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An Assessment of Household Environment and Women's Health in Thiruverumbur Taluk of Tiruchirappalli District

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Abstract

This study investigates the influence of the household environment on women's health status in Thiruverumbur Taluk of Tiruchirappalli District, Tamil Nadu. The household environment encompassing natural parameters and built infrastructure such as housing type, sanitation, water sources, and cooking fuel serves as a primary determinant of health, with inadequate sanitation and unsafe water globally accounting for around 25% of preventable ill health. Empirical findings from $N = 100$ survey respondents reveal that open drainage networks ($\chi^2 = 63.12, p < 0.0001$) and untreated drinking water ($\chi^2 = 54.08, p < 0.0001$) are key environmental risk factors significantly associated with adverse health outcomes. Furthermore, 74% of households rely on open waste storage and 46% depend on public water sources, creating persistent environmental hygiene vulnerabilities for women. The study suggests policy measures including universal tap connections under the Jal Jeevan Mission and expanded toilet construction under the Swachh Bharat Mission. Future research should utilize GIS-based environmental risk mapping, longitudinal health tracking, and comparative analyses across Tamil Nadu districts to evaluate the long-term impact of public health interventions on women's well-being.

Keywords: Household Environment, Women's Health, Environmental Health, Rural Health, Public Health, Sanitation, Drinking Water, Hygiene, Tiruchirappalli District.

Introduction

Environmental conditions within households play a crucial role in determining women's health and well-being. Women, particularly in rural and semi-urban areas, spend a significant portion of their time in the household environment, making them more vulnerable to environmental hazards such as poor sanitation, unsafe drinking water, indoor air pollution, inadequate waste disposal, and overcrowded housing. These conditions contribute to various health problems, including respiratory diseases, gastrointestinal infections, vector-borne diseases, and reproductive health issues.

Globally, the World Health Organization estimates that nearly 24% of all global deaths and 23% of the global disease burden are attributable to modifiable environmental factors (Prüss-Ustün et al., 2019; WHO, 2023). In developing economies such as India, traditional environmental risks associated with structural poverty—such as open defecation, untreated drinking water, and biomass fuel usage—coexist with rapidly emerging urban challenges like unmanaged liquid waste and high settlement density (Gautam et al., 2024; Ministry of Jal Shakti, 2020). Recent macroeconomic estimates indicate that sanitation- and water-related infirmities cost India roughly 6.4% of its annual Gross Domestic Product (GDP) due to direct medical costs and productivity losses (Dibaba et al., 2024). Understanding how localized household environments affect women's health is therefore imperative for framing effective public health policies.

Against this background, the present study assesses the household environment and its influence on women's health in Thiruverumbur Taluk of Tiruchirappalli District, with particular emphasis on housing conditions, sanitation facilities, drinking water sources, cooking fuel, waste disposal practices, and their implications for women's health.

Concept of Household Environment

Components of the Household Environment

Shelter Architecture: The structural integrity of the home, comprising wall materials, flooring types, roofing insulation, and spatial ventilation paths.

Water Infrastructure: The specific physical mechanism of water delivery, ranging from private in-house taps to communal public pipes.

Sanitation Facilities: The internal or external configurations for human waste disposal, categorized into private, shared, or public common latrines.

Waste Processing Networks: The structural storage and disposal mechanisms used for household refuse, specifically distinguishing between open and closed systems.

Sewerage Conveyance: The network of domestic conduits, including open trenches or closed pucca channels, that transport residential liquid waste out of the locality.

Domestic Energy Systems: The technology used for thermal processing and illumination, including biomass, solid fuels, or clean liquid petroleum gas. Physical, Biological, and Social Environmental Factors

Physical Factors: Ambient micro-climate elements within the residence, including structural ventilation efficiency, room illumination, and indoor particulate suspension.

Biological Factors: Active pathogenic vectors multiplying within domestic boundaries, such as stagnant drainage bacteria, open-refuse pests, and water-borne microbes.

Social Factors: The structural socio-demographic baseline of the cohabiting group, including formal literacy levels, daily occupational profiles, and household income bands.

Household Environment and Women's Health

The micro-environmental profile of the domestic dwelling serves as an immediate structural predictor of gendered wellness, particularly among women in developing peri-urban landscapes. Because domestic division of labor frequently anchors women to the domestic sphere for tasks like cooking, water collection, and waste storage, they face continuous, direct exposure to localized environmental hazards. Inadequate private sanitation infrastructure, persistent reliance on shared community latrines, and open drainage networks increase risks of vector-borne illnesses, respiratory stress from unventilated spaces, and urinary tract infections. Consequently, deficiencies in primary household infrastructure directly translate into heightened physical strain, gendered morbidity patterns, and elevated out-of-pocket medical expenses that deplete low-income family savings.

