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Effect of Community Health Education on Eye Health Knowledge, Attitudes, and Practices: A Pre-Test–Post-Test Study in Rural Vijayapura, Karnataka

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Abstract

Avoidable vision impairment remains a significant public health concern, particularly in rural communities where limited awareness and inadequate access to eye-care information and services may contribute to delayed screening and treatment. This study assessed the knowledge, attitude and practice (KAP) regarding the National Programme for Control of Blindness and Visual Impairment (NPCBVI) and examined changes following a community-based health education intervention among residents of Horti, Koluragi and Savalasang villages served by Primary Health Centre (PHC) Horti in Vijayapura District, Karnataka, India. A one-group pre-test–post-test design was adopted, with participants aged 15 years and above selected through systematic random sampling. Data were collected using a structured KAP questionnaire administered through face-to-face interviews. Baseline data were collected from 28 May to 22 June 2025, followed by a multi-site health education programme addressing blindness prevention, cataract, eye screening, eye hygiene, protective eyewear, eye donation and government eye-care services. Post-test data were collected from 24 July to 19 August 2025. Descriptive analysis was performed using frequencies and percentages. The study observed an overall improvement in knowledge, attitudes and selected practices related to NPCBVI and eye health following the community-based health education intervention, although the magnitude of change varied across the three villages. The findings highlight the importance of sustained and locally adapted health education, particularly in communities where awareness and service utilization remain limited. Strengthening community-level communication, screening, referral mechanisms and linkages with primary eye-care services may contribute to improved awareness and utilization of blindness-prevention services in rural populations.

Keywords: National Programme for Control of Blindness and Visual Impairment; NPCBVI; eye health; blindness prevention; knowledge, attitude and practice; community health education; Karnataka.

1. Introduction

Vision is fundamental to education, employment, mobility, social participation and quality of life. The World Health Organization (WHO) reports that at least 2.2 billion people globally live with near or distance vision impairment, and at least 1 billion cases are preventable or remain unaddressed. Refractive error and cataract are among the leading causes of vision impairment and blindness, while

timely access to quality eye care is central to prevention and treatment. WHO therefore emphasizes integrated, people-centred eye care, health-system integration and community awareness as complementary components of effective eye-health strategies (World Health Organization, 2026).

India has a substantial burden of visual impairment. A nationally representative blindness survey conducted during 2015–2019 reported a weighted prevalence of blindness of 1.99% and visual impairment of 26.68% among people aged 50 years and above; cataract accounted for 66.2% of blindness in that age group (Vashist et al., 2022). Earlier population-based research in southern India similarly demonstrated the importance of low-vision services and showed that low vision was associated with increasing age and lower socioeconomic status (Dandona et al., 2002). These findings underline the importance of early detection, referral, treatment and rehabilitation, especially in rural communities.

The National Programme for Control of Blindness and Visual Impairment (NPCBVI) provides a policy and programme framework for preventing avoidable blindness, strengthening eye-care infrastructure and human resources, expanding comprehensive eye-care services and increasing community awareness. The source field-training report identifies disease control, ophthalmic personnel training, information, education and communication (IEC), equipment provision and eye donation/keratoplasty among programme strategies, and highlights cataract surgery, school eye screening, spectacles and management of other eye diseases as programme activities.

Recent evidence from India further demonstrates that access to eye care is influenced by both individual and system-level factors. Studies from southern India have highlighted persistent barriers to accessing services and the potential of integrated and technology-enabled models to improve rural eye-care delivery (Padhy et al., 2024; Chadalavada et al., 2024; Joseph et al., 2024). These findings strengthen the rationale for interventions that combine community awareness with practical pathways to screening and care.

Knowledge and attitudes are closely connected with eye-health service utilization. Evidence from rural South India has shown that person-related barriers, particularly lack of perceived need, can be more important than service-related barriers in explaining non-use of eye-care services, indicating the need for intensive awareness and behaviour-change communication. More recent evidence also emphasizes the influence of beliefs, environmental resources and social influences on eye-care uptake (Marmamula et al., 2014. KAP research in India has likewise shown that better disease knowledge can be associated with more appropriate attitudes and practices (Kumar et al., 2008).

