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ARTICLE

The Effectiveness of a Program to Improve Environmental Hygiene among Selected Households

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ABSTRACT

Ensuring personal hygiene and sanitation facilities are crucial priorities for both rural and urban populations, yet improvements are needed to foster the growth of each family. Achieving this goal necessitates the active involvement of women in rural communities. However, there exists a gap in assessing hygienic literacy, practices, and the efficacy of implementing hygienic environments in rural areas. This study aimed to evaluate the awareness, attitude, and practices concerning environmental hygiene to advance public health and protection. Through the interview cum observation method, 500 families in selected rural areas were assessed to gauge the effectiveness of environmental hygiene. A five-day intensive environmental hygiene program was conducted with selected participants. Various parameters, including demographic profiles and the relationship between hygienic knowledge, attitudes, and practices before and after the education program, were evaluated. The study revealed deficiencies in environmental sanitary practices among rural populations. Furthermore, awareness emerged as the most influential factor, exhibiting a significant and positive correlation with environmental hygiene. Thus, there is an urgent need for awareness programs and educational services to promote proper sanitation practices and foster a hygienic environment in rural areas.

Keywords: Environmental Hygiene, Education, Effectiveness, Awareness, Understanding

Introduction

The concept of the environment encompasses all the surrounding elements, conditions, and factors that can influence the development, functioning, survival, and health of an organism or group of organisms (Medicine Net, 2021). In the realm of environmental health, the term "environment" refers to external factors such as biological, physical, social, and cultural elements that may impact human health (Ahern and Galea, 2011). Environmental health is a branch of public health that assesses and monitors the interaction between humans and their environment to manage and mitigate factors that could affect human health. The promotion of human welfare and health is crucial for fostering secure, healthy, and hygienic societies through coordinated efforts. In many rural areas of India, solid waste is collected and transported in an unsanitary manner. Despite the prevalence of poverty among the majority of Indians, the government is actively addressing the issue of solid waste management (Parmar and Pamnani, 2018). Improper disposal of solid waste, such as burning or dumping in nearby water bodies, exacerbates air and water pollution issues in rural areas (Franjic, 2018).

Inadequate hygiene practices during menstruation can lead to urinary or reproductive tract infections, as well as fungal or bacterial infections (Kaur et al., 2018). Rural areas often exhibit less hygienic menstrual practices compared to urban areas, indicating the need for change. Social stigma and lack of education in rural areas with low literacy rates may deter women from seeking medical care, leading to neglect or denial of the importance of healthcare and early disease detection. Environmental health research focuses on reducing adverse health effects caused by environmental factors, evaluating and mitigating environmental health hazards, and aiding in the formulation of public health and environmental policies (Johnson & Lichtveld, 2017).

The environment encompasses not only natural elements such as air, water, vegetation, and animals used for sustenance, but also includes shelter, transportation modes, and all other technological products, including pollutants and waste materials, which interact to affect health. As energy, economics, and

technology undergo shifts in emphasis, environmental considerations are becoming increasingly crucial. Homes are built to protect individuals from physical, biological, and chemical hazards; however, housing conditions may be compromised in less developed nations due to poverty, resource scarcity, and harsh living conditions. Housing sanitation refers to the safety and cleanliness of individuals' living spaces. Many people in rural areas live in shelters or houses made of unstable materials lacking water, electricity, and sanitation facilities, exposing them to unhealthy environments, external threats, and severe climatic conditions (Ghosh 2015). Housing sanitation is a priority for public health initiatives as individuals spend most of their time at home, and it is essential for various aspects of health and well-being. In rural areas, household size, education level of the household head, age, gender, and access to water influence latrine usage and accessibility (De, 2018).

The quality of housing is crucial for community well-being. Inadequate housing is associated with infectious diseases such as tuberculosis, stress, and depression, among other health issues. Access to quality housing and a comfortable living environment is essential for everyone. Important aspects of good housing include lighting, ventilation, overall cleanliness, and space. Hygiene contributes to the overall health of a community, reflecting its social and mental well-being (WHO & UNICEF, 2010). To improve environmental hygiene in homes and communities, the current project aims to educate women about environmental hygiene

Hypothesis: There is no correlation between environmental hygiene knowledge, attitude, and practice before and after the Education programme.

Material and Methods

An interventional education study targeting 500 households in a rural area was implemented through an environmental hygienic education training program. The selection of these households was guided by specific exclusion and inclusion criteria. Inclusion criteria comprised women who expressed willingness to partake in the awareness program, whereas exclusion criteria encompassed members who were unwilling to

participate, including males, children, and individuals who were physically or mentally impaired.

