



Palm Wine as a Functional Drink: Ethnomedicine Application in Ghana

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Abstract

Palm wine has been ascribed as a functional drink in several countries where it is consumed due to certain health benefits it promotes. In ethnomedicine pharmacopeia, many health benefits are attributed to palm wine consumption. However, no known studies have documented the ethnomedicinal utilization of palm wine in Ghana. This study aimed to document ethnomedicine applications for treating human ailments in Ghana. Data on palm wine ethnomedicine applications were collected from 150 respondents using a semi-structured questionnaire and an in-person interview. Pearson's chi-square test was used to compare ethnomedicine knowledge of palm wine between gender and age groups. The findings revealed that palm wine was applied to treat 40 human ailments. Appetite stimulant was the most mentioned application of palm wine, followed by immune booster, breast milk production, eyesight improvement, and blood tonic. There were variations in the knowledge of the therapeutic functions of palm wine regarding gender and age groupings for certain ailments. The few citations for most of the ailments mentioned indicate that the ethnomedicine application of palm wine belongs to the fringes of cultural practices. The study recommends documentation of knowledge about the ethnomedicine application of palm wine in local communities before they are relegated to fringes of cultural practices.

Subject Areas

Culture, Evidence-Based Medicine, Nutrition

Keywords

Appetite Stimulant, Immune Booster, Breast Milk, Eyesight Improvement

1. Introduction

Palm wine is a traditional beverage obtained from the sap of a variety of tropical

palm trees of the Palmae family. The palm sap is harvested by cutting off the inflorescence and gathering the sap from the damaged peduncle or by the introduction of a tube into the palm's growth point in the center of the crown [1]. The exudates released when a palm is tapped are known as palm sap or wine. In most West African societies, palm wine plays a prominent role in customary practices, such as in traditional libations and rites [1]-[4]. Palm wine has been ascribed as a functional drink in several countries where it is consumed due to the high level of macro and micronutrients that it contains, in addition to the beneficial microbes associated with it and known to promote certain health benefits [4] [5]. Many health benefits have been attributed to the use of palm wine as a functional beverage [2] [4]-[6].

The health benefits attributed to palm wine are from yeasts, lactic acid, and acetic acid bacteria, which confer probiotic qualities to the wine and several antioxidants [5]. Palm wine is claimed to be hypnotic and an antidepressant due to the presence of tryptophan, a precursor for serotonin [7]. Palm wine has a good content of vitamins B1, B2, B6, B12, and C [5] [8] [9], which play a critical role in catabolic and anabolic metabolism [10]. High content of amino acid, potassium, zinc, and iron is linked to palm wine beverage [9] [11]. *Saccharomyces* yeast species in palm wine possess probiotic attributes [5].

In traditional medicine pharmacopeia, many health benefits of palm wine are reported. Palm wine is documented to be used in treating malaria, measles, and jaundice, as a laxative, and enhancement of eyesight [1] [3] [12]. Palm wine is used as a galactagogue to improve milk production in lactating nursing mothers [1] [3] [4] [12] [13]. In Zambia, it is reportedly used for treating skin rashes and sexually transmitted infections (STIs) [14]. In Ghana, palm wine, which is known locally as "nsafufuo", is reported to be used in traditional pharmacopeia for the treatment of human ailments. Traditional healers have reportedly used palm wine as an ingredient in the treatment of Buruli ulcer wounds [15]. Palm wine's ability to fight cancer, improve eyesight, maintenance of healthier, skin, hair, and nail, reduction in the risk of cardiovascular diseases, and promotion of lactation has frequently been cited as health benefits of consumption in the Ghanaian media [16]-[18].