Against this background, the present study examines changes in KAP following a community-based health education programme on KAP related to NPCBVI in Horti, Koluragi and Savalasang villages of PHC Horti, Vijayapura District. The study is particularly relevant because it provides a village-level comparison of change and identifies areas where improvement remained limited despite intervention exposure.

Despite the availability of national eye-health programmes, awareness of services does not necessarily translate into timely screening or treatment. Rural communities may experience barriers related to perceived need, health literacy, accessibility, social beliefs and limited familiarity with available services. Community health education therefore has a potential role not only in increasing knowledge but also in shaping attitudes and encouraging appropriate health-seeking practices.

The present study is positioned within this gap between programme availability and community-level utilization. Rather than examining eye disease prevalence alone, it focuses on the knowledge, attitude and practice dimensions through which communities understand, evaluate and respond to blindness-

prevention services. The inclusion of three villages also permits comparison of changes across settings and identification of communities in which improvements in knowledge may not translate into corresponding behavioural outcomes.

From a health-communication perspective, the study is significant because the intervention used multiple community channels, including schools, women's groups, farmers' groups, Panchayat platforms and primary-health-centre outreach. Such multi-channel communication may improve message reach and relevance, while direct linkage with health services may help convert awareness into screening, referral and treatment-seeking behaviour.

Accordingly, the study addresses the following research question: To what extent does a community-based health education intervention influence knowledge, attitudes and selected eye-health practices related to NPCBVI among residents of Horti, Koluragi and Savalasang?

2. Research Objectives

1. To assess baseline knowledge, attitudes and practices related to NPCBVI among residents of Horti, Koluragi and Savalasang.
2. To compare pre-test and post-test KAP responses following a community-based health education intervention.
3. To describe changes in awareness, attitudes and selected eye-health practices following the intervention.
4. To identify village-level gaps requiring targeted follow-up and strengthened eye-health communication and service linkage.

Research question: To what extent does community-based health education influence KAP related to NPCBVI among residents of the three study villages?

3. Materials and Methods

3.1 Study Design and Setting

The study used a one-group pre-test–post-test design in Horti, Koluragi and Savalasang villages served by PHC Horti in Indi Taluk, Vijayapura District, Karnataka. The source report describes the field work as part of supervised field training and community health education. Secondary information was obtained from the PHC and sub-centres, Panchayat records, Census 2011 materials, Primary Health Care Officers, ASHA workers and Anganwadi workers.

3.2 Study Population, Eligibility and Sampling

Eligibility included persons aged 15 years and above, both males and females, from different socioeconomic backgrounds, who were willing to participate and provide informed consent. Persons below 15 years, those unwilling to participate and those unavailable at the time of data collection were excluded. The report states that systematic random sampling was used for the KAP study and gives a proportional distribution of approximately 225 participants from Horti, 135 from Koluragi and 170 from Savalasang, corresponding to an intended sample of 530.

3.3 Data Collection Procedure

Baseline face-to-face data collection was conducted from 28 May to 22 June 2025. A health education programme was subsequently delivered through community meetings, schools, women's groups, a farmers' society, Panchayat settings and PHC-based sessions. Activities addressed cataract, eye hygiene, regular eye examinations, refractive errors, childhood eye health, protective eyewear, eye donation and

availability of government eye-care services. Post-test data were collected from 24 July to 19 August 2025.

The intervention was delivered between 8 and 23 July 2025 through multiple community and institutional communication channels. The programme included sessions with Panchayat representatives, women's groups, schoolchildren, farmers, college students and community members, followed by a comprehensive PHC-based session.

3.4 Community-Based Health Education Intervention

The intervention followed a community-oriented IEC approach. Sessions were conducted with Panchayat members, mothers, schoolchildren, women's groups, farmers, college students and general community members. The documented programme included sessions from 8 to 23 July 2025 and addressed both preventive and curative dimensions of NPCBVI. The final session at PHC Horti provided a comprehensive programme on preventive and curative eye care.

