



ORIGINAL ARTICLE

Effectiveness of a training program for bleeding disorders among accredited social health activists in Udupi District, Karnataka, India

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Abstract

Introduction: Hemophilia and other bleeding disorders are underreported and cause significant morbidity and mortality in resource-constrained countries. Training and the creation of awareness among accredited social health activists (ASHAs) will aid in the early detection of bleeding disorders at the community level.

Objective: To develop awareness and skills for the screening and identification of cases with bleeding symptoms among ASHAs in Udupi District, Karnataka, India.

Methods: An interventional study was undertaken in Udupi District, which has three taluks and approximately 233 villages. All ASHAs with a current role (586) from rural Udupi were provided a competency-based training program at the community health center using a specifically designed training manual for the identification of cases with bleeding disorders. A pre-test/post-test evaluation was performed to discover the training outcomes.

Results: Sixteen (2.7%) participants had average knowledge in the first post-test, and 570 (92.2%) participants had good knowledge. Thirty-nine (6.6%) participants had average knowledge in second post-test, and 547 (94.3%) participants had good knowledge. The effectiveness of the training program was assessed using Friedman's two-way test. A significant difference in knowledge scores ($\chi^2 = 955.1$) was found at baseline evaluation and end of the training test 1 and at 30 days of training test 2 among the ASHAs.

Conclusion: Accredited social health activists health care workers, who are the most important link between the community and health services, successfully created public awareness concerning the early detection of bleeding disorders.

KEYWORDS

accredited social health activists, bleeding disorders, effectiveness, India, training program

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Essentials

- ASHAs create awareness of health and its social determinants at the community level.
- Application of an adult learning process as an educational program will enhance education and communication.
- Educational programs should include teaching materials, workshops, training session evaluations, and demonstration strategies.
- Training on hemophilia and other bleeding disorders provides first-hand experience for ASHAs at the community level.

1 | INTRODUCTION

India carries a huge burden of hemophilia and other bleeding disorders, which have been given less importance because these conditions are rare and have a low prevalence.¹ Bleeding disorders affect approximately 69 million people worldwide, and the World Federation of Hemophilia (WFH) estimates that one in 1000 men and women have a bleeding disorder. India constitutes 5% of the global burden of patients with bleeding disorders and 9% of patients with hemophilia A. Hemophilia and other bleeding disorders account for 1 in 5000 live male births.¹⁻⁴ Lack of education and awareness, low resource availability for disease management, and less public health importance are the leading causes of the lack of access to screening and diagnosis for hemophilia and other bleeding disorders in India compared to high-income countries.³ A total of 80% of cases of hemophilia and other bleeding disorders were estimated to be unidentified in India in 2014.²⁻⁴ Therefore, there is a great need to target interventions for the disease and its detection at the population level.⁵ Community screening measures, such as training awareness programs for bleeding disorders, are urgently required, because screening programs have a significant impact on the detection of cases and disease management in low resource-constrained countries.

Public health intervention is essential when considering a population-level approach for specific disease identification and management. Compelling evidence has documented the use of population-level approaches in India by accredited social health activists (ASHAs).⁶⁻⁹ Health-care workers, such as ASHAs, play a vital role in the promotion of bleeding disorder awareness, especially in resource-limited environments where knowledge of screening is limited in the general population. ASHAs are part of the rural community, share a cultural and ethnic background with community members, have experienced training offered by the organization, and are committed to community development. These individuals are health activists, because they create awareness of health and its social determinants and mobilize the community toward local health planning and increased utilization and accountability of existing health services.

2 | OBJECTIVE

The study examined the effectiveness of a training program for awareness of bleeding disorders among ASHAs for the screening and identification of cases with bleeding symptoms in rural communities. This study utilized the services of ASHAs, because these

individuals were serving the rural community and were the link workers for the health care system. This strategy was considered a suitable approach for this initiative to improve services and overcome barriers for development.

3 | METHODS

3.1 | Study participants

All study participants were ASHAs who were active in their roles in providing services to rural villages of Udupi District, Karnataka state, India. A researcher implemented a training program in 2012 that spanned a 3-year period. A total of 586 ASHAs from the Udupi District were trained. This study was part of a project entitled Identification Diagnosis Education and Empowerment for Action (IDEEA) of persons with bleeding disorders in south India. This study investigated the feasibility of training ASHAs at the rural community level for the identification of cases with bleeding symptoms in the rural community. The study protocol was approved by the institutional ethics committee of Kasturba Hospital Manipal, Manipal University. Permission was obtained from the district health officer to use the services of ASHAs. Written informed consent was obtained from all participants prior to the study.

