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Herb-drug interactions: Perception and revelations of nurses in primary healthcare clinics, South Africa

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ABSTRACT

Purpose: This study aims to explore and describe the perceptions and revelations of primary healthcare nurses regarding the use of herbal medicine and herb-drug interactions.
Background: Research has shown that a large percentage of the South African population uses herbal medicine (HM) alongside conventional medicine. In light of this, primary healthcare (PHC) nurses should educate and advise patients about potential herb-drug interaction (HDI).
Methods: An exploratory, qualitative study was conducted in primary healthcare clinics in Gauteng, Free State, and Mpumalanga provinces in South Africa. Eight PHC nurses were recruited for face-to-face, digitally recorded interviews. Data was transcribed and coded using content analysis.
Results: The study identified five main themes emanating from the interviews: nurses' perception and personal use of herbal medicine; nurses' knowledge of herbal medicine and herb-drug interaction; enquiring about the use of herbal medicine use; nurses' behaviour, and patient disclosure on herbal medicine use. The sub-themes were nurses pursuing knowledge of herbal medicine, the advice given to patients, and the discouragement of herbal medicine use.
Conclusions: This study revealed that a broader depth of knowledge regarding the use of herbal medicine could enable primary healthcare nurses to communicate better with their patients about the risks and benefits of such use. Taking into account that a large portion of the South African population uses herbal medicine, the nursing profession should consider introducing an education intervention to assist nurses in their response to patients' questions regarding the use of herbal medicine. This study recommends that a history case-taking form should be utilized as a standardized approach to address the use of herbal medicine among patients. This is currently not mandatory in the South African primary healthcare system.

1. Background

Primary healthcare (PHC) is a holistic approach that is centred around the needs of individuals, families, and communities. It is the first level of entry to the healthcare system where health promotion, disease prevention as well as diagnosis, management, and treatment of ailments are provided. Services are available to everyone and are rendered by medical practitioners, nurses, and other allied health professionals (WHO, 2014). Post-democracy (1994), the South African government redesigned the health care system from a clinic-based system to a community-centred system (le Roux et al., 2015). This provides a strong and effective foundation for the healthcare system that reaches many communities allowing for early diagnosis, treatment management, and referral to secondary and tertiary healthcare facilities (Munyewende et al., 2014; Murray-Parahi et al., 2016; Bitton et al., 2017). In over 3500 government PHC clinics, PHC nurses are the first point of contact and vital to the delivery of primary healthcare (Mathibe et al., 2015; Halcomb et al., 2016). Herbal medicine (HM) has become popular due to its global acceptance as a complementary and traditional treatment (Parvez & Vikas, 2019). Research has shown that 60–80% of the population of

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South Africa use HM for the treatment and management of their health (Balogun & Ashafa, 2018). HM include herbs (leaves, flowers, fruit, and seeds), herbal materials (fresh juice, gums, and fixed oils), herbal preparations (tinctures, extracts), and finished labelled products that contain plants as active ingredients (WHO, 2019). In South Africa, these products are used within traditional eco-systems (African Traditional Medicine) and complementary medicine systems (Homeopathy, Phytotherapy, Unani-Tibb, Ayurveda, and Aromatherapy) (Chitindingu et al., 2014).

Within the South African context, there is a deeply embedded sense of trust in the use of HM by rural–urban communities (Shewamene et al., 2017). This could be linked to a culturally diverse population with distinctive traditional health practices and preferences (Hübsch et al., 2014). In a study conducted in Durban, South Africa by Appelbaum Belisle et al. (2014), the use of HM was shown to be integral to the identity of African people. This was attributed to the longstanding successful use of HM for the treatment of many ailments that threatened physical or spiritual existence. Many people rely on HM due to the perceived effect and low cost of products (de Wet & Ngubane, 2014). Other reasons reported for the use of HM include general dissatisfaction with the conventional health care system, the high cost of conventional medicines, and their perceived side effects (Welz et al., 2018). Moreover, the unpleasant behaviour of healthcare providers towards patients also encourages people to use HM (Liwa et al., 2014). The core principle of effective communication aligns with the role of nurses and that of the healthcare providers (HCPs) (Rowland, 2013). According to Haskins et al. (2014), nurses' negative behaviour may influence the patients' willingness to disclose the use of HM. Therefore, an emphasis on effective communication and interpersonal skills should include cultural sensitivity and acknowledging patients' use of HM. Active ingredients in herbal products can alter the pharmacokinetic and pharmacodynamic properties of a prescribed drug, resulting in various severe clinical adverse effects (Bhadra et al., 2015; de Wet et al., 2016).