"The Effectiveness of a Program to Improve Environmental Hygiene among Selected Households." was undertaken with the vision to improve the quality of life of slum people and enable them to lead healthy and satisfactory life. The procedure of the study comprised the following phases:

Phase I: Situational analysis of the environment hygiene in the selected area.

Phase II: Formulation of course content for environmental hygiene intervention programme.

Phase III: Conduct the environmental hygiene Intervention among women.

Phase IV: Evaluate the Effectiveness of the Intervention programme conducted.

Given the necessity for concurrent questioning and observation of the informant and their surroundings, the present study opted for an interview-plus-observation method. This approach offers the advantage of obtaining firsthand and authentic information. It is a flexible method that allows for explanation, adaptation, variation, and observation as per the specific situation. Additionally, it provides an opportunity to build rapport and saves on time and expenses (Gupta 2016).

Approval from the ethical committee of Institute has been obtained to conduct the study.

Course content used for inculcation of environmental hygienic practices

S. No	Main theme	Course content
1.	Environmental education	Need for environmental education, connectivity between human beings and the environment, present environmental scenario, environmental problems and solutions-types of pollution, health hazards of pollution, population explosion and its effect on the environment, Importance of trees, deforestation, soil erosion, and simple technologies to protect the environment
2	Personal Hygiene and hygienic practices	Neat and tidy appearance, clean skin, sparking teeth, clean dress, well-combed hair, cleanliness of hand, cleanliness of nails, cleanliness of face,

		cleanliness of feet, clean nose, bathing daily, brushing teeth daily, proper toilet practices, washing hands before and after meals, washing hands after toileting with soap, and covering mouth while sneezing or coughing.
	Menstrual hygiene	Keep the genital area clean and free from infections, change the undergarments twice a day, change and wash clothes immediately in the presence of stains, and do not frequently expose the genitals to soaps or other chemicals. Changing pads frequently, keep washing the vagina at regular intervals, disposing of the sanitary pads in the right way; avoiding using the same pad for a long time
3.	safety Food and Health measures	Drinking potable water, covering all food items, Store drinking water in closed containers, intake of boiled water, judicial use of water for cleaning purposes, use of water filtration system and rainwater harvesting, Importance of good health, maintenance of health and regular health check-ups, yoga, meditation, walking, regular eating habits Use clean water while cooking, cleanly way of preparation and storage of food suitable for consumption, nutritious food, use of seasonally based foods.
4.	Role of Individuals to safeguard the Environment	Keeping the Interior and exterior of the house clean, Disposing the waste properly, Inculcating good health habits to children, Using sanitary latrine Aware of government's environment programmes, Motivating others to product environment, Motivating tree plantation, Protect soil erosion and cut the trees and Following hygienic practices.
5.	Managerial practices for a good environment	**Cleanliness of domestic environment** **Cleanliness of interior** Kitchen, wall, roof-removing cobwebs, sweeping floor, arrangement of things, proper ventilation Keeping the kitchen clean without any stagnation of water, clean utensils properly. **Cleanliness of exterior** Front and back yard, sweeping and removing unwanted plants, avoiding dumping of garbage and stagnation of water **The proper method of garbage disposal** Segregation of waste into wet and dry waste, Natural decomposition of food waste, separating paper, plastics, and glass, Use of separate dustbins while disposing of waste Manure pit Using dust bins, and Home composting

		The proper method of wastewater disposal Soak pit, Kitchen garden, Avoid defecation around the house, maintain septic tank properly **Cleanliness of the local environment** Proper drainage, Dust bins in the street, Cleanliness of street, Cleanliness of common latrine

The study took place over a duration of approximately 12 months in Eazhunagarkudiruppu, Kallukkatti, Chengalpattu, Tamil Nadu. Women residing in the selected households served as respondents for this study. A structured education program spanning five consecutive days was conducted to promote environmental hygiene. Participants were provided with a structured questionnaire focusing on their knowledge, practices, and attitudes toward environmental sanitation. Pre and post-evaluations of the participants' environmental hygienic perspectives were conducted using the same questionnaire.

Several initiatives were undertaken to implement environmental sanitation and emphasize its importance to rural residents:

1. Demonstrations utilizing charts, posters, pamphlets, exhibitions, and live demonstrations.
2. Guest lectures delivered by subject matter experts.
3. Talks by invited physicians and medical representatives.

