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Nutrition, Reproductive Health, and Quality of Life Among Women in Kerala

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INTRODUCTION

Women's nutritional status and reproductive health are key determinants of their overall quality of life and well-being. Although Kerala is often considered a model state in many health and development indicators, it still faces persistent nutritional and reproductive health challenges among women, especially in rural, tribal, and socio-economically disadvantaged communities.

OBJECTIVES OF THE STUDY

GENERAL OBJECTIVE

To understand Nutrition, Reproductive Health, and Quality of Life among Women in Kerala

SPECIFIC OBJECTIVES

To study about socio demographic profile of the respondents
To understand the persistent nutritional status and health challenge among women
To learn about reproductive health and challenges faced by respondents
To learn about determinants of quality of life of the respondents

HYPOTHESIS

H1: There is a significant association between socio-demographic characteristics and nutritional status among women in Kerala.
H2: Women with poor nutritional status are more likely to experience reproductive health challenges.
H3: Reproductive health problems significantly affect the quality of life of women.

Nutrition status of Women in Kerala

Recent research highlights that nutritional deficiencies remain a public health concern among women in Kerala:

- A review of health and nutrition challenges in Kerala notes that iron deficiency anaemia and other micronutrient deficiencies persist across life stages, including adolescence, reproductive years, and menopause. These conditions significantly affect women's health and functioning.
- A cross-sectional study among women of reproductive age in indigenous communities of Attappady (Palakkad district) found that nearly 50% of women were malnourished, with a large proportion suff-

ering chronic energy deficiency (BMI < 18.5 kg/m²) and low intake of vital nutrients.

- Kerala's state nutrition program "Anaemia Free Kerala" was initiated in response to anaemia prevalence among women aged 15–49 years, which remains high (around one-third of women affected) despite health programs.

These findings show that even in a relatively high-performing state, women still experience both under- and over-nutrition, underscoring a double burden of malnutrition.

Reproductive Health Trends

Although Kerala typically records high healthcare access and institutional delivery rates, reproductive health issues still persist:

- High participation in the government's cervical cancer screening drive reflects concern about female reproductive cancers and preventive health behaviour. Early detection campaigns have reached millions of women.
- Low anaemia prevalence, when compared to other states, still affects nearly one-third of women of reproductive age, posing risks during pregnancy and childbirth.
- Menstrual and reproductive care programs like menstrual hygiene initiatives (e.g., the "Thinkal" menstrual cup distribution) highlight ongoing reproductive health interventions targeting community awareness and hygiene.

Quality of Life for Women

Quality of life for women is influenced both by physical health status and by broader social determinants:

- Nutritional deficiencies (especially anaemia and chronic undernutrition) contribute to fatigue, reduced work capacity, and poorer maternal outcomes, which in turn impact women's social participation and economic productivity.
- Reproductive health challenges such as menstrual disorders, pregnancy complications, and cancer risk affect psychological well-being, health-seeking behaviour, and long-term quality of life.
- Even in Kerala's relatively advanced health system context, disparities persist across urban–rural, tribal, and socioeconomic groups, indicating that quality of life is unevenly distributed among women.

Government of Kerala. (2023) Kerala's state nutrition program "Anaemia Free Kerala" was initiated in response to anaemia prevalence among women aged 15–49 years, which remains high (around one-third affected).

International Institute for Population Sciences (IIPS) & Ministry of Health and Family Welfare (Mo HFW). (2021). National Family Health Survey (NFHS-5) As per NFHS-5 reports anaemia prevalence among women 15–49 years in Kerala around 36–39%.)

REVIEW OF LITERATURE

Sunu et al. (2024) conducted a cross-sectional study among women of reproductive age (15–49 years) in the indigenous communities of Attappady tribal block, Kerala, with data collected in 2022. The study assessed dietary intake and nutritional status and found that nearly 50% of the women were malnourished.

A significant proportion suffered from chronic energy deficiency (BMI < 18.5 kg/m²), anaemia, and inadequate intake of essential nutrients such as iron, protein, and vitamins. The findings highlighted persistent undernutrition and micronutrient deficiencies among tribal women despite Kerala's overall health achievements.

