

Knowledge, Attitudes, and Preventive Practices Regarding Acute Febrile Illness Among Adults in the Bareilly Region, India: A Cross-Sectional Study.

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Abstract

Background: Acute febrile illness (AFI) is one of the leading causes of outpatient visits and hospital admissions in tropical and subtropical countries, including India. The overlapping clinical manifestations of dengue, malaria, enteric fever, leptospirosis, scrub typhus, and other infectious diseases make early diagnosis challenging. Community knowledge, attitudes, and preventive practices (KAP) play a crucial role in reducing disease transmission, promoting early healthcare-seeking behaviour, and improving treatment outcomes. However, evidence on KAP regarding AFI, a broad clinical syndrome, remains limited in northern India. **Objectives:** To assess the knowledge, attitudes, and preventive practices regarding acute febrile illness among adults residing in the Bareilly region of Uttar Pradesh and to determine the association between selected sociodemographic characteristics and KAP levels. **Methods:** A community-based cross-sectional study was conducted among 400 adults aged ≥ 18 years using a structured, pre-tested questionnaire. Information regarding socio-demographic characteristics, knowledge, attitudes, and preventive practices related to AFI was collected through face-to-face interviews and online surveys. Descriptive statistics, Chi-square tests, and Pearson correlation analyses were performed using SPSS, with statistical significance set at $p < 0.05$. **Results:** The mean age of participants was 35.42 ± 7.79 years, and 56.0% were male. Only 9.0% of participants demonstrated good knowledge regarding AFI, whereas 57.0% exhibited positive attitudes and 49.0% reported good preventive practices. Knowledge level was significantly associated with gender, educational status, and place of residence ($p < 0.05$). Similar significant associations were observed for attitude and practice scores. Pearson correlation analysis demonstrated significant positive correlations between knowledge and attitude ($r = 0.317$, $p < 0.001$) and between attitude and practice ($r = 0.329$, $p < 0.001$), whereas knowledge and practice were not significantly correlated ($r = 0.056$, $p = 0.268$). **Conclusion:** Knowledge regarding acute febrile illness among adults in the Bareilly region was inadequate despite relatively favourable attitudes and preventive practices. Educational status and place of residence significantly influenced KAP levels. Community-based health education programmes and strengthened public health interventions are required to improve awareness, encourage early healthcare-seeking behaviour, and reduce the burden of acute febrile illnesses.

Keywords: Acute febrile illness; Knowledge; Attitude; Practice; Community health; Infectious diseases; Cross-sectional study; India...

INTRODUCTION

Acute febrile illness (AFI) is one of the most common clinical syndromes encountered in primary care and hospital settings worldwide. It is generally defined as the acute onset of fever lasting less than two weeks without an immediately identifiable focus of infection. AFI comprises a heterogeneous group of infectious diseases caused by viral, bacterial, parasitic, and rickettsial pathogens, many of which present with overlapping clinical manifestations, making early diagnosis challenging, particularly in resource-limited settings [1,2].

In tropical and subtropical countries such as India, AFI remains a major public health concern because of the endemic occurrence of dengue, malaria, chikungunya, scrub typhus, leptospirosis, and enteric fever. Seasonal rainfall, rapid urbanization, climate variability, poor sanitation, and increasing population density have contributed to the sustained transmission of these infections. Recent epidemiological evidence indicates that AFI accounts for a substantial proportion of outpatient visits and hospital admissions in India, imposing a considerable burden on healthcare systems [3,4].

Despite advances in microbiological and molecular diagnostic techniques, establishing the etiology of AFI remains difficult because of nonspecific clinical presentations and limited access to advanced diagnostic facilities in many healthcare settings. Systematic reviews have demonstrated that numerous diagnostic tests are often required for AFI evaluation, yet a considerable proportion of cases remain undiagnosed, resulting in empirical treatment and inappropriate antimicrobial use [5].

Knowledge, attitudes, and health-related practices of the community play a critical role in the prevention and control of infectious diseases responsible for AFI. Appropriate awareness regarding disease transmission, early recognition of warning symptoms, adoption of preventive measures, and timely healthcare-seeking behaviour can reduce disease severity, interrupt transmission, and improve clinical outcomes. Conversely, poor knowledge, misconceptions, delayed healthcare-seeking, and irrational self-medication may increase morbidity and contribute to antimicrobial resistance [6,7]. The World Health Organization has emphasized that community awareness, surveillance, and early case recognition remain fundamental components of infectious disease prevention and control programmes [8,9].

