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Role of Education in Enhancing Hygiene Management Practices among Rural Women in Bhagalpur District, Bihar

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ABSTRACT

Hygiene and sanitation are critical components of public health, particularly in rural areas where women play a central role in maintaining household cleanliness and family well-being. The present study examines the role of education in enhancing hygiene management practices among rural women in Bhagalpur district, Bihar. The study is based on primary data collected from 120 respondents using a structured questionnaire and supported by secondary sources. A descriptive and analytical research design was adopted, and statistical tools such as percentage analysis and the Chi-square test were employed to analyse the data. The findings reveal that a majority of respondents (48%) possess a moderate level of educational awareness regarding hygiene management, while 30% demonstrate high awareness and 22% exhibit low awareness. In terms of hygiene practices, 43% of respondents follow moderate practices, 35% maintain good practices, and 22% demonstrate poor hygiene behaviour. The study further establishes a strong and statistically significant relationship between educational level and hygiene management practices, with higher education associated with better adoption of sanitation behaviours. The Chi-square test results confirm that educational awareness and hygiene practices are significant, and that education has a meaningful impact on hygiene behaviour. The study highlights that although awareness levels are improving, gaps still exist in the consistent application of hygienic practices. Therefore, strengthening female education, promoting targeted awareness programmes, and implementing community-based behavioural interventions are essential for improving hygiene practices and enhancing public health outcomes in rural communities.

Keywords: *Hygiene Management, Educational Awareness, Rural Women, Sanitation Practices, Bhagalpur District.*

Introduction

Hygiene and sanitation are fundamental components of public health and social well-being. Proper hygiene practices such as regular handwashing, safe disposal of waste, clean drinking water, and the use of sanitary toilets play a significant role in preventing diseases and improving the quality of life. In rural areas of India, women are primarily responsible for managing household hygiene, caring for children, and maintaining sanitation within the family. Therefore, educational awareness among rural women is crucial for promoting effective hygiene management practices and ensuring a healthier community. Education helps women understand the importance of sanitation, safe water usage, and personal hygiene, which directly contributes to improved family health and reduced disease burden.In India, the Government has implemented several programmes to improve sanitation and hygiene awareness, particularly in rural areas. One of the most significant initiatives is the Swachh Bharat Mission (Gramin) launched in 2014 to eliminate open defecation and promote sanitation behaviour across the

country. According to government reports, more than 12 crore toilets have been constructed in rural and urban areas under the Swachh Bharat Mission, which has significantly improved access to sanitation facilities and enhanced the dignity and safety of women. Additionally, the mission has helped India move towards better sanitation coverage, with over 95% of villages in the country declared Open Defecation Free (ODF) Plus under Phase II of the programme. These initiatives demonstrate the government's commitment to improving hygiene and sanitation conditions, especially in rural communities.

Despite these improvements, several challenges still exist in rural areas. Studies indicate that a considerable number of households still lack adequate sanitation facilities. Recent estimates suggest that about 12.5% of Indian households still do not have access to a toilet, and most of these households are located in rural regions. Furthermore, earlier national survey data showed that toilet usage in rural areas is significantly lower compared to urban areas, highlighting the need for continuous awareness and education programmes. These findings indicate that while infrastructure development has improved sanitation coverage, behavioural change and educational awareness remain essential for sustaining hygiene practices.Education plays a key role in transforming hygiene behaviour among rural women. Literate and educated women are more likely to adopt safe hygiene practices, encourage their families to use sanitation facilities, and participate in community health programmes. Educational awareness also empowers women to make informed decisions regarding health, nutrition, and sanitation, which contributes to overall family welfare and community development.

The present study focuses on the role of education in enhancing hygiene management practices among rural women in Bhagalpur district, Bihar. Bhagalpur is predominantly rural, and many households still face challenges related to sanitation awareness, clean water access, and hygiene practices. The study is based on primary data collected from a sample of 120 rural women selected from villages in Bhagalpur district, namely Khiribandh, Goradih, Agarpur, Makanpur, and Rangra.The research aims to analyse the level of educational awareness among rural women and examine how education influences their hygiene management practices. The findings of the study are expected to provide insights for policymakers, health workers, and local authorities to strengthen hygiene education programmes and promote sustainable sanitation practices in rural communities.

Objectives of the Study

- To examine the level of educational awareness regarding hygiene management among rural women in Bhagalpur district, Bihar.
- To analyse the hygiene management practices followed by rural women in the selected rural areas of Bhagalpur district.
- To study the relationship between educational level and hygiene management practices among rural women.

