

A study to assess the knowledge and skills of Accredited Social Health Activists and its retention after training in community-based primary eye care

Pallavi Shukla, Praveen Vashist, Suraj S Senjam, Vivek Gupta, Noopur Gupta

Purpose: Community volunteers like Accredited Social Health Activists (ASHAs) could be utilized for linking community and eye care services. Research is needed to effectively utilize them. This study was to assess whether ASHAs could imbibe new knowledge in eye care and conduct vision screening. **Methods:** Settings and Design: A pre-post-intervention study in South Delhi Integrated Vision Centres. It was conducted from January 2016 to March 2017. One day of conceptual training followed by hands-on training in vision screening was imparted to ASHAs. The knowledge was assessed thrice: before, immediately after, and following 1 year after training. The vision screening skill was assessed twice. Descriptive analysis using percentages, mean and standard deviations. Paired *t*-test was used for assessing the change in scores. **Results:** A total of 102 ASHAs were recruited. A significant increase in the knowledge score of ASHAs before (14.96) and after training (25.38) ($P < 0.001$) was noted. The knowledge score was sustained at 1 year (21.75). The satisfactory skill of vision screening was seen in 88 (86.3%) ASHAs after training, while 79 (77.5%) ASHAs still retained it after 1 year. **Conclusion:** The potential to involve ASHAs in community-based frontline eye care activities: awareness generation of eye diseases, identification of referable conditions, and facilitating individuals to seek eye care facilities. This study informs about the duration, frequency, and content of the training. It also provides evidence on the improvement and sustainability of eye care knowledge and skills by ASHAs after conceptual and hands-on training.

Key words: Accredited social health activists, ASHA, integrated people-centered eye care, knowledge assessment, primary eye care, training, vision screening skill, world report on vision

The World Health Organization (WHO) through its 2019 "World Report on Vision" called for a reform in the eye care delivery system by making it more person-centered. This is achievable through a strengthened primary eye care system.^[1] In sync with the global strategy, India is also looking at a more comprehensive and strengthened primary health care. Our National Health Policy, 2017, paved the way for the development of the "Health and Wellness Centre" concept, wherein all primary health services shall be provided in an integrated manner under one roof by a comprehensive health care provider.^[2]

In India, most of the blindness (93%) among the 50+ age group is still due to avoidable causes like cataract and uncorrected refractive error.^[3] It is contributed by ineffective outreach and a weak referral system which limits optimal utilization of the eye care services.^[4] There are a few reputed eye care institutes which follow the pyramidal model of eye care extending from the grass-root level primary eye care to tertiary level specialty eye care.^[5,6]

However, this needs to be universalized across the country and that is feasible only with the integration of eye care into the existing public health system. A similar concept was supported by The Lancet Global Health Commission on Global Eye Health

stating that eye health should be a part of the mainstream agenda to achieve universal health coverage. This integration requires quality implementation research on exploring the realistic expectations from the primary health care workers for tasks related to eye care which can be delegated to them alongside other duties.^[7]

Accredited Social Health Activists (ASHAs) are the link or grass-root workers in India. Initially, they were engaged in Maternal and Child Health (MCH) activities. However, with changing times, their new roles and responsibilities are being explored and added. Before engaging them in the primary eye care activities, it is imperative to understand whether ASHAs could imbibe new knowledge in the area of eye care imparted to them and how they can transfer that to the community.

This study aimed to quantify the enhancement in knowledge and skills of ASHAs pertaining to community-based primary eye care activities after receiving the training. It also aimed to assess the retention of this knowledge and skill after 1 year of training.

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Methods

After the necessary approvals from the health department and Institute Ethics Committee, the study was initiated in the South Delhi district.

Study design and period: A pre- and post-intervention study was conducted from January 2016 to March 2017.

Study Population: ASHAs working in ASHA units (Delhi Government dispensaries or MCH centers attached with ASHAs) with once-a-week provision for eye examination were enrolled in the study.

Sample size: The estimated sample size was 96 ASHAs, based on the assumption that there would be a minimum of 75% improvement in their knowledge and skills with an absolute error margin of 15%, at 95% confidence level, and design effect of 3. Since each ASHA unit had around 15–20 ASHAs, seven such ASHA units were selected to enroll 96 ASHAs. The ASHAs who had been working for less than 6 months were excluded from the study.

