Perceptions and Attitudes among University Communities Towards Use and Formalizing Traditional Medicine Practice in Tanzania

ABSTRACT

Introduction: Traditional medicines (TMs) play a vital role in the public healthcare system of Tanzania and other sub-Saharan countries. The community has been advocating for greater recognition and formalization of this sector.

Aims: This study aimed to evaluate the community's knowledge and views on formalization to maximize the beneficial use of TMs in Tanzania.

Methodology: A cross-sectional survey was conducted among the university community, involving a total of 458 students and staff from three major public universities in Tanzania. Participants were interviewed regarding their history, knowledge, and inclination towards using TMs. They were also asked about their opinions on community involvement and the necessity of strengthening the formalization of education and usage in this field.

Results: The results revealed that 84.7% of the participants had utilized TMs, with 71.6% currently using them and 16.8% using them on a regular basis. Furthermore, 30.5% of the participants agreed that the community is aware of the importance of TMs, while 18.8% believed that the community receives adequate education regarding their significance. Additionally, 33.6% indicated that the government recognizes and promotes the importance of TMs. The study also found strong community support for introducing TM practitioners who can attend to patients and provide TMs. There was also strong support for formalizing education on TMs within the Tanzanian education system.

Conclusion: The study's findings underscore the significance of recognizing and leveraging traditional medications to improve public health and preserve the benefits of local knowledge.

Key words; Traditional medicines, perception, attitudes, formalization, Tanzania

1. INTRODUCTION

Traditional medicine (TM) encompasses the utilization of traditional knowledge and practices, either individually or in combination, for the treatment, diagnosis, and prevention of ailments in humans and animals. It involves the use of plant, animal, and mineral-based products, manual techniques and exercises, as well as spiritual therapies (Fokunang et al., 2011). In African countries, TM practitioners range from trained individuals to those who have inherited the knowledge. TM has historically served as a reliable healthcare system, but its practice is rapidly being adopted by conventional orthodox medicine, aided by the improved availability of modern healthcare facilities (Yuan et al., 2016). Despite the advancements in modern techniques within conventional medicine, traditional healing continues to be widely embraced in developing countries, with some institutional and governmental support (Bodeker&Kronenberg, 2002).

The Tanzanian government has demonstrated significant efforts in recognizing and facilitating the beneficial practices of TM to enhance community health. These medicines are known for their affordability, accessibility, effectiveness, and minimal side effects (Mahomoodally, 2013). Reports on the effectiveness of herbal and other traditional products in treating various ailments, including chronic diseases, are varied. Studies have indicated diverse effectiveness of TMs in treating diseases such as cancer (Ohnishi & Takeda, 2015; Omara et al., 2020; Yin et al., 2013), chronic

Comment [FS1]: Is this the referencing style of this Journal?

kidney diseases (Bahmani et al., 2016; Chen et al., 2021), liver diseases (Ansari, 2010; Hong et al., 2015; Rajaratnam et al., 2015), abdominal conditions (Kim et al., 2020), cardiovascular-related ailments (Shaito et al., 2020), eye and ear problems (Boylan et al., 2022), and numerous skin conditions (Ahuja et al., 2020; Jones et al., 2021). However, the acceptance and adoption of these remedies vary among individuals within society, primarily due to concerns about the reliability and safety of natural products (Aydin et al., 2008). The practice of TM is predominantly in the hands of traditional healers, who often lack authorized channels to reach and gain the trust of the wider community.

There has been a growing demand from individuals and community groups for greater recognition and formalization of TM education and dispensing in Tanzania. These calls have become more prominent during the outbreak of the Coronavirus Disease (COVID). The beneficial use of natural remedies against COVID was uncertain since most of them were new to the market, lacked scientific evidence of effectiveness, and received limited user feedback. To harness the potential benefits of TMs for public and human health while minimizing any associated adverse effects, concerted efforts are required to study and regulate their utilization.