Knowledge, Attitude, and Practice (KAP) surveys are widely employed in public health research to assess community awareness and behavioural patterns related to disease prevention. These studies help identify misconceptions, behavioural barriers, and vulnerable population groups, thereby providing evidence for designing targeted health education programmes and public health interventions [2,4]. Although several Indian studies have evaluated awareness regarding individual diseases such as dengue or malaria, comparatively few have assessed community knowledge and preventive practices related to acute febrile illness as a broader clinical syndrome, particularly in northern India [5,10].

Bareilly district of Uttar Pradesh experiences recurrent seasonal outbreaks of infectious diseases associated with acute febrile illness. However, published evidence regarding community knowledge, attitudes, and preventive practices toward AFI in this region remains limited. Therefore, the present community-based cross-sectional study was undertaken to assess the knowledge, attitudes, and practices regarding acute febrile illness among adults residing in the Bareilly region of Uttar Pradesh, India, and to determine the association between selected sociodemographic characteristics and KAP scores. The findings are expected to support evidence-based health education strategies and strengthen community-level interventions aimed at reducing the burden of acute febrile illness.

MATERIALS AND METHODS

Study Design and Setting

A community-based cross-sectional study was conducted among the general population of Bareilly district, Uttar Pradesh, India. Bareilly is one of the major districts in northern India, comprising both urban and rural populations with diverse socioeconomic and educational backgrounds. The study was designed to assess the knowledge, attitudes, and preventive practices regarding acute febrile illness (AFI) among adults residing in the study area.

Study Population

The study included adults aged **18 years and above** who had been residing in the Bareilly region for at least six months before the commencement of the study. Individuals who were unable to communicate effectively, had cognitive impairment or severe illness, or declined to provide informed consent were excluded from participation.

Sample Size and Sampling Technique

The sample size was calculated with the help of a software named “Raosoft”. The population of Dist Bareilly, according to the census 2011, was considered to calculate the sample size, i.e. 384, with a margin of error of 5% and a confidence level of 95% by the software; however, additional sampling was carried out to enlarge the study's participant pool to 400 to obtain more precise results [11,12].

Study Instrument

Data were collected using a structured, pre-tested, interviewer-administered questionnaire developed after an extensive review of the available literature on acute febrile illness and Knowledge, Attitude, and Practice (KAP) surveys. The questionnaire was prepared in English and translated into the local language to ensure participant comprehension. A pilot study was conducted prior to the main survey to evaluate the clarity, feasibility, and reliability of the questionnaire. Necessary modifications were incorporated based on participant feedback and expert recommendations [13].

The final questionnaire consisted of four sections:

Section I: Sociodemographic characteristics

Section II: Knowledge regarding acute febrile illness, including causes, modes of transmission, common symptoms, preventive measures, and available treatment.

Section III: Attitudes toward prevention, healthcare-seeking behaviour, and disease control.

Section IV: Preventive practices adopted by participants to reduce the risk of acute febrile illness.

Data Collection Procedure

Eligible participants were approached at their residences or designated community locations by trained investigators. The objectives of the study were explained to all participants, and written informed consent was obtained before enrolment. Face-to-face interviews and online distribution of google forms were conducted using the structured questionnaire. Participant confidentiality and anonymity were maintained throughout the study by assigning unique identification numbers and excluding personal identifiers from the dataset.

Scoring of Knowledge, Attitude, and Practice

The knowledge section consisted of 10 multiple-choice questions, each correct response of knowledge was awarded 1 mark, while incorrect and “don’t know” responses were given 0 marks to avoid guessing bias. The total knowledge score ranged from 0 to 10 [14,15]. The total attitude score ranged from 8 to 24. The attitude section consisted of 8 questions with scores ranging from 1 to 3 depending on the positivity of the response. Based on cumulative scores, participants were categorized as having negative attitude (8–13), neutral attitude (14–18), and positive attitude (19–24) [16]. The practice section included 5 questions assessing real-life preventive behaviors and healthcare-seeking patterns. This scoring reflects the frequency and consistency of healthy practices. Total practice score ranged from 0 to 10. For good practices: Always / Yes have 2 marks, Sometimes / Only if severe have 1 mark, and Never / No have 0 marks [17].

Statistical Analysis

Data were entered into Microsoft Excel and analysed using **Statistical Package for the Social Sciences (SPSS)**. Continuous variables were expressed as mean $\pm$ standard deviation (SD), whereas categorical variables were summarized as frequencies and percentages.