Despite the reported traditional medicine application of palm wine, there is a limited number of studies dedicated to the ethnomedicine application of palm wine in Africa. Indeed, except for Ibegbulem *et al.*'s [19] study that provided insight into the ethnomedicinal values of *Elaeis guineensis* and *Raphia hookeri* wines in Nigeria, there are no known studies focused on the ethnomedicinal utilization of palm wine. Also, previous mentions of palm wine ethnomedicine use did not consider demographic factors such as gender and age differences in knowledge. Gender and age have been shown to influence knowledge and utilization of ethnomedicinal resources [20]-[23]. This study aimed to document palm wine utilization for treating human ailments in Ghana and determine whether gender and age influence knowledge of the ethnomedicine application of palm wine.

2. Materials and Methods

2.1. Study Area

The study was conducted in the Ho municipality of the Volta Region, which covers a total land area of 587 km² and has a human population of 180,420 [24]. The municipality lies between latitudes 6°20"N and 6°55"N and longitudes 0°12'E and 0°53'E and shares boundaries with Adaklu and Agotime-Ziope Districts to the South, Ho West District to the North and West and the Republic of Togo to the East [24]. Palm wine is one of the most widely consumed drinks in the municipality [2]. However, no study has been conducted on the therapeutic reasons for the consumption of palm wine in the municipality.

2.2. Sampling Procedure and Data Collection

The purposeful and snowball sampling approaches were used in this study. The purposeful sampling approach ensured that the selected participants could provide information pertinent to the study, and the snowball sampling approach used the targeted population to recommend other members of that population [25]. Palm wine drinking spots in the Ho municipality, where buyers and sellers converge to trade palm wine, were chosen for the data collection. Consumers who confirmed that they use or have used palm wine for the ethnomedicine treatment of human ailments were potential candidates for this study. The managers of the palm wine drinking spots were first informed about the nature, scope, and aim of the research and obtained informed consent to contact their customers and seek their permission to participate in the study. The purposive-snowball recruitment approach at urban bars may over-represent regular male drinkers and limit generalisability to rural or non-drinking populations. All participants were told of the research's goal and given the freedom to decline or choose to participate willingly through an informed consent process. Only after getting the informed consent of the participants were interviews conducted. The Code of Ethics of the International Society for Ethnobiology (2006) was adhered to. In addition, the ethics committee of the Ho Technical University approved the study (Reference ID: HTU/EC2025-06).

Data on ethnomedicinal use of palm wine were collected from respondents through face-to-face interviews using a semi-structured questionnaire in August 2024. The free-listing technique [26] was employed, and each respondent was allowed to list all the ailments he or she knows palm wine is used to treat. Verbal prompts and probes to motivate and elicit further information from the respondents. The key questions that were asked of respondents were: What was the knowledge of human ailments for which palm wine was utilized to treat? In addition, information about respondents' gender, age, and last level of education was sought. The interviews were conducted in the Ewe language for the participants who could not comprehend English. The Ewe language is embraced as the lingua franca in the municipality and is spoken by many. Every data collector spoke Ewe and English with ease.

2.3. Determination of Sample Size

An initial survey of 20 respondents through a random sampling approach revealed that half of the participants knew at least one medicinal application of palm wine. Based on information, the sampling size for the study was computed using Dagnelie [27] in Equation (1):

$$n = \frac{U_{1-\alpha/2}^2 \times p(1-p)}{d^2} \quad (1)$$

where n is the sample size, p (0.50) is the proportion of people having knowledge about therapeutic knowledge of palm wine, $U_{1-\alpha/2} = 1.96$ is the value of the normal random variable corresponding to a probability value of $\alpha = 0.05$; and d is the margin of error, which was fixed at 8% (0.08) following Assogbadjo *et al.* [28]. Based on these assumptions, 150 respondents were determined to be appropriate for the study.

