A STUDY TO EVALUATE THE EFFECTIVENESS OF INFORMATION, EDUCATION, AND COMMUNICATION ON MALARIA AND ITS PREVENTION AMONG PEOPLE RESIDING AT UDALPUR VILLAGE, MEHSANA

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ABSTRACT

Background: Malaria is a major public health problem, especially in rural settings with poor access to health information. Information, Education, and Communication (IEC) activities are important in enhancing knowledge and awareness of malaria prevention and control. The current study sought to evaluate the effectiveness of IEC in increasing malaria awareness among people living in Udalpur village.

Methods: A one-group pretest-posttest pre-experimental research design was utilized, wherein a sample size of 30 participants was identified using a non-probability convenient sampling approach. A standard self-administered questionnaire assessed the level of knowledge among the participants prior and subsequent to IEC intervention. Descriptive as well as inferential statistics viz. mean, standard deviation, and paired t-test were employed to analyze data in order to determine the outcome of the intervention.

Results: Pretest results showed that 50% of the respondents had poor knowledge, 26.66% had moderate knowledge, 16.66% had average knowledge, and a mere 6.66% had good knowledge about malaria and its prevention. After the intervention, a tremendous improvement was noted with 40% of the respondents showing good knowledge and the poor knowledge reducing to 10%. The average knowledge score went up from 4.3 (SD = 2.9) during the pretest to 20.56 (SD = 3.33) during the posttest with a statistically reliable t-value of 21.6165 ($p < 0.05$).

Conclusion: The results reaffirm that IEC interventions greatly improve malaria prevention knowledge. The inclusion of such educational measures in community health programs can successfully curb malaria and enhance health practices.

I. INTRODUCTION

Malaria is a deadly disease caused by parasites of the genus Plasmodium and transmitted to human beings by the bite of infected female Anopheles mosquitoes. It continues to be a serious public health issue in the tropical and subtropical regions of the globe, where environmental factors facilitate the breeding and survival of the mosquito vectors. Malaria continues to be a serious health threat to human beings globally, with high levels of mortality and morbidity, particularly among the at-risk groups of young children, pregnant women, and people with weakened immunity [1].

Despite spectacular progress in malaria control in recent decades, the disease remains a serious public health issue in much of the world. In 2022, an estimated 249 million cases of malaria and 608,000 deaths were reported worldwide, according to the World Health Organization (WHO). The majority of these cases and deaths were reported in sub-Saharan Africa, where the disease is endemic. India, including the state of Gujarat, continues to report a high number of cases of malaria, although there has been a consistent decline at the national level [2-3].

Malaria is indeed caused by the bite of Anopheles mosquitoes infected with Plasmodium parasites, which invade the human circulation system. The parasites move into the liver, mature, and reproduce before entering the bloodstream to infect red blood cells. The disease of malaria progresses through signs and symptoms of fever, chills, headache, nausea, and body pain. In extremely severe cases, some of the following complications also arise if the disease is left untreated: cerebral malaria, organ failure, acute anemia, and death [4-5].

Malaria is a serious public health problem in India, especially in states like Gujarat, Maharashtra, Rajasthan, Karnataka, and Goa with high parasite incidence rates. Despite a striking decline in the incidence of malaria during the last two decades, outbreaks continue to happen, especially in regions of good climatic conditions for breeding of mosquitoes. Successful control operations, such as vector control, access to health care, and community education, need to be put in place to limit transmission of malaria [6].

As malaria is a preventable illness, prevention measures such as the use of insecticide-treated bed nets (ITNs), indoor residual spraying (IRS), and chemoprophylaxis in high-risk groups have reduced infection. Information, education, and communication (IEC)-based campaigns also play a role in generating awareness about malaria and prevention. Early diagnosis, early treatment, and prevention education within the community help reduce malaria morbidity and mortality [7].