Different opinions have been expressed regarding the actions that should be taken by the community and the government to facilitate the better and safer use of TMs in Tanzania. The incorporation of TM education into formal schooling and the formalization of the dispensing and delivery of traditional medicines have been major topics of debate in Tanzanian society. Consequently, this study aimed to explore the perceptions and attitudes of university communities in Tanzania towards the use and reliability of TMs, as well as the formalization of TM education and drug delivery in the country.

2. METHODOLOGY

2.1 Study area

The study took place in three public universities located in Dar es Salaam and Dodoma cities, as well as in Morogoro municipality in Tanzania. The universities involved were the University of Dar es Salaam (UDSM), the University of Dodoma (UDOM), and Sokoine University of Agriculture (SUA). These three universities were chosen to represent 25% of the total number of public universities in Tanzania at the time of the study. They were also selected to cover different regions of the country and were among the four largest campus universities. At the time of the study, the approximate student populations were 42,000 for the University of Dar es Salaam, 31,000 for the University of Dodoma, and 15,000 for Sokoine University of Agriculture. We also took into account that these three universities offered a wide range of higher education programs, including medical, biomedical, engineering, applied sciences, agriculture, arts, education, law, and business, thereby ensuring coverage of students from various academic disciplines.

1.2 Study design and setting

The study was conducted through a community cross sectional survey design, and data was collected during the odd semester time (March to June) in 2021.

1.3 Study population and sampling procedure

The study encompassed undergraduate and postgraduate students, as well as employees from the three universities. The number of students and employees in each university was obtained from the respective admission and human resource offices. The total student population across the three universities was approximately 88,000, while the total number of employees was around 5,300, resulting in a combined study population of 93,300 individuals. The sample size for the study was determined using Yamane's formula, which is expressed as n=N/1+N(e)2. In this study, “N” represents the total number of individuals in the study population, and “e” represents the margin of error (assumed to be 5%). Applying this formula, the sample size was calculated to be 398 and rounded up to 400 participants. Taking into account the number of students in each university and the possibility of non-response from some participants, the study aimed to target 130 respondents from SUA, 180 from UDOM, and 210 from UDSM. Additionally, for each university, 30 questionnaires were distributed to employees, while the remaining questionnaires were allocated to students (Table 1).

Table 1**. Distribution of the submitted questionnaires to staff and students of the three universities involved in the study**

University	# of students involved	# of employees involved	Total
SUA	100	30	130
UDOM	150	30	180
UDSM	180	30	210
TOTAL	430	90	520

1.4 Data collection

The data collection instrument was designed to gather information regarding the participants' knowledge and experience pertaining to the use, reliability, and effectiveness of traditional medicines (TMs). Additionally, the respondents were interviewed about their support for opinions related to incorporating TM knowledge into the formal education system and whether these medicines should be delivered in hospitals. To ensure the effectiveness of the questionnaires, a test was conducted by distributing them to 20 randomly selected students at the Muslim University of Morogoro. Minor adjustments were made to address any ambiguous or unclear sections, ensuring that the questionnaires were ready for distribution.

The questionnaires comprised a combination of open-ended and close-ended questions. They were printed and randomly distributed to students and employees across the three universities. Upon receiving the questionnaire, each respondent was provided with an overview of the study's objectives and focus and requested to give verbal consent to participate. Only those participants who willingly agreed to take part in the study were given the questionnaires. The participants were instructed to complete the questionnaires at their convenience, and the researchers followed up either by phone call, text message, or in person one week later to collect the completed questionnaires. Up to three attempts were made to recover the questionnaires from each respondent, and any questionnaires that could not be retrieved were excluded from the study.

1.5 Study variables

The study incorporated various descriptive variables to characterize the participants. These variables included age group, sex, and educational level for both students and workers. Additionally, the study assessed whether individuals had a history of living in rural areas for at least one year and their affiliation with a specific university. The outcome variables encompassed general knowledge about traditional medicines (TMs) and personal experiences with using these drugs. The study also explored preferences for TM in comparison to medications available in hospitals, as well as reservations or concerns regarding the use of TMs. Other variables included individual opinions on the current state of community knowledge about TMs and the level of government involvement in supporting these medicines. Participants were also asked about their stance on the inclusion of TM education in schools and colleges, as well as the delivery of these medicines in hospitals. The level of knowledge or support for specific opinions was determined by scoring the responses and calculating average scores, which were then presented in the results.