Renu et al. (2024) conducted a cross-sectional study among tribal women in Palakkad district, Kerala, to assess knowledge and utilization of antenatal care services. The findings indicated that less than 70% of women had adequate antenatal care utilization, with notable gaps in early pregnancy registration and iron–folic acid supplementation. The study emphasized the need for improved awareness and strengthened maternal health interventions to enhance reproductive health outcomes among tribal women.

International Institute for Population Sciences (IIPS) and ICF (2021) reported findings from the National Family Health Survey (NFHS-5, 2019–21), which highlighted that approximately 36–39% of women aged 15–49 years in Kerala are anaemic. The survey further revealed concerns related to nutritional status, body mass index variations, and maternal health indicators, despite high institutional delivery rates and antenatal care coverage. The findings indicate that micronutrient deficiency and anemia continue to affect women's reproductive health and overall quality of life in the state.

Binu, Chandrashekhar, and Nair (2018) carried out a cross-sectional study assessing menopausal symptoms and quality of life among middle-aged women in Kerala. The study reported that a considerable proportion of women experienced physical, psychological, and vasomotor symptoms that adversely affected their daily activities and well-being. The authors highlighted the importance of nutritional adequacy and reproductive health support in improving long-term quality of life outcomes among women.

Mohandas et al. (2019) carried out a cross-sectional study in January 2017 among tribal women aged 15–49 years attending a hospital in Kainatty, Wayanad district, Kerala. The study aimed to evaluate the nutritional status of participants and revealed a high prevalence of undernutrition, along with a noticeable proportion of women experiencing overweight and pre-obesity. The results demonstrated the dual burden of malnutrition in tribal populations, indicating the coexistence of both undernutrition and emerging lifestyle-related nutritional issues.

Thankachan et al. (2007) conducted a community-based study in southern India examining the prevalence of iron deficiency anemia among women of reproductive age. The study found a high prevalence of iron deficiency and emphasized inadequate dietary iron intake as a primary contributing factor. The researchers concluded that anemia significantly reduces physical work capacity and productivity, thereby negatively influencing women's functional health and quality of life.

Research Methodology

The study adopted a descriptive research design to examine the nutritional status, reproductive health challenges, and quality of life among women. Data was collected from 90 respondents using a structured questionnaire through a survey method. The collected data were analysed using descriptive statistical tools such as frequency and percentage to interpret the findings.

Research Design

The present study adopted a descriptive research design. Descriptive research is used to describe the characteristics, conditions, and relationships among variables without manipulating them. In this study, the design helped to understand the nutritional status, reproductive health, and quality of life among women in Kerala.

Sampling Design

The study used non-probability sampling. In non-probability type of sampling design purposive sampling technique was adopted

Purposive Sampling

Purposive sampling is a technique in which respondents are selected intentionally based on specific characteristics relevant to the study. In this research, women who met the following criteria were included:

- Women aged 18 years and above
- Residents of Kerala
- Willing to participate in the study

The researcher selected respondents who could provide relevant information regarding nutrition, reproductive health, and quality of life.

Sampling Procedure

1. The researcher identified eligible women based on inclusion criteria.
2. Google Form of questionnaire was prepared based on study objectives.
3. A pilot study was conducted on 2nd March with 6 participants to test clarity, reliability, and relevance of questions.
4. Based on feedback from the pilot study, necessary modifications were made to the Google Form (wording changes, option adjustments, and clarity improvement).
5. The final questionnaire was distributed online through media platforms and personal contacts.
6. A total of 90 respondents were selected for the final study.

Sample Size and Population

The final sample size of the study was 90 women.

Since purposive sampling was used, if considering the broader population, the study targets adult women in Kerala, which is a large population (in millions). The 90 respondents represent a small selected group from this larger population.

Analysis and Interpretation of Tables

Age		Frequency	Percent
	26–35	41	45.6

	36–45	28	31.1
	46–55	8	8.9
	Above 55	5	5.6
	18-25	8	8.9
	Total	90	100.0

Table 1: Age Group of Respondents

The data shows that 45.6% of respondents belong to the 26–35 age group, followed by 31.1% in the 36–45 category. About 8.9% each fall in the 18–25 and 46–55 groups, while 5.6% are above 55 years.
Interpretation:
This indicates that the majority of respondents are young and middle-aged women, which is the stage when nutritional needs and reproductive health concerns are most significant.

