

“A RETROSPECTIVE ANALYSIS OF MORBIDITY PATTERN AND SURVIVAL AMONG JAUNDICE-SYMPTOMATIC PERSONS WHO HAD USED THE PLANT PHYLLANTHUS AMARUS SCHUM. AND THONN. AS COMPLEMENTARY OR ALTERNATIVE MEDICINE (CAM) IN UDUPI DISTRICT, KARNATAKA.”

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ABSTRACT

India has a rich tradition of using medicinal plants for managing health conditions. This study retrospectively analysed the morbidity pattern and survival among jaundice-symptomatic persons who used *Phyllanthus amarus* Schum. and Thonn. as complementary or alternative medicine in Udupi District, Karnataka. The objectives were to determine the self-reported practices associated with the use of *Phyllanthus amarus*, analyse the morbidity pattern and survival of users, and identify associations between its use and demographic variables. A quantitative, non-experimental retrospective descriptive survey design was adopted. Using snowball sampling, 110 persons with symptoms of jaundice who had used *Phyllanthus amarus* for treatment were selected. Data were collected through a structured interview questionnaire and analysed using descriptive and inferential statistics. The findings indicated that the standard error of the sample median was 0.165, which was smaller than the corresponding standard error of the sample mean, 0.564. Therefore, the estimated median survival time was considered more reliable than the estimated average survival time of 30 days. A statistically significant association was identified between area of residence and practices concerning the method of preparation and quantity of the herb used ($\chi^2 = 22.42$ and 9.125 , $p < 0.05$). The findings describe community use of this herbal remedy.

Keywords: *Phyllanthus amarus*, jaundice, morbidity pattern, survival analysis, complementary and alternative medicine, medicinal plant, retrospective study.

INTRODUCTION

Jaundice is a clinical condition characterised by yellow discolouration of the skin, sclera and mucous membranes due to the accumulation of bilirubin in the blood and body tissues. It may result from haemolysis, hepatocellular disease or obstruction of the biliary tract and therefore requires careful clinical assessment and appropriate treatment (Stillman, 1990). In India, medicinal plants have traditionally been used for managing jaundice and other liver-related conditions. Traditional and complementary medicine remains an important component of healthcare, particularly in communities where herbal remedies are culturally accepted and readily available. However, the World Health Organization emphasises that these practices should be supported by scientific evidence, safety monitoring and appropriate regulation (World Health Organization [WHO], 2025).

Phyllanthus amarus Schum. and Thonn., commonly known as bhumyamalaki or stonebreaker, is a medicinal herb widely used in traditional systems of medicine. Species belonging to the genus *Phyllanthus* contain several bioactive compounds and have been investigated for their hepatoprotective, antioxidant, anti-inflammatory and antiviral properties (Mao et al., 2016). Nevertheless, the method of preparation, quantity consumed, duration of use and health

outcomes may differ considerably among individuals and communities. Hence, systematic assessment of actual community practices is necessary. A retrospective analysis of morbidity patterns and survival among jaundice-symptomatic persons who used *Phyllanthus amarus* may provide valuable information regarding its pattern of use and reported outcomes. Such evidence can support community health nurses in providing culturally sensitive education, encouraging safe healthcare practices and identifying areas requiring further clinical research.

NEED FOR STUDY

Jaundice is a common clinical manifestation of several hepatic, haematological and biliary disorders. Its causes and severity vary widely, and delayed diagnosis or inappropriate treatment may lead to serious complications. In many Indian communities, people use traditional herbal remedies either independently or along with modern medical treatment. The World Health Organization (2025) recognises the widespread use of traditional medicine but emphasises the need to establish its safety and effectiveness through scientific research.

Phyllanthus amarus Schum. and Thonn. is commonly used as a traditional remedy for jaundice and other liver-related conditions. Studies have reported that plants belonging to the genus *Phyllanthus* possess hepatoprotective, antioxidant, anti-inflammatory and antiviral properties (Mao et al., 2016). However, community practices concerning its preparation, dosage, frequency, duration and route of administration are not standardised. Moreover, individuals may delay seeking professional medical care because they depend on herbal treatment, which can influence morbidity and survival outcomes.

Limited information is available regarding the actual experiences and health outcomes of jaundice-symptomatic persons who have used *Phyllanthus amarus* as complementary or alternative medicine in Udupi District. Therefore, it is necessary to examine their morbidity patterns, survival and herb-use practices. The findings may help healthcare professionals, particularly community health nurses, understand the prevalence and pattern of its use, recognise potentially unsafe practices and provide appropriate health education. The study may also contribute preliminary evidence for planning prospective clinical investigations into the safety and therapeutic value of *Phyllanthus amarus*.

