RESEARCH ARTICLE

Knowledge, Attitude and Practice of Health Care Practitioners in Nigeria Towards the Use of Plants/ Herbal Medicines in the Management of COVID-19

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ABSTRACT

The purpose of this study is to investigate the knowledge, attitude, and practice of Nigerian health care practitioners regarding the use of herbal medications in the therapy of COVID-19.

This was an online survey of Nigerian healthcare practitioners. To assess the level of relationship among research variables, descriptive statistics and chi-square tests were used. A *p*-value of less than 0.05 was considered statistically significant.

Many (77.1%) respondents are aware of claims of the use of herbal medicines for COVID-19, 22.9% of the respondents reported that herbal medicines can be used as cure for COVID-19 while 41.8% believed that herbal medicines can only be used to manage COVID-19 and its symptoms. Most (67.3%) respondents were of the opinion that herbal medicine use for the management of COVID-19 is controversial while 53.3% reported that the use of herbal medicine to manage COVID-19 cannot be substantiated. Majority (79.6%) doctors, (85.4%) nurses and 84.3% (pharmacist) were willing to support research into safety and efficacy of herbal medicines to manage COVID-19.

Respondents' observed knowledge of the usage of herbal remedies for COVID-19 could be attributed to the growing awareness in herbal-based products/medicines.

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INTRODUCTION

COVID-19, a World Health Organization (WHO) declared worldwide pandemic, is an extremely contagious and severe acute respiratory illness triggered by the SARS-CoV-2 pathogenic virus, which is transmitted to humans by interaction with and/or consumption of infected animals. COVID-19 symptoms are remarkably similar to viral pneumonia such as fever, exhaustion, cough, shortness of breath, and other issues (Srivastava *et al.*, 2022).

Herbal medicines are derived from plant materials and considered for therapeutic purposes (Calapai, 2008). They are composed of various organic chemical mixes derived from raw or processed plant parts such as leaves, flowers, stems, seeds, and roots (Bent, 2008). Due to the increasing population, the scarcity of modern remedies and costly prices, the scarcity of resources for managing noncommunicable diseases, and the budding social behaviors of several patients in low-income countries, enormous attention has been given to medicinal herbs use for treatment of countless illnesses in recent years (Mesfin *et al.*, 2014; Zhang *et al.*, 2015). However, there is growing concern about herbal medication safety, owing to worries about standardization and the challenge of obtaining precise procedures for justifying use (Jeong *et al.*, 2012; Saad *et al.*, 2006).

Herbal medicines have assisted in alleviating the aftermath of infectious diseases such as SARS-CoV-2 (Huang *et al.*, 2020). There have been claims that Chinese medicines mixed with western treatment greatly relieved SARS symptoms, such as lower body temperature, cough and breathing difficulties, lower corticosteroid dosages, increased absorption of pulmonary infiltration, and general life value (Lee *et al.*, 2021). According to Luo *et al.* (2020) and Tang *et al.* (2022), the use of Traditional Chinese Medicine had a major influence in reducing deterioration, mortality rates, and increasing recovery period.

It is hypothesized that healthcare professionals in Nigeria do not advocate the use of herbs / herbal medicines for the treatment of diseases and infections due to issues associated with its safety and efficacy, lack of supporting scientific evidence, and non-disclosure of accurate information by traditional

medicine practitioners (Bhat *et al.*, 2019). According to some studies, the use of herbal medicine could become a huge public health risk due to late diagnosis, disease complications, and sometimes even death (Koonrungsesomboon & Karbwang, 2016). According to reports, medical professionals could not advise patients on the safety use of herbal remedies because of a dearth of information and poor training on herbal medications; thus, suitable awareness among health professionals about the safety and efficacy of herbal medicine is vital. It is uncertain whether herbal remedies can be utilized to prevent and cure COVID-19, also, the attitudes of medical professionals toward this requirement must also be investigated. In Nigeria, there is dearth of information that describes the perception of health care practitioners regarding the use of herbal medicines in COVID-19 which could impact on the rate at which research is carried out and the acceptability of results. This study explores the knowledge of Nigerian health care practitioners, their attitudes and practice towards the use of herbal medicines for the management and treatment of COVID-19 and evaluate factors influencing their decisions.

