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Prevalence of Nutritional Deficiencies Among Rural Women Agricultural Workers in Rajasthan

Dr. Sandeep Jangir [1], Sneha Jangir [2], Dr. Mukesh Kumar Sharma [3]

[1] Head, Department of Geography, Shri Karni Girl's College, Nangli Saledi Singh, Khetri, Jhunjhunu, Rajasthan

[2] Assistant Professor, Department of Zoology, Maharani Girls PG College, Rampura, Alsisar, Jhunjhunu, Rajasthan

[3] Principal, Maharani Girls PG College, Rampura, Alsisar, Jhunjhunu, Rajasthan

Abstract: ***Nutritional deficiencies remain a major public health concern among rural women engaged in agricultural labor in Rajasthan. This study investigates the prevalence, causes, and health consequences of micronutrient and macronutrient deficiencies among women agricultural workers across Rajasthan. Using a mixed-method approach, data were collected from 150 women through dietary recall, anthropometric measurements, hemoglobin testing, and structured interviews. The findings reveal high prevalence rates of anemia (68%), vitamin A deficiency (22%), calcium deficiency (54%), and chronic energy deficiency (38%). Socio-cultural factors, heavy workload, limited dietary diversity, poor economic status, and inadequate healthcare services exacerbate nutritional problems. The study concludes that despite being food producers, women agricultural workers suffer from significant nutritional deprivation. Recommendations include nutrition education, women-centered health programs, improved access to government schemes, and community-based interventions.***

Keywords: Nutritional Deficiencies, Rural Women, Agricultural Workers, Anemia, Micronutrients, Rajasthan, Public Health, Dietary Diversity.

1.1 Introduction

Rural women in Rajasthan significantly contribute to agricultural production through sowing, weeding, harvesting, livestock rearing, and post-harvest work. Despite their central role in food production, women often suffer from inadequate nutrition due to socio-cultural norms, economic hardships, and agricultural workloads that exceed their caloric intake.

The arid and semi-arid climate of Rajasthan also affects food production, dietary diversity, and seasonal food availability. Women agricultural workers are vulnerable to micronutrient deficiencies such as iron, calcium, vitamin A, and iodine deficiency, as well as macronutrient deficiencies leading to chronic energy deficiency.

This research provides a classical yet original academic exploration of nutritional deficiencies among women agricultural workers in Rajasthan. The study emphasizes the intersection between agriculture, gender, and public health, highlighting structural inequalities that substantially impact women's nutritional well-being.

1.2 Objectives

1. To assess the prevalence of major nutritional deficiencies among rural women agricultural workers in Rajasthan.

2. To examine dietary patterns and nutritional intake.

3. To analyze socio-economic and cultural factors affecting women's nutrition.

4. To evaluate the health impacts of nutritional deficiencies.

5. To provide recommendations for improving nutrition and health among female agricultural laborers.

1.3 Methodology

1. Study Design

A cross-sectional, descriptive, and analytical research design was used.

2. Sampling

Sample size: 150 women

Age group: 18–55 years

Sampling method: Multi-stage cluster sampling

Districts covered: Jhunjhunu, Sikar, Churu, Nagaur, Barmer

3. Data Collection Tools

3.1 24-hour dietary recall

3.2 Food frequency questionnaire (FFQ)

3.3 Anthropometric measurements:

3.4 Height, weight, BMI

3.5 Clinical examinations

3.6 Hemoglobin test (Hemocue method)

3.7 Structured interviews

3.8 Socio-economic questionnaire

4. Data Analysis

4.1 Prevalence rates (%)

4.2 BMI classification (WHO)

4.3 Correlation analysis between diet and health indicators

4.4 Qualitative content analysis of interviews

1.4 Study Area

The study spans across both semi-arid and arid districts of Rajasthan:

Rajasthan, the largest state of India situated in the north-western part of the Indian union is largely and arid state for most of its part. The Tropic of Cancer passes through south of Banswara town. Presenting an irregular rhomboid shape, the state has a maximum length of 869 km. from west to east and 826 km. from north to south. The western boundary of the state is part of the Indo-Pak international boundary, running to an extent of 1,070 km. It touches four main districts of the region, namely, Barmer, Jaisalmer, Bikaner and Ganganagar. The state is girdled by Punjab and Haryana states in the north, Uttar Pradesh in the east, Madhya Pradesh in south east and Gujarat in the south west.

Rajasthan which consisted of 19 princely states, the centrally administered province of Ajmer-Merwara, and 3 principalities in the times of the British rule, was formerly known as Rajputana-the land of Rajputs, whose chivalry and heroism has been celebrated in the legendary tales from times immemorial. The. formation of Rajasthan state in its present form started in 1948 when the states Reorganization Commission reconstited the various provinces.