Associations between sociodemographic variables and KAP categories were assessed using the Chi-square test or Fisher's exact test wherever appropriate. Pearson's or Spearman's correlation coefficients were calculated to evaluate the relationship between knowledge, attitude, and practice scores. A two-sided p -value of <0.05 was considered statistically significant [18,19].

Ethical Considerations

Ethical approval for the study was obtained from the Clara Swain Mission Hospital, Bareilly, Uttar Pradesh, India. All participants were informed about the purpose of the study, and written informed consent was obtained before participation. Confidentiality and anonymity of the participants were strictly maintained throughout the study [20].

RESULTS

Sociodemographic Characteristics of Participants

Table 1 presents the socio-demographic characteristics of the 400 participants included in the study. Nearly half of the respondents (49.0%) were in the 31–40 years age group, followed by 28.0% in the 18–30 years age group. The mean age of the participants was 35.42 ± 7.79 years.

Table 1: Demographic Characteristics of Study Participants (N = 400)

Variable	Category	Frequency (n)	Percentage (%)
Age Group (years)	18–30	112	28.0
	31–40	196	49.0
	41–50	68	17.0
	51–60	24	6.0
Gender	Male	224	56.0
	Female	176	44.0
Educational Status	Illiterate	52	13.0

	Primary	80	20.0
	Secondary	32	8.0
	Graduate	108	27.0
	Postgraduate	128	32.0
Place of Residence	Urban	276	69.0
	Rural	124	31.0
History of Recent Fever/Illness	Yes	176	44.0
	No	224	56.0

Association Between Knowledge Level and Demographic Characteristics

Table 2 shows the association between knowledge level regarding Acute Febrile Illness (AFI) and selected socio-demographic characteristics of the study participants.

Table 2: Association Between Knowledge Level and Demographic Characteristics of Participants (N = 400)

Demographic Variable	Category	Good (%)	Moderate (%)	Poor (%)	χ^2	p-value
Gender	Male (n=224)	28 (12.5)	112 (50.0)	84 (37.5)	20.87	<0.001*
	Female (n=176)	8 (4.5)	64 (36.4)	104 (59.1)		
Educational Status	Illiterate (n=52)	4 (7.7)	20 (38.5)	28 (53.8)	54.08	<0.001*
	Primary (n=80)	0 (0.0)	20 (25.0)	60 (75.0)		
	Secondary (n=32)	0 (0.0)	16 (50.0)	16 (50.0)		
	Graduate (n=108)	16 (14.8)	44 (40.7)	48 (44.5)		
	Postgraduate (n=128)	16 (12.5)	76 (59.4)	36 (28.1)		
Place of Residence	Urban (n=276)	32 (11.6)	124 (44.9)	120 (43.5)	9.18	0.010*
	Rural (n=124)	4 (3.2)	52 (41.9)	54 (43.9)		

Association Between Attitude Level and Demographic Characteristics

Table 3 shows the association between Attitude level regarding Acute Febrile Illness (AFI) and selected socio-demographic characteristics of the study participants.

Table 3: Association Between Attitude Level and Demographic Characteristics of Participants (N = 400)

Demographic Variable	Category	Positive (%)	Neutral (%)	Negative (%)	χ^2	p-value
Gender	Male (n=224)	144 (64.3)	56 (25.0)	24 (10.7)	12.84	0.002*
	Female (n=176)	84 (47.7)	60 (34.1)	32 (18.2)		
Educational Status	Illiterate (n=52)	16 (30.8)	20 (38.4)	16 (30.8)	42.67	<0.001*
	Primary (n=80)	36 (45.0)	28 (35.0)	16 (20.0)		
	Secondary (n=32)	16 (50.0)	12 (37.5)	4 (12.5)		
	Graduate (n=108)	68 (63.0)	28 (25.9)	12 (11.1)		
	Postgraduate (n=128)	92 (71.9)	28 (21.9)	8 (6.2)		
Place of Residence	Urban (n=276)	176 (63.8)	72 (26.1)	28 (10.1)	15.31	<0.001*
	Rural (n=124)	52 (41.9)	44 (35.5)	28 (22.6)		

* Statistically significant at $p < 0.05$

3.4. Association Between Practice Level and Demographic Characteristics

Table 4 shows the association between Practice level regarding Acute Febrile Illness (AFI) and selected socio-demographic characteristics of the study participants.