METHODOLOGY

Sample size determination

The Epi. Info application was used to compute sample size. At a 95% confidence level, the sample size was set at 384, with the premise of 50% prevalence of right knowledge and attitude, 5% bound-on error, and a 10% non-response rate. The convenience sampling method was used. Health Care Practitioners, including medical doctors, pharmacists, medical laboratory scientists, and nurses, were eligible to participate in this survey. After four months, response acceptance was closed.

For this investigation, the minimum determined sample size was 384. However, 170 study participants completed the questionnaire and were used for data analysis.

Study tool and data collection

This was a national online study using electronic survey from May to August 2022 via Google Forms. The survey was conducted among healthcare practitioners in Nigeria, survey tool was circulated through emails, professional association groups, and social media platforms – Telegram, WhatsApp. The survey was performed anonymously, with no personal information collected, but with specific questions designed to assure adequate population selection. Healthcare practitioners practicing in Nigeria were included in the study while healthcare practitioners not practicing in Nigeria were excluded.

The survey tool was created following a thorough review of literature. Questionnaire was designed to assess participants knowledge of herbal medicines in the management of COVID-19, attitude of participants to use of herbal medicine in COVID-19 and practice regarding the use of herbal remedies for COVID-19. All questions in the questionnaire were close-ended questions The data collection tool was validated using the face and content validity techniques where 9 experts reviewed the questionnaire for easy comprehension, appropriateness and relevance of the objectives of the study. The content validity

index (CVI) for relevancy and clarity were tested for each item according to the Lawshe's table. CVI of items higher than 79% was considered suitable, between 70 and 79% was revised and less than 70% were eliminated.

The questionnaire was divided into four sections that included information on the participants' socio-demographic characteristics, their knowledge of herbs/herbal medicines, their perception of the use of medicinal herbs in the treatment and management of COVID-19, and their practice of using herbal remedies in COVID-19.

Data Analysis

The data analysis was performed using Microsoft Excel 2016 and SPSS version 25.0 (Chicago, IL, USA). Microsoft Excel was used for editing, sorting, and coding. Descriptive statistics (frequencies and percentages) and chi-square tests were performed. The chi-square test was used to determine the degree of connection between research variables. A statistical *p*-value of less than 0.05 was considered significant.

Ethical consideration

The National Institute for Pharmaceutical Research and Development Health Research Ethics Committee (NIPRD HREC) approved the study protocol (NIPRD-HREC NHREC/039/21A-09). There was no need for a consent form. The completion of an online response to the questionnaire was taken as agreement to participate in the study.

RESULTS

Demographic characteristics of study participants

One hundred and seventy health care practitioners in Nigeria participated in this study. More than half of the participants were females 110 (64.6 %), 85 (50%) were between 30-45 years of age representing about half of the respondents while 61 (35.9%) had 1-5 years' work experience. Pharmacist were 54 (31.8%) while medical doctors represent 49 (28.8 %) respectively. Other details on responders' demographic attributes are presented in Table 1.

Knowledge

To determine the knowledge of the respondents on the use of herbal medicines for COVID-19, questions on the awareness of COVID-19, access to information on herbal medicines and use of herbal medicines for COVID-19 were assessed.

Most 115 (67.6%) of the respondents have access to information on herbal medicines, 131 (77.1%) respondents are aware of claims of the use of herbal medicines for COVID-19. Some 39 (22.9%) of the respondents reported that herbal medicines can be used as cure for COVID-19 while 71 (41.8%) believed that herbal medicines can only be used to manage COVID-19 and its symptoms. Respondents with/without access to sufficient and current information about herbal medicines were 68 (40%) and 91(54.5%) respectively. The sources of information about herbal medicines were majorly from the internet, media and school curriculum (Figure 1). The respondents' knowledge on the use of herbal remedies for COVID-19 is in (Figure 2).