3.5 Study Instrument

The structured questionnaire contained four sections: (1) demographic variables; (2) a semi-structured knowledge questionnaire; (3) an attitude scale; and (4) a practice questionnaire. The source report states that the instrument was reviewed by experts and pre-tested before the final KAP survey.

The available analysis was descriptive and was conducted using Microsoft Excel. Frequencies and percentages were reported for KAP items. Percentage-point changes between reported pre-test and post-test proportions were calculated for this manuscript. Because the participant-level dataset was unavailable, paired inferential testing, confidence intervals and effect-size estimation could not be validly performed. Findings are therefore interpreted as descriptive pre-post changes and are not presented as statistically proven causal effects.

Analytical framing: Results are presented across knowledge, attitude and practice domains. Changes are expressed as percentage-point differences between reported pre-test and post-test proportions. Because no control group was included and only descriptive analysis was reported, the observed changes are interpreted cautiously and are not treated as definitive causal effects.

3.8 Conceptual Framework for the Intervention

The intervention is conceptualized as a multi-channel community health-communication process: community-based health education → increased programme knowledge → more favourable attitudes towards eye care → improved eye-health practices → greater potential for screening, referral and service utilization. Accessibility, perceived need, social influence and community participation may influence each stage of this pathway. The present study directly measures the first three KAP domains but does not directly measure completed referrals or service utilization.

4. Results

4.1 Socio-Demographic and Community Profile

The household/community survey described substantial socioeconomic and demographic differences across the three villages. The reported population figures were 2,874 for Horti, 1,674 for Koluragi and 2,400 for Savalasang. The sex distribution was relatively balanced. The source report also describes high proportions of BPL households and a predominance of nuclear families. Semi-pucca housing was common, and open wells were an important source of water, particularly in Savalasang. These contextual characteristics are relevant because socioeconomic conditions, education and service accessibility can influence health knowledge and health-seeking behaviour.

Table 1. Socio-Demographic and Selected Community Characteristics of the Study Villages

Indicator	Horti	Koluragi	Savalasang
Population	2,874	1,674	2,400
Male population	1,476 (51.36%)	859 (51.31%)	1,214 (50.58%)
Female population	1,398 (48.64%)	815 (48.69%)	1,186 (49.42%)
BPL households	90.36%	93.58%	89.61%
Nuclear families	95.91%	95.45%	95.92%
Semi-pucca houses	80.88%	82.89%	79.41%
LPG use	98.98%	98.40%	99.44%

Note. BPL = Below Poverty Line; LPG = liquefied petroleum gas. Values are reproduced from the source study.

4.2 Changes in Knowledge Related to NPCBVI

The clearest improvement was observed in awareness of NPCB and its core services. Baseline awareness of NPCB was 18.4% in Horti, 6.5% in Koluragi and 4.5% in Savalasang. Post-test awareness increased to 94.6%, 67.4% and 85.8%, representing percentage-point increases of 76.2, 60.9 and 81.3, respectively. Recognition that cataract is a major cause of blindness increased to 89.6%, 91.0% and 91.2%. Awareness that NPCB provides free spectacles to schoolchildren increased to 97.8%, 100% and 98.8%.

Table 2. Comparative Changes in Knowledge Related to NPCBVI Before and After the Intervention

Knowledge indicator	Horti pre→post	Koluragi pre→post	Savalasang pre→post
Awareness of NPCB	18.4% → 94.6% (+76.2 pp)	6.5% → 67.4% (+60.9 pp)	4.5% → 85.8% (+81.3 pp)
NPCB provides free eye care	32.7% → 81.8% (+49.1 pp)	42.9% → 62.2% (+19.3 pp)	16.4% → 52.9% (+36.5 pp)
NPCB aims to eliminate avoidable blindness	5.8% → 98.3% (+92.5 pp)	14.5% → 69.6% (+55.1 pp)	5.9% → 87.6% (+81.7 pp)
Cataract as major cause of blindness	1.1% → 89.6% (+88.5 pp)	47.3% → 91.0% (+43.7 pp)	2.5% → 91.2% (+88.7 pp)
Free spectacles for schoolchildren	1.8% → 97.8% (+96.0 pp)	0% → 100% (+100 pp)	0% → 98.8% (+98.8 pp)

Note. Values are percentages reported in the source field-study report. Because participant-level raw data were unavailable for this revision, denominators could not be independently reconciled.

