

USE OF HERBAL SUPPLEMENTS AND POTENTIAL DRUG INTERACTIONS IN CANCER PATIENTS: A CROSS-SECTIONAL INVESTIGATION.

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Abstract

Background

The use of herbal supplements among cancer patients has become increasingly prevalent, raising concerns about potential drug interactions that may compromise treatment outcomes and patient safety. Although herbal supplements are often perceived as natural and harmless, they can interact with cancer therapies, potentially altering drug metabolism and efficacy.

Objective

This study aimed to evaluate the prevalence, types, and patterns of herbal supplement use among cancer patients, assess potential drug interactions with prescribed cancer treatments, and determine the level of awareness and communication regarding supplement use.

Methods

A descriptive cross-sectional study was conducted at the Konaseema Institute of Medical Sciences and Research Foundation, Amalapuram, from **January to June 2023**. A structured questionnaire was used to survey 200 adult cancer patients undergoing active treatment. Descriptive statistics and logistic regression analysis were used to evaluate associations.

Results

Of the 200 patients, 60% reported using herbal supplements during cancer treatment. The most commonly used supplements were St. John's Wort (20%), Ginger (17.5%), and Turmeric (12.5%). 25% of patients experienced potential herb-drug interactions, including increased toxicity (15%) and reduced treatment efficacy (10%). Only 35% of patients disclosed herbal supplement use to their healthcare providers, while 65% did not, primarily due to perceived irrelevance or fear of disapproval.

Conclusion

A substantial proportion of cancer patients use herbal supplements alongside prescribed treatments, often without informing their healthcare providers. This practice poses risks of adverse drug interactions and reduced therapeutic efficacy.

Recommendations

Cancer care providers should integrate routine inquiry about herbal supplement use into patient assessments. Increased patient education is essential to help patients understand the potential risks and make informed decisions. Improved communication and awareness can enhance treatment safety and outcomes.

Keywords: Herbal Supplements, Cancer, Drug Interactions, Awareness, Communication.

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INTRODUCTION

The use of herbal supplements in cancer patients has increased significantly, driven by patients' desire to enhance

treatment efficacy and manage symptoms. However, this rise is accompanied by the risk of potential adverse drug interactions, which could compromise the effectiveness of conventional cancer treatments. The literature provides numerous instances where herbal supplements have altered the pharmacokinetics of chemotherapeutic agents, either by increasing toxicity or reducing therapeutic efficacy. For example, St. John's Wort is known to induce the cytochrome P450 enzyme system, potentially decreasing the effectiveness of drugs like irinotecan, a commonly used chemotherapeutic agent.[1]

Despite these risks, the full extent of herbal supplement use and its implications in oncology are poorly understood. Many patients do not disclose their use of herbal products to their oncologists due to the fear of disapproval or the belief that natural products do not warrant discussion. This lack of communication is problematic, as it hinders the ability of healthcare providers to manage their patients' overall treatment regimens safely.[2]

Given the potential for significant clinical implications, it is crucial to conduct comprehensive studies to understand the scope of herbal supplement usage among cancer patients and to identify potential drug interactions. Such knowledge will enable healthcare providers to give better guidance and care to their patients, ensuring that the use of these supplements does not compromise treatment efficacy or patient safety.[3]

Aim and Objectives

This study aims to evaluate the prevalence and nature of herbal supplement usage among cancer patients and to identify potential drug interactions with conventional cancer therapies. Specifically, the study seeks to determine the types of herbal supplements most commonly used by cancer patients, identify and document possible interactions between these supplements and standard cancer treatments, and assess the level of awareness and communication regarding herbal supplement use between patients and their healthcare providers.

Material and Methodology

Study Design

This was a descriptive, cross-sectional study designed to assess the use of herbal supplements among cancer patients and explore their potential interactions with cancer therapies.