3.2 | Study design

An evaluative approach with a quasi-experimental, one group, pre-test and repeated post-test design was carefully chosen to determine the effectiveness of the training program. Demographic information was collected from the ASHAs, and a knowledge assessment was performed at baseline. The effectiveness of the training program was accomplished by carrying out a baseline evaluation, at the end of training test 1 and at day 30 of post-training test 2 to assess the retention of knowledge acquired during the training program by the ASHAs. The training program was also evaluated using feedback questions at the end of the program.

3.3 | Development of the training program

3.3.1 | Development of the training module for the identification of bleeding disorders for ASHAs

The training program content was an add-on module to the ASHA core curriculum, which provided training in areas such as community mobilization and training, leadership, communication strategies, home visit and outreach, team work, time management, and

follow-up. The content of the training manual was designed and developed by the researcher with support from the literature^{10,11} and in consultation with experts in the areas of hemophilia, hematology, public health, and nursing. Experts, including ASHA mentors (who are instructors of ASHAs), validated the developed content for understandability and adequacy. The objectives of the chapters were specified, and equal weight was given during the preparation phase of module development. The chapters of the module included the introduction, basic elements of blood, the blood clotting process, bleeding disorders and their types, screening persons with bleeding symptoms, management of bleeding disorders, and the role and responsibility of health care workers in community screening. The content also focused on creating awareness of hemophilia and other bleeding disorders, performing a door-to-door survey to screen cases with bleeding symptoms and making referrals to hemophilia treatment centers. Review questions were asked at the end of each session to assess the immediate knowledge acquired by the ASHAs. Table 1 details the blueprint of the training manual. A training session evaluation was incorporated at the end of the module, including session evaluation questions, case scenarios, body mapping of the location of bleeding symptom sites and narration of role play for home visits and household screenings. The total time allotted for module delivery was 8 hours, and the sessions were divided into 45 minutes each. The module was developed initially in English and translated into the local language (Kannada).

3.3.2 | Outcome measurement questionnaires

Evaluation of the training included one specific component for each of the training programs. The following tools were developed and validated to evaluate the outcome of the training program. The

demographics of the ASHAs, such as age, education, years of experience, and exposure to previous education for bleeding disorders, were considered. A knowledge questionnaire on hemophilia and other bleeding disorders was developed by the researcher to assess the knowledge of ASHAs for the identification of individuals with bleeding disorders. The questionnaire contained 27 items comprised of knowledge questions based on the training module content, which included basic elements of blood, the clotting process, bleeding disorders and their types, screening of individuals with bleeding symptoms, management of bleeding disorders and the role and responsibilities of ASHAs in community screening. Each correct answer was given a score of "1", and a wrong answer received a score of "0". The knowledge score ranged from 0 to 27 and was categorized into 0-9 (poor), 10-18 (average), and 19-27 (good). The questionnaires were translated into the Kannada language and translated back into English to check for equivalences of meaning. The content validity of the tool was performed by experts in the areas of hematology, nursing, pediatrics and community health. The reliability of the tool was tested using the test retest method and $r = 1$. Skills were assessed using role play of home visits, for which a script was developed with a case scenario of a family with a history of bleeding disorders that was validated by experts and translated. The role play basically consisted of how to perform a home visit and assess family members for suspected bleeding symptoms. Data on knowledge of bleeding disorders were collected at baseline, post-training test 1, and 30 days post-training test 2 using a structured knowledge questionnaire. All of the ASHAs were included in the assessment. There was no loss to follow-up 30 days after the intervention. Feedback on the training program was evaluated by developing a program evaluation questionnaire.