4.3 Changes in Attitudes Towards Eye Health and NPCBVI

Attitudes toward eye health also improved in several domains, but village-level variation was pronounced. Agreement that regular eye check-ups are essential increased from 3.1% to 67.3% in Horti, from 1.5% to 34.1% in Koluragi and from 6.5% to 57.3% in Savalasang. Belief that blindness can be prevented through awareness and education increased particularly strongly in Horti and Savalasang. By contrast, Koluragi showed much weaker positive change for several programme-confidence indicators.

Table 3. Comparative Changes in Attitudes Towards Eye Health and NPCBVI Before and After the Intervention

Attitude indicator	Horti pre→post	Koluragi pre→post	Savalasang pre→post
NPCB important for preventing blindness	50.2% → 78.7% (+28.5 pp)	67.4% → 48.9% (-18.5 pp)	62.4% → 88.1% (+25.7 pp)
Regular eye check-ups are essential	3.1% → 67.3% (+64.2 pp)	1.5% → 34.1% (+32.6 pp)	6.5% → 57.3% (+50.8 pp)
Confidence in NPCB efforts	49.8% → 81.7% (+31.9 pp)	32.6% → 5.9% (-26.7 pp)	37.6% → 82.4% (+44.8 pp)
Recommend NPCB eye-care services	49.8% → 68.0% (+18.2 pp)	32.6% → 8.9% (-23.7 pp)	37.6% → 82.4% (+44.8 pp)
Blindness preventable through awareness/education	10.7% → 88.4% (+77.7 pp)	0.7% → 13.3% (+12.6 pp)	0% → 85.2% (+85.2 pp)

Note. Values represent agreement responses. pp = percentage-point change. Negative values indicate a decrease in agreement.

4.4 Changes in Eye-Health Practices

Practice indicators showed substantial improvement in Horti and Savalasang, whereas several indicators remained low in Koluragi. Encouraging others to undergo eye checks increased from 4.0% to 78.7% in Horti and from 5.3% to 88.1% in Savalasang. Regular eye-check-up practice increased from 4.9% to 81.7% in Horti and from 8.1% to 82.4% in Savalasang but changed only from 9.6% to 5.9% in Koluragi. Similar divergence was observed for school screening participation, eye hygiene and protective eyewear.

Table 4. Comparative Changes in Eye-Health Practices Before and After the Intervention

Practice indicator	Horti pre→post	Koluragi pre→post	Savalasang pre→post
Encouraged others to have eye checks	4.0% → 78.7% (+74.7 pp)	10.4% → 48.9% (+38.5 pp)	5.3% → 88.1% (+82.8 pp)
Attended NPCB awareness programme	4.4% → 67.3% (+62.9 pp)	1.5% → 34.1% (+32.6 pp)	5.3% → 57.3% (+52.0 pp)
Regular eye check-ups	4.9% → 81.7% (+76.8 pp)	9.6% → 5.9% (-3.7 pp)	8.1% → 82.4% (+74.3 pp)
Participation in school eye screening	2.7% → 68.0% (+65.3 pp)	0% → 8.9% (+8.9 pp)	1.7% → 82.4% (+80.7 pp)
Good eye hygiene	0.9% → 88.4% (+87.5 pp)	2.2% → 13.3% (+11.1 pp)	3.4% → 85.2% (+81.8 pp)
Use of protective eyewear	0% → 89.8% (+89.8 pp)	1.5% → 1.5% (0 pp)	0% → 94.7% (+94.7 pp)

4.5 Data Integrity and Interpretation

The reported aggregate results indicate substantial pre-post changes in several indicators, but interpretation is constrained by differences in denominators across source tables and by the absence of

participant-level data. In particular, the apparent decline in several Koluragi indicators should be treated as a finding requiring verification rather than as evidence of a true deterioration. The source percentages have been retained without inventing or imputing individual responses.