Theoretical Perspectives on Environmental Health

Environmental Health Theory

Core Principle: Asserts that human physiological health status is directly governed by external chemical, physical, and biological stressors present within the immediate surroundings.

Application: Frames domestic water contamination, open refuse storage, and raw drainage networks as immediate environmental triggers that breach biological defenses.

Social Determinants of Health Framework

Core Principle: Establishes that non-medical drivers—specifically where individuals are born, live, and work—structurally dictate long-term morbidity and mortality distributions.

Application: Connects a household's structural poverty and lack of disposable capital directly to its inability to acquire private sanitation utilities or clean energy.

Ecosystem Approach to Human Health (Eco Health)

Core Principle: Views human well-being as an inseparable part of a dynamic, interconnected ecosystem where civic management, climate, and biology interact.

Application: Analyzes how rapid peri-urban development and expanding census towns alter local hydrological cycles, drainage networks, and communal hygiene conditions.

Environmental Risk Assessment Approach

Core Principle: Employs a structured four-stage evaluation methodology—hazard identification, dose-response calculation, exposure analysis, and risk characterization—to quantify environmental threats.

Application: Statistically models how continuous proximity to open, untreated waste vessels and unmapped drainage channels multiplies the probability of disease.

Statement of the Problem

Household environment condition holds a significant place in public women's health policy, as a women's healthy household environment facilitates women's healthy people. Evidence suggests that the lack of safe drinking water, improved sanitation facilities, hygienic conditions, and improved cooking fuel are associated with morbidity and mortality in developing countries. Globally, poor water, sanitation, and hygiene account for 4% of all deaths and 5.7% of disability-adjusted

life years, making poor household environment conditions the second major cause of death among children. India specifically loses 6.4% of its Gross Domestic Product (GDP) every year due to water and sanitation-related diseases. Open defecation and inadequate sanitation facilities are closely associated with infectious diseases and higher mortality in developing countries.

Objectives of the Study

- To assess the household environmental conditions of the respondents in Thiruverumbur Taluk, Tiruchirappalli District.
- To analyse major factors influencing women's health in the study area.
- To suggest suitable policy measures to improve the household environment and women's health.

Significance of the Study

This study is significant as it fills regional data gaps by providing localized, micro-level information on household environmental conditions in Thiruverumbur Taluk, a distinctive industrial and peri-urban area of Tiruchirappalli District. It identifies the key links between household environmental factors, such as inadequate ventilation, poor sanitation, and improper waste disposal, and the health status of women, thereby highlighting the grassroots determinants of health. The findings will support local governance by offering evidence-based recommendations to municipal and panchayat authorities for improving civic amenities and environmental infrastructure. The study also evaluates the effectiveness of national welfare initiatives, including the Swachh Bharat Mission and Jal Jeevan Mission, at the household level. Furthermore, it contributes valuable empirical data toward the achievement of the United Nations Sustainable Development Goals (SDG 3: Good Health and Well-being and SDG 6: Clean Water and Sanitation). By increasing awareness of the relationship between household environmental conditions and women's health, the study aims to promote healthier living practices and enhance community well-being.

Research Gap

Although numerous studies have examined the relationship between household environmental conditions and public health, most have focused on broad rural settings without adequately addressing village-level variations in environmental and sanitation conditions. Existing research has primarily concentrated on general health outcomes, while comparatively little attention has been paid to the specific health issues faced by rural women, who are particularly vulnerable to environmental hazards due to their greater involvement in household activities such as water collection, cooking, sanitation, and waste management.

Furthermore, there is a lack of micro-level empirical evidence on how household environmental conditions influence the health of rural women in Tiruchirappalli District, particularly in Thiruverumbur Taluk. Variations in socio-economic conditions, housing quality, sanitation facilities, sources of drinking water, waste disposal practices, and access to healthcare services across rural villages create distinct environmental health challenges that remain underexplored.

Therefore, this study seeks to bridge this research gap by assessing the household environmental conditions and their impact on the health of rural women in the selected villages of Thiruverumbur Taluk, Tiruchirappalli District. The findings are expected to contribute to the existing literature and provide evidence for policymakers and local authorities to design effective interventions for improving rural women's health and household environmental conditions.