The impact of IEC interventions for improving malaria and prevention awareness and knowledge among individuals of Udalpur village, Mehsana, is to be evaluated in the current research. By examining the pre- and post-intervention comparison among the villagers' knowledge levels and a post-intervention comparison, the research strives to determine the contribution of educational programs in prevention against malaria. The findings from this research shall be a useful source of evidence regarding the efficiency of IEC strategies and would help in favor of further momentum towards the goal of malaria being eliminated as a public health hazard in India. By a systematic process with flashcards, visual representations, pamphlets, and graphs, this study seeks to empower the local community with accurate information about malaria transmission, symptoms, treatment, and prevention. The outcomes of this study shall serve as the foundation for future interventions at the community level to generate awareness and thereby reduce the incidence of malaria in Udalpur village and such settings [8].

II. METHODS

Research Design and Method

The present study applied an evaluative research design to assess the influence of information, education, and communication (IEC) on malaria and prevention of malaria among the population of Udalpur village, Mehsana. An evaluative design was most suitable because it allows systematic measurement of the enhancement of the knowledge level after the educational intervention. The study employed a pre-experimental one-group pretest-posttest research design, through which it was possible to measure the knowledge level before and after providing the IEC activities. The design was employed to identify the influence of the intervention on malaria and prevention methods of malaria among the participants.

Study Setting and Population

The study was conducted in the Udalpur village, Mehsana district. The rural community was selected as the area to evaluate the community's awareness of malaria prevention and to apply specific education interventions. The study population was adult members residing in the selected community, providing a representative sample of socio-demographic factors.

Sampling Method and Criteria

A convenience sampling non-probability sampling method was used to obtain study participants. This is due to the fact that the method was readily available in accessing the available and willing members of the

community for the study. The sample comprised 30 eligible members from Udalpur village. The participants were available members who were present during data collection and were willing to be part of the study. The members who had previously attended malaria awareness programs and the sick members, including children, were excluded from participating.

Data Collection Tool and Procedure

Data was collected using a structured, self-report questionnaire designed to assess knowledge about malaria and prevention. The questionnaire contained two parts: demographic variables and a knowledge section designed to assess knowledge. The knowledge section consisted of 30 multiple-choice questions with one mark for a correct answer and zero marks for an incorrect answer. The score ranged from 0 to 30, and the levels of knowledge were divided into three: poor (0–10), average (11–20), and good (21–30).

Before data collection, administrative formal permission was obtained from the medical officer of the Udalpur community health center. The study was conducted on 22nd October and the participants were brought together in a particular community setting. Pre-test was conducted to identify baseline knowledge, and then the IEC intervention was administered in the form of educational materials such as charts, flashcards, and pamphlets. The intervention covered malaria transmission, symptoms, prevention, and treatment. Post-test was conducted after the educational session using the same questionnaire to identify change in knowledge levels. The total time spent in data collection, including pre-test and post-test sessions, was approximately 30 minutes per participant.

Content Validity and Reliability

To ascertain the validity of the data collection instrument, the questionnaire was piloted among a panel of four nurses and one doctor. The experts checked the instrument for completeness, relevance, and sufficiency. Following their comments, any necessary adjustments were done to enhance clarity and effectiveness. Instrument reliability was confirmed using the inter-rater approach, which provided a reliability coefficient of 0.07, to ensure consistency in the measurement of knowledge levels.

Pilot Study

A pilot test was carried out to determine the feasibility and usefulness of the research design. Pilot testing was done on a small group of participants from Udalpur village and separate from the main research sample. The pilot study served as a prelude to describing the process of data collection to prevent any confusion in questionnaire administration and intervention presentation. Pilot testing results showed the methodology to be feasible and functional for the main research.

Data Analysis Plan

Data were analyzed systematically using descriptive and inferential statistical analysis. Descriptive statistics such as frequency, percentage, mean, and standard deviation were applied to give demographic information and levels of knowledge. Inferential statistics in the form of paired t-tests were employed to compare pre-test and post-test scores to ascertain the efficacy of the IEC intervention. Chi-square tests were employed to ascertain the relationship between demographic variables and pre-test knowledge scores. The analysis was undertaken to offer an insight into the influence of IEC strategies on malaria awareness in the rural community.