Table 4: Association Between Practice Level and Demographic Characteristics of Participants (N = 400)

Demographic Variable	Category	Good n (%)	Moderate n (%)	Poor n (%)	χ^2	p-value
Gender	Male (n=224)	128 (57.1)	72 (32.1)	24 (10.8)	14.62	0.001*
	Female (n=176)	68 (38.6)	64 (36.4)	44 (25.0)		
Educational Status	Illiterate (n=52)	12 (23.1)	20 (38.5)	20 (38.4)	48.29	<0.001*
	Primary (n=80)	24 (30.0)	36 (45.0)	20 (25.0)		
	Secondary (n=32)	12 (37.5)	12 (37.5)	8 (25.0)		
	Graduate (n=108)	60 (55.6)	36 (33.3)	12 (11.1)		
	Postgraduate (n=128)	88 (68.8)	32 (25.0)	8 (6.2)		
Place of Residence	Urban (n=276)	156 (56.5)	88 (31.9)	32 (11.6)	18.95	<0.001*
	Rural (n=124)	40 (32.3)	48 (38.7)	36 (29.0)		

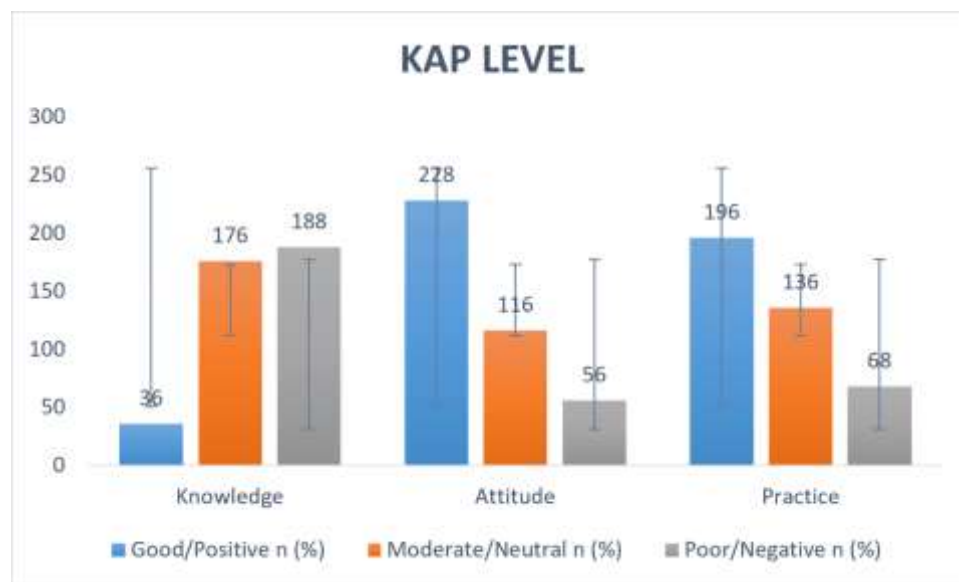
* Statistically significant at $p < 0.05$

3.5. KAP Level Among Participants

Overall, participants demonstrated relatively favorable attitudes (57.0%) and practices (49.0%) toward AFI prevention and management. However, knowledge levels were comparatively low, with only 9.0% demonstrating good knowledge and 47.0% poor knowledge (Table 5). This highlights the need for targeted educational interventions to improve awareness regarding causes, transmission, prevention, and treatment of acute febrile illness (Figure 1).

Table 5: KAP Levels Among Participants (N = 400)

KAP Component	Good/Positive n (%)	Moderate/Neutral n (%)	Poor/Negative n (%)
Knowledge	36 (9.0)	176 (44.0)	188 (47.0)
Attitude	228 (57.0)	116 (29.0)	56 (14.0)
Practice	196 (49.0)	136 (34.0)	68 (17.0)

**Figure 1: KAP level among participants**

3.6. Correlation Analysis between knowledge, attitude, and practice scores

Table 6 shows Pearson correlation analysis which revealed a statistically significant positive correlation between knowledge and attitude scores ($r = 0.317$, $p < 0.001$), indicating that participants with better knowledge regarding acute febrile illness tended to exhibit more positive attitudes toward disease prevention and management (Figure 2).