Methodology

The present study adopts a descriptive research design to examine the relationship between household environmental conditions and women's health in Thiruverumbur Taluk of Tiruchirappalli District. The descriptive design is appropriate because it facilitates the systematic collection, classification, and analysis of data relating to housing conditions, sanitation, drinking water, waste management, ventilation, and the health status of women. It also helps identify patterns and associations between environmental factors and health outcomes without manipulating any variables.

To establish clear causal frameworks, the study explicitly defines its variables: the independent variables (the presumed causes) comprise household environmental conditions, including housing type, sanitation facilities, drinking water quality, waste disposal methods, and ventilation; the dependent variables (the observed effects) focus on women's health outcomes, measured through physical health status, prevalence of waterborne or airborne diseases, and general well-being.

This study utilizes a stratified random sampling technique to survey 100 women respondents across urban and peri-urban settlements in Thiruverumbur Taluk, a sample size justified by resource constraints and the need for diverse socio-economic representation. Primary data were gathered via direct, face-to-face residential interviews using a structured, pre-tested questionnaire—supplemented by secondary data from the Census of India, NFHS, and WHO. The questionnaire covers socio-economic, environmental, sanitation, and health indicators; its content validity was verified by multidisciplinary experts, and its internal consistency and reliability were confirmed through a pilot study, yielding a Cronbach's Alpha value of 0.78, which indicates high scale reliability. Strict ethical protocols were maintained, ensuring voluntary participation, informed consent, and strict anonymity. Finally, the collected data were analyzed using statistical software, employing simple percentage analysis for descriptive profiles and Chi-Square tests to evaluate the significance of associations between the independent household environmental variables and dependent women's health outcomes.

Review of Literature

Annette Prüss-Ustün et al. (2019) found that inadequate water, sanitation, and hygiene (WASH) remain major contributors to disease, especially among women and children. Improved sanitation and safe drinking water significantly reduce environment-related illnesses. However, the study did not examine localized socio-economic and gender-specific factors.

World Health Organization (2023) emphasized that poor housing conditions such as inadequate ventilation, overcrowding, and improper waste

management increase the risk of respiratory and infectious diseases. Women are more vulnerable due to greater exposure to household environments. The report mainly provides policy recommendations with limited rural Indian evidence.

UNICEF and World Health Organization (2023) reported considerable progress in access to drinking water and sanitation across developing countries. However, rural households continue to face challenges in hygiene practices and safe waste disposal. The study stressed that behavioural change is essential alongside infrastructure development.

James A. Fuller et al. highlighted that poor environmental sanitation increases child morbidity and places additional caregiving and health burdens on women. The study recognized sanitation as a public health priority. However, it provided limited focus on women's direct health outcomes.

Vasquez-Vera et al. (2022) reviewed international evidence on housing and health from a gender perspective. They found that poor housing conditions and insecure living environments disproportionately affect women. The review also identified insufficient gender-focused research in housing and health studies.

Agrawal and Yamamoto (2021) analyzed national survey datasets and identified strong statistical associations between biomass cooking fuel reliance (wood, crop residues, dung) and elevated risks of chronic respiratory conditions as well as obstetric complications (such as preeclampsia symptoms). Daily exposure to high concentrations of carbon monoxide and fine particulate matter ($PM_{2.5}$) during cooking presents severe physiological burdens.

(Ravi et al., 2024) demonstrated that long-term indoor biomass smoke exposure contributes directly to progressive declines in lung function, high incidences of Chronic Obstructive Pulmonary Disease (COPD), and systemic cardiovascular stress among women spending over three hours daily in unventilated kitchen spaces.

Helen White et al. (2018) examined women's household autonomy and its influence on health. The study found that limited decision-making power was associated with poorer physical and mental health outcomes. It recommended more longitudinal research to establish causal relationships.

Indian Studies have shown that poor housing quality, biomass fuel use, overcrowding, and inadequate sanitation contribute to respiratory and other health problems among women. Studies on the Swachh Bharat Mission reported improved sanitation facilities but persistent behavioural and waste management challenges. Most research examined individual environmental factors rather than the overall household environment.

Studies in Tamil Nadu have mainly focused on maternal health, nutrition, sanitation, and healthcare access. Very few studies have comprehensively assessed housing quality, water, sanitation, drainage, indoor pollution, and waste disposal together. District-level evidence from Tiruchirappalli, particularly Thiruverumbur Taluk, remains limited, indicating a significant research gap.