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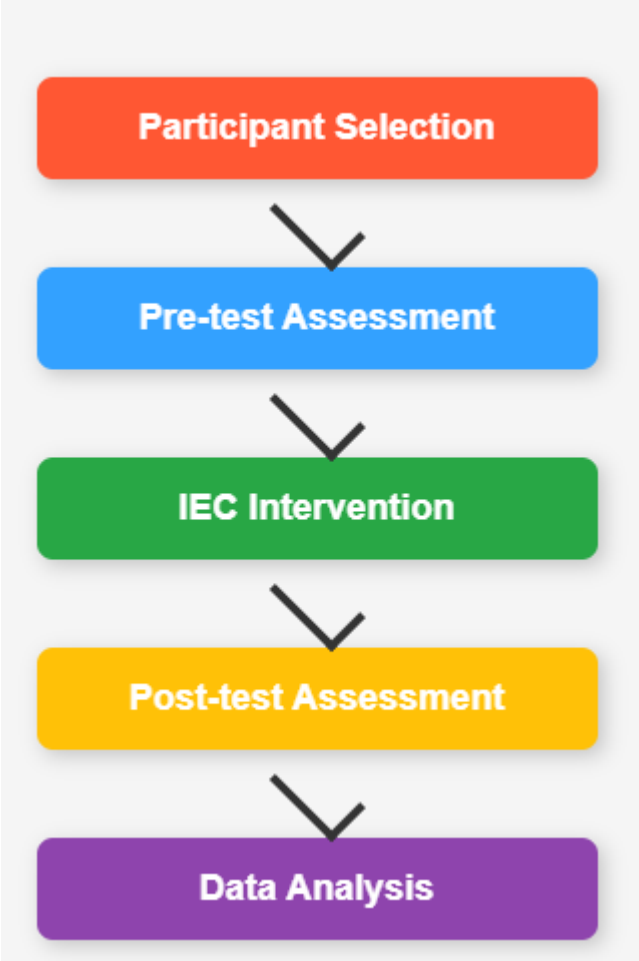

Figure 1: Flow Diagram of Study Methodology

III. RESULTS

This chapter reports the analysis and interpretation of the data collected. The findings are organized in a systematic manner to address the research questions and offer insights into the study. Descriptive and inferential statistics were used to analyze the data to determine the effectiveness of IEC intervention on malaria prevention. The findings are reported under three sections:

- **Section A:** Frequency and percentage distribution of demographic variables
- **Section B:** Comparison of pre-test and post-test knowledge scores
- **Section C:** Association of knowledge levels with selected demographic variables

Section A: Demographic Characteristics of Participants

Table 1 presents the frequency and percentage distribution of participants based on demographic characteristics such as age, gender, language, education, marital status, and occupation.

Table 1: Frequency and Percentage Distribution of Socio-Demographic Variables

Sr. No	**Demographic Variables**	**Frequency (N=30)**
	Age	
21-30 years	6	20%
31-40 years	8	26.66%
41-50 years	9	30%
51-60 years	7	23.33%
	Gender	
Male	12	40%
Female	18	60%
	Language	
Gujarati	26	86.66%
Hindi	4	13.33%
	Education	
Graduate	6	20%
H.S.C	15	50%
Illiterate	9	30%
	Marital Status	
Married	23	76.66%
Unmarried	7	23.33%

	Occupation	
Farmer	18	60%
Government Job	5	16.66%
Private Job	7	23.33%

The results show that the highest number of participants (30%) belonged to the age group of 41-50 years, followed by the least represented age group of 21-30 years (20%). In terms of gender, the highest number of participants were female (60%), and 40% were male. The most common language spoken was Gujarati (86.66%), followed by Hindi (13.33%). In terms of education, 50% had higher secondary education, and 30% were illiterate. Most (76.66%) of the participants were married, and the majority of them were farmers (60%) by occupation.