Hypotheses of the Study

H_{01}: There is no significant level of educational awareness regarding hygiene management among rural women in Bhagalpur district.

H_{11}: There is a significant level of educational awareness regarding hygiene management among rural women in Bhagalpur district.

H_{02}: Rural women in Bhagalpur district do not significantly follow proper hygiene management practices.

H_{12}: Rural women in Bhagalpur district significantly follow proper hygiene management practices.

H_{03}: There is no significant relationship between educational level and hygiene management practices among rural women in Bhagalpur district.

H_{13}: There is a significant relationship between educational level and hygiene management practices among rural women in Bhagalpur district.

Research Methodology

Research methodology provides the systematic framework used to conduct the study and analyse the research problem in a scientific manner. It outlines the procedures and techniques used for data collection, sampling, analysis, and interpretation of results. For the present study an appropriate methodological design has been adopted to examine the relationship between educational awareness and hygiene management practices among rural women.

Research Design

The study adopts a descriptive and analytical research design. The descriptive approach is used to describe the level of educational awareness and hygiene practices among rural women, while the analytical approach is used to examine the relationship between education and hygiene management practices. This design helps in understanding the patterns, behaviour, and influence of education on hygiene-related practices in rural households.

Study Area

The research is conducted in Bhagalpur district of Bihar, which is predominantly rural and characterized by diverse socio-economic and educational conditions. Bhagalpur district has a significant rural population where women play a central role in maintaining household hygiene, sanitation, food preparation, and childcare. Despite the implementation of various government sanitation and awareness programmes, several rural areas in the district still face challenges related to hygiene awareness and sanitation practices. Therefore, Bhagalpur district provides a suitable geographical context for examining the impact of education on hygiene management practices among rural women.

Population of the Study

The target population of the study consists of rural women residing in selected villages of Bhagalpur district, namely Khiribandh, Goradih, Agarpur, Makanpur, and Rangra.Rural women were selected as the primary respondents because they are directly responsible for maintaining household sanitation, personal hygiene, and family health. Their educational level and awareness significantly influence hygiene behaviour within the household.

Sample Size and Sampling Technique

For the purpose of this study, a sample size of 120 rural women has been selected from different villages of Bhagalpur district, namely Khiribandh, Goradih, Agarpur, Makanpur, and Rangra.The respondents were chosen using a simple random sampling technique, ensuring that each individual in the target population had an equal chance of being selected. This sampling method helps in minimizing bias and ensuring that the sample represents the broader population of rural women in the district.

Sources of Data

- **Primary Data:** Primary data were collected directly from the respondents through a structured questionnaire and personal interviews. The questionnaire included questions related to educational background, awareness of hygiene practices, sanitation behaviour, water usage, waste disposal, and menstrual hygiene management. Personal interviews were conducted to obtain detailed responses and to ensure clarity in understanding the questions.
- **Secondary Data:** Secondary data were collected from various reliable sources including government reports, published research articles, official statistics, and reports from national programmes such as the Swachh Bharat Mission, National Health Mission, and Jal Jeevan Mission. Government publications from ministries such as the Ministry of Jal Shakti and Ministry of Health and Family Welfare were also used to provide contextual information regarding sanitation and hygiene initiatives in India.

Data Analysis Techniques

The collected data were systematically organized and analysed using statistical tools such as percentages, frequency distribution tables, and comparative analysis. These techniques help in interpreting the responses of the respondents and identifying patterns related to hygiene awareness and practices. Tabular presentation was used to summarize the findings in a clear and understandable format. Furthermore, the relationship between educational level and hygiene management practices was examined in view of the formulated hypotheses of the study. The analytical interpretation of the data helps in understanding whether educational awareness significantly influences hygiene behaviour among rural women.

Importance of Educational Awareness for Hygiene Management

Educational awareness plays a crucial role in improving hygiene management practices, particularly among rural women who are responsible for maintaining sanitation and cleanliness in households. In rural India, women are often the primary caregivers who manage water usage, food

preparation, childcare, and household cleanliness. Therefore, their knowledge regarding hygiene and sanitation significantly influences the health status of family members and the wider community.

The Government of India has recognized the importance of sanitation awareness and has implemented several initiatives aimed at improving hygiene behaviour. The Swachh BharatMission (Gramin), launched in 2014, is one of the most significant programmes promoting sanitation awareness across rural India. According to official government data, more than 11 crore toilets have been constructed in rural areas under the mission, contributing to improved sanitation coverage and reduction of open defecation.