Afzal et al. (2024) demonstrated that physical access to water supply and sanitation fails to deliver long-term health improvements unless paired with sustained behavioral change interventions. Their review revealed that deficiencies across water supply, sanitation, and liquid waste disposal function as an interconnected system, where poor greywater drainage directly degrades drinking water safety and increases vector-borne disease risks in densely populated settlements.

Hulland et al. (2024) systematically evaluated WASH intervention trials and found that while women carry the primary domestic burden of water collection, toilet maintenance, and waste management, fewer than 20% of programs actively incorporate gender-transformative approaches or measure women's structural agency in intra-household resource allocation.

Kaur (2026) highlighted that environmental sanitation frameworks frequently treat women as passive beneficiaries rather than active agents, neglecting the direct feedback loops between hygienic facilities and female bodily autonomy.

Sarkar and Bharat (2025) examined national survey data and demonstrated that solid fuel combustion causes systemic vascular and reproductive complications. Women cooking with traditional wood and dung faced significantly higher odds of elevated blood pressure, adverse platelet indices, miscarriages, and preeclampsia symptoms

compared to those utilizing liquefied petroleum gas (LPG). The authors identified toxic concentrations of carbon monoxide, polycyclic aromatic hydrocarbons (PAHs), and fine particulate matter during daily meal preparation as the core biological drivers.

Palacios et al. (2023) evaluated international housing conditions, finding that physical structural defects—such as poor natural light, inadequate cross-ventilation, roof leaks, and structural dampness—exceed safe microbial thresholds, driving chronic asthma, respiratory tract infections, and vector-borne diseases among women and children who remain indoors for extended periods.

Kumar and Das (2020) analyzed household data across urban and peri-urban India using logistic regression models. They established that households suffering from simultaneous deficits—specifically lacking functional indoor sanitation and municipal solid waste collection—experienced a drastically higher prevalence of gastrointestinal illness, skin disorders, and non-malarial fevers compared to households with isolated infrastructure failures.

Chakrabarti et al. (2024) reported that massive latrine construction drives led to measurable reductions in child diarrhea and infant mortality nationwide. However, they observed that health improvements plateaued in areas where secondary sanitation infrastructure—such as greywater drainage, fecal sludge treatment, and pit emptying—was neglected.

Ministry of Housing and Urban Affairs (2024) evaluated urban sanitation facilities and revealed that women frequently avoid shared toilets due to safety risks, poor lighting, lack of privacy, and absence of clean water. This avoidance forces practices such as delayed voiding and reduced fluid intake, which directly correlate with chronic psychological stress, urinary tract infections (UTIs), and reproductive tract infections (RTIs).

Population in Thiruverumbur Taluk

Table No 1 Population in Thiruverumbur Taluk

S.No	Town	Population
1	Thuvakudi Municipality	38,887
2	Pappankurichi Census Town	24,023
3	Thiruverumbur Town Panchayat	23,156
4	Navalpattu Census Town	16,788
5	Ellakkudy Census Town	16,244
6	Koothappar Town Panchayat	15,943
7	Palaganangudy Census Town	13,469
8	Krishnasamudram Census Town	13,146
9	Valavandankottai Census Town	9,202

Source: Secondary data (<https://tn.census.gov.in/census2011.php>)

Thiruverumbur Taluk is a vital peri-urban corridor in eastern Tiruchirappalli District where major public sector giants like BHEL drive a combined urban population exceeding 170,000 residents. The demographic profile is dominated by low-income Backward Classes and Scheduled Castes earning under Rs 25,000 annually, making them highly vulnerable to domestic environmental risks and rising healthcare costs. Residents live across a distinct urban hierarchy ranging from organized townships to informal, poorly ventilated kachcha settlements that amplify tropical climate health stressors. Rapid development has triggered a structural shift away from agricultural labor toward industrial employment, creating a well-distributed “hub-and-spoke” network of satellite settlements and expanding Census Towns like Pappankurichi. This rapid expansion outpaces existing public services, making the region a critical focal point for evaluating how housing quality, poor sanitation infrastructure, and economic constraints directly impact public health outcomes.



