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Table of Contents

		Page
1	<i>Analysis of fat content and fatty acid profile of selected bakery products available in Jaffna district, Sri Lanka</i>	04
	S. Thivya, M. R. Premdharshan and S. Sivakanthan	
2	<i>Knowledge and awareness of medicinal values of selected traditional rice varieties among villagers in Wellawaya, Sri Lanka: A pilot study</i>	14
	R.M.B.N Dilrukshi, D.A.L Munasinghe *, Y.S.G Wimalasiri	
3	<i>Controlled Sulfur Incorporation in SILAR-Deposited CdS Quantum Dots for Suppression of Interfacial Recombination in TiO₂ Quantum Dot-Sensitized Solar Cells</i>	20
	N.F. Ajward*, J.V.P. Fernando and V.P.S. Perera	
4	<i>solving deterministic multi-objective assignment problems using ant colony optimization algorithm</i>	34
	C. P. S. Pathirana and W. B. Daundasekera	
5	<i>Characterization of Domestic Auto Diesel Adulteration with Kerosine up to 20%</i>	48
	J. A. C. P.Jayasinghe*, R. C. L. De Silva, D. A. D.I. Sewwandi M. I. Mallikaratchy	

Knowledge and awareness of medicinal values of selected traditional rice varieties among villagers in Wellawaya, Sri Lanka: A pilot study

Running Title: Awareness of Traditional Rice Medicinal Values in Wellawaya

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ABSTRACT

Traditional rice varieties in Sri Lanka possess significant cultural, nutritional, and medicinal value. However, modernization of agriculture and replacement with high-yielding varieties has contributed to declining cultivation and erosion of indigenous knowledge systems. This pilot study aimed to assess the knowledge and awareness of medicinal values of selected traditional rice varieties among villagers in Wellawaya, Sri Lanka. A community-based cross-sectional descriptive survey was conducted among 30 participants selected through systematic random sampling. Data were collected using a pre-tested structured questionnaire through face-to-face interviews. Descriptive statistics were used to summarize demographic characteristics and awareness levels, while chi-square tests were applied as exploratory analyses to examine associations between demographic variables and knowledge levels. Findings revealed moderate general awareness of traditional rice varieties, with higher recognition of Suwadel, Kalu Heenati, and Maa Wee. However, knowledge of specific medicinal properties was limited. Although older participants and those engaged in agriculture demonstrated relatively higher knowledge levels, no statistically significant associations were observed ($p > 0.05$), likely due to the limited sample size and reduced statistical power inherent in pilot studies. The study indicates a gradual erosion of community-level knowledge regarding medicinal applications of traditional rice. These findings provide preliminary evidence to inform larger-scale studies and support policy initiatives aimed at preserving indigenous knowledge and promoting traditional rice varieties for nutritional and health benefits in Sri Lanka.

Keywords: Community awareness, Indigenous knowledge, Medicinal properties, Pilot study, Sri Lanka

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INTRODUCTION

Rice (*Oryza sativa* L.) is the staple food of Sri Lanka and forms the dietary foundation of the population. Historically, Sri Lanka cultivated a wide diversity of indigenous rice varieties adapted to different agro-ecological zones and cultural practices. These traditional varieties were not only food sources but also held cultural and medicinal significance, particularly within indigenous Ayurvedic systems.

Traditional rice varieties such as Suwadel, Kalu Heenati, Pachchaperumal, and Maa-Wee are recognized for their superior nutritional composition, including higher levels of dietary fibre, phenolic compounds, antioxidants, and micronutrients. These bioactive components have been associated with improved glycaemic control and reduced oxidative stress (Abeysekera et al., 2017; Ranaweera et al., 2014).

Non communicable diseases (NCDs), including diabetes, cardiovascular diseases, and obesity, are increasing in Sri Lanka and globally. Dietary interventions using functional foods such as traditional rice varieties have been identified as a potential preventive strategy (World Health Organization [WHO], 2022). Additionally, agricultural biodiversity plays a critical role in food security and sustainable development (Toledo & Burlingame, 2006).

Despite scientific recognition of their nutritional value, indigenous knowledge regarding the medicinal uses of traditional rice varieties is declining. Modern agricultural practices and the dominance of high-yielding rice varieties have contributed to erosion of biodiversity and intergenerational knowledge loss (Biodiversity Secretariat, 2016). However, limited empirical research has assessed community level awareness of these medicinal properties.