Study Plan: The ASHAs were enrolled after obtaining written informed consent from them. The study proceeded as per the flow diagram [Fig. 1].

Training: One-day conceptual training and hands-on training in vision screening was imparted to ASHAs. The training content was designed by a group of experts in ophthalmology and public health, based on the existing training materials and experiences shared by the participants from various countries during an inter-country workshop held at the base hospital in collaboration with WHO-SEARO.^[8]

It included a brief description of the structure and function of the human eye, common diseases of the eyes which were largely preventable or treatable like conjunctivitis, refractive error, cataract, ocular trauma, and diabetic retinopathy. They were briefed about some serious eye conditions like glaucoma and retinopathy of prematurity. The ASHAs were sensitized about Vitamin A deficiency and eye donation. They were

informed about referral linkages for disease management and the role of ASHA in each eye condition. The training tools comprised lectures and demonstrations, role plays, and a film on primary eye care developed by the base hospital.

After conceptual training, ASHAs were given hands-on training in estimating the visual acuity in individuals aged ≥ 40 years using the 6/18 Snellen's Optotype "E chart."

Knowledge assessment: The questionnaire used for knowledge assessment of ASHAs was prepared after deliberations with the experts of the research team which had been involved with the training of the primary eye care volunteers for more than a decade. It comprised of six sections: blindness, cataract, glaucoma, refractive error, diabetic retinopathy, and general eye care. The number of questions in each section was based on the public health importance of that disease. Each question was crafted to let ASHAs imbibe the important key messages which need to be percolated in the community. The questions in each section were allotted 1 mark for the correct response and 0 for the incorrect response. The maximum score was 32 [Table 1].

The knowledge assessment was done thrice: before training, immediately after training, and after 1 year.

Statistical Analysis: Percentages, mean and standard deviations were used for descriptive analysis. Paired *t*-test was used for comparing the change in the knowledge scores.

Skill assessment: Each ASHA was first made to practice her vision screening skill on at least 10 individuals aged ≥ 40 years. Later, her vision screening and recording skills were assessed on any one randomly selected individual using the 6/18 Snellen optotype "E" charts and were also asked to record their findings.

The skill was assessed as "satisfactory" or "unsatisfactory" based on the following essential criteria:

1. Explaining to the participant about the procedure of vision screening
2. Measuring accurate distance
3. Positioning and tumbling of card
4. Four-time measurement by each eye

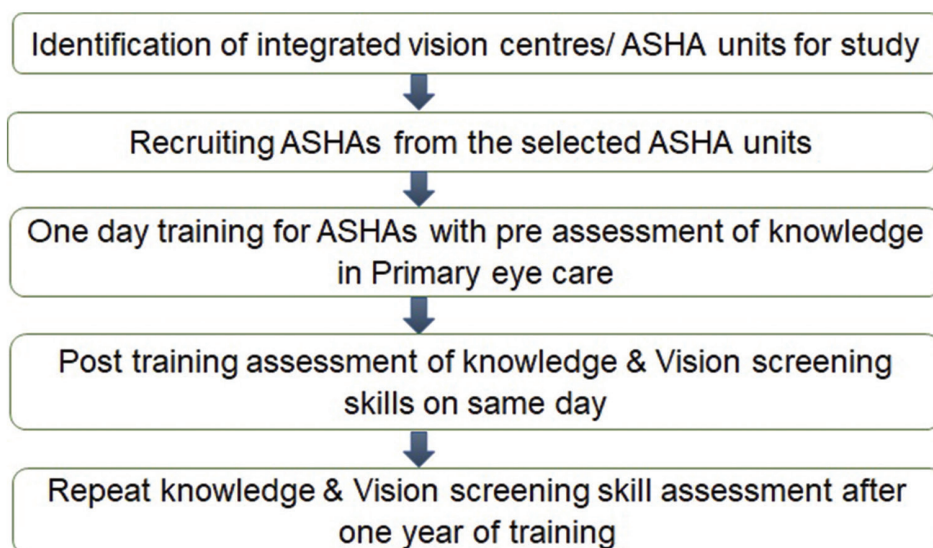


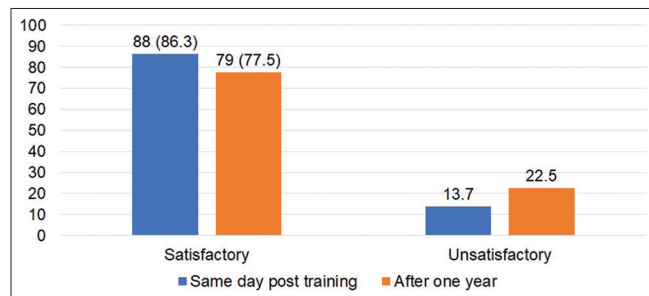
Figure 1: Flowchart depicting the flow of the study.