The main issue lies in the fact that any single herbal preparation contains several active ingredients, all of which are associated with unknown adverse effects. These adverse effects range from mild (allergic reaction, gastrointestinal upset, and nausea), moderate (coagulation abnormalities) to severe (cerebral haemorrhage, death, hepatitis, and liver damage) to mention a few common ones (Posadzki et al., 2013; Ekor, 2014; Di Lorenzo et al., 2015; Izzo et al., 2016). Moreover, herbal products may have antagonistic effects, which could cause potential therapeutic failure as seen with many drugs like diuretics, antihyperlipidemic anticoagulants, and antiplatelets (Borse et al., 2019; Thomas et al., 2021). For instance, Ginkgo (*Ginkgo biloba*) can induce seizures when combined with phenytoin or valproic acid (Awortwe et al., 2018), and excessive bleeding when combined with warfarin (Milić, et al., 2014). Red or Korean ginseng (*Panax ginseng*) causes sleeplessness, tremors, and headaches when used concurrently with phenelzine (Izzo et al., 2016).

Several studies have been conducted in South Africa examining the concurrent use of herbal products and conventional medicines. The results identified adverse effects including, altered gastrointestinal functioning of the drug absorption; induction and inhibition of metabolic enzymes; and alteration of renal excretion of drugs and their metabolites (de Wet et al., 2010; Fasinu et al., 2012; Hughes et al., 2013; Calitz et al., 2015; Cohen & Hunter, 2017; Awortwe et al., 2018).

Primary healthcare nurses need to discuss the use of HM during consultations. Poor reporting from patients using herbal products and the inability of health care providers to identify the HDI play a major role in the limited reporting of HDIs (de Wet et al., 2016). The South African Medical Research Council's Biomedical Research and Innovation Platform noted in 2018 that 60% of adverse drug reactions reported resulted from concurrent use of herbal medicine (SAMRC, 2018; Awortwe et al., 2018). This warrants an investigation into the nurse-patient communication around potential herb-dug interaction during the consultation (Hughes et al., 2015). Currently, there is limited research related to the role of the PHC nurses' communication regarding patient use of HM as having implications on the quality of health care, within the South African context (Sibiya et al., 2017).

1.1. Purpose of the study

The purpose of this study was to explore and describe the perceptions and revelations of PHC nurses regarding the use of HM. Secondary aims included whether nurses communicate to their patients about HM and address the anticipated HDI.

2. Methods

This qualitative, exploratory study used semi-structured, digitally recorded interviews to answer the research question.

2.1. Population and sampling

The population in this study consisted of PHC nurses who met the inclusion criteria: being a registered PHC nurse and employed in the PHC clinic. Eight PHC nurses were recruited in three provinces (Gauteng, Mpumalanga, and Free State). Three nurses were recruited in Gauteng, two in Mpumalanga, and three in Free State province. The PHC clinics selected were in black township (urban) areas. Currently, in South Africa, there is increasing use and commercialization of HM due to urbanization (Matotoka & Masoko, 2017; Hughes et al., 2020), which is why these areas were chosen. The PHC clinics and provinces were selected using random sampling techniques, where the list from the National Health Research Database (NHRD) was used as a sample frame (Polik & Beck, 2018). Once permission was granted by the Provincial Health Research Committee (PHRC) of each province, the recruitment process commenced.