Study Location

The study was conducted at the **Konaseema Institute of Medical Sciences and Research Foundation (KIMS & RF), Amalapuram, Andhra Pradesh, India**. KIMS & RF is a tertiary care teaching hospital and academic institution offering comprehensive care and a diverse patient population. It serves a diverse patient population from rural

and urban backgrounds across the Konaseema region. The institute is equipped with modern diagnostic and treatment facilities, making it a suitable setting for evaluating complementary therapy practices among patients.

Study Duration

The data collection period spanned six months, from January to June 2023.

Sample Size

The sample size of 200 cancer patients was determined based on an expected herbal supplement usage prevalence of approximately 50% from prior studies, with a 95% confidence level and a 7% margin of error. Using the formula for sample size calculation for prevalence studies, $n = Z^2(p)(1-p)/d^2$, where $Z = 1.96$, $p = 0.5$, and $d = 0.07$, the estimated minimum sample size was 196. To account for potential non-response or incomplete data, the sample size was rounded to 200 participants.

Inclusion Criteria

Adult cancer patients (18 years and older) currently undergoing active cancer treatment were included in the study.

Exclusion Criteria

Terminal illness or were under palliative care only, with no active treatment being administered.

Cognitive impairments or psychiatric conditions could hinder their ability to understand the questions or provide informed responses.

Concurrent participation in another interventional study involving herbal or complementary therapies.

Inability or unwillingness to provide informed consent.

Known history of allergy or hypersensitivity to commonly used herbal products.

Procedure and Methodology

Data were gathered using a structured questionnaire developed specifically for this study. Trained researchers conducted patient interviews to ensure the consistency and reliability of the data.

Sample Processing

As this study did not involve biological samples, sample processing was not applicable.

Statistical Methods

Descriptive statistics were used to analyze the prevalence and types of herbal supplements used by the patients. Logistic regression analysis was employed to investigate potential interactions between herbal supplements and cancer drugs.

Data Collection

Data were collected through direct interviews with patients, supplemented by information obtained from their medical records to verify treatment details and supplement usage.

Bias

To minimize potential sources of bias, several steps were taken. Selection bias was reduced by using consecutive sampling of eligible patients attending the oncology department. Interviewer bias was controlled by training all data collectors with a standardized script and questionnaire. Recall bias was addressed by verifying supplement use and treatment details with medical records whenever possible. Social desirability bias was mitigated by assuring participants of confidentiality and anonymity and encouraging honest reporting of herbal supplement use and any related experiences.

Ethical Considerations

This study was conducted by the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the **Institutional Ethics Committee (IEC) of the Konaseema Institute of Medical Sciences and Research Foundation, Amalapuram**, before initiating the study. Written informed consent was obtained from all participants before data collection, and confidentiality of personal and medical information was strictly maintained throughout the study.

RESULTS

Participant Flow and Enrollment

A total of 240 cancer patients were initially approached during the study period. Of these, 220 were examined for eligibility, and 205 met the inclusion criteria. Five patients

declined to participate, citing personal reasons or lack of interest. Thus, 200 patients were enrolled in the study and completed the survey. All responses were included in the final analysis. There was no loss to follow-up, as data collection occurred during routine clinical visits, and no patient withdrew after enrollment.

Socio-Demographic Characteristics

The socio-demographic profile of the 200 cancer patients is presented below:

Gender: 110 females (55%) and 90 males (45%)

Age Range: 28 to 76 years, with a mean age of 52.4 ± 11.6 years

Employment Status: 94 (47%) unemployed or retired, 62 (31%) engaged in informal labor, 44 (22%) formally employed

Place of Residence: 132 (66%) from rural areas, 68 (34%) from urban settings

Education Level: 58 (29%) with no formal education, 74 (37%) with primary education, 68 (34%) with secondary or higher education

Marital Status: 178 (89%) married, 22 (11%) unmarried or widowed

Table 1 presents the prevalence of herbal supplement usage among a sample of 200 cancer patients. Sixty percent of patients reported using herbal supplements. When examining the type of cancer, breast cancer patients had a slightly higher odds ratio (OR = 1.30), indicating a trend towards increased herbal supplement use, though this result was not statistically significant ($p = 0.15$). Patients with lung cancer (OR = 0.95), prostate cancer (OR = 1.15), and other cancer types (OR = 0.85) also showed no significant associations with herbal supplement usage (p -values of 0.83, 0.58, and 0.35, respectively).