Table 1: Knowledge assessment of ASHAs

Questions	Score	ASHAs conforming the right choice		
		Pre-Training n (%)	Post Training n (%)	One year after Training n (%)
Blindness	5			
Definition of Blindness as per NPCB - Unable to count fingers at a distance of 6 meters from both eyes	1	28 (27.5)	66 (64.7)	56 (54.9)
While taking vision which kind of glasses need to be removed - Near vision glasses	1	1 (1.0)	47 (46.1)	22 (21.6)
Blindness most commonly seen in - Old age	1	85 (83.3)	95 (93.1)	85 (83.3)
Most important cause of Blindness in India- Cataract	1	43 (42.2)	91 (89.2)	62 (60.8)
Other important causes - (RE/Glaucoma/DR)	1	69 (67.7)	89 (87.3)	91 (89.2)
Cataract	10			
Diminution of vision in cataract - (Painless and gradual)	1	55 (53.9)	85 (83.3)	81 (79.4)
Part of the eye affected by cataract - (Lens)	1	10 (9.8)	84 (82.4)	29 (28.4)
Can eye medicine can help in regaining his eyesight in cataract? (No)	1	87 (85.3)	95 (93.1)	94 (92.2)
When should cataract be operated? (As soon as possible)	1	70 (68.6)	99 (97.1)	81 (79.4)
Best season for cataract surgery- (Any Season)	1	70 (68.6)	98 (96.1)	95 (93.1)
Post cataract surgery care at home				
Daily cleaning the eyes with clean cotton.	1	78 (76.5)	97 (95.1)	95 (93.1)
Avoid Lying sideways on the bed with operated eye facing down, it would give comfort to the eyes.	1	47 (46.1)	71 (69.6)	76 (74.5)
Avoid lifting heavy weights for at least 4 weeks.	1	66 (64.7)	73 (71.6)	79 (77.5)
To get his eyes examined again after 4-6 weeks.	1	86 (84.3)	96 (94.1)	95 (93.1)
Avoid taking bath for at least 2 weeks.	1	36 (35.3)	60 (58.8)	57 (55.9)
Advice for known Glaucoma cases	3			
Medicines in glaucoma need to be used regularly and for a long period of time.	1	39 (38.2)	68 (66.7)	61 (59.8)
All family members of glaucoma patients should be advised to undergo glaucoma examination.	1	46 (45.1)	92 (90.2)	56 (54.9)
Role of glaucoma medication used regularly (Prevent further deterioration of vision)	1	69 (67.7)	86 (84.3)	83 (81.4)
Refractive Error	6			
Correct Diagnosis of the patient in case scenario- (Refractive Error)	1	42 (41.2)	83 (81.4)	76 (74.5)
Treatment of this condition (Refractive Error)-				
Spectacles	1	71 (69.6)	88 (86.3)	86 (84.3)
Others (Surgery/Lasik)	1	14 (13.7)	19 (18.6)	6 (5.9)
Others (Contact lens)	1	11 (10.8)	26 (25.5)	9 (8.8)
Different types of Refractive Errors- (Near and Far Sightedness)	1	22 (21.6)	79 (77.5)	59 (57.8)
Can Near/Far Sightedness occur together in one eye? (Yes)	1	28 (27.5)	80 (78.4)	67 (65.7)
Diabetic Retinopathy	3			
Part of eye mostly affected in diabetes- (Retina)	1	16 (15.7)	89 (87.3)	78 (76.5)
Can Diabetes lead to blindness? (Yes)	1	62 (60.8)	81 (79.4)	87 (85.3)
How often should a diabetic get his retina examined? (1 Year)	1	3 (2.9)	80 (78.4)	7 (6.9)
General Eye Care	5			
Can conjunctivitis spread from one person to another by looking into each other's eyes? (No)	1	26 (25.5)	88 (86.3)	23 (22.6)
What are the 3 important symptoms of conjunctivitis?	1	61 (59.8)	90 (88.2)	94 (92.2)
Which of the following can be used to keep eyes healthy? (Washing eyes with clean water)	1	85 (83.3)	100 (98.0)	99 (97.1)
An open eye vial can be used within 15-30 days	1	40 (39.2)	95 (93.1)	74 (72.6)
At what distance will you check for blindness (As per NPCB Programme)?	1	60 (58.8)	99 (97.1)	96 (94.1)