2.4. Data Analysis

Descriptive analysis was performed to determine the characteristics of the respondents in the study. A word cloud visual representation was used to gain insight into the ailments that palm wine is most prominently or prevalently applied for treatment, based on respondents' frequency of mentions or citations. The sizes of the words were proportional to the frequency with which the words (*i.e.*, ailment) recurred (*i.e.*, were mentioned by the respondents). The Pearson's chi-square test (χ^2) of independence was used to assess the influence on knowledge of ailments by gender, and age groups. Each ailment was coded 1 (Yes) and 2 (No) for respondents who affirmed having it and those who did not have it, respectively. The appropriate method of chi-square test was applied depending on whether the variable was nominal or ordinal. No adjustment was made for the purposes of using the test statistic to draw comparative analysis because Cramer's V was specifically employed to cater for the nature of the variables being considered. All statistical analyses were performed using SPSS version 29. A significant level of 5% was adopted to test the relevant hypothesis.

3. Results

Of the 150 respondents, 69.3% ($n = 104$) were males, and 30.7% ($n = 46$) were females. The age group of the respondents revealed that most were between the ages of 31 - 40 years ($n = 46$; 30.67%) followed by ages 41 - 50 ($n = 35$; 23.33%), ages 51 - 60 ($n = 31$; 20.67%), ages 21 - 30 ($n = 26$; 17.33%), ages above 60 ($n = 7$; 4.67%), and ages 18 - 20 ($n = 5$; 3.33%). Regarding respondents' last level of education, the majority had attained Senior High School ($n = 45$; 30%), Tertiary ($n = 40$; 26.67%), Junior High School ($n = 27$; 18.00%), Middle School Leaving Certificate ($n = 18$; 12.00%), basic/primary and no formal education had equal number of participants ($n = 10$; 6.67%).

A total of 40 ailments were mentioned to be treated with palm wine. A visual

presentation of the ailments identified is depicted in **Figure 1**.



Figure 1. Ailments mentioned by participants to be treated with palm wine in the Ho municipality of the Volta region. Maximum mentions are 85 for appetite stimulant.

Appetite stimulant received the highest number of mentions ($n = 85$) followed by immune booster ($n = 75$), breastmilk production ($n = 64$), eyesight improvement ($n = 60$), blood tonic ($n = 60$), infusion of traditional medicine ($n = 53$), healthy skin ($n = 47$), male fertility ($n = 32$). Sperm production and pain had the same number of mentions ($n = 25$; each), fever ($n = 24$), chicken pox ($n = 20$), stomach disorder ($n = 16$), and skin diseases ($n = 14$). Anxiety and headache ($n = 13$; each), blood cleanser and diabetes ($n = 11$; each), laxative ($n = 10$), clears throat ($n = 9$), sedative ($n = 7$), aids digestion, malaria, heart disease ($n = 6$; each), diarrhea and stomach pain ($n = 5$; each), retentive memory, and reduce stress ($n = 4$; each). Blood pressure, cancer, and strong bone had the same number of mentions ($n = 3$; each), likewise kidney disease, weight management, cholesterol, catarrh ($n = 2$; each), wound healing, aphrodisiac, rheumatism, detoxify body, and cataracts treatment ($n = 1$; each).

The chi-square test (χ^2) results revealed a significant gender-specific influence on knowledge of palm wine application as infusion of traditional medicine ($\chi^2 = 4.532$, $df = 1$, $p = 0.033$), and the treatment male fertility ($\chi^2 = 8.673$, $df = 1$, $p = 0.003$) being frequent for men, breastmilk production ($\chi^2 = 70.024$, $df = 1$, $p = 0.001$), healthy skin ($\chi^2 = 35.404$, $df = 1$, $p = 0.001$), stomach disorder ($\chi^2 = 5.513$, $df = 1$, $p = 0.019$), and catarrh ($\chi^2 = 4.583$, $df = 1$, $p = 0.032$) being frequent for women. Regarding age group, significant differences were observed for breastmilk ($\chi^2 = 19.750$, $df = 5$, $p = 0.001$), retentive memory ($\chi^2 = 19.986$, $df = 5$, $p = 0.001$), and

aphrodisiac ($\chi^2 = 20.566$, $df = 5$, $p = 0.001$), with the frequency tilted toward older generation.