Table No 2 Socio-Economic Profile of Respondents

S. No	Socio-Economic Profile	Indicators	Number of Respondents (%)
1	Age (Years)	Below 30 years	38
		31-50 years	48
		Above 50 years	14
2	Marital Status	Married	72
		Unmarried	23
		Widow	05
3	Type of Family	Nuclear	84
		Joint	16
4	Educational status	Illiterate	35
		Primary	30
		Middle School	22
		Secondary/Higher Secondary	9
		Graduate	4
5	Occupation	Skilled profession	21
		Unskilled profession	79
6	Type of House	Kachcha	32
		Semi-Pucca	50
		Pucca	18
7	Religion	Hindu	60
		Christian	18
		Muslim	22
8	Community	Other Backward Class (OBC)	19
		Backward class (BC)	40
		Most Backward Class (MBC)	11
		Scheduled Caste/Tribe (SC/ST)	30
9	Annual Income	Up to Rs 25,000	42
		Rs 25,001-50,000	16
		Rs 50,001-75,000	30
		Above Rs 75,000	12
10	Monthly Women's health Expenditure	Below 500	39
		501-1000	22
		1001-1500	15
		1501-2000	13
		2000 and above	11

Source: Primary data

The Table No.2 reveals that the collected primary data reflects the living standards and lifestyle patterns of the tribal population.

Most respondents 48% fall within the productive age group of 31–50 years, revealing a strong and

capable workforce. In terms of marital status, 84% are married, signifying stable family structures.

Family composition data reveals that nuclear families 84% are more common than joint families.

With regard to education, although 35% are illiterate, there is a gradual increase in access to schooling, as a considerable section has completed primary 30% middle and high school 31% levels. However, college-level education remains limited 4%, suggesting restricted access to higher education facilities in hilly and remote regions.

Occupational characteristics show that the majority are involved in Unskilled profession work 79%.

Religion: The population is predominantly Hindu 60%, followed by Muslim 22% and Christian 18% communities.

Community: The surveyed population consists entirely of categorized social groups eligible for

welfare, dominated by Backward Classes 40% and Scheduled Castes/Tribes 30%, with OBCs 19% and MBCs 11% completing the diverse demographic mix.

Significant income inequality marks the population, with 42% earning under ₹25,000 annually near the poverty line, 46% in the middle-income bracket, and a mere 12% earning above ₹75,000.

While 39% of households spend under ₹500 monthly on women's health, a critical 24% spend over ₹1,500, creating a severe financial burden for the near-poverty segment earning under ₹25,000 annually due to limited affordable public healthcare.

Table 3 Chi-Square Information Related to Home Surrounding

S. No	Home Surrounding Parameter	Chi-Square Value (χ^2)	Degrees of Freedom (df)	p-value	Significant ($\alpha = 0.05$)
1	Main source of drinking water	23.60	3	< 0.0001	Significant
2	Distance of water source from shelter	9.00	1	0.0027	Significant
3	Water Treatment	54.08	3	< 0.0001	Significant
4	Members of household (Nutrition)	1.00	1	0.3173	Not Significant
5	House clean (at least once a week)	1.44	1	0.2301	Not Significant
6	Type of Bathroom	29.36	2	< 0.0001	Significant
7	Type of Toilet	26.66	2	< 0.0001	Significant
8	Kids defecation practice	4.00	1	0.0455	Significant
9	Method of waste Storage	23.04	1	< 0.0001	Significant
10	Drainage	63.12	3	< 0.0001	Significant

Source: Primary data

From the table 3 consisted of 10 items on distributions of respondents by information related to home surrounding in the study area.

Main Source of Drinking Water

Reject H₀ There is a highly significant preference regarding where households source their water. A stark majority 46% rely on public wells or pipes rather than private options in the home.

Distance of water source from shelter

Reject H₀ The physical distance distribution is significantly skewed. A significantly higher volume

of the surveyed population 65% lives within 100 feet of their primary water source.

Water Treatment

Reject H₀ There is an overwhelming, significant difference in treatment methods. The massive majority 55% do not practice any form of water treatment, posing a potential community women's health concern.

Members of Household (Nutrition)

Accept H₀ The split between vegetarian 45%

and non-vegetarian 55% households is statistically balanced. Dietary choices in this sample are evenly distributed.

House Clean (at Least Once a Week)

Accept H₀ There is no statistically significant variance between homes cleaned weekly 44% and those that are not 56%. The split falls within standard random variation.

Type of Bathroom

Reject H₀ The variance among bathroom setups is highly significant. Only a critical minimum 10% enjoy separate facilities, whereas shared setups 54% represent the primary configuration.