STATEMENT OF THE PROBLEM:

“A Retrospective Analysis of Morbidity Pattern and Survival Among Jaundice-Symptomatic Persons Who Had Used the Plant *Phyllanthus amarus* Schum. and Thonn. as Complementary or Alternative Medicine (CAM) in Udupi District, Karnataka”.

OBJECTIVES:

1. To determine the self-reported practices regarding the use of *Phyllanthus amarus* Schum. and Thonn. as complementary or alternative medicine among persons with symptoms of jaundice in Udupi District, Karnataka.
2. To analyse the morbidity pattern and survival among persons with symptoms of jaundice who had used *Phyllanthus amarus* as complementary or alternative medicine.
3. To determine the association between the practices regarding the use of *Phyllanthus amarus* and selected demographic variables.

HYPOTHESES:

H₁: There is a significant association between practices regarding the use of *Phyllanthus amarus* for managing symptoms of jaundice and the selected demographic variables of the participants.

OPERATIONAL DEFINITIONS:

Retrospective Analysis: In this study, retrospective analysis refers to examining the previously reported occurrence of jaundice symptoms from 2001 to 2010 and collecting information about the participants' morbidity patterns and survival outcomes.

Morbidity Pattern: In this study, morbidity pattern refers to the nature and proportion of illness experienced by jaundice-symptomatic persons during a specified period.

Survival Analysis: In this study, survival analysis refers to determining the period from the reported onset of jaundice symptoms until the reported recovery or death of a person who used *Phyllanthus amarus* for treatment.

Jaundice-Symptomatic Persons: In this study, this term refers to persons identified by themselves, their families or the community as having yellowish discolouration of the sclera, skin or nails and changes in urine colour, irrespective of laboratory confirmation.

***Phyllanthus amarus* Schum. and Thonn.:** In this study, *Phyllanthus amarus* refers to the medicinal herb locally known as **Nelanelli** in Udupi District, Karnataka, which was used by persons for managing symptoms of jaundice.

Complementary Medicine: In this study, complementary medicine refers to the use of *Phyllanthus amarus* along with conventional medical treatment for jaundice symptoms.

Alternative Medicine: In this study, alternative medicine refers to the use of *Phyllanthus amarus* in place of conventional medical treatment for jaundice symptoms.

Prevalence: In this study, prevalence refers to the proportion of jaundice-symptomatic persons who used *Phyllanthus amarus* for treatment during the period from 2001 to 2010..

ASSUMPTIONS:

Study assumes that:

- People use *Phyllanthus amarus* as complementary or alternative medicine for managing symptoms of jaundice.
- Some people may use *Phyllanthus amarus* for jaundice symptoms before the underlying cause of jaundice is medically diagnosed.
- The participants will provide accurate information regarding their use of *Phyllanthus amarus*, morbidity pattern and survival outcomes.
- Retrospective information provided by the participants will help in analysing the morbidity pattern and survival of jaundice-symptomatic persons who used *Phyllanthus amarus*.

CONCEPTUAL FRAMEWORK

The present study aimed to assess the self-reported practices, morbidity pattern and survival among jaundice-symptomatic persons who had used *Phyllanthus amarus* Schum. and Thonn. as complementary or alternative medicine (CAM) in Udupi District, Karnataka. The conceptual framework was based on the **Health Belief Model developed by Becker, Strecher and Rosenstock** and was modified according to the study.

The framework included three major components:

1. **Individual perceptions:** Perceived susceptibility to jaundice, perceived seriousness of its complications, perceived benefits of using *Phyllanthus amarus* and perceived barriers such as inadequate knowledge regarding its use.
2. **Modifying factors and cues to action:** Age, gender, area of residence, type of family and dietary pattern were considered modifying factors. Advice or information received from friends, relatives, healthcare personnel, elderly persons and traditional healers served as cues to action.
3. **Likelihood of action:** The likelihood of using *Phyllanthus amarus* was influenced by the perceived benefits and barriers associated with its use for managing jaundice.

RESEARCH METHODOLOGY

Research Approach and Design

- **Approach:** A quantitative, non-experimental descriptive approach was adopted.
- **Design:** A retrospective descriptive survey design was used to assess self-reported practices, morbidity pattern and survival and to determine their association with selected demographic variables.