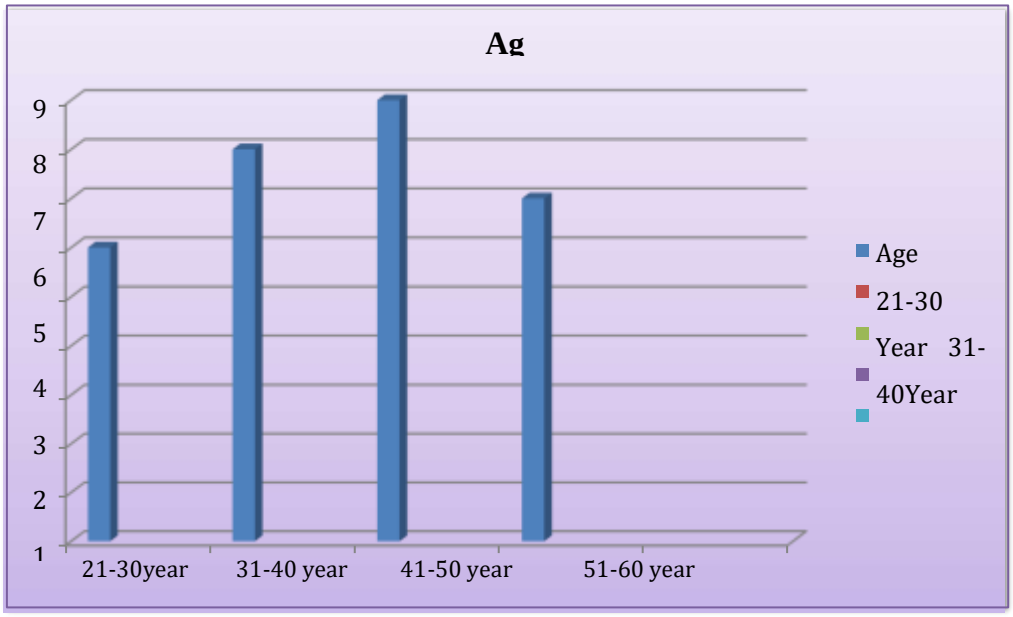

Figure 1: Column Diagram Showing Percentage Distribution of Age Groups

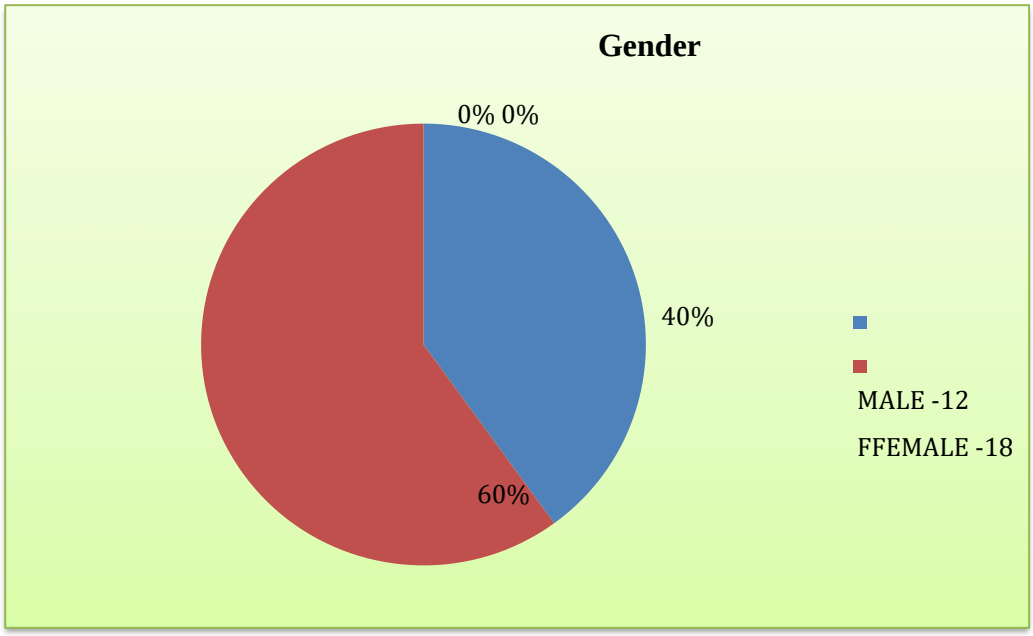

Figure 2: Pie Chart Showing Gender Distribution

Section B: Pre-Test and Post-Test Knowledge Comparison

The effectiveness of the IEC intervention was assessed by comparing pre-test and post-test knowledge scores among the participants. The findings are presented in Table 2.

Table 2: Comparison of Pre-Test and Post-Test Knowledge Scores

Level of Knowledge	Pre-Test Frequency (%)	Post-Test Frequency (%)
Poor (0-10)	15 (50%)	3 (10%)
Average (11-20)	8 (26.66%)	4 (13.33%)
Moderate (21-25)	5 (16.66%)	11 (36.66%)
Good (26-30)	2 (6.66%)	12 (40%)

The findings show that before the intervention through IEC, 50% of participants possessed poor knowledge and 6.66% possessed good knowledge. But post-intervention, the number of participants with good knowledge rose to 40% and those with poor knowledge went down considerably to 10%. This shows the positive effect of the IEC program on increasing malaria prevention knowledge.