1.6 Data management and analysis

After collecting the questionnaires, thorough inspections were conducted to ensure their completeness and adherence to the provided filling instructions. Subsequently, the data were carefully cleaned and entered into a Microsoft Excel database. The numerical data was coded and then exported to SPSS version 26 for further analysis. The analysis encompassed descriptive statistics, as well as the distribution and comparison of variables. Microsoft Excel 2010 was utilized to examine the data's descriptive statistics and distribution, allowing for reliable results to be obtained by comparing information from various sources.

3. RESULTS

2.1Participant sociodemographic characteristics and response rate

Among the participants, 52.2% were male and 47.8% were female. Additionally, 71% of the respondents reported having lived in rural areas for at least one year when they were 15 years old or older. The age of the respondents varied, with 12% below 20 years old and 7% above 40 years old. The majority (60.5%) fell within the 20 to 30-year age range. The education status of the respondents, whether completed or ongoing, encompassed a range of educational levels, including certificate and graduate programs, as presented in Table 2.

Table 2. Demographic and affiliations of participants who responded by returning filled questionnaires

Variable (n)	(%)
Sex	
Females (219)	47.8
Males (339)	52.2
Age	
Below 20 years (55)	12.0
20-30 years (277)	60.5
31-40 years (94)	20.5
Above 40 years (32)	7.0
Education	
Graduate (45)	9.9
Bachelor degree (284)	62.0
Diploma (92)	20.0
Certificate (37)	8.1
History of living in village for ≥ 1 year	
Yes (325)	71.0
No (133)	29.0
University affiliated	
SUA (119)	26.0
UDOM (158)	34.5
UDSM (181)	39.5

A total of 510 questionnaires were distributed, out of which 458 were returned. This included 382 questionnaires (88.8%) from students and 76 questionnaires (84.4%) from employees. Therefore, a total of 458 questionnaires were received, surpassing the calculated minimum sample size of 400. The distribution of the received questionnaires among the three universities involved in the study is outlined in Table 3.

Table 3.Distribution of the received questionnaires among the three universities involved in the study

University	Delivered			Returned (%)		
	Students	Employees	Total	Students	Employees	Total
SUA	100	30	130	92 (92)	27 (90)	119 (91.5)
UDOM	150	30	180	134 (89.3)	24 (80)	158 (87.8)
UDSM	180	30	210	156 (86.7)	25 (83.3)	181 (82.2)
TOTAL	430	90	520	382 (88.8)	76 (84.4)	458 (88.1)

2.2History, Usage Patterns, and Knowledge of Traditional Medicine (TM)

In this section, the participants were asked to provide information regarding their history of TM usage, whether they were currently using TMs at the time of the study, and if they used TMs on a regular basis. The results revealed that 84.7% of the participants reported having used TM at some

point, with 71.6% indicating current usage during the study, and 16.8% reporting regular use. The utilization of TMs varied across different factors such as age, gender, status (student or employee), educational level, and history of living in rural areas for at least one year at the age of 15 years and above. Detailed information can be found in Table 4.

Table 4. Comparison between participant groups with regard to if they have used TMs, if they were using any during the study time and if they regularly used them.

	Questions					
	Have you ever used TMs?		***Are you using TMs now?***		***Do you use TMs regularly?***	
Variable	Yes (%)	p-value	Yes (%)	p-value	Yes (%)	p-value
Overall	84.7		71.6		16.8	
Sex						
Female	88.1	0.0520	71.7	0.9732	19.2	0.1949
Male	81.6		71.5		14.6	
Status						
Employee	94.0	< .001	82.1	< .001	33.3	<.001
Student	79.3		65.5		7.2	
Age (years)						
Below 20	30.2	<.001	11.6	<.001	0.0	<.001
20-30	91.4		76.5		9.3	
31-40	87.4		82.3		32.2	
Above 40	100		100		100	
Lived in Rural						
Yes	84.8	0.848	71.5	0.918	15.6	0.811
No	84.1		71.0		16.4	
Education level						
Graduate	89.5	0.268	89.5	< .001	21.1	0.869
Undergraduate	83.8		68.6		16.5	

With regard to awareness on the use of the medicines, 98.3% of the respondents indicated to know at least one TM for treating a disease condition to humans. Disease conditions mentioned by the respondents include abdominal pain, gastric ulcers, haemorrhoids, mental illness, impaired vision, diabetes, infertility, cancer and scrotal hernia (Figure 1).