In addition, the Jal Jeevan Mission, launched in 2019, aims to provide functional household tap connections to rural households. Access to clean water enables families to maintain hygienic practices such as handwashing, safe cooking, and proper sanitation. Government reports indicate that millions of rural households have already received tap water connections under this mission.Despite these initiatives, awareness regarding hygiene practices remains uneven in many rural regions due to educational disparities, socio-economic factors, and cultural beliefs. In states such as Bihar, where rural literacy levels among women remain relatively low, awareness regarding hygiene practices often varies significantly among communities.The present study therefore focuses on examining the level of educational awareness among rural women in Bhagalpur district and how such awareness influences hygiene management practices.

Assessment of Hygiene Awareness among Rural Women

In order to evaluate the level of educational awareness regarding hygiene management practices, primary data were collected from 120 rural women respondents in selected villages of Bhagalpur district, namely Khiribandh, Goradih, Agarpur, Makanpur, and Rangra. Respondents were asked questions regarding their knowledge of basic hygiene practices such as handwashing with soap, use of sanitary toilets, safe drinking water storage, waste disposal, and menstrual hygiene management.The responses were classified into three awareness categories: high awareness, moderate awareness, and low awareness.Below Table 1 shows the distribution of respondents according to their level of educational awareness regarding hygiene management practices.

Table 1: Level of Educational Awareness on Hygiene Management among Rural Women

Level of Awareness	Number of Respondents	Percentage (%)
High Awareness	36	30
Moderate Awareness	58	48
Low Awareness	26	22
Total	**120**	**100**

Source: Field Survey Data, Bhagalpur District (2026)

As presented in above Table 1, the distribution of respondents indicates that a majority of rural women (48%) fall under the moderate awareness category, suggesting that many possess basic knowledge of hygiene but lack comprehensive understanding. Further, 30% of respondents fall under high awareness, reflecting a satisfactory level of knowledge influenced by education and sanitation programmes. In contrast, 22% of respondents are in the low awareness category, indicating existing gaps in essential hygiene knowledge. Overall, the findings suggest that while a considerable proportion of rural women are aware of hygiene practices, a significant section still requires improved educational and awareness interventions.

Hygiene Behaviour and Health Outcomes in Rural India

Hygiene management practices are closely associated with public health outcomes, particularly in rural areas where sanitation infrastructure and healthcare access may be limited. Poor hygiene practices can contribute to the spread of communicable diseases such as diarrhoea, cholera, and typhoid.

The Government of India has therefore implemented several programmes aimed at improving sanitation and hygiene practices. The Swachh Bharat Mission Phase II (ODF Plus) focuses on sustainable sanitation practices, including solid waste management, greywater management, and behavioural change campaigns. According to government reports, the sanitation coverage in rural India has increased significantly since the launch of Swachh Bharat Mission.

However, the actual adoption of hygienic practices depends not only on infrastructure availability but also on awareness and behavioural change among households. In rural households, women play a central role in implementing hygiene practices such as maintaining household cleanliness, ensuring safe water storage, and promoting sanitary habits among children.

Assessment of Hygiene Management Practices among Respondents

The present study assessed hygiene practices among rural women through questions related to handwashing behaviour, toilet usage, water storage practices, and household cleanliness. The responses were categorized into three groups: good hygiene practices, moderate hygiene practices, and poor hygiene practices. Below Table 2 shows the distribution of respondents according to their hygiene management practices.

Table 2: Hygiene Management Practices among Rural Women

Hygiene Practice Level	Number of Respondents	Percentage (%)
Good Hygiene Practices	42	35
Moderate Hygiene Practices	52	43
Poor Hygiene Practices	26	22
Total	**120**	**100**

Source: Field Survey Data, Bhagalpur District (2026)

As presented in above Table 2, the majority of respondents (43 percent) demonstrate moderate hygiene practices, indicating that while many rural women follow certain hygienic behaviours, they may not consistently maintain all recommended sanitation practices. Approximately 35 percent of respondents demonstrate good hygiene practices, suggesting that these individuals regularly follow recommended practices such as washing hands with soap, maintaining clean surroundings, and using sanitary toilets. However, 22 percent of respondents fall within the poor hygiene practices category, which suggests that a considerable proportion of rural women still do not consistently adopt hygienic behaviours.

Role of Education in Promoting Sanitation Behaviour

Education is widely recognized as one of the most significant determinants of health behaviour. Educated individuals tend to possess better knowledge regarding disease prevention, sanitation practices, and health management. In rural India, women's education plays a critical role in improving household hygiene and sanitation practices. Studies based on the National Family Health Survey (NFHS-5) indicate that women with higher educational attainment are more likely to use improved sanitation facilities and practice safe hygiene behaviours. Government programmes such as Beti Bachao Beti Padhao, National Health Mission, and Swachh Bharat Mission awareness campaigns emphasize the importance of female education as a strategy for improving public health indicators. In the present study, the relationship between educational attainment and hygiene practices was examined using primary survey data.