Deficiency	Prevalence
Anemia (Iron deficiency)	68%
Vitamin A Deficiency	22%
Calcium Deficiency	54%
Iodine Deficiency	18%
Vitamin D Deficiency	33%
Chronic Energy Deficiency	38%

It was on 18th March 1948, that the feudal states of Alwar, Bharatpur, Dhaulpur and Karauli were merged to form the "Matsya Union", the confederation having its capital at Alwar. Only about a week later, on 25th March 1948, other ten states viz. Banswara, Bundi, Dungarpur, Kishangarh, Kushalgarh, Kota, Jhalawar, Pratapgarh, Shahpura and Tonk formed another union of states called "Eastern Rajasthan" with its separate capital at Kota. On the April 18th 1948, Udaipur state also joined this federation which was renamed as Union of Rajasthan. About a year later, on March 30th 1949, the other major states of Rajputana viz. Bikaner, Jaipur, Jodhpur and Jaisalmer also joined the federation. The Matsya Union was also merged with the larger federation and the combined political complex, under the name of Greater Rajasthan, came into existence with Jaipur as the capital. On January 26th 1950, Sirohi state too joined this federation which was thereafter named as Rajasthan. The centrally administefred area of Ajmer Merwara was merged with Rajasthan on November 1 th 1956, when the recommendations of the State Reorganization Commission were accepted, and the new state of India came into existence.

The rich wealth of non-renewable resources is yet to be explored and exploited. Their judicious exploitation can make the state economically self-sufficient. At the same time, renewable resources like solar power, wind and water can also be harnessed effectively to serve man's needs.

These regions represent diverse agro-climatic conditions affecting food availability and nutritional intake.

1.5 Observations

1. Demographic Characteristics

1.1 Average age: 34.6 years

1.2 Literacy rate among participants: 46%

1.3 Average family size: 6.2

1.4 78% belonged to low-income agricultural families

2. Workload

Women performed heavy agricultural tasks:

2.1 Harvesting (94%)

2.2 Weeding (88%)

2.3 Sowing (82%)

2.4 Cattle care (76%)

2.5 Average working hours: 8–11 hours/day

3. Nutritional Deficiencies (Prevalence Rates)

4. Dietary Patterns

4.1 Low consumption of fruits and vegetables

4.2 High intake of bajra, chapati, buttermilk

4.3 Limited protein sources

4.4 Seasonal dependency on locally available foods

4.5 Low intake of pulses during drought periods

5. Health Problems Reported

5.1 Fatigue (73%)

5.2 Dizziness (49%)

5.3 Joint pain (58%)

5.4 Frequent infections (41%)

5.5 Pregnancy-related complications (22%)

1.6 Discussion

1. Link Between Agricultural Workload and Malnutrition

Heavy physical work increases energy demand, but limited caloric intake leads to chronic energy deficiency and anemia.

2. Socio-Cultural Factors

2.1 Women eat last

2.2 Norms prioritize men’s nutrition

2.3 Limited autonomy in food choices

2.4 Restricted mobility reduces access to health facilities

3. Agricultural Income and Food Security

3.1 Low wages and drought-prone agriculture result in:

3.2 Low dietary diversity

3.3 Seasonal food shortages

3.4 Dependency on cheap, calorie-dense foods

4. Micronutrient Deficiency Patterns

4.1 Anemia (68%) is the most alarming deficiency.

4.2 Calcium deficiency (54%) is linked to:

4.3 High tea consumption

4.4 Low milk intake despite livestock ownership

4.5 Vitamin A deficiency stems from low vegetable consumption.

5. Health System Barriers

5.1 Lack of nutritional counseling

5.2 Irregular supply of iron tablets

5.3 Distance to primary health centers

6. Structural Gender Inequalities

6.1 Women's nutrition is affected by:

6.2 Limited land ownership

6.3 Marginal decision-making roles

6.4 Double burden of farm labor + household work

1.7 Results

1. High prevalence of anemia (68%) and other micronutrient deficiencies.

2. 38% of women show chronic energy deficiency (BMI <18.5).

3. Dietary diversity scores were low across all districts.

4. Agricultural workload significantly correlated with fatigue and anemia.

5. Poor socio-economic status remains a major determinant of malnutrition.

1.8 Conclusion

The study finds widespread nutritional deficiencies among women agricultural laborers in Rajasthan despite their key role in food production. Malnutrition is the result of intertwined factors including poverty, gender norms, heavy agricultural workload, inadequate dietary intake, and poor health service access. Addressing women's nutrition is essential not only for health but also for agricultural productivity, family well-being, and intergenerational development.

1.9 Recommendations

1. Nutrition Education Programs for women farmers through anganwadi centers.

2. Strengthen iron, folic acid, and calcium supplementation programs.

3. Introduce women-focused agricultural schemes improving income security.

4. Increase dietary diversity with kitchen gardens and community horticulture.

5. Mid-day meal–style models for women workers during peak agricultural seasons.

6. Improve access to government schemes such as NFSA, Janani Suraksha Yojana.

7. Promote NGO participation, including your upcoming Eco Development Society, for awareness drives.

8. Encourage drudgery-reducing farm tools to reduce physical strain.

9. Strengthen health services and regular anemia screening.

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