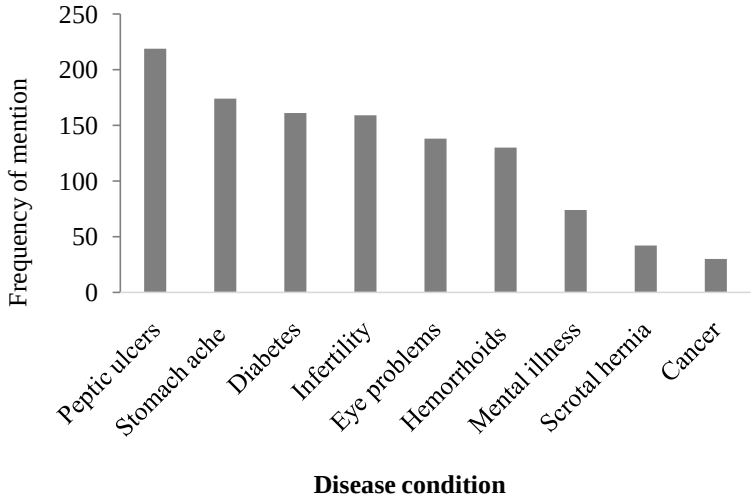

Fig. 1. Frequency of mention (number of participants who mentioned) of the given disease conditions for which participants know at least one TM used for its treatment.

2.3Community Engagement and Utilization of Traditional Medicines (TMs)

The participants were requested to evaluate the level of community awareness and access to information regarding the significance of TMs, as well as the extent of government recognition and appreciation of TMs. They were also asked to identify the factors that contribute to individuals avoiding the use of TMs. The findings revealed that approximately 30.5% of the participants agreed that the community possesses awareness about the importance of TMs, while 18.8% believed that the community receives sufficient education on the significance of these medicines. Additionally, 33.6% of the participants indicated that the government recognizes and appropriately appreciates the importance of TMs (refer to Figure 2 for further details).

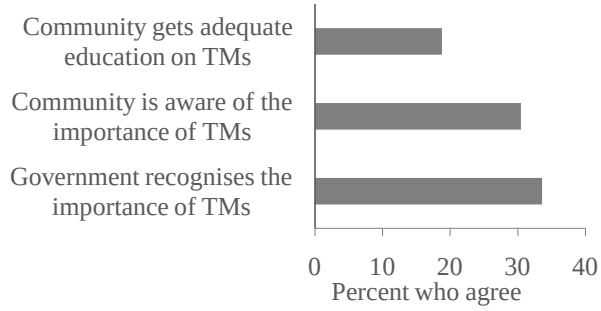

Fig. 2. Percentage of participants who accept on facts about educational adequacy and awareness of community, and government recognition on the importance of TMs in Tanzania.

2.4Formalization of Traditional Medicines (TMs) and Education

The participants expressed diverse opinions regarding the formalization of TM education and delivery. They were asked to provide a score ranging from 0 (not important at all) to 5 (very important) for each opinion. Overall, the results indicated that formalizing the dispensation of TMs in hospitals, permitting TM specialists to practice within hospital settings, and introducing TM courses or programs in colleges were considered highly important opinions (refer to Figure 3 for a visual representation of the findings)