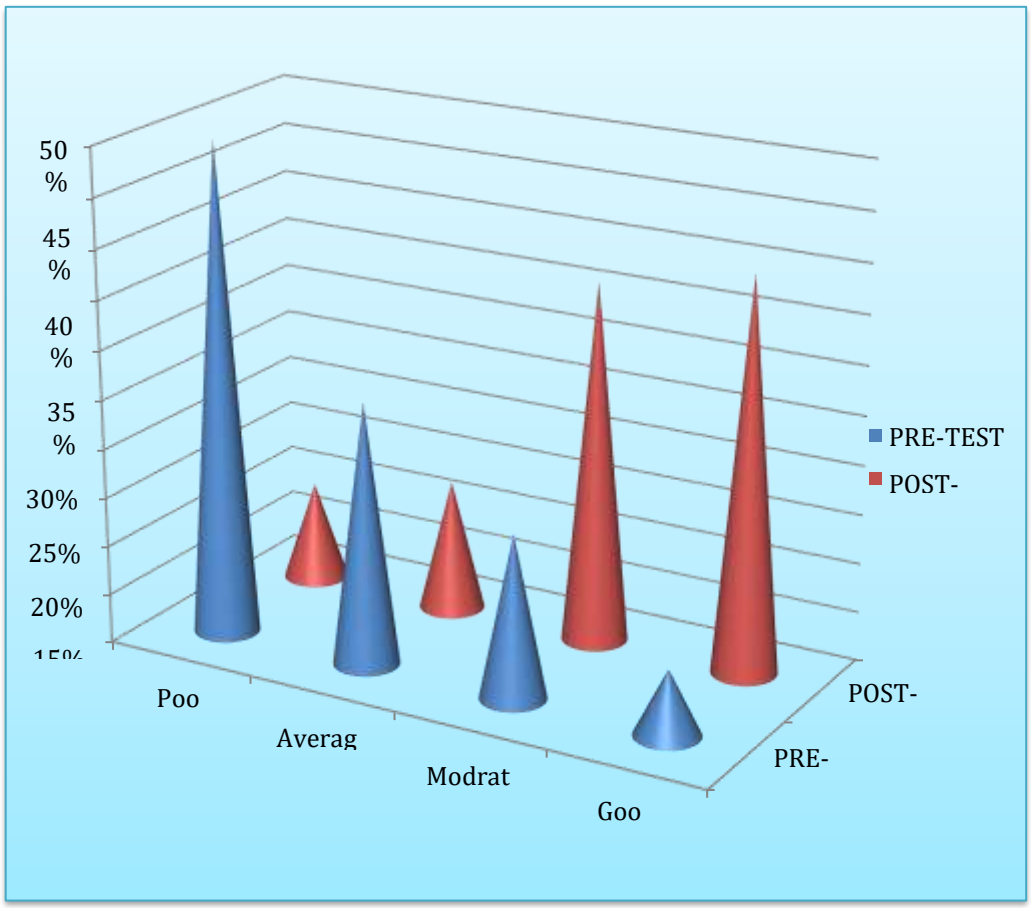

Figure 3: 3D Cone Diagram Showing Pre-Test and Post-Test Knowledge Levels

Further statistical evaluation was conducted to assess the significance of the knowledge improvement. The results are presented in Table 3.

Table 3: Effectiveness of IEC Intervention Based on Mean, Standard Deviation, and t-Value

Parameter	Mean	Standard Deviation	Mean Difference	Calculated t-Value	Table t-Value (0.05)
Pre-Test	4.3	2.91	16.26	21.6165	Significant ($p < 0.05$)
Post-Test	20.56	3.33			

The study revealed that the pre-test mean score of knowledge increased from 4.3 in the pre-test to 20.56 post-test. Calculated t-value (21.6165) was more than the table value at 0.05 level of significance, establishing beyond doubt that IEC intervention made a difference towards enhancing the prevention of malaria in the respondents.

Section C: Association Between Knowledge and Selected Demographic Variables

A chi-square test was run to identify whether there was significant association between level of knowledge and chosen demographic characteristics like age, gender, language, education, marital status, and occupation. The findings are presented in Table 4.

Table 4: Association Between Knowledge Levels and Demographic Variables

Sr. No	Demographic Variable	Chi-Square Value	Significance (p<0.05)
1	Age	0.742	Not Significant
2	Gender	0.089	Not Significant
3	Language	2.65	Not Significant
4	Education	0.543	Not Significant
5	Marital Status	0.312	Not Significant
6	Occupation	0.032	Not Significant

The chi-square test outcomes reveal that there was no statistical association between the levels of knowledge and any of the chosen demographic variables ($p > 0.05$). This implies that the efficacy of IEC intervention was not affected by age, gender, language, education, marital status, or occupation.