Table 1: Prevalence and Nature of Herbal Supplement Usage among Cancer Patients

Variable	n (%)	Odds Ratio (OR)	95% CI	p-value
Herbal Supplement Usage				
Yes	120 (60%)	1.00	Reference	—
No	80 (40%)	—	—	—
Type of Cancer				
Breast Cancer	45 (22.5%)	1.30	0.90 - 1.89	0.15
Lung Cancer	30 (15%)	0.95	0.58 - 1.56	0.83
Prostate Cancer	25 (12.5%)	1.15	0.70 - 1.89	0.58
Other	100 (50%)	0.85	0.60 - 1.20	0.35

Table 2 summarizes the most commonly used herbal supplements among cancer patients. St. John's Wort was the most prevalent, with 20% of the sample using it. It showed a significantly higher odds ratio (OR = 2.40, $p = 0.001$), indicating a strong association with herbal supplement usage. Ginger, used by 17.5% of patients, also demonstrated

a notable odds ratio (OR = 1.85, $p = 0.02$), suggesting a significant association. While turmeric was used by 12.5% of patients (OR = 1.65, $p = 0.11$), the association was not statistically significant. Garlic, the least commonly used supplement, showed a low OR (1.20) with no significant association ($p = 0.55$).

Table 2: Types of Herbal Supplements Most Commonly Used by Cancer Patients

Herbal Supplement	n (%)	Odds Ratio (OR)	95% CI	p-value
St. John's Wort	24 (20%)	2.40	1.56 - 3.68	0.001
Ginger	21 (17.5%)	1.85	1.10 - 3.10	0.02
Turmeric	15 (12.5%)	1.65	0.90 - 3.02	0.11
Garlic	12 (10%)	1.20	0.65 - 2.21	0.55

Table 3 highlights the potential drug interactions between herbal supplements and conventional cancer treatments. A significant quarter of the sample (25%) reported experiencing interactions (OR = 1.75, p = 0.02). Specific types of interactions included increased toxicity, which was

reported by 15% of patients (OR = 2.50, p = 0.001), and reduced efficacy of treatment, which was reported by 10% of patients (OR = 1.90, p = 0.049). Both types of interactions exhibited statistically significant risks.

Table 3: Potential Drug Interactions Between Herbal Supplements and Conventional Cancer Treatments

Interaction Identified	n (%)	Odds Ratio (OR)	95% CI	p-value
Yes	50 (25%)	1.75	1.10 - 2.80	0.02
No	150 (75%)	1.00	Reference	—
Type of Interaction				
Increased toxicity	30 (15%)	2.50	1.40 - 4.45	0.001
Reduced efficacy of treatment	20 (10%)	1.90	1.00 - 3.61	0.049

Table 4 examines the awareness and communication surrounding herbal supplement use between patients and their healthcare providers. While 35% of patients discussed their use of herbal supplements with their healthcare provider, 65% did not (OR = 0.45, p = 0.001), indicating a significant communication gap. Among those who did not

disclose their supplement use, 45% felt that it was not important to mention (OR = 0.50, p = 0.01), while 20% were concerned about disapproval from their healthcare provider (OR = 0.65, p = 0.10). The findings suggest a need for improved communication and awareness about herbal supplement use in clinical settings.

Table 4: Awareness and Communication Levels Regarding Herbal Supplement Use between Patients and Healthcare Providers

Variable	n (%)	Odds Ratio (OR)	95% CI	p-value
Discussed with Healthcare Provider	70 (35%)	1.00	Reference	—
Not Discussed	130 (65%)	0.45	0.28 - 0.72	0.001
Reasons for Non-Disclosure				
Belief that it's not important	90 (45%)	0.50	0.30 - 0.85	0.01
Fear of disapproval	40 (20%)	0.65	0.39 - 1.08	0.10

Discussion

This study revealed that **60% of cancer patients reported using herbal supplements**, a finding consistent with the prevalence reported in earlier studies [4]. Notably, usage appeared to vary by cancer type, with **breast cancer patients more frequently reporting supplement use**. Although these associations were not statistically significant in this study, the trend supports findings from previous research emphasizing the influence of demographic and

disease-specific factors on complementary therapy uptake [5,6].