Statistical Analysis

A rating scale was devised to assess the knowledge, attitude, and practices of the selected women regarding environmental hygiene concepts. Valid statements were included in the scale, and items were graded on a three-point scale based on the nature of the problem. To ensure the validity of the scale, ten professionals from various fields, including educationists, environmentalists, extension workers, and homemakers, were consulted. They were asked to rank the statements under each area according to their importance. The rating scale categorized assessments as poor, fair, and good. For knowledge assessment, the criteria were set as follows: Good (>5), Fair (3 to 5), Poor (<3). For attitude assessment, the criteria were: Good (>32), Fair (28 to 32), Poor (<28). In practice assessment, the values were:

Good (>16), Fair (12 to 16), Poor (<12). The effectiveness of the education program in promoting a hygienic environment was statistically evaluated using paired t-tests. This test examines the magnitude of differences within pairs and prioritizes pairs with larger differences over those with smaller differences. The significance of the differences was determined by the p-value ($p<0.01$), indicating whether the observed differences were statistically significant.

Results and Discussion

There is a pressing need for environmental hygiene measures in many rural areas across the nation. This program targeted 500 rural homes to educate them on various aspects of environmental cleanliness. The evaluation focused on measuring the disposition, expertise, and methods employed in addressing environmental hygiene issues.

Socio-demographic profile of the selected households

Social demography explores population composition and changes, examining how they intersect with sociological variables on both individual and contextual levels. It utilizes demographic approaches and methods to understand social, economic, and political phenomena. In this study, demographic variables such as age, family type, family size, education, occupation, family income, and frequency of monthly health check-ups were considered for analysis. Tables 1 and 2 provide an overview of the socio-demographic profile of the selected households in the rural area of Eazhunagar kudiruppu, Kallukkatti, Chengalpattu, TamilNadu.

Table 1: Age, Educational Qualification, and Occupational Status of Selected Households N = 500

S. No.	Category	Classification	Head of Family	%	Home Maker	%
1.	Age (in years)	21-25	4	1	75	15
		26-30	67	13	92	18
		>=31	429	86	333	67

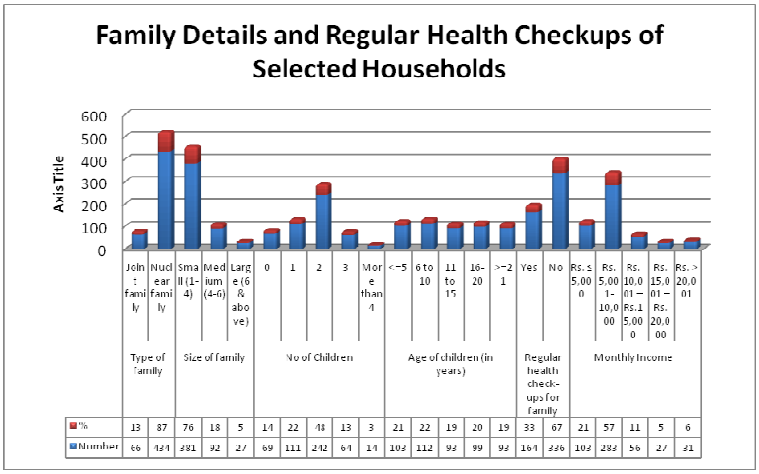
2.	Education	Illiterate	189	38	131	26
		Primary	62	12	72	14
		Secondary	181	36	204	41
		High secondary	23	5	44	9
		Graduate	8	2	8	2
		Postgraduate	31	6	34	7
		Diploma	6	1	7	1
3.	Occupational Status	Agriculture	49	10	20	4
		Daily laboured	344	69	66	13
		Homemaker	0	0	209	42
		Maid /Cook	32	6	160	32
		Self-employed	75	15	45	9

Among the selected households, the majority of 86 per cent of the family heads and 67 per cent of homemakers belonged to the age group greater than 31 years. Educational backgrounds have had an impact on economic status and, the lifestyle of an individual. Changes in lifestyle have effects on health. The analysis of the educational status of the respondents shows that the majority of 38 per cent of heads of family were illiterate, whereas 41 per cent of homemakers and 36 per cent of heads of the family have completed their secondary education. It was clearly stated that 8 per cent of both heads of family and homemakers have completed their graduation, six per cent of the heads of family, and seven per cent of homemakers were postgraduates. They also trained through social media for their personal care in the period of lockdown.

The occupation of the respondents was also analysed and presented in the above table. The majority of 69 per cent of men and only 13 per cent of women were working as daily labourers, and the majority of 42 per cent of women were homemakers, and none of the men were homemakers.

Similarly, a survey on environmental sanitation in 315 households from the village of Narjamandap in Nepal was conducted. The study suggested that gaps still exist in maintaining proper environmental hygiene, thus recommended to promote specific environmental interventions (Bandhari et al., 2019).