5. Discussion

The study shows a marked descriptive increase in reported awareness following a community-based eye-health education programme. The magnitude of improvement was greatest for basic programme knowledge, including awareness of NPCB, its goal of reducing avoidable blindness, cataract as a major cause of blindness, and the availability of spectacles for schoolchildren. These findings are consistent with the broader public-health principle that accessible health information and early identification can support timely care. WHO emphasizes awareness, prevention, treatment and rehabilitation as interconnected components of eye-health strategies (World Health Organization, 2026).

The findings are also consistent with evidence from rural India that awareness and perceived need influence uptake of eye-care services. Marmamula et al. (2014) found that person-related barriers were common among people with avoidable visual impairment in South India, with lack of perceived need being a major barrier. The strong increase in willingness to encourage family and community members to seek eye examinations in the present study therefore has practical significance: communication interventions may help convert passive awareness into active referral and care-seeking behaviour.

The village-level differences are particularly important. Horti and Savalasang generally showed substantial gains across knowledge, attitude and practice domains. Koluragi, however, displayed persistent or even negative shifts in selected attitude and practice indicators. This pattern cautions against treating a community intervention as uniformly effective. It may reflect differences in exposure, local participation, trust, access, baseline characteristics, recall, or measurement conditions. Because the study did not collect qualitative explanations for the divergent Koluragi findings and did not use a control group, the reasons cannot be established from the available data.

The results also reinforce the need to move from information dissemination to service linkage. Research on eye-care uptake in South India shows that barriers may involve perceived capability, environmental resources and social influences. Therefore, future NPCBVI communication should combine awareness with clear referral pathways, appointment support, community screening, follow-up reminders, family involvement and locally trusted intermediaries. For agricultural communities, protective eyewear and injury prevention should be incorporated into routine occupational health messaging.

The present findings are also broadly consistent with recent eye-health education research. Community-based and school-based programmes have demonstrated the value of structured education, screening and referral in improving eye-health awareness and practices, although intervention design and outcome measurement vary considerably across settings (Goyal et al., 2023; Sil et al., 2023; Prakash et al., 2024).

The intervention can also be understood as a community health-communication process in which eye-health information was delivered through trusted interpersonal and institutional channels. The combination of Panchayat engagement, women's groups, schools, farmers' groups and PHC outreach provides a multi-channel communication model. Future interventions should evaluate not only message exposure but also message comprehension, perceived relevance, trust, referral completion and continued service utilization.

6. Implications for Practice, Health Communication and Policy

- Strengthen repeated village-level IEC activities rather than relying on one-time awareness sessions.

- Integrate eye-health education with PHC outreach, school health activities, women's groups, farmer groups and Panchayat platforms.
- Use community health workers and local leaders as referral facilitators for suspected cataract, refractive error and other visual problems.
- Develop village-specific strategies for locations such as Koluragi where awareness gains did not consistently translate into attitudes and practices.
- Link every awareness programme to screening/referral information, service availability and follow-up support.
- Include occupational eye-injury prevention and protective eyewear in agricultural communities.
- Monitor KAP longitudinally to determine whether improvements persist beyond the immediate post-test period.

7. Strengths of the Study

- The study addresses an important rural eye-health communication gap using community-level primary data.
- The pre-test–post-test framework permits direct description of change following a defined intervention period.
- The intervention used multiple community platforms, including schools, women’s groups, farmers, Panchayat settings and the PHC.
- Village-level reporting reveals heterogeneity that would be obscured by an overall aggregate alone.

8. Limitations

Future research should use larger samples, validated KAP scales, reliability testing, participant-level paired analysis, a comparison group and longer-term follow-up. A mixed-methods component would also help explain differences between villages, particularly the limited improvement across several indicators in Koluragi.

- The one-group pre-test–post-test design does not permit strong causal attribution because no comparison/control group was included. The available analysis is descriptive; inferential statistics, confidence intervals and effect sizes could not be calculated without participant-level data.
- The participant-level raw dataset was unavailable, so individual-level pairing and independent reproduction of all reported percentages could not be verified. The source report uses different denominators across some result tables. The present manuscript retains the reported percentages and does not invent a common denominator.
- Some source tables and narrative interpretations contain transcription or formatting inconsistencies, particularly in selected Koluragi indicators, and these findings should therefore be interpreted cautiously. Formal reliability coefficients and a standardized KAP scoring system were not available in the source report.
- The follow-up period was short, and long-term retention of knowledge and sustained behavioural change were not assessed. The source document does not provide formal institutional ethics approval or exemption documentation; the applicable information should be added before submission if available.