2.2. Data collection

Data was collected during 2018–2019 using individual semi-structured interviews until data saturation was reached with eight participants. The researcher approached the participants in person in the PHC clinics where the purpose of the study was explained and a request to participate was made. Participants were made aware of their right to withdraw from the study at any point during the interview without consequences. Participants who agreed to participate in the study were requested to sign the consent forms to participate in the study and for audio recording prior to data collection. The voice-recorded interviews were conducted in English in a private consultation room allowing participants to feel free to express their views. Code-switching was accepted during the interviews to clarify some of the English words. Each interview lasted between 30 and 45 min. Each interview began with the following question:" What do you understand about herbal medicine?". Further questions included:

- What is your perception of herbal medicine?
- Do you ask your patients about herbal product use?
- If no, why not?
- If yes, does the response encourage open communication about herbal medicine?
- Are you aware of herb-drug interaction?
- Do you make your patients aware of herb-drug interaction?
- How do you think you can encourage open communication about herbal medicine use?
- Any comments?

The transcripts were verified through member checking, and themes were developed around the main topic of the conversation. The researcher captured the perceptions and revelations regarding the use of HM from the PHC nurses' perspectives.

2.3. Data analysis

A thematic analysis was used for data captured during the semi-structured interviews. This involved the initial narrative analysis at a semantic level to bring meaning to what the participants said (Whitehead et al., 2016). The coding of data was divided into primary and secondary cycles (Saldaña, 2020). The primary cycle involved a summary of data segments, whilst the secondary cycle grouped these segments into categories and themes. The categories and themes were combined, analyzed and findings were deduced. Five themes and three sub-themes emerged from the data to address the aims of the research (as seen in Table 1). The qualitative data analysis software was utilized for further analysis. After coding, the categories and common themes were collated and reported as final findings.

2.4. Ethical consideration

The research was approved by the University of Johannesburg, Research Ethics Committee (REC-01-106-2018), and the PHRC of Gauteng, Free State, and Mpumalanga provinces prior to conducting the research.

2.5. Trustworthiness of the study

Trustworthiness of the findings was ensured following the five criteria: credibility, transferability, dependability, confirmation, and authenticity as outlined by Lincoln and Guba (1985) in Pilot and Beck (2018). To ensure credibility, the researcher transcribed each audio-recorded interview immediately to make sure all responses were captured correctly. The researcher ensured transferability by providing a thick description of the findings for use in other settings or groups. Confirmability was ensured that the data collected represented the responses participants provided and the interpretation of the findings were not the views of the researcher. An audit trail and member checking were done by taking some of the transcripts back to the participants for the confirmation of the accuracy of the transcripts. To ensure authenticity, collected data was digitally recorded and transcribed verbatim.

3. Results

Participants were all female aged between 30 and 63 years and had more than 5 years of clinical experience. This demographic is confirmed by the South African Nursing Council (SANC), statistics 2020, where it recorded 136 975 registered female nurses and 17 049 male nurses (South African Nursing Council, 2020).

Participants are given a numeric identification for reporting purposes and to ensure anonymity. Thematic analysis revealed five themes and three sub-themes (Table 1).

Table 1
The main categories and subcategories extracted from collected data.

Main categories	Subcategories
Nurses' perceptionsand personal use of HM	
Nurses' knowledge of HM and herb-drug interaction	Pursuing knowledge of herbal medicine by nurses The nurses' advice The nurses' discouragement of herbal medicine use
Enquiring about the use of HM use	
The nurses' behaviour	
The patient disclosure on HM use	

3.1. Theme 1: Nurses' perceptions and personal use of herbal medicine

Participants in this study had a positive attitude towards HM, they reported using herbal products and mentioned that during their upbringing they used HM to treat ailments.

> They are good if they are used with consciousness by someone who knows. They are effective because they don't have preservatives. ~ [P 6]
> 'I actually use very less of conventional medicine. Getting older I believe that pure natural medication is better because of the allergies that people develop myself I've got a problem anything that is preserved including tablets, medication you know the preservatives don't really treat me well I believe that it is a better option'. ~ [P8]
> 'If it was rubbish I wouldn't be using it as a healthcare professional, I just look at the health benefits those who did research say this thing give so much health benefits, if I can prevent disease before it come on me, I will rather do it that'. ~ [P4]
> 'We grew up using and making our own medication, so it is normal, it is just acceptable'. ~[P1].