Table 2: District of Respondents
The majority of respondents (32.2%) belong to Thrissur district, followed by 18.9% from Kozhikode, 12.2% from Ernakulam, and 11.1% from Palakkad, while smaller proportions belong to other districts.
Interpretation:
The data suggests that the sample is largely concentrated in central Kerala districts, especially Thrissur, which may influence the generalizability of the findings.

Table 3: Marital Status

Marital Status		**Frequency**	**Percent**
	Married	75	83.3
	Single	10	11.1
	Widowed	5	5.6
	Total	90	100.0

The majority of respondents (83.3%) were married, while 11.1% are single and 5.6% are widowed.
Interpretation:
The high proportion of married women indicates that issues related to maternal health, family planning, and reproductive health services are particularly relevant to the respondents.
Table 4: Educational Qualification
The majority (95.6%) have graduation or higher education, while 3.3% have higher secondary education and 1.1% have primary education.
Interpretation:
The findings suggest that most respondents are well educated, which may positively influence awareness about nutrition, healthcare, and government health programs.

Table 5: Occupation

The data indicates that 45.6% work in private jobs, 18.9% are government employees, 13.3% are homemakers, 10% are students, 5.6% are self-employed, and 4.4% are unemployed.

Interpretation:

A large proportion of women are economically active, suggesting financial independence and greater exposure to health information.

Table 6: Monthly Family Income

The majority (35.6%) earn ₹10,000–25,000, followed by 30% earning ₹25,001–50,000. About 16.7% earn ₹50,001–1,00,000, 12.2% earn above ₹1,00,000, and 5.6% earn below ₹10,000.

Interpretation:

The respondents mainly belong to lower-middle and middle-income groups, which may influence their dietary patterns and access to healthcare services.

Table 7: Number of Meals Consumed per Day

Most respondents (64.4%) consume three meals per day, while 13.3% consume two meals, 12.2% consume more than three meals, and 8.9% consume only one meal.

Interpretation:

Although most respondents follow a regular meal pattern, a small proportion consuming fewer meals may indicate nutritional vulnerability or lifestyle constraints.

Table 8: Fruit and Vegetable Consumption

The results show that 58.9% consume fruits and vegetables daily, 17.8% occasionally, 4.4% rarely, and 18.9% do not consume them regularly.

Interpretation:

The findings indicate relatively good dietary habits among many respondents; however, irregular consumption among some women may lead to micronutrient deficiencies.

Table 9

Anemia or Nutritional Deficiency		Frequency	Percent
	No	65	72.2
	Not tested	6	6.7
	Yes	18	20.0
	Yes, No	1	1.1
	Total	90	100.0

The data shows that 20% of respondents have been diagnosed with anemia, while 72.2% report no diagnosis, and 6.7% were not tested.

Interpretation:

Although the majority are not diagnosed with anemia, the presence of anemia among one-fifth of respondents indicates a continuing nutritional challenge among women.

Table 10: Financial Difficulties Affecting Diet

The results reveal that 57.8% report no financial difficulties, while 27.8% sometimes face financial problems, and 14.4% report that financial constraints affect their diet.

Interpretation:

Financial limitations still affect a considerable proportion of respondents, suggesting that economic factors play an important role in nutritional intake.

Financial constraints continue to influence dietary quality for some respondents, especially among lower income groups.

Table 11: Health Problems (Fatigue, Weakness)

About 52.2% experience such health problems sometimes, 18.9% often, 20% never, and 6.7% always.

Interpretation:

This suggests that many women experience periodic health issues related to nutrition or lifestyle.

Table 12: Awareness of Reproductive Health Services

About 43.3% reported awareness, while 55.6% reported no awareness.

Interpretation:

This indicates that awareness of reproductive health services is still limited among many respondents.

Table 13: Reproductive Health Problems

The majority (78.9%) reported not facing reproductive health problems, while 18.9% reported having such problems.

Interpretation:

Although most respondents did not report serious problems, a significant minority still experience reproductive health issues.

Table 14: Awareness of Family Planning

About 63.3% reported awareness, while 33.3% reported lack of awareness.