Table 1: Socio-demographic Characteristics of respondents (n=170)

Variables	Response	Frequency	Percentage (%)
Sex	Male	60	35.4
	Female	110	64.6
Age	Less than 21yrs	1	1
	21-30	54	31.8
	30-45	85	50
	46-60	27	15.9
	Above 60	3	1.8
Educational qualification	Doctorate	23	13.5
	Masters	21	12.4
	Graduate	123	72.4
	National diploma	3	1.8
Years of practice	1-5	61	35.9
	6-10	38	22.4
	11-15	39	22.9
	16-20	10	5.9
	20 & above	22	12.9
Area of practice	Civil/Public service	106	62.4
	Private sector	42	24.7
	Self employed	22	12.9
Occupation	Medical doctor	49	28.8
	Nurse	44	25.9
	Pharmacist	54	31.8
	Others (Medical Laboratory Scientist Radiologist, Physiotherapist)	23	13.5

Attitude

Majority of the respondents (64.9%) believe that herbal medicines can help with the treatment of COVID-19 and associated symptoms, mainly via immune boosting and anti-in-flammatory effects (Figure 3). Whilst Findings from the study showed that 67.3% of the respondents believed that the use of herbal medicine in COVID -19 is controversial, 53.3% are of the opinion that herbal medicine use for COVID-19 cannot be substantiated. Respondent who believed that herbal medicine use in Africa can be more or not effective than vaccination represents 26.5 % and 41.0 % respectively (Figure 4).

Practice

The majority of participants have favorable experience with herbal medicine in the treatment and management of COVID-19. About 120 (71.9%) reported that they have used some forms of herbal medicines before while 94 (56.3%) of the respondents believed that herbal medicines and orthodox medicines cannot be used concomitantly. Also 137 (83.5%) of respondents agreed to support research into the safety and efficacy of herbal medicines for COVID-19. The practice of the respondents on the use of herbal medicine for COVID-19 is presented in Figure 5.

DISCUSSION

The use of therapeutic herbs for the treatment of variety of infections and diseases have received significant attention over the years. Since the emergence of COVID- 19 pandemic there is currently no precise treatment, however there have been some claims of the use of herbal medicines for its treatment. The wide acceptability of herbal medicines is dependent on the knowledge, attitude, practice of health practitioners towards its use and effectiveness. A positive notion combined with

adequate knowledge on the efficacy of herbal medicines in the management of COVID-19 will enhance the administration of quality health practice.

Demographic data from this study showed that more than half (64.6 %) of the respondents were female while 35.4% were male, while 50% of respondents were between 30-45 years of age, 31.8% between 21-30 and 15.9% between 46-60 years. Majority (72.4%) of the respondents had graduate, (13.5%) doctorate and (12.4%) masters level of education. The level of education was evident in their knowledge and awareness of herbal medicines for COVID-19. Similarly, respondents' knowledge on herbal medicines as cure for COVID-19 was significantly (p= 0.05) impacted by educational qualification. Knowledge on the use of herbal medicines increased as educational qualification increased. The occupation of respondent also significantly (p= 0.05) played a role in their knowledge about the claims of the use of herbal medicine to cure COVID-19. This is in agreement with previous reports of (Pu *et al.*, 2021) .

Respondents in this study were mostly pharmacist (31.8%) followed by medical doctors (28.8%) and nurses (25.9%). About 35.9% of the respondent had 1-5 years of work experience, 22.9% had 11-15years experience while 5.9% had 16-20 years of work experience respectively. The years of experience played a significant (p = 0.03) role in respondents' awareness about claims of the use of herbal medicines to cure COVID-19. As expected, the number of years of experience as a health practitioner was evident in their level of knowledge and awareness of herbal medicines for COVID-19 as the more the years of experience, the more the depth of knowledge. Many with 63.9% depth of awareness/knowledge had 1-5 years of work experience, 89.5% had 6-10 years of work experience, 82.1 % had 11-15 years of work experience while 80.0% had 16-20 years of work experience on cross tabulation. This is in agreement with previous reports of which stated that

knowledge of herbal medicine use in COVID-19 increased with years of work experience (Altun *et al.*, 2021).

More respondents (67.6%) had access to information on herbal medicines while 32.4% said they had no access to information on herbal medicines. About 40.0% of the respondents had sufficient and current information about herbal medicines while 54.8% had no sufficient and current information about herbal medicines. Sources of information on herbal medicines included the internet (45%), school curriculum (20%), patients (15%) and others sources (17%) respectively (Figure 1). The access to timely and accurate information of the efficacy and toxicity of herbal medicines is affected by factors such as general lack of information on the herbal medicine/crude drug in question as medicinal plants are numerous in number and not all have been appropriately and adequately tested and documented (Kamsu-Foguem & Foguem, 2014). Another major factor is the cost for access to information e.g., in text books, closed access journals, media, a course of study and other possible sources (Bhatia *et al.*, 2018). Despite the ancient and increasing use of herbal medicines, a deficiency in the school curriculum was observed as 80% of respondents did not claim knowledge of herbal medicines from their training as health practitioners. This suggests the importance and inclusion of traditional, complementary and alternative medicines (TCAM) in the training curriculum of health care practitioners. Consequently, there is need for the review of academic curriculum and health policies to ensure standardized health care practice of TCAM especially for COVID-19 and other infections. The internet/ social media has become a major channel for accessing information even on herbal medicines, information from these platforms must be regulated to disallow ambiguous and false claims. Pu *et al.* (2021) stated that the internet just as observed in this study, was the major source of information on herbal medicines for COVID-19.