- Data availability and transparency statement: The manuscript was derived from the uploaded field-training report, which contains aggregate KAP tables and narrative interpretations but not the respondent-level dataset. The reported percentages have been retained from the source report and recalculated only as descriptive percentage-point changes. No unreported individual-level data have been reconstructed or imputed.

9. Conclusion

This community-based KAP study indicates substantial descriptive improvements in awareness of the National Programme for Control of Blindness and Visual Impairment (NPCBVI) and in several eye-health attitudes and practices following a structured health education programme among rural communities served by Primary Health Centre (PHC) Horti. The observed changes suggest that community-oriented health education can play an important role in increasing awareness of blindness-prevention initiatives, improving understanding of common causes of visual impairment and encouraging more favourable attitudes towards preventive eye care and regular eye examinations. The improvement in awareness of NPCBVI, recognition of cataract as an important cause of blindness, knowledge regarding the availability of free spectacles for schoolchildren and selected eye-care practices demonstrates the potential value of communicating programme-related information through locally accessible community platforms.

The findings also highlight considerable variation between the three study villages. Horti and Savalasang villages demonstrated comparatively greater improvements across several knowledge, attitude and practice indicators, whereas Koluragi continued to show gaps in selected domains. This variation is important from a community health-communication perspective because it suggests that the availability of information alone may not be sufficient to produce consistent changes in health-related attitudes and practices. Differences in community participation, perceived need for eye care, accessibility of services, social influences, trust in health systems and exposure to intervention messages may potentially contribute to variations in outcomes. However, these factors were not independently examined in the present study and therefore cannot be established as explanations for the observed differences.

The findings have practical implications for the implementation of community-based eye-health programmes. Health education initiatives should move beyond one-time information dissemination and adopt sustained, locally adapted communication strategies that are integrated with screening, referral and treatment services. Engagement of Panchayat representatives, community health workers, schools, women's groups, farmers' groups and other locally trusted institutions can provide multiple channels for reinforcing eye-health messages and encouraging appropriate health-seeking behaviour. Particular attention may be required in communities where improvements in knowledge do not appear to translate consistently into preventive practices or service utilization. Regular follow-up, repeated communication, community-level screening and clear information regarding the availability and accessibility of government eye-care services may help strengthen the pathway from awareness to action.

From a broader public-health perspective, the study reinforces the importance of integrating communication with service delivery within comprehensive eye-care programmes. Awareness campaigns are likely to have greater practical value when community members are not only informed about eye-health risks and available programmes but are also provided with clear and accessible pathways to screening, referral and treatment. The observed differences between villages further

emphasize the need for context-sensitive approaches rather than uniform communication strategies across rural populations.

Nevertheless, the findings should be interpreted within the methodological limitations of the study. The one-group pre-test–post-test design does not include a comparison group and therefore cannot establish that the observed changes were caused exclusively by the health education intervention. In addition, participant-level raw data were unavailable for the present revision, preventing independent verification of individual-level pre-test and post-test pairing and the calculation of inferential statistics, confidence intervals and effect sizes. Consequently, the reported changes are appropriately interpreted as descriptive pre-test to post-test associations rather than definitive causal effects.

Overall, the study provides useful community-level evidence on the potential role of structured health education in strengthening awareness and selected eye-health attitudes and practices related to NPCBVI. Future research should build on these findings through larger samples, validated KAP measurement tools, participant-level statistical analysis, comparison groups and longer-term follow-up. A mixed-methods approach could also provide deeper insight into why responses differ between communities and how factors such as perceived need, accessibility, trust, social norms and community participation influence the translation of eye-health knowledge into sustained preventive practices and utilization of eye-care services. Such evidence can contribute to the development of more responsive, community-centred and sustainable strategies for reducing avoidable vision impairment in rural populations.

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