However, one participant did not trust the use of herbal medicine.

> 'I don't believe in them, unless I go to a professional doctor… some doctor… use herbal medicine. they combine, them because they have studied about herbal medicine but those from traditional doctor's I don't use them'. ~ [P7].

3.2. Theme two: Nurses' knowledge of herbal medicine and herb-drug interaction

Participants were asked if they knew what herb-drug interaction was. The results showed that nurses were familiar with the term herb-drug interaction, but they lacked the understanding of the pharmacodynamic, and pharmacokinetic mechanisms of the herb-drug interaction as stated:

> 'Yes, I know about herb-drug interaction even though I don't know what is interacting with what, but I know there is interaction'. ~ [P2]
> 'Yes, I am aware that there is interaction between the herbs and our medicines ~ [P5]
> 'Yes, cause whatever they are taking might interact with the herbal medication, so you must check what they have. Most of the time we don't know much about herbal medicine what they contain. ~ [P6]

3.3. Sub-theme 1: Pursuing knowledge of herbal medicine by nurses

Participants recognised their limited knowledge of herb-drug interaction and raised the importance of gaining knowledge about HM:

> I think if we can get some education on how herbal medicine works it can help the nurses". ~ [P8]
> Because I absolutely know nothing about African potato, if we can know the benefits and what does it contain as a nurse I can educate the patient better. ~ [P6]

3.4. Sub-theme 2: The nurses' advice

Despite participants declaring their lack of knowledge of HM, participants still gave varied advice on HM to their patients. One participant mentioned that she usually recommends natural remedies to her patients instead of conventional medicines.

> 'I normally advise them about natural remedies. I will advise them on how to do things natural instead of using medication'. ~ [P1]

On the other hand, participants mentioned that they advise their patients not to take HM and conventional treatment concurrently rather than discouraging them to use HM.

> 'I give them information, just advise them not like telling them to stop. The only thing I can do is to advise the patient that if you are using this from us you are not allowed to add with this, like especially the pregnant patient'. ~ [P7]
> 'Our people believe too much in herbal medicines so it is very much important to tell them let's do things this way and it is not necessarily saying do not believe in your things, but we do things the other way'. ~ [P5]

3.5. Sub-theme 3: The nurses' discouragement of herbal medicine use

Participants' lack of knowledge on HM has proved to be the dominant finding as a hindrance to the HM communication between PHC nurses and patients. Some of the participants felt that they would rather discourage the use of HM instead of advocating for it due to the lack of knowledge..

> 'Most of the nurses discourage patients from taking herbal medication because they don't know how this herbal medication work, so they just play safe by discouraging patients to take it ~ [P8]
> 'We nurses we know nothing or very little about these herbs, so to us they are wrong so it must be stopped'…… once they say I am drinking something we say stop it will interact with whatever I am giving we don't say it might interact. ~ [P6]

3.6. Theme three: Enquiring about the use of HM use

Some of the participants in this study declared that they do enquire about the use of HMby their patients:

> Yes, we do, part of the initial interview with patients is to ask what medicine you are using… ~ [P3]
> 'Always I ask them whether they are on herbal medicine'. ~ [P5]

However, some participants confirmed that they have never enquired about HM use to their patients.

> 'Not really, the only time I found myself talking about herbal medicine, will be when a person says to me sister 'I am coming here to ask you to give me contraceptives, I just want to know if this herbal tea that I am on is going to make my contraceptive pill less effective'. ~ [P4]
> 'We hardly ask 'do you take any herbal medicine, we only ask when you realise something is not working like the current medication you are giving is not working ~ [P6]

3.7. Theme four: Nurses' behaviour

All participants in this study expressed that the manner of approach, how questions are asked, and a positive attitude toward patients are essential in healthcare. They mentioned that these behaviours have a direct impact on patient non-disclosure of HM use.