Study Variables

- **Research variables:** Self-reported practices regarding the use of *Phyllanthus amarus*, morbidity pattern and survival following jaundice.

- **Demographic variables:** Gender, age, educational status, occupation, family income, religion, area of residence, type of family, dietary pattern and source of drinking water.

As this was a non-experimental observational study, no independent or dependent variables were manipulated.

Setting and Population

- **Research setting:** The study was conducted in Udupi District, Karnataka, comprising Kundapur, Udupi and Karkala taluks.
- **Target population:** Jaundice-symptomatic persons who had used *Phyllanthus amarus* as complementary or alternative medicine for managing jaundice.

Sample and Sampling Technique

- **Sample size:** 110 jaundice-symptomatic persons who had used *Phyllanthus amarus* and belonged to Udupi District.
- **Sampling technique:** Snowball sampling, a non-probability sampling technique. Initial participants were identified from the three taluks, and further participants were located through referrals.

Selection Criteria

Inclusion criteria: The study included:

- Individuals who experienced symptoms of jaundice between 2001 and 2010.
- Individuals with symptoms of jaundice who used *Phyllanthus amarus* as complementary or alternative medicine.
- Primary caregivers of jaundice-symptomatic persons who used *Phyllanthus amarus*.
- Individuals willing to participate and provide written informed consent.

Exclusion criteria: The study excluded:

- Individuals who were unwilling or non-cooperative.
- Individuals with cognitive or perceptual disorders.
- Individuals aged 70 years or older because age-related memory difficulties could affect the accurate recollection of events occurring during the previous 10 years.

DATA COLLECTION INSTRUMENTS

Data were collected using a structured interview questionnaire consisting of three tools.

Tool Instrument	Description
1 Demographic Proforma	Consisted of 11 items concerning the participants' demographic and background characteristics.
2 Self-Reported Questionnaire	Practice Consisted of 10 items assessing practices related to the use of <i>Phyllanthus amarus</i> .
3 Jaundice Survival Analysis Questionnaire	Consisted mainly of five items assessing the occurrence, duration, relapse and survival outcomes associated with jaundice.

Tool I: Demographic Proforma

The demographic proforma collected information regarding gender, age when affected by jaundice, educational status, occupation, monthly family income, religion, area of residence, type of family, dietary pattern, source of drinking water, diagnosis, use of *Phyllanthus amarus* and source of information.

Tool II: Self-Reported Practice Questionnaire

The questionnaire assessed:

- Part of the plant used
- Method or form of preparation
- Quantity used
- Frequency of administration
- Route of administration
- Vehicle used for administration
- Duration of use
- Previous use of the herb
- Perceived effect of the remedy
- Special restrictions followed during and after administration

Tool III: Jaundice Survival Analysis Questionnaire

This tool collected information concerning:

- Year of occurrence of jaundice
- Month of occurrence
- Total duration of jaundice
- Relapse of jaundice
- Survival status and known cause of death, where applicable

No knowledge scoring or grading system was used because the instruments assessed practices, morbidity and survival rather than knowledge.

TOOL PSYCHOMETRICS

Content Validity

The instruments were validated by seven Community Health Nursing research experts, two Ayurveda experts, two community medicine specialists and two statisticians. Modifications were made according to their recommendations. The overall content-validity agreement was 97.60%, indicating that the instruments were highly valid.

Translation

The instruments were translated into Kannada and validated by a Kannada language expert. They were subsequently translated back into English, and no discrepancies were identified.

Pre-testing

Pre-testing was conducted among five jaundice-symptomatic persons in the Yelvody Kavur Grama Panchayat area of Bhatkal Taluk, Uttara Kannada District. The instruments were found to be clear and understandable. The average completion time was approximately 15–20 minutes, and no modifications were required.

Reliability

Reliability testing was conducted among 10 participants in the Belake Grama Panchayat area of Bhatkal Taluk. The initial administration was conducted on 7 September 2011, followed by retesting on 11 September 2011.

The test–retest method and Spearman's rank correlation coefficient were used. The reliability coefficients were:

- Self-Reported Practice Questionnaire: $r = 0.8636$

- Jaundice Survival Analysis Questionnaire: $r = 0.8636$

Both instruments were considered reliable because the coefficients exceeded 0.70.