Many respondents (77.1%) were aware of claims of the use of plants/herbal medicines for the management of COVID-19 and its symptoms however, 22.9% believed that herbal medicines can cure COVID-19, 33.5% were of the opinion that herbal medicines cannot be used as cure of COVID-19 and its symptoms, while 41.8 % of the respondents reported that herbal medicines can only be used to manage symptoms of COVID-19. Belief and perception have often been related to practice (Li *et al.*, 2021). This finding is in agreement with Alabi *et al.* (2021) who reported that respondents from their study believed that COVID-19 and its symptoms can be treated or managed with herbal medicines. Respondents believe that herbal medicines can play a role in the management of COVID-19 and its symptoms, mainly via immune boosting and anti-inflammatory effects. Medicinal herbs have been proven in studies to slow disease progression in COVID-19 patients by changing the immune-inflammation state (Chowdhury *et al.*, 2022; Lucas *et al.*, 2017; Mukherjee *et al.*, 2022). Some respondents (41.1%) disagreed that herbal medicines can be used as adjuvants with orthodox medicine to manage COVID-19, while 33.9% do not know if herbal medicines can be used as adjuvants with orthodox medicines. The majority of respondents (56.3%) stated that they will not advise patients on the concurrent use of herbal and orthodox medicines,
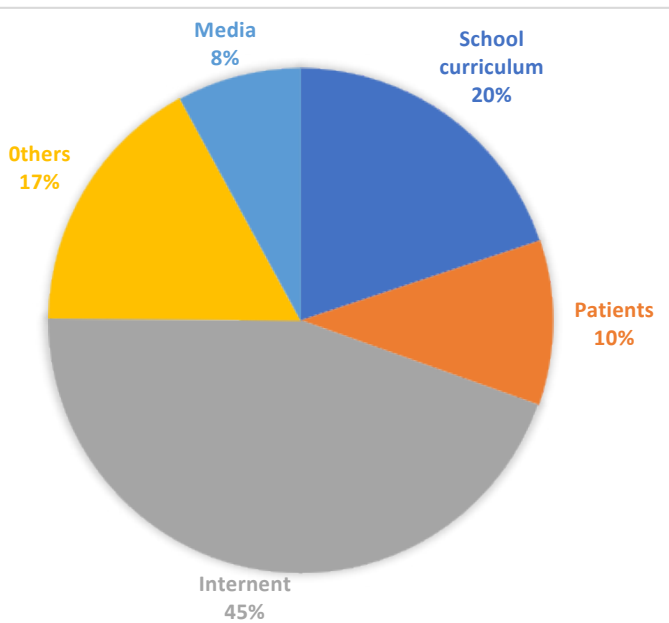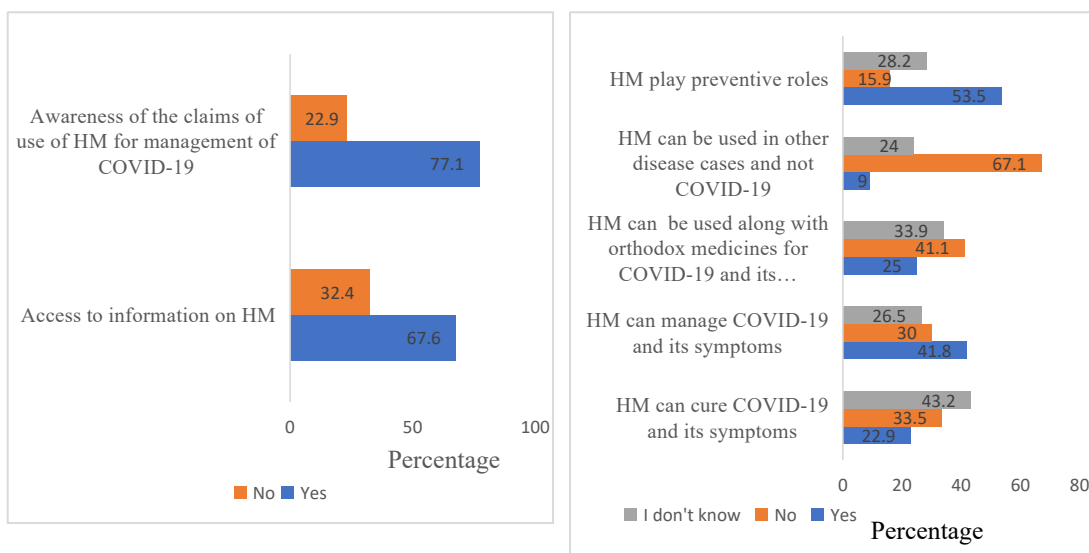