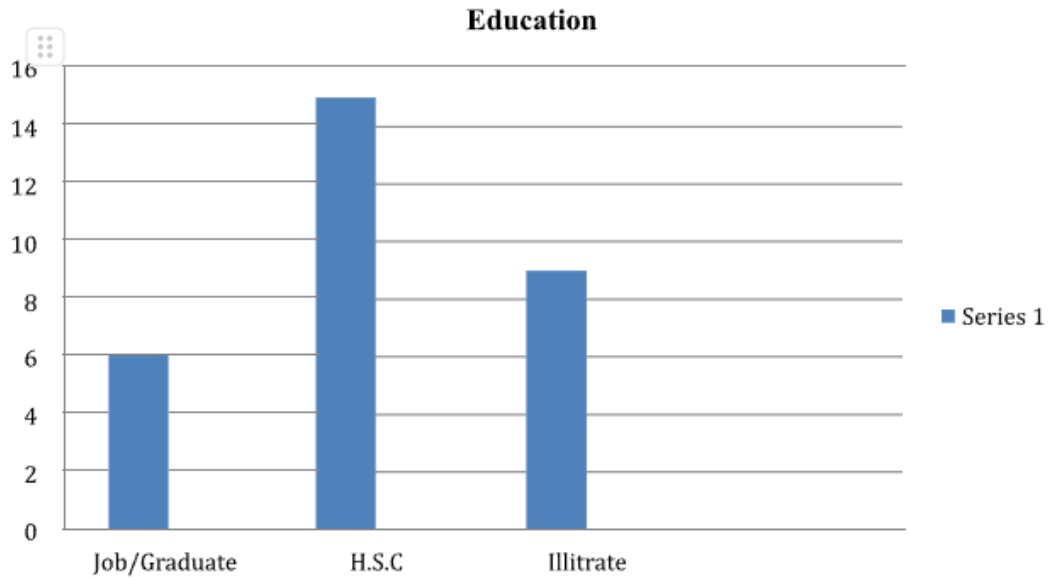

Figure 4: Column Diagram Showing Percentage Distribution of Education Levels

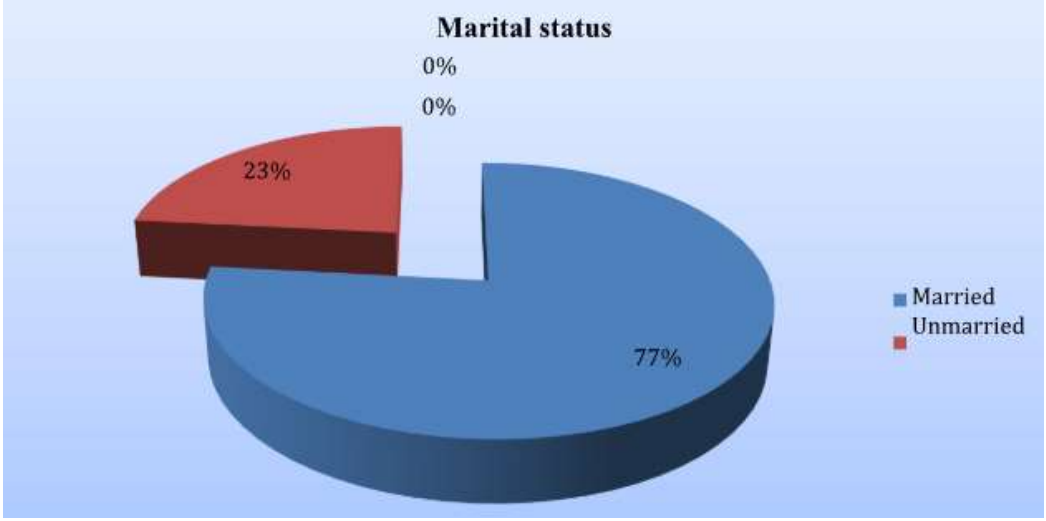

Figure 5: Pie Chart Showing Percentage of Marital Status

Findings from the research show that the IEC intervention was efficient in enhancing knowledge about malaria prevention among participants. During pre-tests, poor levels of knowledge among most participants were reflected, but after the intervention, considerable improvement was experienced. The statistical analysis revealed that the improvement in knowledge was significant. In addition, demographic factors did not significantly influence the level of knowledge, suggesting that IEC interventions can be uniformly implemented across populations for successful health education.

IV. DISCUSSION

This study was conducted to evaluate the effectiveness of Information, Education, and Communication (IEC) regarding malaria prevention among the residents of Udalpur village. The findings have been analyzed and discussed in relation to the study objectives, theoretical framework, and literature review. A total of 30 participants were selected for the study, categorized based on their initial level of knowledge about malaria. The findings show remarkable increases in malaria knowledge after the introduction of the IEC program.

Pre-test knowledge levels assessment indicated that the majority of participants had poor awareness on malaria and prevention. A total of 50% of the respondents had poor knowledge and 26.66% had average knowledge. The rest of the participants (6.66%) showed good knowledge prior to the intervention. These results show that the awareness of malaria among the community was mostly low, highlighting the need for specific educational interventions to close this knowledge gap. Poor perception of malaria transmission, symptoms, and prevention measures may lead to increased infection rates, further highlighting the need for formal health education campaigns [9].