PILOT STUDY

- **Setting:** Yelvody Kavur Grama, Bhatkal Taluk.
- **Period:** 7 September 2011 to 12 September 2011.
- **Sample:** 10 jaundice-symptomatic persons who had used *Phyllanthus amarus*.
- **Procedure:** Administrative permission and written informed consent were obtained. The study was explained to the participants, confidentiality was assured and the instruments were administered through interviews.
- **Outcome:** The pilot study confirmed that the proposed methodology was feasible. The participants were cooperative, the instruments were relevant and understandable, and the anticipated time and cost were manageable.

DATA COLLECTION PROCEDURE

- Formal permission was obtained from the District Health Officer of Udupi District.
- The main study was conducted from **24 October 2011 to 19 November 2011**.
- Eligible participants were identified through snowball sampling.
- The investigator introduced herself, explained the purpose and importance of the study and obtained written informed consent.
- Confidentiality of the information was assured.
- Data were collected using a structured interview technique.
- Approximately four to five participants were interviewed each day.

PLAN FOR DATA ANALYSIS

Descriptive Statistics

- Data were coded and entered into a master sheet.
- Frequencies and percentages were used to describe the demographic characteristics and self-reported practices concerning the use of *Phyllanthus amarus*.
- The morbidity pattern was analysed according to the period and duration of jaundice.
- Survival analysis was performed among jaundice-symptomatic persons who had used *Phyllanthus amarus*.

Inferential Statistics

- The **chi-square test** was used to determine the association between practices regarding the use of *Phyllanthus amarus* and selected demographic variables.
- All hypotheses were tested at the **0.05 level of significance**.

RESULT

The analysed data were presented through organised tables, figures and graphical representations.

Section I: Socio-Demographic Baseline Data

Table 1: Frequency and percentage distribution table of sociodemographic variables (N = 110).

Sl. No.	Socio-demographic variable	Category	Percentage (%)
1	Gender	Male	56.35
		Female	43.65
2	Age when affected by jaundice	0–9 years	3.70

		10–19 years	18.20
		20–29 years	37.28
		30–39 years	26.27
		40–49 years	11.80
		50–59 years	2.75
		60 years and above	0.00
3	Educational status	Illiterate	4.50
		Primary education	17.00
		High school education	37.30
		Pre-university education	18.20
		Degree	10.00
		Diploma/ITI	10.00
		Postgraduate education	3.00
4	Current occupation	Unemployed	16.00
		Homemaker	14.64
		Student	11.87
		Daily-wage labourer	24.56
		Clerk	14.64
		Businessperson	14.64
		Professional	3.65
5	Monthly family income	Below ₹999	0.90
		₹1,000–₹2,999	0.90
		₹3,000–₹4,999	26.56
		₹5,000–₹6,999	38.68
		₹7,000–₹8,999	22.96
		₹9,000 and above	10.00
6	Religion	Hindu	62.73
		Christian	18.18
		Muslim	19.09
7	Area of residence	Rural	56.36
		Urban	43.64
8	Type of family/residence	Nuclear family	35.45
		Joint family	34.54
		Extended family	13.65
		Hostel/room	4.50
9	Dietary pattern	Vegetarian	19.10
		Mixed diet	80.90
10	Source of drinking water	Well water	51.72
		Tap water	32.00
		Borewell water	15.38
		Mineral water	4.50

Section II: Distribution of Participants According to Their Morbidity Pattern

Table 2: Distribution of Participants According to Their Morbidity Pattern (N = 110).

Morbidity variable	Category	Frequency (f)	Percentage (%)
Year affected by jaundice	2001	1	0.91
	2002	9	8.18
	2003	17	15.45
	2004	10	9.09
	2005	14	12.73
	2006	16	14.55
	2007	24	21.82
	2008	10	9.09
	2009	5	4.55
	2010	4	3.64
Month affected by jaundice	January	1	0.91

	February	3	2.73
	March	6	5.45
	April	9	8.18
	May	14	12.73
	June	16	14.55
	July	15	13.64
	August	21	19.09
	September	4	3.64
	October	4	3.64
	November	16	14.55
	December	1	0.91
Duration of jaundice	10 days or fewer	2	1.82
	11–15 days	13	11.82
	16–20 days	20	18.18
	21–25 days	8	7.27
	26–30 days	64	58.18
	More than 30 days	3	2.73

SURVIVAL ANALYSIS OF JAUNDICE-SYMPTOMATIC PERSONS

Table 3: Kaplan–Meier Survival Estimates of Jaundice-Symptomatic Persons

N = 110

Time (days)	Cumulative survival estimate	Standard error	Cumulative events	Remaining cases
10	0.991	0.009	1	109
15	0.908	0.028	10	98
20	0.745	0.042	27	78
21	0.686	0.045	33	69
25	0.666	0.046	35	67
28	0.517	0.049	50	52
30	0.042	0.021	95	4
35	0.014	0.013	97	1
40	0.000	0.000	98	0