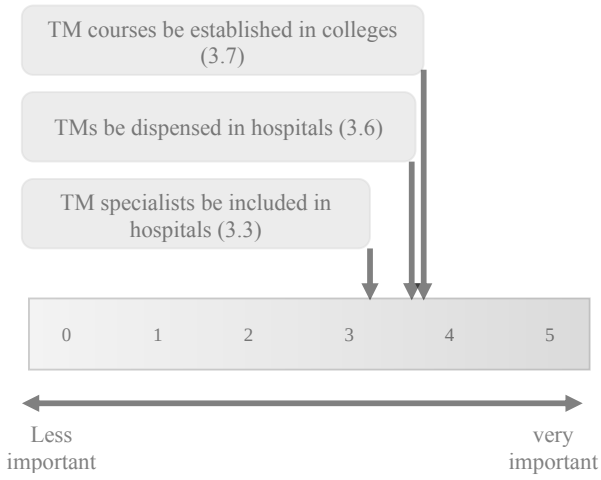

Fig. 3.Average respondent score in support of opinions about establishing TM courses in colleges, allowing specialists to operate and dispense TMs in hospitals

4. DISCUSSION

This study has revealed a high prevalence of TM usage within the university community. In comparison to a study conducted in the University of Nigeria, which reported a TM usage rate of approximately 70% among students and staff (Nworu et al., 2015), our findings indicate a significantly higher rate. This disparity could be attributed to regional and cultural differences between Nigeria and Tanzania, as well as the timing of our study during the COVID-19 pandemic. Previous research has demonstrated that communities in various locations turned to different natural products for prevention or relief of COVID-19 symptoms, given the uncertainty surrounding the outbreak (Chali et al., 2021).

While less than twenty percent of participants reported regular TM usage, a substantial majority (71.6%) indicated that they were using TM during the study period. This proportion is notably higher than the findings of another study involving a university community in South Africa, where only 30.4% of respondents reported TM usage (Mphekgwana et al., 2021). The variance could potentially be attributed to the Tanzanian government's emphasis on adopting and promoting complementary traditional remedies believed to enhance immune function for combating COVID-19 (Mfinanga et al., 2021). One particular method that received significant attention in Tanzania was the use of sauna steaming enriched with various herbs and spices. Many families adhered to this advice and incorporated daily steaming routines, especially for vulnerable family members.

The utilization of TMs varied among different age groups, with younger individuals, particularly those below 20 years, demonstrating significantly lower usage compared to older respondents above 40 years. The impact of age on TM usage has shown varying results in different studies, with some indicating no significant difference across age groups (Sally Rahayu et al., 2021), while others associate higher knowledge of TMs with older individuals (Bhamra et al., 2017). This discrepancy may be attributed to the fact that COVID-19 was found to be more problematic for older individuals (Mahase, 2020), leading them to take more precautions, including the use of various TMs. Furthermore, many TMs are commonly used to manage chronic or recurring diseases, which typically increase in prevalence with age (Anderson &Durstine, 2019).

The study reveals that employees exhibit a higher tendency to use TMs compared to students. This may be due to the average age of employees being higher than that of students, and as indicated in this study, the propensity to use TMs increases with age. Another possible factor is that during the COVID-19 pandemic, staff had more opportunities to access media campaigns promoting the use

of TMs through television and radio at home. Additionally, staff members may have had easier access to certain herbs in their local environments compared to many students residing in hostels.

The study highlights that gastric/peptic ulcers are conditions for which most people are familiar with at least one TM used in their treatment. Although the exact reasons are not clear, other studies indicate that ulcers are commonly treated using a wide variety of traditional herbs (Kumar et al., 2011). Less than one-third (30.5%) of the respondents believe that the community is aware of the importance of TMs. While limited studies have been conducted on community perceptions of government involvement in enhancing TM usage, several related studies suggest that TMs are considered an important part of healthcare management (Gari et al., 2015; Suswardany et al., 2015). Furthermore, less than one-fifth (18.8%) agree that the community receives sufficient relevant information about these medicines. Approximately one-third of the respondents (33.6%) agree that the government recognizes the importance of TMs and their contributions to public health.

On average, the respondents support the opinion that TM providers should be introduced in hospitals and dispensed when necessary. They also advocate for the inclusion of TM knowledge in Tanzania's education system, particularly in colleges. The government of Tanzania has taken bold steps to enhance the utilization of beneficial aspects of TMs. For instance, the Traditional and Alternative Medicine Act (2002) provides legal recognition and governance of TM professionalism to ensure maximum benefit and safety (FAOLEX, 2002). However, the community believes that efforts to maximize the beneficial use of TMs should be further increased. The diversity, accessibility, affordability, and acceptance of TMs in developing countries, along with their relatively low side effects and the growing issue of microbial resistance to pharmaceutical drugs, present positive factors for embracing TMs (WHO, 2002).