Fig. 1: Sources of Information About Herbal Medicines

Key: HM- Herbal medicine

Fig. 2: Respondents Knowledge on the use of Herbal Medicines for COVID-19

while 35.3% will advise patients on the concurrent use of herbal and orthodox medicines. The reports of possible interactions between orthodox medicines and herbal drugs have discouraged the use of both concomitantly. More so, some of these interactions have not been researched nor documented. Interestingly, most (67.1%) of the respondent reported that herbal medicines can only be used for other disease cases but not COVID-19, possibly due to the absence of the disease in African indigenous folklore, or the scarcity of information on already developed herbal medicines available for COVID-19 management. Most (64.9%) of the respondents believed that herbal medicine can have a role to play in the management of COVID-19 and its symptoms, 67.3% were of the opinion that herbal medicine use for the management of
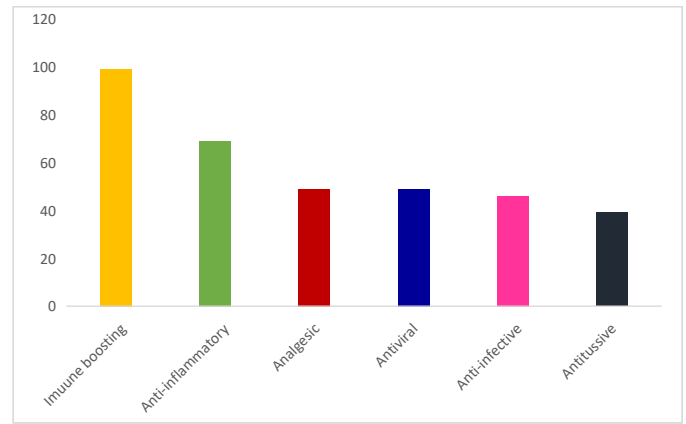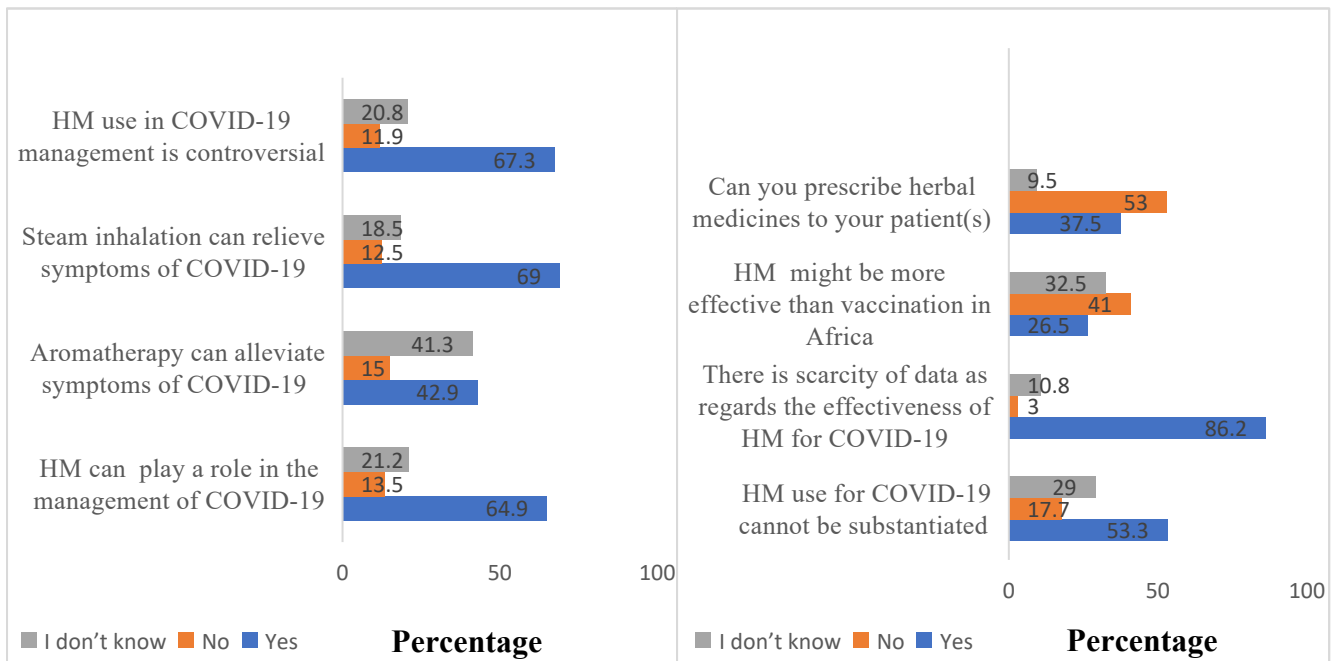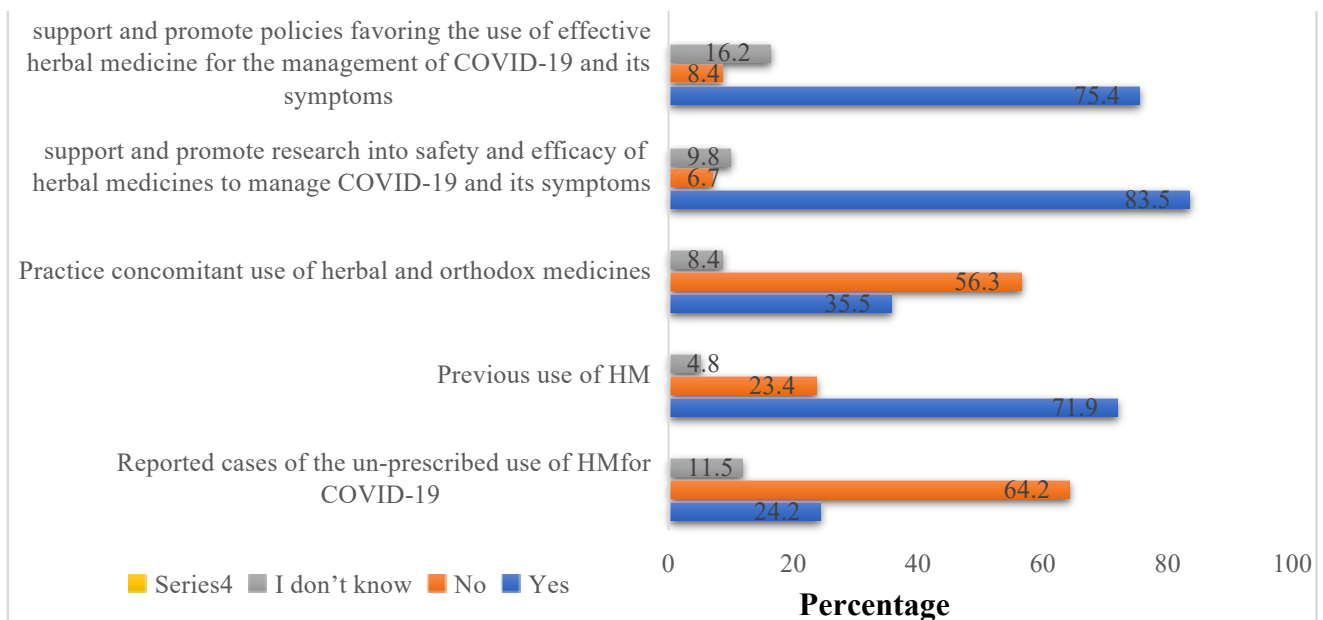

Fig. 3: Role of Herbal Medicines in the management of COVID-19

Key: HM- Herbal medicine

Fig. 4: Respondents Attitude on the use of Herbal Medicines for COVID-19

Key: HM- Herbal medicine

Fig. 5: Respondents Practice of the use of Herbal Medicines for COVID-19

COVID-19 is controversial while 53.3% reported that the use of herbal medicine to manage COVID-19 cannot be substantiated. Respondents, (53.5%) believed that herbal medicines can only play preventive roles and not curative nor treatment roles. This aligns with the school of thought that herbal medicines are best regarded as nutraceuticals. It is often advised as many herbal medicines are many times edible and are food plants, "eat your food as medicine" is the common advice given.