> 'Manner of approach is very important; they are open and say I am using this or sometimes at church or at home we are using this. They are honest depending on how you asked that question, your approach'. [P6]
> 'First thing, you as a sister, you don't have to be judgemental because as soon as you get judgmental the patient will not open to you'. ~ [P7]
> 'The attitude is very much important; it does not only go about attitude also respect. The client once you respect him/her you gain her but if ever you come with the negative attitude it is not going to work'. ~ [P5]

3.8. Theme five: Patients' disclosure on herbal medicine use

With the lack of communication between patients and nurses being the barrier to patient disclosure of HM use, participants in this study confirmed that patients are not forthcoming about the use of HM or when asked about it, they are not honest about their answers.

> 'Normally they say they do not use any herbal medicine, even if you can see the signs and symptoms that they might have taken something, they say no no no.. I don't do that my grandmother do it but I don't' ~[P3]
> 'Some do say they started using herbs first before they come to the clinic as some will believe they have been bewitched and they started at the traditional healers'. ~ [P2]

4. Discussion

The purpose of this study was to explore and describe the perceptions and revelations of PHC nurses regarding herb-drug interaction. The majority of participants in this study had a positive attitude towards HM and confirmed that they used HM during their upbringing to treat diseases. (Jong et al., 2015; Gyasi et al., 2017). These findings are supported by a review conducted on 21 studies where the overall use of complementary medicine by nurses, and the main modality used was HM (Balouchi et al., 2018). On the other hand, there was one participant who showed a lack of confidence in HM because they are not prescribed by a medical practitioner. This viewpoint could be attributed to the insufficient scientific evidence of HM in the public domain and the fact that most herbal products await to be regulated and registered by the South African Health Products Regulatory Authority (SAHPRA) (Keyter et al., 2020). Evidence has shown that the majority of South Africans use HM, yet the nurses' lack of knowledge is concerning (Sibiya et al., 2017). All participants declared that they lacked adequate knowledge of HM and their understanding of herb-drug interaction was insufficient to respond to the patients' enquiries. Having a clear understanding of HM and mechanisms of HDI offers the nurses a basis to educate and assist patients in making informed decisions about using HM (Christina et al., 2018). A study by Chang and Chang (2015), found that PHC nurses' lack of knowledge regarding HM products prevents them from warning patients about the consequences of herb-drug interaction. To avoid possible HDIs, nurses must understand HM and be adept in effectively communicating the associated risks and benefits with patients (Chen et al., 2012). Even though nurses in this study admitted that they lacked sufficient knowledge regarding the use of HM, a recommendation was that obtaining more information about HM will enable them to give reliable information to their patients. Numerous studies correlate with this finding where PHC nurses expressed the need to have training on complementary medicine and for it to be included in the nursing curriculum offered at various learning institutions (Cinar et al., 2016; Sibiya et al., 2017). Despite the recommendations to include HM in the nursing curriculum, South Africa like other countries in sub-Saharan Africa, currently, has no consideration to include HM in the nursing curriculum (Gyasi et al., 2017).

In the current study, participants shared mixed feelings on advising patients about HM use. Participants who confirmed that they use HM were the ones who recommended the use of natural remedies to their patients. Consistent with this finding, a study by Ott et al. (2018), revealed that nurses who have a positive experience with HM are likely to recommend it to their patients. Other participants mentioned that they would advise patients not to concurrently use HM and prescribed medication rather than discourage the use of it. This might be due to the participants' uncertainty about the safety of HM and their responsible

way of minimizing possible HDIs. The findings by Noor Abdulhadi et al. (2012) and Stub et al. (2018), confirm that it is better to communicate with the patient about the dangers of the concurrent use of HM and prescribed medication rather than a direct instruction to stop using HM. According to Trail-Mahan et al. (2013), nurses would rather discourage the use of HM than advocate for it. This behaviour might be seen as a natural response of nurses trying to be cautious and avoid giving unreliable information to patients due to their uncertainty about the efficacy and toxicity of HM. Additionally, Bahall and Legall (2017), concluded that healthcare providers first need evidence-based guidelines of HM to be able to recommend it. Considering the minimal evidence to support the safety of HM, PHC nurses need to receive training to be able to communicate better with patients about the use of HM (Nguyen et al., 2014). Results of this study show that nurses do ask patients about the use of HM. However, this does not constitute effective communication regarding HM and possible HDI. Effective communication is a process of acting on information (Trenholm, 2017).