Despite the growing scientific interest in investigating local therapeutic remedies, the TM sector in developing countries still operates with a level of uncertainty. The knowledge and practices of harvesting, processing, and composing these medicines remain an art understood by only a few traditional healers. The professionalism of dispensing and delivering most TMs has also been questionable and difficult to control due to the absence of measurable, educational, and monitored standards. While medical practices require strict ethical adherence, the ethical guidelines for TMs are not clearly defined, and cases of improper practices are not uncommon in the sector.

4. CONCLUSION

The findings of this study indicate that a significant number of Tanzanians have a history of using TMs, and many continue to use them regularly. Among different age groups, younger individuals show a lower tendency to use TMs compared to older individuals. Moreover, within a university setting, staff members have a higher rate of TM usage compared to students. The majority of Tanzanians, as represented by the university community, are familiar with at least one TM used as a medicine for human health, with peptic ulcers and abdominal pain being recognized conditions for which TMs are commonly employed in treatment.

The study reveals a general consensus among respondents regarding the formalization of TM use. There is agreement on the importance of allowing TM specialists to operate in hospitals and establishing dispensary services for these medicines within healthcare facilities. Furthermore, there is a shared belief that knowledge dissemination about TMs should be expanded, particularly through the improvement and incorporation of TM education at higher levels of the country's educational system.

Overall, these findings provide valuable insights into the prevalence of TM usage and the perspectives of Tanzanians on formalizing TM practices and enhancing knowledge about these traditional medicines.

REFERENCES

1. Ahuja, A., Gupta, J., & Gupta, R. (2020). Miracles of Herbal Phytomedicines in Treatment of Skin Disorders: Natural Healthcare Perspective. Infectious Disorders - Drug Targets, 21(3), 328–338. https://doi.org/10.2174/1871526520666200622142710

2. Anderson, E., &Durstine, J. L. (2019). Physical activity, exercise, and chronic diseases: A brief review. Sports Medicine and Health Science, 1(1), 3–10. https://doi.org/10.1016/J.SMHS.2019.08.006

3. Ansari, J. A. (2010). Therapeutic approaches in management of drug-induced hepatotoxicity. Journal of Biological Sciences, 10(5), 386–395. https://doi.org/10.3923/JBS.2010.386.395

4. AYDIN, S., BOZKAYA, A. O., MAZICIOĞLU, M. M., GEMALMAZ, A., ÖZÇAKIR, A., & ÖZTÜRK, A. (2008). What Influences Herbal Medicine Use? - Prevalence and Related Factors. Turkish Journal of Medical Sciences, 38(5), 455–463. https://doi.org/-

5. Bahmani, M., Baharvand-Ahmadi, B., Tajeddini, P., Rafieian-Kopaei, M., & Naghdi, N. (2016). Identification of medicinal plants for the treatment of kidney and urinary stones. Journal of Renal Injury Prevention, 5(3), 129. https://doi.org/10.15171/JRIP.2016.27

6. Bhamra, S. K., Slater, A., Howard, C., Johnson, M., & Heinrich, M. (2017). The Use of Traditional Herbal Medicines Amongst South Asian Diasporic Communities in the UK. Phytotherapy Research, 31(11), 1786–1794. https://doi.org/10.1002/PTR.5911

7. Bodeker, G., &Kronenberg, F. (2002). A Public Health Agenda for Traditional, Complementary, and Alternative Medicine. American Journal of Public Health, 92(10), 1582. https://doi.org/10.2105/AJPH.92.10.1582

8. Boylan, F., Monari, S., Ferri, M., Salinitro, M., & Tassoni, A. (2022). Ethnobotanical Review and Dataset Compiling on Wild and Cultivated Plants Traditionally Used as Medicinal Remedies in Italy. Plants 2022, Vol. 11, Page 2041, 11(15), 2041. https://doi.org/10.3390/PLANTS11152041