Generally, 26.5 % of respondents agreed that herbal medicine use might be more effective than vaccination in the management of COVID-19 in Africa, 41.0% disagreed while 32.5% stated they had no knowledge on the possible effectiveness. The perception towards the effectiveness of herbal medicine use over vaccination in Africa was not affected significantly by the level of education (p=0.326) but by the occupation (p = 0.04) and years of experience(p≤0.001) on cross tabulation. From the occupation of respondents surveyed, more doctors (41.7%), nurses (53.5%) and pharmacists (38.5%) did not believe that herbal medicine use for COVID-19 can be more effective than vaccination. This may be due to the fact that health care practitioners in Nigeria upheld vaccination over the use of herbal medicines.

Practice of health practitioners showed that 37.5% of the study participants could prescribe herbal medicines to their patients, 53.0% were against prescribing herbal medicine to their patients while 9.5% do not know if they would prescribe herbal medicines to their patients. Prescription and advice to use any drug often stems from knowledge on the efficacy and toxicity of such drug along with the perception of how beneficial or effective the drug would be (Chowdhury *et al.*, 2022). Most (42.9%) of the respondents believed that aromatherapy can alleviate symptoms, (69.0%) were of the opinion that steam inhalation relieves COVID-19 symptoms. The effectiveness of aromatherapy and steam inhalation in the management of common cold, nasal blockage, fever and other symptoms of respiratory tract infections is widely reported (Choi & Park, 2016). The decision to prescribe herbal medicines, use herbal medicines, support research into safety and efficacy of herbal medicines and support/ promote policies favoring the use of effective herbal medicines in the management of COVID-19 was not dependent (p≤0.05) on the respondents' educational qualification, occupation nor years of experience. Majority (79.6%) doctors, (85.4%) nurses and 84.3% (pharmacist) were willing to support research into safety and efficacy of herbal medicines to manage COVID-19, (66.7%) doctors, (81.4%) nurses and 75.5% (pharmacist) will support and promote policies favoring the use of effective herbal medicines for the management of COVID-19 and its symptoms. The knowledge that many orthodox medicines in use today were developed from plant sources, general knowledge on the folkloric use of herbal medicines along with the degree of use of herbal medicines by the health practitioners themselves (71.9% stated they have used some form of herbal medicine before) could inform their notion towards the support of research and promotion of favorable policies.

Summarily, healthcare practitioners surveyed in this study had professional knowledge or otherwise that could enable them make objective decisions. This could act as a wake-up call to government bodies to fund research into effective herbal remedies for the treatment and management of COVID-19, as well as offer evidence through clinical trials.

The observed knowledge, attitude, and practice of participants on the use of herbal medicines for COVID-19 could be attributed to the growing awareness in herbal-based products/medicines. Herbal medicine is the most theoretically accessible branch of the expanding field of complementary and alternative medicine (Chikowe *et al.*, 2021). The World Health Organization (WHO) acknowledges that traditional, complementary, and alternative therapies have numerous benefits, and herbal medicines might be evaluated as potential COVID-19 treatments (Ilori *et al.*, 2021). However, randomized clinical trials are required to demonstrate the safety and efficacy of these medicinal herbs. In order to provide safe, high-quality, and effective herbal medicines for COVID-19 into the Nigerian healthcare system, herbal medicine regulatory agencies (NAFDAC and SON), manufacturers, and researchers must follow stringent scientific methods and techniques, good manufacturing practices (GMPs), and preclinical testing.

In this study, knowledge of the use of herbal medicines was affected by respondents' educational qualification, occupation and years of experience. There is the dare need to boost the source of information on herbal medicines especially through the school curriculum as all licensed health care practitioners pass through one form of tertiary formal education or the other. There must be enhanced support for research into safe, efficacious and affordable herbal medicines along with the promotion of policies and laws that regulate the herbal medicine industry.

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