B., & Nabyonga-Orem, J. (2019). Towards universal health coverage: advancing the development and use of traditional medicines in Africa. BMJ Global Health, 4(Suppl 9), e001517. https://doi.org/10.1136/bmjgh-2019-001517

Kigen GK, Ronoh HK, Kipkore WK, & JK, R. (2013). Current trends of Traditional Herbal Medicine Practice in Kenya: A review. Afr. J. Pharmacol. Ther. 2013. 2(1): 32-37.

Kipkore, W., Wanjohi, B., Rono, H., & Kigen, G. (2014). A study of the medicinal plants used by the Marakwet Community in Kenya. J Ethnobiol Ethnomed, 10, 24. https://doi.org/10.1186/1746-4269-10-24

Krah, E., de Kruijf, J., & Ragno, L. (2018). Integrating Traditional Healers into the Health Care System: Challenges and Opportunities in Rural Northern Ghana. J Community Health, 43(1), 157-163. https://doi.org/10.1007/s10900-017-0398-4

Mashoto, K. O. (2024). Protection of Rights of Knowledge Holders and Practitioners of Traditional Medicine in Tanzania. East Afr Health Res J, 8(2), 280-287. https://doi.org/10.24248/eahrj.v8i2.791

Mutola, S., Pemunta, N. V., & Ngo, N. V. (2021). Utilization of traditional medicine and its integration into the healthcare system in Qokolweni, South Africa; prospects for enhanced universal health coverage. Complement Ther Clin Pract, 43, 101386. https://doi.org/10.1016/j.ctcp.2021.101386

NCAPD. (2008). National Coordinating Agency for Population & Development (NCAPD) NCAPD : Policy Brief No. 1, Seeking Solutions for Traditional Herbal Medicine: Kenya Develops a National Policy www.ncapd-ke.org

Ngere, S. H., Akelo, V., Ondeng'e, K., Ridzon, R., Otieno, P., Nyanjom, M., . . . Barr, B. A. T. (2022). Traditional Medicine Beliefs and Practices among Caregivers of Children under Five Years-The Child Health and Mortality Prevention Surveillance (CHAMPS), Western Kenya: A qualitative study. PLoS ONE, 17(11), e0276735. https://doi.org/10.1371/journal.pone.0276735

Ogirima, S. A. O., Arulogun, O. T., Baale, A. A., & Oyeleye, C. A. (2021). Perception of herbal practitioners on the application of modern technology to healthcare delivery in Nigeria. Informatics in Medicine Unlocked, 23, 100560. https://doi.org/10.1016/j.imu.2021.100560

Okaiyeto, K., & Oguntibeju, O. O. (2021). African Herbal Medicines: Adverse Effects and Cytotoxic Potentials with Different Therapeutic Applications. Int J Environ Res Public Health, 18(11). https://doi.org/10.3390/ijerph18115988

Okumu, M. O., Ochola, F. O., Onyango, A. O., Mbaria, J. M., Gakuya, D. W., Kanja, L. W., . . . Onyango, M. A. (2017). The legislative and regulatory framework governing herbal medicine use and practice in Kenya: a review. Pan Afr Med J, 28, 232. https://doi.org/10.11604/pamj.2017.28.232.12585

Orwa, J. A. (2002). Herbal medicine in Kenya: evidence of safety and efficacy. East Afr Med J, 79(7), 341-342. https://doi.org/10.4314/eamj.v79i7.8835

Parveen, A., Parveen, B., Parveen, R., & Ahmad, S. (2015). Challenges and guidelines for clinical trial of herbal drugs. J Pharm Bioallied Sci, 7(4), 329-333. https://doi.org/10.4103/0975-7406.168035

TheKingsFund (Producer). (2008, 24/09/24). Regulating complementary medical practitioners, Accessed on 23/09/24; Available at: https://www.kingsfund.org.uk/insight-and-analysis/reports/regulating-complementary-medical-practitioners. Governance and regulation.

TheKingsFund (Producer). (2008, 24/09/24). Regulating complementary medical practitioners, Accessed on 23/09/24; Available at: https://www.kingsfund.org.uk/insight-and-analysis/reports/regulating-complementary-medical-practitioners. Governance and regulation.

Wachtel-Galor, S., & Benzie, I. F. F. (2011). Herbal Medicine: An Introduction to Its History, Usage, Regulation, Current Trends, and Research Needs. In I. F. F. Benzie & S. Wachtel-Galor (Eds.), Herbal Medicine: Biomolecular and Clinical Aspects. Boca Raton (FL): CRC Press/Taylor & Francis Copyright © 2011 by Taylor and Francis Group, LLC.

Wang, H., Chen, Y., Wang, L., Liu, Q., Yang, S., & Wang, C. (2023). Advancing herbal medicine: enhancing product quality and safety through robust quality control practices. Front Pharmacol, 14, 1265178. https://doi.org/10.3389/fphar.2023.1265178

WHO. (2023, 30th January 2023). WHO: Integrating Traditional Medicine in Health Care, Available at: https://www.who.int/southeastasia/news/feature-stories/detail/integrating-traditional-medicine. World Health Organization, South East Asia: Integrating Traditional Medicine in Health Care

Xiong, Y., Gao, M., van Duijn, B., Choi, H., van Horssen, F., & Wang, M. (2021). International policies and challenges on the legalization of traditional medicine/herbal medicines in the fight against COVID-19. Pharmacol Res, 166, 105472. https://doi.org/10.1016/j.phrs.2021.105472

Zhou, X., Li, C. G., Chang, D., & Bensoussan, A. (2019). Current Status and Major Challenges to the Safety and Efficacy Presented by Chinese Herbal Medicine. Medicines (Basel), 6(1). https://doi.org/10.3390/medicines6010014