Table 6: Pearson Correlation Analysis of KAP Scores

Variable Pair	Pearson Correlation (r)	p-value	Interpretation
Knowledge vs Attitude	0.317	<0.001	Moderate positive correlation
Knowledge vs Practice	0.056	0.268	No significant correlation
Attitude vs Practice	0.329	<0.001	Moderate positive correlation

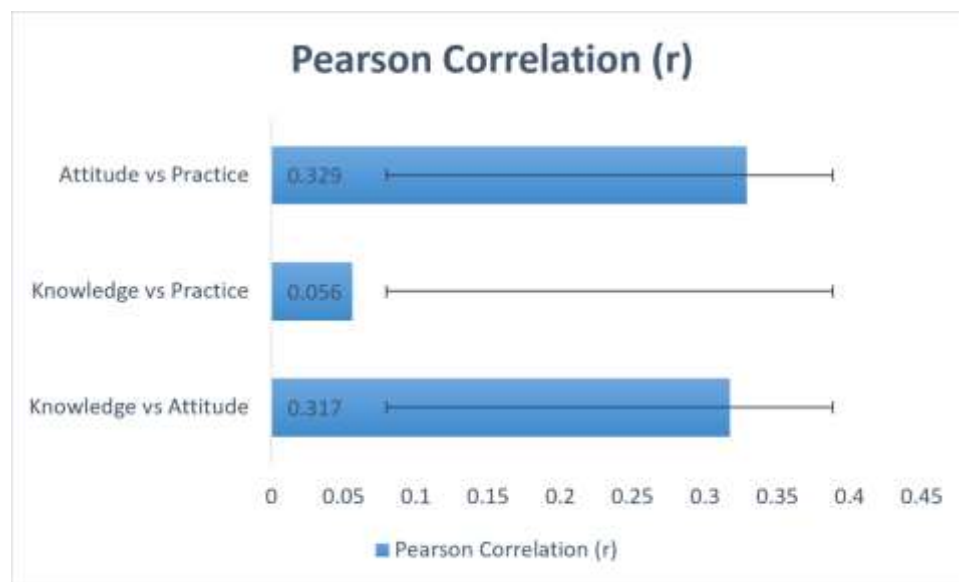


Figure 2: Correlation between KAP level

DISCUSSION

The present study evaluated the knowledge, attitudes, and preventive practices (KAP) regarding acute febrile illness (AFI) among 400 adults residing in the Bareilly region of Uttar Pradesh. The study found that the mean age of participants was 35.42 ± 7.79 years, with the majority belonging to the 31–40-year age group (49.0%), 56.0% being male, 69.0% residing in urban areas, and 32.0% having postgraduate education (Table 1). These demographic characteristics indicate that the study population included adults from diverse educational and residential backgrounds, providing a representative assessment of community awareness regarding AFI [1].

One of the most important findings of the present study was the low level of knowledge regarding acute febrile illness. Only 36 participants (9.0%) demonstrated good knowledge, whereas 176 (44.0%) had moderate knowledge and 188 (47.0%) had poor knowledge. These findings indicate that nearly half of the respondents lacked adequate understanding of the causes, transmission, symptoms, and prevention of AFI. Similar findings have been reported by Bhaskaran et al., who observed that inadequate community awareness contributes to delayed diagnosis and inappropriate management of acute febrile illnesses. Likewise, Robinson and Manabe highlighted that limited public knowledge remains a major obstacle to the early recognition and appropriate treatment of febrile illnesses in resource-limited settings. The poor knowledge observed in the present study suggests an urgent need for structured community education programmes focusing on AFI as a syndrome rather than on individual diseases alone [2].

Knowledge was significantly associated with gender, educational status, and place of residence. Among males, 12.5% had good knowledge compared with only 4.5% of females ($\chi^2 = 20.87$, $p < 0.001$). Similarly, participants with postgraduate education demonstrated substantially better knowledge (12.5% good knowledge and 59.4% moderate knowledge) compared with individuals having only primary education, among whom 75.0% had poor knowledge. Urban residents also exhibited better knowledge than rural residents (11.6% vs. 3.2% good knowledge; $\chi^2 = 9.18$, $p = 0.010$) (Table 2). These findings are consistent with previous KAP studies demonstrating that higher educational attainment and better access to health information improve awareness regarding infectious

diseases. Urban residents generally have greater exposure to healthcare services, educational campaigns, and digital health information than rural populations, which may explain these differences [4,5].