Table 2: Comparison of knowledge score of ASHAs prior to training, post training and one year after training

Section	Max	Pre-Training Mean (SD)	Post Training Mean (SD)	P	% Increase after training	After 1 year of Training Mean (SD)	P	% Increase after 1 year
Section I: Blindness	5	2.22 (0.90)	3.80 (1.04)	<0.001	71.2	3.10 (1.22)	<0.001	39.6
Section II: Cataract	10	5.93 (1.92)	8.41 (1.56)	<0.001	41.8	7.67 (1.37)	<0.001	29.3
Section III: Glaucoma	3	1.51 (0.84)	2.41 (0.68)	<0.001	59.6	1.96 (0.86)	<0.001	29.8
Section IV: Refractive Error	6	1.84 (1.36)	3.68 (1.05)	<0.001	100.0	3.56 (1.74)	<0.001	93.5
Section V: Diabetic Retinopathy	3	0.79 (0.72)	2.45 (0.78)	<0.001	210.1	1.69 (0.66)	<0.001	113.9
Section VI: General Eye Care	5	2.67 (1.23)	4.63 (0.64)	<0.001	73.4	3.78 (0.82)	<0.001	41.6
Total Score	32	14.96 (4.34)	25.38 (3.48)	<0.001	69.7	21.75 (4.16)	<0.001	45.4

**Figure 2: Assessment of vision screening skills of ASHAs immediately after training and 1 year after training.**

If any of the criteria from 1–4 were not fulfilled, the skill exhibited by ASHAs was labeled as “unsatisfactory.” If all four criteria were correctly fulfilled, they were labeled as “satisfactory.” The skill assessment was done twice: first immediately after training and the second after 1 year.

The ASHAs who were found to be unsatisfactory in these skills after the first assessment were re-trained in vision screening. If required, they were also provided some support for a few days in their field practice area.

Results

The study was conducted in the South Delhi district. Overall, 107 ASHAs were enrolled in the study. All three assessments (pre-training, same day post-training, and at 1 year) were completed for 102 ASHAs.

Almost all ASHAs (99.0%) worked within 5 km from the vision center (VC), out of which 45 (44.1%) had their catchment areas as near as 1 km to the VC. Majority (77, 75.5%) of them were educated up to high school. Almost all ASHAs (97, 95.1%) were currently married and only five of them were divorced or widowed. Most (68, 66.7%) of the ASHAs lived in nuclear families.

Knowledge assessment of ASHAs

Many ASHAs had some prior knowledge about blindness, its causes, and diseases like cataract and conjunctivitis. However, there was an enhancement in knowledge about the other eye diseases like refractive error, glaucoma, and diabetic retinopathy after 1 year [Table 1].

Prior to training, less than half (42.2%) of ASHAs were aware that cataract was the most important cause of blindness. After training, nearly 90% knew it. Even before training, a majority were aware that no medicine could treat cataract,

but only two-thirds of the ASHAs knew about the best time and season to get operated on. The knowledge about post-operative care increased after training and was sustained after 1 year [Table 1].

The section on glaucoma focused on the known glaucoma cases. The knowledge on the compliance to treatment did enhance after training (67.7–84.3%) and was sustained after 1 year (81.4%) [Table 1].

There was an improvement in knowledge about diabetic retinopathy after training (before training: 60.8%; after training: 79.4%; and after a year: 85.3%) but the score on the frequency of retinal examination in diabetics decreased after a year (before, after, and later: 2.9, 78.4, and 6.9%, respectively).

There was a myth prevailing among the majority of ASHA workers that conjunctivitis spreads by looking into each other’s eyes (before, after, and later: 25.5, 86.3, and 22.6%, respectively). The training helped them in identifying the three important symptoms of conjunctivitis; 92.2% ASHAs retained this knowledge after 1 year.

There was a significant increase in the knowledge score of ASHAs before and after training ($P < 0.001$). The total mean score increased from 14.96 (± 4.34) before training to 25.38 (± 3.48) immediately after training. There was also a significant increase in the scores after 1 year ($P < 0.001$). Compared to baseline (14.96 \pm 4.34), the knowledge score increased after 1 year (21.75 \pm 4.16) of training [Table 2].