Table 2: Family Details and Regular Health Checkups of Selected Households



A joint family is a type of extended family composed of parents, their children, and the children's spouses and offspring in one household. Irrespective, a majority of 87 per cent of them belong to the nuclear family. A maximum of 76 per cent of respondents were living in a small family (1-4) size and 18 per cent of respondents were living in a medium family (4-6) and only five per cent of respondents belonged to a large family (6 and above).

Regarding the number of children of the respondents, 48 per cent have two children, 22 per cent with one child, 14 per cent do not have children, 13 per cent have three children and three per cent have more than four children. The age details of the children were also studied. The respondents have children of all ages. 21 per cent were under the age of 5, 22 per cent were between the ages of 6 and 10, 19 per cent were between the ages of 11 and 15, 20 per cent are between the ages of 16 and 20, and 19 per cent were 21 and older. The number of respondents who have regular medical checkups or not is also studied. 33 per cent of respondents are under regular health check-ups, and 67 per cent of respondents were not under regular health check-ups. Regarding family income, 57 per cent of the respondent's family income was between Rs 5,000 and Rs 10,000/-. 21per cent of respondents have a family income less than or equal to Rs 5,000,

11 per cent have a family income in the range of Rs 10,001 to Rs 15,000, 6 per cent have a family income above Rs 20,001.

Community participation plays a vital role in health or environmental-related projects. A total of 100 people from Tanzania were engaged in an environmental-health-related study. Questionnaires, interviews, discussions, and analysis were used as a tool to collect the empirical data (Mketo et al., 2022).

Effectiveness of Intervention programme on environmental hygiene among selected women

Intervention is an intentional action (singular or collective) designed for an individual, a community, or a region that alters behaviour, reduces risk, or improves outcomes. Interventions can include medical or behavioural therapy, natural or built environment modification, engineering controls, public health policy, public health programmes, health communication, or public health law. Effectiveness refers to the intervention's ability to do more good than harm for the target population in a real-world setting.

Outcomes and impacts are the results of public health interventions, including effects that people experience and care about, such as a change in the ability to function, improved health, quality of life, satisfaction, or cost. Comparison of knowledge, attitudes, and practices of respondents on environmental hygiene. Hence, the effectiveness of the intervention programme conducted among selected women on environmental hygiene was assessed and presented under the following headings:

1. Relationship of knowledge scores with attitudes and practices in environmental hygiene

2. Frequency and percentage distribution of respondents' knowledge, attitudes, and practices on environmental hygiene.

Comparison of selected women's knowledge of environmental hygiene

Knowledge is the fact or condition of knowing something through familiarity gained through experience or association. Knowledge makes it easy to solve the problem and helps enhance the ability to think diversely. Hence, it is essential to

identify the level of knowledge possessed by the respondents before and after the training programme (Table 3).

Table 3: Comparison of selected women's knowledge of environmental hygiene N = 500

Variable	Impact of intervention	Mean	SD	t value	p value
Knowledge of environmental hygiene	Before	4.57	1.602	27.69	0.000**
	After	10.23	4.422		
** p<0.01 level					

Daily bathing is one aspect of personal hygiene knowledge that includes washing the hands with soap after going to the toilet, brushing the teeth twice daily, and covering the mouth and nose when sneezing or coughing. The interior hygiene, such as keeping living areas, food preparation areas, bathrooms, and and bedrooms to remove dirt and comfortable, as well as efficiently cleaning laundry items, and the exterior environment, such as waste management practices were analysed before and after the awareness. The result showed that there was a significant difference after the training programme like issuing of pamphlet (27.96) due to the effectiveness of the education programme and also the involvement and keenness of the respondents to learn and change their environmental conditions.

Similarly, cognitive interviews in correlation to sanitation and hygienic practices were conducted with women participants from the area of Tiruchirapalli, India. This analysis highlighted the importance of sanitation-related decisions that must start with women of our nation and they also valued sanitation practices for the good hygienic environment (Doma *et al*., 2023).

Comparison of selected women's attitudes toward environmental hygiene

Attitude is a mental position with regard to a fact or state. Attitude is the basis for everything and determines how we react to adversity, grow, learn & overcome challenges, and create bonds with others. Table 4 explains the practices of environmental hygiene before and after the education programme.

Table 4: Comparison of respondent's attitudes of environmental hygiene N = 500

Variable	Impact of intervention	Mean	SD	t value	p value
Attitudes on environmental hygiene	Before	30.15	3.663	9.303	0.000**
	After	32.85	5.964		
** p<0.01 level					

The findings suggest that enhancing hygienic attitudes may play an important role in promoting hygienic behaviour among the selected households. A hygienic education programme in connection with preventive health examinations might also contribute to activating hygienic-promoting behaviour. Hence, in the aspect of attitude towards hygiene, there was a significant difference (9.303) found after the intervention.