Therefore, this pilot study aimed to assess knowledge and awareness of medicinal values of selected traditional rice varieties among villagers in Wellawaya, Sri Lanka.

OBJECTIVES

General Objective

To assess community-level knowledge and awareness of medicinal values of selected traditional rice varieties in Wellawaya, Sri Lanka.

Specific Objectives

To evaluate awareness of selected traditional rice varieties

To assess knowledge of their medicinal properties

To determine associations between demographic characteristics and knowledge levels

LITERATURE REVIEW

Sri Lanka has historically maintained a rich diversity of rice germplasm, with over 2,000 traditional rice varieties reported to have been cultivated across different agro-ecological zones (Biodiversity Secretariat, 2016). These varieties have long been valued not only for their adaptability and resilience but also for their nutritional and therapeutic significance within indigenous medical systems.

A growing body of scientific literature has provided evidence supporting the enhanced nutritional properties of traditional rice varieties. Abeysekera et al. (2017) demonstrated that several Sri Lankan traditional red rice varieties exhibit higher antioxidant activity in bran extracts compared to modern improved varieties. Similarly, Ranaweera et al. (2014) reported that indigenous rice varieties possess significantly higher phenolic content and antioxidant capacity, suggesting their potential role in reducing oxidative stress and associated chronic diseases.

Further supporting these findings, Gunathilake et al. (2024) identified that traditional varieties such as Suwadel and Pachchaperumal contain higher levels of dietary fibre and essential micronutrients. These nutritional characteristics are increasingly associated with improved glycaemic regulation and metabolic health outcomes, particularly in populations affected by non-communicable diseases.

On a broader scale, biodiversity has been recognised as a critical determinant of nutritional security and sustainable food systems. Toledo and Burlingame (2006) emphasised the interrelationship between biodiversity conservation and human nutrition, highlighting the importance of maintaining traditional food systems for longterm health and sustainability.

Despite this growing scientific evidence at the biochemical and nutritional level, most existing studies have focused on laboratory-based analyses of rice composition. Relatively little attention has been given to understanding how such nutritional and medicinal knowledge is perceived, retained, and transmitted within rural communities. In particular, there is a lack of empirical evidence on community awareness of the medicinal values of traditional rice varieties in Sri Lanka. This gap is significant because the sustainability of traditional rice conservation efforts depends not only on agronomic and biochemical validation but also on community knowledge and cultural transmission. Therefore, assessing public awareness is essential for linking scientific evidence with indigenous knowledge systems and for informing culturally appropriate agricultural and public health interventions.

METHODOLOGY

Study Design

A community-based cross-sectional descriptive study design was employed.

Study Area

The study was conducted in Wellawaya, Monaragala District, Uva Province, Sri Lanka.

Sample Size

The sample size for the main study was estimated using the standard prevalence formula (Naing et al., 2006):

$$N = Z^2P(1-P)/D^2$$

Where $Z = 1.65$ (90% confidence level), $P = 0.5$ (assumed maximum variability), and $D = 0.047$ (margin of error).

The calculated sample size for the main study was 300. As this investigation was designed as a pilot study, 10% of the calculated sample size ($n = 30$) was selected in accordance with established guidance for pilot research, which recommends using approximately 10% of the main study sample to assess feasibility, instrument clarity, and preliminary trends (Hazzi & Maldaon, 2015). The use of a 90% confidence level was considered appropriate for this exploratory pilot study aimed at generating preliminary evidence rather than making population-level generalisations.

Sampling Technique

Systematic random sampling was used to select households. One eligible participant per household was recruited.

Inclusion Criteria

- Individuals aged 18–70 years
- Permanent residents of Wellawaya
- Willingness to participate and provide informed consent

Exclusion Criteria

- Individuals below 18 or above 70 years
- Individuals unwilling to participate
- Individuals with physical or psychological conditions that could impair participation

Data Collection Instrument

Data were collected using a pre-tested structured questionnaire developed based on relevant literature. Content validity was assessed by experts in Indigenous Medicine. The questionnaire consisted of three sections: demographic characteristics, awareness of traditional rice varieties, and knowledge of medicinal properties.