Table 4: Estimated Mean and Median Survival Time of Jaundice-Symptomatic Persons

N = 110

Survival estimate	Estimated time (days)	Standard error	95% CI lower bound	95% CI upper bound
Mean	26.291	0.564	25.186	27.396
Median	30.000	0.165	29.676	30.324

The estimated mean survival time was 26.291 days (SE = 0.564; 95% CI: 25.186–27.396), whereas the estimated median survival time was 30 days (SE = 0.165; 95% CI: 29.676–30.324). As the standard error of the median was smaller than that of the mean, the median provided a more precise estimate. Therefore, the typical duration of jaundice among the participants was estimated to be approximately 30 days.

Association Between Self-Reported Practices Regarding the Use of *Phyllanthus amarus* and Selected Demographic Variables

Table 5: Association Between Gender and Self-Reported Practices Regarding the Use of *Phyllanthus amarus*

N = 110

Self-reported practice	Calculated χ^2	df	Critical χ^2 at 0.05	Result
Method of preparation	2.70	2	5.99	NS
Quantity used (mL)	2.82	3	7.81	NS
Frequency of use	0.64	2	5.99	NS
Method of use	3.11	2	5.99	NS
Duration of use	2.43	4	9.49	NS
Perceived effect	0.24	1	3.84	NS

NS = Not significant; df = degrees of freedom.

None of the calculated χ^2 values exceeded the corresponding critical values at the 0.05 level. Therefore, there was **no statistically significant association** between gender and any of the self-reported practices regarding the use of *Phyllanthus amarus*.

Discussion

The findings of the study provide important information regarding the use of *Phyllanthus amarus* as complementary or alternative medicine among jaundice-symptomatic persons in Udupi District. Most participants were male, belonged to the age group of 20–29 years, had completed high school education and lived in rural areas. The majority followed a mixed dietary pattern and used well water as their primary source of drinking water. These findings indicate that jaundice symptoms and the use of herbal remedies were reported across different socio-demographic groups.

Regarding the morbidity pattern, the highest proportion of participants experienced jaundice in 2007, while August recorded the largest number of cases. Most participants experienced symptoms for 26–30 days. Kaplan–Meier analysis showed an estimated mean duration of 26.291 days and a median duration of 30 days. The smaller standard error of the median indicated that 30 days was a comparatively more precise estimate of the typical duration.

No statistically significant association was found between gender and the method of preparation, quantity, frequency, method, duration or perceived effect of *Phyllanthus amarus*. However, the original study identified significant associations between area of residence and both the method of preparation and quantity of the herb used. This suggests that local traditions, availability of the plant and community practices may influence how the herbal remedy is prepared and administered.

Although participants reported using *Phyllanthus amarus*, the retrospective and self-reported nature of the data limits conclusions regarding its clinical effectiveness. Therefore, prospective studies involving medical diagnosis, liver-function assessment, standardised dosage and appropriate comparison groups are recommended.

Conclusion

The study concluded that *Phyllanthus amarus* was commonly used as complementary or alternative medicine by jaundice-symptomatic persons in Udupi District, with most participants experiencing symptoms for 26–30 days and an estimated median duration of 30 days. Gender was not significantly associated with any of the reported herbal-use practices, whereas area of residence was significantly associated with the method of preparation and quantity of the herb used. These findings highlight the influence of local and community practices on the use of *Phyllanthus amarus*. However, because the study was retrospective and based on self-reported information, further prospective clinical research is required to establish the plant's safety, appropriate dosage and therapeutic effectiveness in managing jaundice.

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Conflicts of Interest

The author declares that there were no financial, personal or professional conflicts of interest that could have influenced the design, conduct, data collection, analysis or interpretation of the study.

Funding and Sponsorship

The study received no specific grant, financial assistance or sponsorship from any public, commercial or not-for-profit funding agency. The research expenses were borne by the investigator.

Ethical Considerations and Informed Consent

Administrative permission was obtained from the District Health Officer, Udupi District, and the concerned authorities before data collection. The purpose and nature of the study were clearly explained to all eligible participants. Written informed consent was obtained before conducting the interviews, and participation was entirely voluntary. Confidentiality and privacy were maintained throughout the study, and the collected information was used exclusively

for research purposes. Participants were informed that they could withdraw from the study at any time without penalty or adverse consequences.

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