9. Chali, B. U., Melaku, T., Berhanu, N., Mengistu, B., Milkessa, G., Mamo, G., Alemu, S., &Mulugeta, T. (2021). Traditional Medicine Practice in the Context of COVID-19 Pandemic: Community Claim in Jimma Zone, Oromia, Ethiopia. Infection and Drug Resistance, 14, 3773. https://doi.org/10.2147/IDR.S331434

10. Chen, J., Tsim, K. W. K., & Zhao, Y. Y. (2021). Editorial: Applications of Herbal Medicine to Control Chronic Kidney Disease. Frontiers in Pharmacology, 12, 2383. https://doi.org/10.3389/FPHAR.2021.742407/BIBTEX

11. FAOLEX. (2002). Traditional and Alternative Medicine Act (No. 23 of 2002). Report. https://www.ecolex.org/details/legislation/traditional-and-alternative-medicine-act-no-23-of-2002-lex-faoc155105/

12. Fokunang, C. N., Ndikum, V., Tabi, O. Y., Jiofack, R. B., Ngameni, B., Guedje, N. M., Tembe-Fokunang, E. A., Tomkins, P., Barkwan, S., Kechia, F., Asongalem, E., Ngoupayou, J., Torimiro, N. J., Gonsu, K. H., Sielinou, V., Ngadjui, B., Angwafor, I., Nkongmeneck, A., Abena, O. M., … Kamsu-Kom. (2011). Traditional Medicine: Past, Present and Future Research and Development Prospects and Integration in the National Health System of Cameroon. African Journal of Traditional, Complementary, and Alternative Medicines, 8(3), 284. https://doi.org/10.4314/AJTCAM.V8I3.65276

13. Gari, A., Yarlagadda, R., &Wolde-Mariam, M. (2015). Knowledge, attitude, practice, and management of traditional medicine among people of Burka Jato Kebele, West Ethiopia. Journal of Pharmacy &Bioallied Sciences, 7(2), 136. https://doi.org/10.4103/0975-7406.148782

Comment [FS2]: Use the guideline of this journal for your references

14. Hong, M., Li, S., Tan, H., Wang, N., Tsao, S.-W., & Feng, Y. (2015). Current Status of Herbal Medicines in Chronic Liver Disease Therapy: The Biological Effects, Molecular Targets and Future Prospects. International Journal of Molecular Sciences, 16(12), 28705–28745. https://doi.org/10.3390/ijms161226126

15. Jones, V. A., Patel, P. M., Wilson, C., Wang, H., &Ashack, K. A. (2021). Complementary and alternative medicine treatments for common skin diseases: A systematic review and meta-analysis. JAAD International, 2, 76–93. https://doi.org/10.1016/J.JDIN.2020.11.001

16. Kim, Y. S., Kim, J. W., Ha, N. Y., Kim, J., & Ryu, H. S. (2020). Herbal Therapies in Functional Gastrointestinal Disorders: A Narrative Review and Clinical Implication. Frontiers in Psychiatry, 11, 601. https://doi.org/10.3389/FPSYT.2020.00601/BIBTEX

17. Kumar, M. R., Mohamed, N. K., Mani, T. T., Rahiman, O. M. F., & Satya, K. B. (2011). A review on medicinal plants for peptic ulcer. Der Pharmacia Lettre, 3(2), 180–186.

18. Mahase, E. (2020). Covid-19: death rate is 0.66% and increases with age, study estimates. BMJ, 369. https://doi.org/10.1136/BMJ.M1327

19. Mahomoodally, M. F. (2013). Traditional medicines in Africa: An appraisal of ten potent African medicinal plants. Evidence-Based Complementary and Alternative Medicine, 2013. https://doi.org/10.1155/2013/617459

20. Mfinanga, S. G., Mnyambwa, N. P., Minja, D. T., Ntinginya, N. E., Ngadaya, E., Makani, J., &Makubi, A. N. (2021). Tanzania's position on the COVID-19 pandemic. Lancet (London, England), 397(10284), 1542. https://doi.org/10.1016/S0140-6736(21)00678-4