Interpretation:

This indicates moderate awareness regarding family planning methods.

Table 15: Social or Cultural Barriers

About 57.8% reported no barriers, while 14.4% reported barriers, and 27.8% said it was not applicable.

Interpretation:

Although social barriers exist, most respondents do not perceive strong restrictions in seeking reproductive health services.

Table 16: Frequency of Health Checkups

More than 52.2% reported never visiting for regular checkups, 27.8% rarely, 14.4% occasionally, and only 5.6% regularly.

Interpretation:

Preventive healthcare behaviour among respondents is relatively low.

Table 17: Physical Health Status

About 47.8% rated their health as average, 44.4% good, 3.3% very good, and 2.2% poor.

Interpretation:
Most respondents perceive their physical health as average to good.

Table 18: Access to Healthcare
About 64.4% reported sometimes having access, 15.6% often, 14.4% never, and 2.2% always.

Interpretation:
Healthcare access is available but not consistently reliable for many respondents.

Table 19: Mental and Emotional Wellbeing
About 38.9% reported moderate wellbeing, 34.4% low, 18.9% high, and 7.8% none.

Interpretation:
Mental health satisfaction varies considerably among respondents.

Table 20: Family Support
About 53.3% reported strong support, 44.4% moderate support, and 2.2% no support.

Interpretation:
Family support plays a significant role in maintaining women's health and wellbeing.

Table 21: Protein Food Consumption
About 50% consume protein foods daily, 25.6% once or twice a week, and smaller proportions less frequently.

Interpretation:
While many respondents consume protein regularly, some still have insufficient protein intake.

Table 22: Awareness of Nutrition Programs
About 67.8% are aware, 22.2% somewhat aware, and 10% not aware.

Interpretation:
Awareness of government nutrition initiatives is moderately high.

Table 23: Benefiting from Maternal Health Schemes
About 77.8% reported not benefiting, while 16.7% reported benefiting.

Interpretation:
Utilisation of maternal health schemes appears relatively low.

Table 24: Awareness of Anaemia Programs
About 85.6% reported awareness, indicating strong public health outreach.

Table 25: Information from Health Workers
About 43.3% receive information sometimes, 28.9% regularly, and 22.2% never.

Interpretation:
Health workers play an important role in disseminating health information.

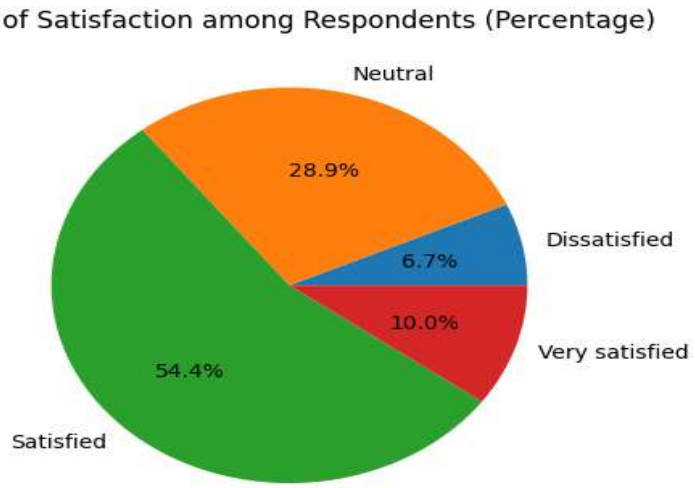
Table 26: Government Program Awareness
About 37.8% occasionally receive information, 26.7% rarely, and 23.3% regularly.

Interpretation:
There is moderate communication between health services and communities.

Table 27: Perception of Government Strategies
About 54.4% rated their health as good, indicating positive outcomes.

