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DETERMINING COMMON DOSAGE FORMS OF CURCUMIN (TURMERIC) AVAILABLE AT PHARMACIES IN BLANTYRE, MALAWI

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Introduction

According to the national cancer institute (NCI) dictionary, curcumin is defined as a phyto-polyphenol pigment extracted from a herbaceous plant called *Curcuma longa*, also known as turmeric(1). It is among the notable curcuminoids found in *curcuma longa*; the constituents are the ones responsible for the yellow color of turmeric. This has been widely used as a yellow coloring agent in food coloring purposes and additives(2). Multiple dosage forms of curcumin are available depending on users or manufacturers preference. The aim of this study was to determine the common dosage forms of curcumin available at pharmacies in Blantyre city, Malawi.

The findings of the study will be used to contribute to an herbal medicine database for Malawi. Furthermore, the findings will add value to research done at Kamuzu University of Health Sciences, Pharmacy Department. It will also provide contemporary data for upcoming/future researchers interested in the same field or subject matter. The research data findings will also be used by the manufacturing industry. Manufacturers could use the information to make dosage forms of curcumin which have better pharmacokinetic and pharmacodynamic parameters. If the data is made public, it can improve patient's adherence to the herbal drug given the various dosage forms that may be available.

Methods

The type of study design was a descriptive cross-sectional study design that was conducted in pharmacies in Blantyre, Malawi(3)(4), located at **-15.786111, 35.005833**(5). from 6th March 2022 to 3rd November 2022.

The study population was all community pharmacies found in Blantyre city that are registered with Pharmacy and Medicines Regulatory Authority (PMRA) of Malawi. Since the herbal medicines are available at community pharmacies in Malawi, it was an ideal venue to study curcumin dosage forms(6)(7). There's an estimate of about forty retail pharmacies in Blantyre city according to the 2021 PMRA registers (8). Using convenience sampling, only community pharmacies, and those who consented to the study were recruited and hospital pharmacies were excluded.

Data was collected using a self-administered questionnaire. Investigators left the questionnaire to the pharmacist to be answered on their own free time and the answered questionnaire was collected 3 days after. The results were recorded on an excel data sheet and stored in Google Drive. The data was analyzed using descriptive statistics such as frequency tables.

Results

A total of 40 pharmacies were recruited into the study, 30 participated in the study as eight did not consent and two pharmacy owners were out of reach. Twenty-five out of 30 of the pharmacies sell herbal products and ten of the pharmacies sell curcumin, while eight of the pharmacies sell curcumin containing products.

Table 1 – Types of curcumin sold

Kinds	Quantity	Percentage
Crude	3	17.6%
Manufactured	12	70.6%
Both Crude & Manufactured	2	11.8%
Total	17	

Table 2 – Plant part sources

Plant Part	Quantity	Percentage
Rhizomes	14	63.6%
Leaves	3	13.6%
Stem	2	9.1%
Flowers	3	13.6%
Total	22	

Table 3 – Available dosage forms

Dosage forms	Quantity	Percentage
Powder	13	43.3%
Capsules	12	40.0%
Creams	1	3.3%
Ointments		0.0%
Solutions	2	6.7%
Tablets	1	3.3%
oils-	1	3.3%
Total	30	

Table 4 – Frequency of curcumin sold

Frequency of buying	Number of pharmacies	Percentage
Rarely	13	72.2%
Often	1	5.6%
Very often	0	0.0%
Never	4	22.2%
Total		100%

Table 5 – Pharmacist curcumin recommendation to patients

Pharmacist recommendation	Number of pharmacies	Percentage
Yes	10	33%
No	20	67%
	30	

Discussion

Curcumin can be extracted from various parts of the turmeric plant - such as leaves, stems and rhizomes. Research indicates that the major source of curcumin is from the rhizome of the plant .[9][10][11]

In this study, curcumin products were derived from rhizomes (63.3%), leaves (13.6%), flowers (13.6%), and stems (9.1%). This determination was based on the label of the product and also the pharmacist's knowledge. In comparison with the literature, the rhizome is the main plant part source for curcumin, which is almost the same for the Malawian curcumin[9][10][11][12].

The following dosage forms were identified in this study - powder (43.3%), capsules (40%), solutions (6.7%), creams (3.3%), tablets

(3.3%), oils (3.3%). This distribution was similar to the dosage forms that are found in the literature; for example, documented data from Zambia indicates that it used in medical soap as a solid formulation [13]. In Morocco, Tanzania and Ethiopia, it is mostly available as a powder formulation [14]. In other parts of Sub-Saharan Africa, its common forms are powder and some tablet formulations [9]. In Asian countries, curcumin is mainly available in dosage forms such as creams, lotions, paste, capsules, tablets, medicated soaps[15][16]. In western countries it is found in forms like capsules, tablets, powder, and also some modified forms such as micelles, and modified emulsions [11].

Curcumin in Blantyre, Malawi is being mainly used as a nutrient supplement, a spice and in the management of pain. Research data from multiple African countries shows that the herbal entity is largely used as a spice, and also in the treatment of medical ailments such as diabetes, joint pains, and nutrient supplement [9] [13]. In majority of Asian countries, it is mainly used as a food spice, coloring agent, pain management and as an antiseptic [15][16] [17]. Data from western countries indicated that turmeric was being used as a coloring agent and in the treatment of diabetes [11].

This study found that compared to Asian countries, sale of curcumin product in Malawi was much less. Only 5.6% of the pharmacies sold any of these products during a week, 72.2% of the pharmacies rarely sold the products, and 22.2% of the pharmacies never sold any curcumin product. In Asian countries, retail pharmacy pharmacists reported high sales of curcumin[18].

Most pharmacists in Blantyre claimed that they do not recommend curcumin or any herbal products due to lack of safety and efficacy data while 33% of the pharmacist interviewed recommend curcumin and other herbal products as nutrient supplements. In Asian countries, it is reported that herbal medicine such as curcumin recommended by pharmacists was used by 50% of their customers and 70% of them believed that herbal medicines are safer alternative to contemporary medicine[18]. In Africa, especially Ethiopia, few pharmacists are recommending herbal medication to their patients due to lack of additional training about herbal medication preparation; the same problem was also identified in Nigeria and Kenya, in which the use of herbal medicine is slowly being accepted by pharmacists and other healthcare providers. Limited access to information on how to prepare herbal medicines is a large barrier for African countries, and retail pharmacists need addition training on the subject matter[6]. Further studies should be conducted across the country to determine common dosage forms available in pharmacies and to identify common conventional and other traditional medicines used concurrently with curcumin.

Conclusion

The current findings indicate that the common dosage forms of curcumin available in pharmacies in Blantyre City, Malawi, are powders and capsules with percentages of 43.3% and 40%, respectively. However, curcumin and curcumin containing products are rarely sold and most pharmacists from the city do not recommend the herbal entity. This data should not be generalized for the whole Blantyre district since the study only targeted part of the district.

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