The lack of effective communication could be influenced by PHC nurses' limited knowledge of HM. These findings differ from numerous studies where they mention that nurses who have basic knowledge of HM are more likely to enquire about HM from their patients (Trail-Mahan et al., 2013; Spencer et al., 2016; Shorofi & Arbon, 2017). According to PHC nurses in this study, they do enquire about HM use despite declaring the lack of knowledge on HM. This may well have been motivated by the fact that South Africa is a culturally diverse country with historical uses of traditional HM by its population. The results also revealed the inconsistency in the collection of patient medical history by PHC nurses where some of the nurses enquire about HM use and others do not. The reason could be that within the South African clinical context, the standardized form for record-keeping does not specifically reference the use of HM (Matsoso, 2021). Moreover, the inconsistency within provinces is reflected in the differing views of the nurses regarding the use of HM. These results require a call to action for policymakers and healthcare stakeholders in different provinces to review the medical history taking forms and include herbal medicine as a separate component. Additionally, the provinces should mandate that every nurse enquire about the use of HM to prevent unnecessary strains on the health system of patients revisiting these facilities with HDIs. The poor communication and negative behaviour shown by nurses towards patients is constantly heard in the media and has been substantiated in previous studies (Cheruiyot & Brysiewicz, 2019; Nesengani et al., 2019). Participants in this study spoke out and acknowledged that nurses need to approach their patients appropriately and should not have a negative attitude towards their patients. This is confirmed by Haskins et al. (2014), where nurses in a South African hospital mentioned that negative attitudes that they observed from their colleagues is the disrespectful communication with patients. In the same study, participants emphasized that a respected, non-judgemental medical history should be collected from patients using herbal medicine. Although individual nurses' attitude varies, participants in this study had a common voice about their colleagues' behaviour towards patients. Lastly, participants confirmed that patients do not voluntarily disclose the use of HM.

These findings indicate a common behaviour pattern of non-disclosure by patients' regarding the use of HM to healthcare providers. Several studies conducted in South Africa (Puoane et al., 2012; Nlooto, 2015; Marais et al., 2015; Thandar et al., 2017) and globally (Kretch et al., 2014; Naja et al., 2015; Asfaw Erku & Basazn Mekuria, 2016) have confirmed these findings. The non-disclosure of herbal medicine use may lead to the underreporting of HM, which will result in the lack of factual data regarding HDI cases (Awortwe et al., 2018). Even so, PHC nurses need to encourage patient participation to ensure patient care is not compromised (Wagner et al., 2015).

5. Conclusion and recommendation

The results of this study show that PHC nurses do ask patients about the use of HM. However, the patient-nurse dialogue is limited due to insufficient knowledge regarding HM by nurses. As a result, the nurses tend to discourage the use of HM. Accordingly, it is recommended that an educational component of HM be included in nurses' curriculum to raise awareness, broaden knowledge, and emphasise the need to enquire about HM use. This will subsequently ensure nurses are empowered with the knowledge required for HM and enhance the reporting of HDI cases. The PHC nurses' attitude was found to influence the ability of patients to discuss the use of HM. An understanding attitude and open communication are the key elements to identify and prevent misinformation and potential HDIs (Jermini et al., 2019). Consequently, a recommendation would be to implement a monitoring system of communication regularly through patient satisfaction surveys. Another recommendation would be for the nine provinces in South Africa to make it mandatory that the method of gathering medical history should include HM use.

5.1. Limitations

This study explored and described the perceptions and revelations of PHC nurses regarding HDI in only three provinces. The sample size does not allow findings to be generalized. More studies are required to replicate these findings.

6. Availability of data

Data of this study is available from the corresponding author upon reasonable request due to promised participants' confidentiality.

Author contributions

T.T-T conducted the research and was the writer of the manuscript. H.M-E and E.P were supervisors, and all reviewed the final draft together.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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