Assessment of the vision screening skill of ASHAs

The skill on vision screening was assessed immediately and 1 year after training. The skill assessment was done in the VC itself.

It was seen that immediately after training, 88 (86.3%) ASHAs performed satisfactorily. One year later, 79 (77.5%) ASHAs were still able to conduct vision screening satisfactorily [Fig. 2].

Discussion

Integrated people-centered eye care strategy of the World report on vision envisages engaging people and communities in their eye care planning.^[1] This strategy inculcates good eye health-care-seeking behavior and increases demand for eye health services. Engaging communities provides a continuum of care across their life course. The ASHA worker can be a vital link in this regard because she has been associated with the community as well as the health system for a long time.

ASHAs have been utilized as MCH workers for more than a decade. Their new role in the other national health programs has been explored in various studies. Their emerging role requires acceptance from both the ASHAs as well as the community. There are examples where ASHAs have been effectively utilized in non-MCH activities. In Kerala, ASHAs were effectively utilized for the prevention of non-communicable diseases, while in Hyderabad and Odisha, they were engaged for cardiovascular disease prevention and malaria interventions, respectively.^[9-11]

Even in eye care, the role of Community Health Workers (CHW) has been studied globally. There are examples from Pakistan and Nepal where their CHWs were trained in certain aspects of eye care.^[12,13]

Knowledge assessment

For ASHAs to be successfully utilized in spreading awareness in the community, they need to be empowered through knowledge enhancement. In various national programs, ASHAs have been well utilized in spreading awareness about diseases like malaria, cancer, diabetes, and hypertension apart from the MCH activities.^[14,15] In a majority of training programs for ASHAs, the knowledge scores were found to increase significantly after training compared to the pre-training scores.^[16,17] It was also noticed that knowledge depleted with time. However, in a study conducted in South India on the training of ASHAs in hypertension, it was observed that the knowledge score not only increased immediately after training, but it increased furthermore after 3 months of training. The probable reason could be continuous learning by practical application, active engagement, and reinforcement. In that study, the ASHAs were so actively engaged for 3 months in the program that their knowledge enhanced. In yet another feasibility study conducted in Dayalpur, Faridabad, the knowledge scores were taken at four time intervals pre, post, after 3 months, and after 6 months. It was observed that the scores increased post-training and continued to increase after 3 months, but after 6 months, they declined.^[18] In our study, it was seen that there was a significant increase in the knowledge immediately after training and most of the scores did deplete a bit but were still significantly above the baseline even after 1 year of training. The reason could be the interest of ASHAs in the activity and the time-bound targets they were given to stay motivated for the work.

The knowledge assessment of ASHAs was done for all those eye conditions which were either preventable or avoidable. Through the knowledge assessment process, those points were emphasized which were supposed to be translated to the community. Critical awareness about common eye diseases is poor among people. As was evident from a study conducted in North India, a majority of the people had heard about cataract but only 42% knew about the symptoms of cataract, and only 40% knew that surgery was the only treatment for cataract.^[19] The ASHAs in our study, however, had better knowledge about cataract. Even at baseline, 85% knew that there were no eye medicines to treat cataract. Apart from a lack of awareness, people reported other barriers for cataract surgery like the lack of escort and fear of surgery. The grass-root workers could be helpful in mitigating these apprehensions as shown in a study from South India.^[20] Follow-up after cataract surgery is a very essential part of eye care. Often due to lack

of awareness or attitudinal barriers, patients do not undergo follow-up examinations leading to poor visual outcomes. It was noticed in one study that the patients with complications and poor visual outcomes at discharge were significantly less likely to follow-up.^[21] The ASHAs could be quite helpful in motivating and facilitating such patients for a follow-up examination. During knowledge assessment, it was found that the knowledge of ASHAs regarding follow-up care after cataract surgery increased after 1 year. The reason could be that the ASHAs accompanied patients for cataract surgery to the base hospital. At the time of discharge from the hospital, the patients were given post-surgery care instructions, which the ASHAs also imbibed in the process.

During the training of ASHAs, the common causes of blindness like cataract and refractive error were emphasized. They were told that the commonest way of treating refractive error was through spectacles.