A community-based cross-sectional study was conducted with 422 participants from Ethiopia by random sampling technique. The knowledge, attitude, and practice associated with wastewater management were analysed in the selected area. Various factors such as house rent and civil servants were associated with the knowledge of the participants while good knowledge and space availability were connected with the attitude of the participants and the positive attitude was in connection with good practice of the selected participants. There was a lack of practice, attitude, and knowledge among the participants. In most cases, hygienic treatments are required. (Kabito *et al*., 2022).

Comparison of household practices on environmental hygiene

Environmental hygiene includes the use of safe drinking water, personal hygiene, proper refuse, and liquid waste management, provision of food safety, and healthful housing the practice of environmental hygiene before and after the training programme was assessed. The statistical difference in the practice of environmental hygiene is represented in table 5.

Table 5: Ccomparison of household practices on environmental hygien N = 500

Variable	Impact of intervention	Mean	SD	t value	p value
Practices of environmental hygiene	Before	14.26	2.653	20.277	0.000**
	After	23.31	9.976		
** p<0.01 level					

In the aspect of practices on health, food, and sanitation before and after the intervention, there is a significant difference (20.27) since the respondents realised the importance and role of safeguarding the interior and exterior environment to promote individual, family, community, and overall well-being of the society.

A cross-sectional and descriptive study was conducted with 135 participants with random sampling in the place of South Africa. The findings might make it easier to implement a programme for knowledge improvement that incorporates a formal training curriculum and standard operating procedures. The findings of the study cannot be applied to the entire nation; thus, it is suggested that a nationwide survey of similar occurrences be taken into consideration (Thompson *et al*., 2022).

Relationship of knowledge scores with attitudes and practices on environmental hygiene before and after intervention

The positive correlations between knowledge & attitude, knowledge & practice, and attitude & practice in this study reaffirm the relationship between knowledge, attitude, and practice with infection control measures. It is concluded that adequate knowledge can lead to a positive attitude and good practices. The relationship between environmental hygiene before and after the programme was evaluated on the basis of knowledge, attitude, and practices. The results are summarised in Table 6.

Table 6: Relationship of knowledge scores with attitude and practices on Environmental hygiene before and after Intervention N = 500

Variables	Before			After		
	Knowledge	**Attitude**	**Practice**	**Knowledge**	**Attitude**	**Practice**
Knowledge	1	.183**	-.002	1	.324**	.671**
Attitude	.183**	1	-.045	.324**	1	.303**
Practice	-.002	-.045	1	.671**	.303**	1
**. Correlation is significant at the 0.01 level						

Before the intervention, there is a significant positive correlation between knowledge and attitude respondents (.183), whereas there is no significant correlation between knowledge & practice or attitude & practice. After the intervention, there is a significant positive correlation between knowledge, attitudes, and practices. The correlation between knowledge and attitude is .324, the correlation between knowledge and practice is .671, and the correlation between attitude and practice is .303. Based on the results, the positive correlations between knowledge & attitude, knowledge & practice, and attitude & practice were clearly observed. This confirms the relationship between knowledge, attitude, and practice in relation to infection control measures. It is concluded that adequate knowledge can result in a positive outlook and ethical conduct.

A cross-sectional study was designed to involve individuals over 18 years of age living in Thandalam village, Chennai, India. Basic information about socio demographic profiles and existing drinking water and sanitation-related knowledge, attitude, and practices were collected using a modified version of a previously validated questionnaire and analysed. 45% of the participants were not following any methods of water treatment and among them, half of the participants felt that water available to them was clean and did not require any additional treatment. 25% of the participants surveyed did not have access to toilets inside their households. There is a need for intervention to educate individuals about drinking water treatment methods, sanitation, and hand-washing practices (Kuberan *et al*., 2015).

Conclusion

The research highlights that overpopulation, poverty, illiteracy, lack of understanding, and inadequate environments are exacerbating environmental degradation. It emphasizes that educating people on good environmental hygiene practices is crucial for inspiring action toward the planet's future. There's a clear call for more environmental education to equip community groups and individuals with foundational knowledge about the environment and its associated challenges. Furthermore, the study recommends repeated hygiene promotion programs for rural populations to actively participate in promoting sanitation and hygienic practices. Targeting women for health and hygiene education is particularly emphasized, as they can serve as effective conduits for disseminating information within their communities. Sanitation promotion programs that target women at home in their respective areas are seen as effective ways to address their needs and problems while promoting positive hygiene practices.

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