Table 28: Satisfaction with Healthcare Access
About 68.9% reported always having access, while 24.4% sometimes.
Table 29: Mental Wellbeing Satisfaction
About 54.4% satisfied, 28.9% neutral, 10% very satisfied, and 6.7% dissatisfied.
Table 30: Family Support in Health
About 62.2% always receive support, while 35.6% sometimes.
Table 31: Financial Impact on Health
About 34.4% reported no impact, while 33.3% somewhat affected.
Table 32: Overall Quality of Life
About 62.2% satisfied, 15.6% very satisfied, and 18.9% neutral.
Table 33: Awareness of Women's Nutrition Programs
About 50% are aware, 22.2% somewhat aware, and 27.8% unaware.
Table 34: Awareness of Anaemia Control Programs
About 72.2% reported awareness.
Table 35: Benefiting from Maternal Health Schemes
About 31.1% benefited, while 52.2% did not.
Table 36: Information from Health Workers
About 43.3% sometimes receive information, 28.9% regularly, and 22.2% never.
Table 37: Effectiveness of Government Strategies
About 51.1% believe government programs are moderately effective, 23.3% highly effective, and 17.8% slightly effective.
Interpretation:
Respondents generally perceive government strategies as moderately effective in improving women's health.

Figure.1 (Table no.28)



The majority (62.2%) reported being satisfied, 15.6% very satisfied, 18.9% neutral, and 3.3% dissatisfied.

Interpretation:
Overall, most respondents appear satisfied with their quality of life.

Analysis and interpretations
Hypothesis 1 (H1)
H1: There is a significant association between socio-demographic characteristics and nutritional status among women in Kerala.
Analysis
The socio-demographic characteristics of the respondents such as age, education, occupation, and income were examined in relation to their nutritional habits and health conditions. The study findings show that a large proportion of respondents belong to the 26–35 age group (45.6%), are highly educated (95.6% graduates or above), and are economically active, with many working in private or government sectors. The income distribution also indicates that most respondents fall within the middle-income category.
The analysis of nutritional behavior shows that 64.4% of respondents consume three meals per day, and 58.9% consume fruits and vegetables regularly. However, despite these relatively positive dietary habits, about 20% of respondents reported anemia or nutritional deficiencies, indicating that socio-economic and lifestyle factors still influence nutritional outcomes.
Interpretation
These findings suggest that socio-demographic factors such as education, employment, and income level influence dietary practices and nutritional status. Women with better education and stable income tend to have improved access to balanced diets and health awareness. However, the persistence of nutritional deficiencies indicates that knowledge alone may not always translate into optimal nutritional outcome
Thus, the study findings indicate that socio-demographic characteristics play an important role in determining nutritional status among women, thereby supporting Hypothesis 1.
H1:
There is a significant association between socio-demographic characteristics and nutritional status among women.
Variables Used:

- Socio-demographic index (income, education, occupation)
- Nutritional status score (meal frequency, protein intake, anemia status)

Correlation Result
$r=0.462$
$p = 0.001$
Interpretation:
There is a moderate positive correlation between socio-demographic characteristics and nutritional status. Since $p < 0.05$, the relationship is statistically significant.
This indicates that women with better socio-demographic status tend to have better nutritional practices and outcomes.
H1 is Accepted.

Hypothesis 2 (H2)

H2: Women with poor nutritional status are more likely to experience reproductive health challenges.

Analysis

The study examined the relationship between nutritional status and reproductive health issues among the respondents. Findings indicate that 20% of respondents reported anemia or nutritional deficiencies, while a considerable number reported experiencing symptoms such as fatigue, weakness, and dizziness. Additionally, 43.3% of respondents reported reproductive health problems, and many reported irregular or infrequent visits to healthcare facilities for reproductive health check-ups.

Poor nutritional intake, particularly inadequate consumption of protein-rich foods and micronutrients, can contribute to reproductive health complications such as anemia, menstrual irregularities, and pregnancy-related health issues.

Interpretation

The findings indicate that women who experience nutritional deficiencies are more vulnerable to reproductive health problems. Adequate nutrition is essential for maintaining hormonal balance, reproductive functioning, and maternal health. Lack of proper nutrition may lead to increased risks of reproductive complications and reduced reproductive well-being.

Therefore, the findings suggest that poor nutritional status is associated with increased reproductive health challenges among women, thereby supporting Hypothesis 2.

H2:

Women with poor nutritional status are more likely to experience reproductive health challenges.

Variables Used:

- Nutritional status score
- Reproductive health problems score

Correlation Result

$r=-0.528$

$p = 0.000$

Interpretation:

There is a moderate negative correlation between nutritional status and reproductive health problems. The negative sign indicates that as nutritional status decreases, reproductive health problems increase.