Comparative post-test and pre-test comparison showed a significant improvement post-IEC intervention. Post-test results indicated a significant reduction in the percentage of poor-knowledge participants from 50% to 10%. The percentage of good-knowledge participants improved from 6.66% to 40%. This improvement signifies that the IEC program efficiently improved the understanding of malaria and prevention among the participants. Increased awareness indicates the effectiveness of well-planned educational interventions in enhancing health literacy in communities. The efficiency of the IEC program was also confirmed by statistical analysis, which revealed a significant difference in pre-test and post-test knowledge scores. The mean knowledge score was 4.3 in the pre-test and 20.56 in the post-test, with a mean difference of 16.26. The calculated t-value (21.6165) was much greater than the table value, validating that the intervention had a major effect on enhancing knowledge. These results support the hypothesis that IEC measures are effective in raising awareness and knowledge about malaria prevention [10 -11].

The study findings indicate that education is a key factor in disease prevention, especially in rural settings where misinformation and ignorance can be responsible for the persistence of infectious diseases. The results concur with the existing literature that highlights the significance of community-based interventions in malaria control. Different studies have indicated that IEC programs, where well-implemented, can contribute immensely to public health behavior and knowledge. The findings of this study strengthen the imperative of continued health education efforts aimed at empowering communities with facts about malaria prevention and control.

From a medical point of view, the study underlines the importance of nursing professionals playing a role in conveying health-related information. The results suggest that nurses can play an important role in preventing malaria through community education, awareness generation, and organized intervention programs. Improved nursing education and the integration of malaria prevention measures into nursing curricula can further increase the impact of such interventions. Continuous in-service education among healthcare workers can also ensure that they are kept abreast of new strategies for the control and prevention of malaria [12].

The results of this research have far-reaching implications for nursing administration and health policy. Nursing administrators have the responsibility of coming up with procedures for the diagnosis, treatment, and prevention of malaria. Preparing well-planned training courses for health care providers and ensuring there are proper facilities for the promotion of malaria awareness are basic steps in eliminating the disease. Additionally, cooperation between health institutions and community agencies can promote large-scale education to be carried out for malaria prevention [13].

From a research view, the research emphasizes the need for additional investigations into the long-term effects of IEC interventions on the prevention of malaria. Future research is possible with different educational strategies in terms of measuring their effectiveness against each other, and determining mechanisms to incorporate latest technology into health education. Providing incentives to nursing students and medical professionals to study communicable diseases can lead to more effective methods of prevention [14].

The results also suggest wider policy-level recommendations for malaria control. Strategies should aim to eradicate malaria and not just control it, with more emphasis on community participation. Building partnerships among government institutions, health agencies, and communities can optimize malaria prevention campaigns. Increased support for malaria control initiatives, coupled with high community participation, can bring sustainable changes to the awareness and prevention of malaria. Community leaders being empowered and tapping into local resources can further amplify the effectiveness of malaria eradication programs.

Summarily, the research confirms that IEC interventions are strongly effective in enhancing malaria knowledge in rural communities. The large difference in post-test scores of knowledge points to the significance of well-structured training programs in public health. The nurses and the healthcare educators have a pivotal role in the success of such programs, and concerted efforts are essential to incorporate malaria education into community health programs. The results hold great importance for policymakers, health administrators, and researchers in planning effective interventions in malaria prevention and control.

V. CONCLUSION

The research successfully assessed the effect of Information, Education, and Communication (IEC) on malaria knowledge among the people of Udalpur village, indicating a substantial increase in levels of knowledge post-intervention. The results proved that before the IEC intervention, a significant number of participants lacked proper awareness about malaria, and there was a need for organized educational programs. Post-intervention findings indicated a significant increase in knowledge, with statistical testing affirming the efficacy of the IEC method in improving public awareness of malaria prevention. The research highlights the importance of health professionals, and nurses in particular, in spreading correct health

information and conducting education programs to empower communities. It also underscores the need for incorporating malaria education into health policies, enhancing community involvement, and promoting research-based methods for preventing disease. These results enjoin continued efforts towards malaria awareness and control, calling for ongoing public health interventions to guarantee long-term gains in malaria decline.

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