The frequent use of **St. John's Wort, Ginger, and Turmeric** among these participants reflects previously documented usage patterns in oncology, where these herbs are popular due to their perceived ability to alleviate treatment-related symptoms [7]. In particular, **St. John's Wort demonstrated a significant association** in this study (OR = 2.40, p = 0.001), underscoring its potential clinical

implications. This is consistent with its recognized role in cancer care, especially for managing depression associated with treatment [8]. While Ginger and Turmeric were also widely used, their associations did not reach statistical significance in this study, highlighting the need for further research into their effects and interactions.

Importantly, **25% of patients reported experiencing potential herb-drug interactions**, a clinically meaningful finding that aligns with previous reports of increased pharmacological risks associated with herbal supplement use in cancer patients [9]. These interactions—ranging from increased toxicity to diminished therapeutic response—underscore the need for improved patient education, routine screening, and clinical vigilance. This further supports recommendations for stronger regulatory and clinical oversight of herbal supplement use during cancer treatment [10].

Equally important is the **communication gap**, as only **35% of patients disclosed herbal supplement use** to their healthcare providers. This is consistent with prior research identifying low disclosure rates due to fear of disapproval or the belief that such information is unimportant [11]. This study found similar reasons for nondisclosure, reinforcing the need for **empathetic and proactive communication strategies** to foster transparency and ensure patient safety [12].

Generalizability

The findings may be generalizable to similar tertiary care oncology settings in India, especially in semi-urban and rural populations; however, broader generalizability is limited due to the single-center design and region-specific cultural practices regarding herbal supplement use.

Conclusion

This study highlights the widespread use of herbal supplements among cancer patients, with 60% reporting usage—commonly St. John's Wort, Ginger, and Turmeric. Notably, 25% experienced potential drug interactions, emphasizing the importance of clinician awareness and patient-provider communication. Many patients failed to disclose supplement use due to fear or perceived irrelevance, underlining the need for open dialogue and integrated care strategies. Educating patients and incorporating herbal supplement considerations into cancer care can help enhance treatment safety and outcomes.

Limitations

This study has several limitations that should be acknowledged. The cross-sectional design restricts the ability to infer causal relationships between herbal supplement use and treatment outcomes. Relying on self-reported data introduces potential recall and social desirability biases, possibly affecting the accuracy of the

findings. The sample size of 200 participants from a single center limits the generalizability of results to broader cancer populations. Additionally, the study did not capture detailed information regarding the dosage, frequency, or duration of herbal supplement use, which is essential to assess their true impact. Confounding factors such as cancer stage, comorbid conditions, concurrent medications, and dietary habits were not comprehensively accounted for, which may influence both supplement use and the likelihood of interactions. Furthermore, the investigation focused on a limited number of commonly used herbal supplements and relied on existing literature to identify potential drug interactions, which may not fully reflect real-world clinical scenarios.

Recommendations

Based on the findings, it is recommended that healthcare providers proactively inquire about herbal supplement use during patient consultations to identify potential risks and ensure safe integration with conventional cancer therapies. Developing standardized screening tools and incorporating discussions about complementary and alternative medicine into routine cancer care can improve patient-provider communication. Educational initiatives should be implemented to raise awareness among patients about the possible interactions and side effects of herbal supplements. Additionally, future research should employ longitudinal designs, include diverse populations, and gather detailed data on supplement type, dosage, and duration to better understand their effects. Clinical trials and pharmacological studies are also needed to validate and expand current knowledge on herb-drug interactions in oncology settings.

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List of Abbreviations

CAM – Complementary and Alternative Medicine

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Conflict of interest

The author declares no conflict of interest.

Data availability

Data Available

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