Despite the poor knowledge observed, participants demonstrated relatively favourable attitudes toward AFI prevention. Overall, 228 participants (57.0%) had a positive attitude, 116 (29.0%) had a neutral attitude, and only 56 (14.0%) exhibited a negative attitude. Positive attitudes were significantly more common among males (64.3%) than females (47.7%; $p = 0.002$). Likewise, positive attitudes increased steadily with educational level, ranging from 30.8% among illiterate participants to 71.9% among postgraduates. Urban residents also showed significantly better attitudes than rural participants (63.8% vs. 41.9%; $p < 0.001$) (Table 3). These findings suggest that although disease-specific knowledge was inadequate, participants generally recognized the importance of prevention and early healthcare seeking. Similar observations have been reported in studies on dengue and malaria, where public health campaigns have successfully improved attitudes even when factual knowledge remained limited.

Preventive practices were also relatively encouraging. Nearly half of the respondents (196 participants; 49.0%) reported good preventive practices, while 136 (34.0%) demonstrated moderate practices and 68 (17.0%) had poor practices (Table 4). Good preventive practices were significantly more common among males (57.1%) than females (38.6%; $p = 0.001$). Educational status again showed a strong influence, with 68.8% of postgraduate participants reporting good preventive practices compared with only 23.1% among illiterate individuals. Similarly, urban participants demonstrated better practices than rural residents (56.5% vs. 32.3%; $p < 0.001$) (Table 5). These findings indicate that educational attainment and accessibility to healthcare information play an important role in translating awareness into preventive behaviour [9].

The correlation analysis provided additional insight into the relationship between knowledge, attitude, and practice. A statistically significant positive correlation was observed between knowledge and attitude ($r = 0.317$, $p < 0.001$), suggesting that participants with better knowledge tended to have more favourable attitudes toward disease prevention. Similarly, attitude demonstrated a moderate positive correlation with preventive practices ($r = 0.329$, $p < 0.001$), indicating that positive perceptions may encourage healthier behaviours. However, knowledge was not significantly associated with preventive practices ($r = 0.056$, $p = 0.268$) (Table 6). This finding implies that knowledge alone may not be sufficient to change behaviour, as preventive practices are also influenced by socioeconomic conditions, accessibility of healthcare facilities, public health interventions, cultural beliefs, and environmental factors. Similar observations have been reported in behavioural health research, where attitude often serves as a mediator between knowledge and behavioural change [8].

The findings of this study have important public health implications. The combination of poor knowledge (47.0% poor knowledge) with relatively positive attitudes (57.0%) and acceptable preventive practices (49.0%) indicates that existing health promotion activities may be influencing behaviour without adequately improving disease-specific understanding. Strengthening community education regarding the causes, transmission, early symptoms, warning signs, and timely healthcare-seeking behaviour for acute febrile illness should therefore become a priority, particularly among females, rural residents, and individuals with lower educational attainment.

The present study has several strengths, including a relatively large sample size of 400 participants, inclusion of both urban and rural populations, and comprehensive evaluation of KAP regarding AFI. However, certain limitations should also be acknowledged. The cross-sectional design limits causal inference, the data were self-reported and therefore subject to recall and social desirability bias, and the study was conducted in a single district, which may limit the generalizability of the findings to other regions of India. Future multicentre studies and intervention-based research are recommended to evaluate whether targeted health education programmes can improve knowledge and subsequently strengthen preventive practices.

CONCLUSION

This study demonstrated that knowledge regarding acute febrile illness (AFI) among adults in the Bareilly region was inadequate, with only 9.0% of participants exhibiting good knowledge, despite relatively positive attitudes (57.0%) and good preventive practices (49.0%). Educational status, gender, and place of residence significantly influenced KAP levels, while positive correlations were observed between knowledge and attitude and between attitude and practice. These findings emphasize the need for targeted community-based health education, particularly among rural populations and individuals with lower educational attainment. Strengthening public

awareness, promoting early healthcare-seeking behaviour, and encouraging appropriate preventive measures may contribute to reducing the burden of AFI

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Conflicts of Interest

The authors affirm that no known competing financial interests or personal relationships influenced the work described in this publication.

Ethics Acceptance

The study received ethical approval from Clara Swain Mission Hospital, Bareilly, Uttar Pradesh, India. (Reference No. CSJV/4015/2025, dated:20/09/2025).

Consent to Take Part

Before data collection, each participant in the study gave their informed consent.

Consent to Publish

Each participant permitted for anonymized data to be used for publication and study.

Data and Material Availability

Upon reasonable request, the corresponding author will provide the datasets created and/or analyzed during the current work.

Code Availability

Not applicable.

Authors' Contributions

Pinky Rani: Conceptualization, methodology, data collection, analysis, and manuscript drafting.
Neelanchal Trivedi: Supervision, validation, and critical revision of the manuscript.

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