The ASHAs had some prior knowledge about blindness, cataract, and general eye care. However, for diseases like diabetic retinopathy and glaucoma, their pre-training scores were relatively less. But after training, their scores increased significantly (pre-training, post-training, and after 1 year, the scores were 0.79, 2.45, and 1.69, respectively for DR and 1.51, 2.41, and 1.96, respectively for glaucoma). A study from Vellore reported that only 4.5% of the enrolled diabetics had good knowledge about DR.^[22] Another study from a tertiary care hospital in Mumbai reported that nearly 63% of the diabetics were unaware that diabetes affects the retina.^[23] In our study, the ASHAs were taught that DR screening needs to be done annually in the patients who do not have any DR changes, but still after 1 year, a majority answered that a 6-month follow-up is required. This could be because, in the vision centers, they were asked to bring patients for DR follow-up after 6 months. Hence, they retained the knowledge of what they practiced rather than what they were taught theoretically.

Similarly, for glaucoma, studies from the North and South India have reported very poor awareness about glaucoma (8.3 and 0.32%, respectively).^[24,25] Mostly, relatives of glaucoma patients were the ones who knew about this irreversible cause of blindness.^[24] In this study, the ASHAs were given the key messages for glaucoma patients and their family members.

Skill assessment

The 6/18 cut-off was used for vision screening by ASHAs. According to the WHO classification, presenting visual acuity of < 6/18 was regarded as a visual impairment.^[26] The Universal Eye Health: Global Action Plan targeted at reducing visual impairment by 25% by the year 2020 from its baseline value of 2010.^[27] This could be achieved if the ASHAs could screen the visual acuity of people aged ≥ 40 years in both eyes using the < 6/18 Snellen's optotype cut-off.

The skill of ASHAs pertaining to vision screening was assessed after the training and again after 1 year. It was found that immediately after training, the vision screening skill was satisfactory in 88.3% of the ASHAs and was sustained by 77.5% of the ASHAs after 1 year of training. A majority of the ASHAs were well-versed with the procedural details; however, many fumbled in recording them correctly. This was most likely because it was a new task for them and required

a bit of hand-holding in the field by their supervisors like the auxiliary nurse midwife (ANM). This finding re-iterated the fact that the ASHAs require refresher training repeatedly. There were other studies to support the fact that refresher training improved the outputs to a great extent in other diseases. Visceral Leishmaniasis referrals increased from 7% before training to 28% after training and to 46% after two training programs in a study conducted in Bihar.^[28]

The ASHAs were trained to screen vision of individuals aged ≥ 40 years. Avoidable (treatable or preventable) visual impairment including presbyopia is most common in this age group. The vision of school-going children is already screened by the school teachers under the school vision screening program.^[29] For toddlers and infants, ASHAs are not suitable as it requires higher expertise. For people aged 18–40 years, the prevalence of blindness and visual impairment is too low in this age group to yield a good outcome.^[30]

Lancets Global Commission stresses the need for implementation research to effectively integrate primary eye care into primary health care. This study is the first step to understand whether the bottom-most tier of the health system, the ASHA workers, are capable to undertake this additional responsibility of strengthening primary eye care through awareness generation, vision screening, and patient mobilization. Among the three, visual acuity estimation is a completely new responsibility and may pose a challenge, so it does require greater supportive supervision and a certain amount of incentivization. This study also throws light on the duration, content, and frequency of primary eye care training for ASHAs.

Conclusion

ASHAs have become an integral part of the health care system in India since their introduction. They receive performance-based monetary incentives for these activities. They are approachable and acceptable to the community. Thus, there is a potential to involve them in community-based frontline eye care activities like awareness about the prevention of eye diseases, identification of referable conditions, and informing and facilitating the community to seek eye care facilities, and guiding the community to receive effective and timely treatment.

It is, however, imperative to understand whether ASHAs can be trained in this regard. This study provides concrete evidence on the improvement and sustainability of eye care knowledge and skills by ASHAs after conceptual and hands-on training. This knowledge and skill acquired can be used to improve the eye health awareness of the community. A trained ASHA could be an important resource in facilitating patients to seek eye care, and hence, increase the service utilization of eye care services available at the primary or secondary levels. The study also provides evidence that 1 day of conceptual training with a few hours of hands-on training on vision screening skills is enough to capacitate ASHAs to take up community-based primary eye care activities.

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Conflicts of interest

There are no conflicts of interest.

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