Educational Level and Hygiene Practices among Respondents

The respondents were categorized based on their educational attainment: illiterate, primary education, secondary education, and higher education. Their hygiene practices were then analysed across these categories. Below Table 3 shows the relationship between educational level and hygiene management practices among rural women.

Table 3: Educational Level and Hygiene Management Practices among Rural Women

Educational Level	Good Practices	Moderate Practices	Poor Practices	Total
Illiterate	6	12	14	32
Primary Education	10	16	8	34
Secondary Education	16	14	3	33
Higher Education	10	10	1	21
Total	**42**	**52**	**26**	**120**

Source: Field Survey Data, Bhagalpur District (2026)

As presented in above Table 3, hygiene management practices vary across the educational levels of respondents. Among illiterate women, a higher number (14 out of 32) fall under poor hygiene practices, while only 6 follow good practices. Among those with primary education, 10 out of 34 show good practices and 8 fall under poor practices. Improvement is observed among women with secondary education, where 16 out of 33 follow good hygiene practices and only 3 falls under poor practices.

Similarly, among respondents with higher education, 10 out of 21 exhibit good practices, while only 1 fall under poor practices. Overall, the data show that with an increase in education, good hygiene practices increase and poor practices decline, indicating a positive relationship between education and hygiene management practices.

Test of Hypothesis 1

H_{01}: There is no significant level of educational awareness regarding hygiene management among rural women in Bhagalpur district.

H_{11}: There is a significant level of educational awareness regarding hygiene management among rural women in Bhagalpur district.

The distribution of respondents shown in Table 1 has been considered for statistical testing of Hypothesis H_{01} to examine whether the observed differences in awareness levels are statistically significant.

$$E = \frac{Total}{Number\ of\ Categories}$$

$$E = \frac{120}{3} = 40$$

Table 4: Observed and Expected Frequencies of Educational Awareness Regarding Hygiene Management

Awareness Level	Observed (O)	Expected (E)
High	36	40
Moderate	58	40
Low	26	40

Chi-Square Formula

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Table 5: Chi-Square Test Calculation for Educational Awareness Regarding Hygiene Management Among Rural Women

Category	O	E	(O−E)	(O−E) ²	(O−E) ²/E
High	36	40	-4	16	0.40
Moderate	58	40	18	324	8.10
Low	26	40	-14	196	4.90
					$\chi^2 = 13.40$

Degrees of Freedom

$$df = n - 1 = 3 - 1 = 2$$

Chi-square critical value at 0.05 significance level

$$\chi^2_{table} = 5.99$$

Result

$$13.40 > 5.99$$

Therefore, Null hypothesis (H_{01}) is rejected.

Decision

Since the calculated chi-square value ($\chi^2 = 13.40$) is greater than the table value ($\chi^2 = 5.99$) at 0.05 level of significance with 2 degrees of freedom, the null hypothesis (H_{01}) is rejected and the alternative hypothesis (H_{11}) is accepted.

Hence, it is concluded that there is a statistically significant level of educational awareness regarding hygiene management among rural women in Bhagalpur district.

Test of Hypothesis 2

H_{02}: Rural women in Bhagalpur district do not significantly follow proper hygiene management practices.

H_{12}: Rural women in Bhagalpur district significantly follow proper hygiene management practices.

The distribution of respondents shown in Table 2 is used to statistically test Hypothesis H_{02} in order to examine whether the observed differences in hygiene practices are significant.

Table 6: Observed and Expected Frequency of Hygiene Management Practices Among Rural Women

Category	O	E
Good	42	40
Moderate	52	40
Poor	26	40

Table 7: Chi-Square Test for Hygiene Management Practices of Rural Women

Category	O	E	(O−E)	(O−E) ²	(O−E) ²/E
Good	42	40	2	4	0.10
Moderate	52	40	12	144	3.60
Poor	26	40	-14	196	4.90
					$\chi^2 = 8.60$

Degrees of Freedom

$$df = 3 - 1 = 2$$

$$\chi^2_{table} = 5.99$$

Result

$$8.60 > 5.99$$

Therefore, Null hypothesis (H_{02}) is rejected.

Decision

Since the calculated chi-square value ($\chi^2 = 8.60$) is greater than the table value ($\chi^2 = 5.99$) at 2 degrees of freedom, the null hypothesis (H_{02}) is rejected and the alternative hypothesis (H_{12}) is accepted.