4. Discussion

Many health benefits attributed to the use of palm wine in this study have been mentioned in previous studies [4]-[6]. Palm wine, as a galactagogue to improve milk production in lactating nursing mothers, in this study was consistent with previous studies that reported on its health benefits [1] [3] [4] [12] [13]. Likewise, the reported health benefit of palm wine for eyesight improvement has been cited in previous studies [1] [3] [12] [29]. The application of palm wine for the treatment of malaria, prevention of cataracts, and as a sedative and laxative has been reported in previous studies [1] [3] [5] [12]. The use of palm wine as an infusion for traditional medicine in this study was consistent with findings in Cameroon [29]. Palm wine medicinal applications in this study were consistent with ailments treated with traditional medicine in the municipality and adjoining districts [30]-[32] and among the commonly reported ailments at outpatient departments across hospitals in the city [33]. Potential recall and social desirability biases inherent in self-reported therapeutic use may have affected the ailments mentioned by the study participants.

Palm wine is an alcoholic drink obtained by the natural fermentation of the sap from palm species [29]. Alcohol is believed to have the potential to improve appetite amongst users in Ghana, even in moderate amounts [34]-[37]. Indeed, Dordoye *et al.* [35] found that 94.1% of their study participants in the Ho municipality use alcohol to improve their appetite. The belief that alcohol, even in moderate amounts, may boost appetite in some people may have influenced the high knowledge of palm wine as an appetite stimulant in this study. This finding is contrary to Oluwole *et al.*'s [5] assertion that palm wine is consumed after meals.

The perceived efficacy of a resource in treating specific ailments influences its application for traditional medicine purposes. The few numbers of mentions of some ailments may be an indication that palm wine is no longer perceived as effective in treating the specific ailments mentioned, despite being listed in traditional pharmacopeia. According to Thomas *et al.* [38], the mere mention of a resource in traditional medicine inventory for treating an ailment does not mean it is effective in treating a cited ailment. Sexual enhancement is one of the main pertinent reasons for alcohol consumption in Ghana [34] [36] [37], but received a low number of mentions, which may be related to the ineffectiveness of palm wine as sexual enhancer. Likewise, rheumatism, blood pressure (hypertension), pain, diabetes, and stomach disorders, identified to be prevalent in the Ho municipality [33], received few citations due to palm wine relegation in the treatment of these ailments. Relegation of ethno resources to fringes of cultural practice due to ineffectiveness in treating folk illnesses, which resulted in their infrequent citations, has been found in ethno-biological studies in Ghana [30] [31] [39] [40].

Gendered variation in the application of ethnomedicine resources has been

recorded in varied ethnomedicine studies [23] [31] [32]. Men and women may have access to the same medicinal resources but may utilize the resources differently to remedy a variety of diseases [31] [32]. Women's social role as caretakers of home and family health care usually makes them responsible for diagnosis of illness and recommending treatment, making them more knowledgeable than men about certain ailments [23]. Healthcare-seeking behavior decision-making on holistic well-being, and maternal and child health are usually made by women in Ghana [41] [42]. Breastmilk production, healthy skin, stomach disorders, and catarrh are ailments usually managed by women, reflecting their higher knowledge than men in this study. Generally, ethnomedicinal knowledge is higher among older generations than young ones [20] [21]. Cultural erosion of traditional knowledge systems has been attributed to the loss of knowledge among the young [22] [23] [43], which may account for the differences in knowledge in this study.

5. Conclusion

The findings from this study have revealed that palm wine is used to treat human ailments. Gender and age influenced the knowledge of specific therapeutic applications of palm wine. Gendered roles and cultural erosion of traditional knowledge may have accounted for the variation in specific knowledge about the therapeutic application of palm wine. Amongst the ailments treated with palm wine, appetite stimulants were the most mentioned. The number of mentions of ailments in this study is an indication that palm wine application as an ethnomedicine belongs to the fringes of cultural practice. This study was conducted in an urban setting and recommends a study in the rural setting where palm wine is produced and mostly consumed to determine variation in knowledge.

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Conflicts of Interest

The author declares no conflicts of interest.

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