The internal consistency reliability of the knowledge assessment section was evaluated using Cronbach's alpha ($\alpha=0.80$).

Data Collection Procedure

Face to face interviews were conducted from June to August 2025. Written informed consent was obtained from all participants prior to data collection.

Ethical Considerations

Ethical approval was obtained from the Ethical Review Committee of the Faculty of Indigenous Medicine, University of Colombo (ERC UG 25/358). Confidentiality and anonymity of participants were strictly maintained throughout the study.

Statistical Analysis

Data were analysed using SPSS version 26. Descriptive statistics were used to summarise demographic characteristics and awareness levels. Knowledge scores were computed based on correct responses and categorised into low and moderate levels using predetermined cutoff values based on score distribution.

Pearson's chi-square test was used as an exploratory analysis to examine associations between demographic variables and knowledge levels. Statistical significance was set at $p < 0.05$. Given the small pilot study sample size, results of inferential tests were interpreted cautiously due to limited statistical power.

RESULTS AND DISCUSSION

Demographic Characteristics

Among the 30 participants, 40% were aged between 61–70 years, indicating a relatively older sample population. Males constituted 63% of the respondents. Nearly half of the participants had education up to the Ordinary Level, while 43.33% were engaged in farming activities.

Awareness of Traditional Rice Varieties

All respondents reported familiarity with at least one traditional rice variety, indicating that these rice types remain culturally recognised within the study population. Suwadel (73.33%), Heenati (70%), and Maa-Wee (53.33%) were the most commonly identified varieties, suggesting sustained cultural visibility of specific traditional rice types.

Knowledge of Medicinal Properties

Although general awareness of traditional rice varieties was relatively high, detailed knowledge of their medicinal properties was limited. Heenati (63.33%) was most frequently associated with therapeutic benefits, whereas other varieties were inconsistently linked to specific health effects. This indicates that while recognition persists, depth of knowledge regarding medicinal applications is fragmented at the community level.

Inferential Analysis

Chi-square analysis revealed no statistically significant association between knowledge levels and age ($p = 0.471$), gender ($p = 0.717$), education ($p = 0.509$), or occupation ($p = 0.205$). These findings suggest that demographic variables were not strong predictors of knowledge within this sample. However, given the small sample size, these results should be interpreted cautiously as the study had limited statistical power to detect significant associations.

Discussion

The findings of this study indicate a clear distinction between cultural recognition of traditional rice varieties and detailed knowledge of their medicinal properties. While awareness remains relatively high, particularly for varieties such as Suwadel and Heenati, in-depth understanding of their health-related benefits appears to be diminishing.

This pattern aligns with concerns regarding the erosion of indigenous knowledge systems in Sri Lanka, particularly in rural communities undergoing agricultural transition (Biodiversity Secretariat, 2016). The observed higher awareness among older and farming participants, although not statistically significant, may reflect experiential knowledge acquisition and intergenerational transmission, which are key mechanisms in sustaining traditional ecological knowledge.

Similar trends have been reported in other contexts where modernization of agriculture has led to reduced reliance on traditional crops and associated knowledge systems. The weakening of such knowledge transmission may reduce community engagement with nutritionally beneficial traditional foods, despite increasing global recognition of functional foods in preventing non-communicable diseases (World Health Organization, 2022).

From a public health and agricultural perspective, these findings highlight the need for integrated awareness programmes that connect scientific evidence on nutritional benefits with community-level knowledge systems. Strengthening agricultural extension services and incorporating traditional rice knowledge into local education initiatives may contribute to both biodiversity conservation and improved dietary practices.

CONCLUSION

This pilot study demonstrated that villagers in Wellawaya possess moderate awareness of traditional rice varieties but limited detailed knowledge of their medicinal properties. No

statistically significant associations were observed between demographic factors and knowledge levels, likely due to the limited sample size and exploratory nature of the study.

The findings suggest a gradual decline in detailed indigenous knowledge related to traditional rice varieties. Strengthening documentation, community education, and agricultural extension programmes is recommended to preserve this knowledge and promote its integration into nutrition and public health strategies. Further large-scale studies are required to confirm these preliminary findings and support policy development in this area.

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