Hence, it is concluded that rural women in Bhagalpur district significantly follow proper hygiene management practices, although the level of practice varies among respondents.

Test of Hypothesis 3

H_{03}: There is no significant relationship between educational level and hygiene management practices among rural women in Bhagalpur district.

H_{13}: There is a significant relationship between educational level and hygiene management practices among rural women in Bhagalpur district.

The cross-tabulated data in Table 3 are utilized to examine the association between educational level and hygiene management practices. These observed frequencies form the basis for applying the Chi-square test to test Hypothesis H_{03}.

Table 8: Expected Frequencies for Educational Level and Hygiene Practices

Education Level	Good	Moderate	Poor	Total
Illiterate	11.20	13.87	6.93	32
Primary	11.90	14.73	7.37	34
Secondary	11.55	14.30	7.15	33
Higher	7.35	9.10	4.55	21
Total	42	52	26	120

Table 9: Chi-Square Calculation for Relationship between Educational Level and Hygiene Practices

Education Level	Hygiene Practice	O	E	$(O-E)^2/E$
Illiterate	Good	6	11.20	2.41
	Moderate	12	13.87	0.25
	Poor	14	6.93	7.21
Primary	Good	10	11.90	0.30
	Moderate	16	14.73	0.11
	Poor	8	7.37	0.05
Secondary	Good	16	11.55	1.72
	Moderate	14	14.30	0.01
	Poor	3	7.15	2.41
Higher	Good	10	7.35	0.96
	Moderate	10	9.10	0.09
	Poor	1	4.55	2.25
				$\chi^2 = 23.76$

Degree of Freedom

$$df = (r-1)(c-1)$$
$$df = (4-1)(3-1)$$
$$df = 6$$

Chi-square critical value (0.05 level)

$$\chi^2_{table} = 12.59$$

Result

$$23.76 > 12.59$$

Therefore, Null hypothesis (H_{03}) is rejected.

Decision

Since the calculated chi-square value ($\chi^2 = 23.76$) is greater than the table value ($\chi^2 = 12.59$) at 0.05 level of significance with 6 degrees of freedom, the null hypothesis (H_{03}) is rejected and the alternative hypothesis (H_{13}) is accepted.

Hence, it is concluded that there is a statistically significant relationship between educational level and hygiene management practices among rural women in Bhagalpur district.

Findings and Discussion

The study provides important insights into the level of educational awareness and hygiene management practices among rural women in Bhagalpur district. As shown in Table 1, a majority of respondents (48%) possess a moderate level of awareness, while 30% demonstrate high awareness and 22% fall under the low awareness category. This indicates that although basic knowledge exists, comprehensive understanding remains limited among a section of respondents.

With regard to hygiene practices, Table 2 shows that 43% of respondents follow moderate practices, 35% exhibit good practices, and 22% demonstrate poor hygiene behaviour. These findings suggest that while awareness has translated into practice to some extent, consistency in maintaining proper hygiene remains a concern. The presence of poor practices highlights the gap between knowledge and its effective implementation.

A key finding of the study is the strong association between educational level and hygiene management practices. As indicated in Table 3, respondents with higher levels of education are more likely to adopt good hygiene practices, whereas illiterate respondents are largely concentrated in the poor hygiene category. This clearly reflects the influence of education on sanitation behaviour.

The results of the Chi-square tests further support these observations, as all three null hypotheses were rejected, confirming the presence of significant awareness, adoption of hygiene practices, and a meaningful relationship between education and hygiene behaviour. These findings reinforce the role of education as a key determinant of hygiene practices in rural settings.

Overall, the study highlights that although improvements in awareness and practices are evident, continued efforts in female education, targeted awareness programmes, and behavioural change strategies are essential for achieving sustainable improvements in hygiene and public health outcomes.

Conclusion

The study clearly establishes education as a critical determinant of hygiene management practices among rural women in Bhagalpur district. The findings indicate that while a majority of respondents possess moderate awareness, the translation of this knowledge into consistent hygienic behaviour remains uneven, reflecting a gap between awareness and actual practice. The coexistence of good and poor hygiene practices further highlights the need for improved behavioural implementation. Importantly, the study reveals a strong and statistically significant relationship between educational level and hygiene behaviour, with higher education associated with better adoption of sanitation practices. The statistical results confirm that education significantly influences both awareness and hygiene management practices. Therefore, strengthening female education, along with targeted hygiene awareness programmes and community-based interventions, is essential. Such efforts can effectively enhance hygiene practices, reduce health risks, and contribute to improved public health and overall development in rural areas.

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