21. Mlozi, S. H. (2022). The role of natural products from medicinal plants against COVID-19: traditional medicine practice in Tanzania. Heliyon, 8(6), e09739. https://doi.org/10.1016/J.HELIYON.2022.E09739

22. Mphekgwana, P. M., Makgahlela, M., &Mothiba, T. M. (2021). Use of Traditional Medicines to Fight COVID-19 during the South African Nationwide Lockdown: A Prevalence Study among University Students and Academic Staff. The Open Public Health Journal, 14(1), 441–445. https://doi.org/10.2174/1874944502114010441

23. Nworu, C. S., Udeogaranya, P. O., Okafor, C. K., Adikwu, A. O., &Akah, P. A. (2015). Perception, usage and knowledge of herbal medicines by students and academic staff of University of Nigeria: A survey. European Journal of Integrative Medicine, 7(3), 218–227. https://doi.org/10.1016/J.EUJIM.2015.01.005

24. Ohnishi, S., & Takeda, H. (2015). Herbal medicines for the treatment of cancer chemotherapy-induced side effects. Frontiers in Pharmacology, 6(FEB), 14. https://doi.org/10.3389/FPHAR.2015.00014/BIBTEX

25. Omara, T., Kiprop, A. K., Ramkat, R. C., Cherutoi, J., Kagoya, S., MoraaNyangena, D., AzezeTebo, T., Nteziyaremye, P., Nyambura Karanja, L., Jepchirchir, A., Maiyo, A., JematiaKiptui, B., Mbabazi, I., Kiwanuka Nakiguli, C., Nakabuye, B. V., &ChepkemoiKoske, M. (2020). Medicinal Plants Used in Traditional Management of Cancer in Uganda: A Review of Ethnobotanical Surveys, Phytochemistry, and Anticancer Studies. Evidence-Based Complementary and Alternative Medicine, 2020. https://doi.org/10.1155/2020/3529081

26. Rajaratnam, M., Prystupa, A., Lachowska-Kotowska, P., Załuska, W., & Filip, R. (2015). Herbal medicine for treatment and prevention of liver diseases. Journal of Pre-Clinical and Clinical Research, 8(2), 55–60. https://doi.org/10.26444/JPCCR/71468

27. Sally Rahayu, Y. Y., Araki, T., &Rosleine, D. (2021). Predictors of the Use of Traditional Medicines in the Universal Health Coverage System in Indonesia. Global Journal of Health Science, 13(6), 24. https://doi.org/10.5539/GJHS.V13N6P24

28. Shaito, A., Thuan, D. T. B., Phu, H. T., Nguyen, T. H. D., Hasan, H., Halabi, S., Abdelhady, S., Nasrallah, G. K., Eid, A. H., &Pintus, G. (2020). Herbal Medicine for Cardiovascular Diseases: Efficacy, Mechanisms, and Safety. Frontiers in Pharmacology, 11, 422. https://doi.org/10.3389/FPHAR.2020.00422/BIBTEX

29. Suswardany, D. L., Sibbritt, D. W., Supardi, S., Chang, S., & Adams, J. (2015). A critical review of traditional medicine and traditional healer use for malaria and among people in malaria-endemic areas: Contemporary research in low to middle-income Asia-Pacific countries. Malaria Journal, 14(1), 1–9. https://doi.org/10.1186/S12936-015-0593-7/TABLES/3

30. WHO. (2002). WHO traditional medicine strategy 2002-2005. Report. https://www.who.int/publications/i/item/WHO-EDM-TRM-2002.1

31. Yin, S. Y., Wei, W. C., Jian, F. Y., & Yang, N. S. (2013). Therapeutic Applications of Herbal Medicines for Cancer Patients. Evidence-Based Complementary and Alternative Medicine : ECAM, 2013. https://doi.org/10.1155/2013/302426

32. Yuan, H., Ma, Q., Ye, L., & Piao, G. (2016). The Traditional Medicine and Modern Medicine from Natural Products. Molecules, 21(5). https://doi.org/10.3390/MOLECULES21050559

33.