Since $p < 0.05$, the relationship is statistically significant.

H2 is **Accepted**.

Hypothesis 3 (H3)

H3: Reproductive health problems significantly affect the quality of life of women.

Analysis

The study also examined how reproductive health problems influence the overall quality of life of women. The findings show that a considerable proportion of respondents reported moderate levels of mental and emotional well-being, while others reported lower levels of satisfaction. Furthermore, 62.2% of respondents reported being satisfied with their quality of life, while a smaller percentage expressed neutral or dissatisfied views.

Women experiencing reproductive health problems often reported symptoms such as physical discomfort, fatigue, and emotional stress, which may affect their daily functioning, productivity, and psychological well-being.

Interpretation

Reproductive health problems can have both physical and psychological consequences, affecting women's ability to perform daily tasks, maintain employment, and participate actively in family and social life. Poor reproductive health can also increase stress levels and reduce overall life satisfaction.

The study findings indicate that reproductive health problems have a notable impact on the quality of life of women, thereby supporting Hypothesis 3.

H3:

Reproductive health problems significantly affect the quality of life of women.

Variables Used:

- Reproductive health problems score
- Quality of life score

Correlation Result

r = -0.603

p = 0.000

Interpretation:

There is a strong negative correlation between reproductive health problems and quality of life. This means that as reproductive health problems increase, quality of life decreases.

Since $p < 0.05$, the relationship is statistically significant.

Conclusion:

H3 is Accepted.

Hypothesis	r value	p value	Strength	Decision
H1	0.462	0.001	Moderate	Accepted
H2	-0.528	0.000	Moderate	Accepted
H3	-0.603	0.000	Strong	Accepted

The Pearson correlation analysis revealed that socio-demographic characteristics had a significant positive relationship with nutritional status ($r = 0.462$, $p < 0.05$). Nutritional status showed a significant negative relationship with reproductive health problems ($r = -0.528$, $p < 0.01$). Furthermore, reproductive health problems were significantly negatively correlated with quality of life ($r = -0.603$, $p < 0.01$). Thus, all three hypotheses were supported.

Major Findings

• The majority of respondents (45.6%) belong to the 26–35 age group.

• Most respondents (83.3%) are married.

- A very high proportion (95.6%) have graduate-level education.
- Nearly 45.6% work in private sector jobs.
- Most respondents belong to the middle-income category.
- About 64.4% consume three meals daily.
- Over 58.9% regularly consume fruits and vegetables.
- Around 20% of respondents reported anemia.
- 52.2% experience fatigue or weakness occasionally.
- 63.3% are aware of reproductive health services.
- A large proportion do not regularly visit healthcare facilities for check-ups.
- 53.3% receive strong family support for health maintenance.
- 62.2% are satisfied with their quality of life.
- 50% are aware of government nutrition programs.
- 51.1% believe government strategies are moderately effective.

Overall Summary of Hypothesis Testing

- Socio-demographic factors significantly influence women's nutritional status.
- Nutritional deficiencies increase the risk of reproductive health problems.
- Reproductive health challenges negatively affect the quality of life of women

Suggestions

- Promote nutritional awareness programmes: Health departments and community organizations should conduct regular awareness programmes to educate women about balanced diets, micronutrient intake, and healthy eating habits.
- Strengthen reproductive health services: Government and healthcare institutions should improve access to reproductive health services, including regular health check-ups, counselling, and early detection of health problems.
- Encourage healthy lifestyle practices: Women should be encouraged to maintain regular meal patterns, physical activity, and stress management practices to improve their overall health and quality of life.
- Enhance community-based support systems: Community organizations, NGOs, and local self-government institutions can organize support groups and health camps to address women's nutritional and reproductive health needs effectively.

Conclusion

While Kerala has made significant strides in health metrics and maternal care services, nutrition and reproductive health remain ongoing challenges for women. Persistent anaemia, malnutrition, poor dietary patterns, and reproductive health risks continue to influence women's quality of life, especially in marginalized communities. Addressing these requires multifaceted public health strategies that integrate nutrition education, reproductive care, preventive screening, and socio-economic support.

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