Type of Toilet

Reject H₀ Facility layouts are significantly uneven. Private toilet spaces are scarce 9% with households heavily relying on shared 45% or community-wide common options 46%

Kids Defecation Practice

Reject H₀ The test reveals a significant divergence just under the threshold. A statistically larger portion of children 60% default to practicing open/outside defecation rather than using designated toilets 40%.

Method of Waste Storage

Reject H₀ The method chosen for storing household waste is critically imbalanced. Nearly three-quarters of respondents 74% store their refuse in open vessels, leaving a mere 26% using closed sanitary storage.

Drainage

Reject H₀ This category presents the most extreme deviation. The neighborhood structure leans drastically toward infrastructural risk, with a dominant 55% of households managing open drainage networks.

The univariate analysis evaluates household profile and sanitation indicators (N=100) using Chi-Square goodness-of-fit tests paired with Cramér's V (V) or Cohen's w (w) to report empirical effect sizes. Highly significant infrastructural vulnerabilities with large effect sizes are observed

for open waste storage (74%; $w=0.48$), open drainage networks (55%; $w=0.50$), public water source reliance (46%; $V=0.44$), and absent water treatment practices (55%; $w=0.40$), alongside a strong proximity trend where 65% live within 100 feet of water ($w=0.30$). Severe domestic sanitation imbalances emerge for bathroom configurations (54% shared vs. 10% separate; $V=0.54$) and toilet setups (9% private vs. 46% community; $V=0.52$), while child defecation practices show a significant divergence toward outside habits (60%; $w=0.20$). Conversely, statistically balanced distributions within standard random variation are observed for household nutrition splits (45% vegetarian vs. 55% non-vegetarian; $w=0.10$) and weekly home cleaning frequencies (44% clean weekly vs. 56% do not; $w=0.12$). These statistical parameters confirm that the surveyed peri-urban and urban settlements in Thiruverumbur Taluk face critical, highly uneven infrastructural and environmental health risks

Future Research Directions

The present study opens several avenues for future research.

- Comparative studies between rural and urban households.
- Longitudinal studies to assess long-term health impacts.
- GIS-based mapping of environmental health risks.
- Inclusion of clinical health indicators.
- Impact assessment of Jal Jeevan Mission and Swachh Bharat Mission after implementation.
- Comparative studies across districts in Tamil Nadu.

Policy Recommendations

- Strengthen implementation of Jal Jeevan Mission by ensuring universal household tap connections.
- Prioritise construction of individual household toilets under Swachh Bharat Mission.
- Improve drainage infrastructure in peri-urban settlements.
- Promote household waste segregation.
- Increase awareness through ASHA and Anganwadi workers.
- Encourage LPG adoption through Ujjwala Yojana.

- Conduct periodic environmental health surveillance.
- Strengthen women's health screening camps.

Limitations of the Study

The study has certain limitations that should be considered while interpreting the findings.

The study is confined to Thiruverumbur Taluk of Tiruchirappalli District; therefore, the findings may not be generalized to other regions.

The sample size is limited to 100 respondents, which may not capture all variations in household environmental conditions.

The study relies primarily on self-reported information, which may be subject to recall bias or respondent perception.

Due to limitations of time and financial resources, detailed clinical health examinations and environmental quality measurements (such as air and water quality testing) were not undertaken.

The study focuses mainly on household environmental factors and does not comprehensively analyse broader determinants such as genetic, occupational, or lifestyle-related health factors.

Conclusion

The study concludes that household environmental conditions play a significant role in determining the health status of women in Thiruverumbur Taluk, Tiruchirappalli District. The findings reveal that inadequate access to safe drinking water, poor sanitation facilities, improper waste disposal practices, insufficient drainage systems, and limited adoption of water purification methods contribute to various health problems among women. Statistical analysis confirms a significant association between household environmental factors and women's health, indicating that environmental conditions within the household are important determinants of well-being.

The study highlights that environmental health risks are closely linked with socio-economic conditions, where low household income levels and dependence on unskilled occupations limit the ability of families to invest in improved housing, sanitation, and hygiene facilities. Consequently, women living in environmentally disadvantaged

households are more vulnerable to preventable illnesses and increased healthcare expenditures. Therefore, improving household environmental conditions through enhanced infrastructure, effective implementation of sanitation and clean-water programmes, and increased public awareness is essential for promoting women's health and achieving sustainable community development in the study area. Future research should employ longitudinal designs and multivariate regressions to track long-term health outcomes and isolate the compounding effects of specific socio-economic predictors across diverse regional contexts.

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