Chapters	Content
Chapter 1. Basic elements of blood	<ul style="list-style-type: none"> • Understanding the body system • Blood components • Blood circulation
Chapter 2. Bleeding and clotting mechanisms	<ul style="list-style-type: none"> • What is normal bleeding? • How does bleeding stop in a normal person?
Chapter 3. Bleeding disorders	<ul style="list-style-type: none"> • What are bleeding disorders? • Why do some people bleed longer? • Common inherited bleeding disorders <ul style="list-style-type: none"> ○ Hemophilia ○ von Willebrand disease ○ Specific factor deficiencies ○ BD related to platelet dysfunction
Chapter 4. Screening persons with bleeding disorders	<ul style="list-style-type: none"> • Signs and symptoms of bleeding disorders • External bleeding sites • Internal bleeding sites
Chapter 5. Management of bleeding disorders	<ul style="list-style-type: none"> • Replacement of specific clotting factors • Transfusion of blood products • Staying healthy and preventing bleeding
Chapter 6. Guidelines for screening of blood disorders by primary health care providers	<ul style="list-style-type: none"> • Identify risk groups • Create awareness of bleeding disorders • Refer individuals with bleeding disorders

TABLE 1 Content of the training program for accredited social health activists

3.3.3 | Implementation of the training program

This training program adopted the model of a public-private partnership in which the district health department were partners in the implementation of the program and facilitated the ASHA training program through provision of a training center with a well-equipped district community health center, resources, logistics, and boarding for the trainees and trainers. District ASHA mentors, who were instrumental during the training workshops, were present to provide necessary support to the trainer at the center. The content of the teaching material was delivered in the local language (Kannada) throughout the training process. Adult learning principles were adopted throughout the teaching learning process.^{12,13} Training was provided through a series of workshops with a group of 40 (\pm 5) ASHAs. The teaching was participatory in nature, and the trainer employed teaching methods such as lecture cum discussion, small group activity, body mapping, role play, and case discussions. The teaching aids used for the training sessions were charts, blackboard, posters, pamphlets, and worksheets. Each session was evaluated via the administration of evaluation questions, and reinforcement was provided in areas where the ASHAs required clarification. An evaluation was performed at each session via a quiz and demonstration of skills. Twelve workshops were performed to complete all of the ASHA training. The ASHAs were also provided reinforcement after 30 days of evaluation training test 2 to clarify their queries and strengthen the obtained knowledge.

3.4 | Statistical analysis

All analyses were performed using the SPSS software package version 16.0. Descriptive statistics were used to describe the baseline characteristics and feedback responses of the training program provided by the participants. A Friedman non-parametric statistical test was used to compare the median response scores at baseline and post-intervention. A *P* value $<.05$ was considered significant.

4 | RESULTS

4.1 | Participant demographics

The mean age of the ASHAs was 38.1 ± 6.02 (SD) years, and most 338 (55.9%) were 36-45 years of age. The majority 298 (50.9%) of the ASHAs had higher secondary education. Most 443 (76%) of the ASHAs had worked for more than 5 years in the community as community health workers, and none of them had any previous training or educational exposure with bleeding disorders (Table 2).

4.2 | Effectiveness of the ASHA training program in gain in knowledge

The baseline evaluation was performed prior to the training program, and the knowledge scores of all participants were poor.

TABLE 2 Demographic characteristics of the participants (N = 586)

Sample characteristics	Frequency (f)	Percentage (%)
Age in years		
<35	200	34.1
36-45	338	56
46-55	55	9.4
>56	3	0.5
Mean age in years	38.12 \pm 6.02 (SD)	
Education attainment		
7th-10th grade	277	47.2
Pre-university/college	298	50.9
Graduate degree	11	1.9
Years of experience as an ASHA		
<5 years	143	24
>5 years	443	76
Exposure to previous education on bleeding disorders		
Yes	0	0
No	586	100

Sixteen (2.7%) participants had average knowledge at the end of the training test 1, and 570 (92.2%) participants had good knowledge. Thirty-nine (6.6%) participants had average knowledge at 30 days post training test 2, and 547 (94.3%) participants had good knowledge. There was a significant increase in knowledge scores from baseline to the post-intervention period at 30 days. The effectiveness of the training program was assessed using Friedman's two-way test. A significant difference was found between the pre-test and post-test 1 and 2 knowledge scores ($\chi^2 = 955.1$, $P < .05$) in the group (Table 3).

Table 4 and Figure 1 show that the median post training test 1 knowledge score (25) was significantly higher than the baseline median score (2). The post training test 1 lower quartile Q1 was 23, and the upper quartile Q3 was 26. The baseline lower quartile Q1 was 1, and the upper quartile Q3 was 5. The 30 day post training test 2 median knowledge score (23) was lower than the post training test 1 median score (25). The 30 days post-training test 2 lower quartile Q1 was 21, and the upper quartile Q3 was 25.

4.3 | Evaluation of the training program

4.3.1 | Training program feedback

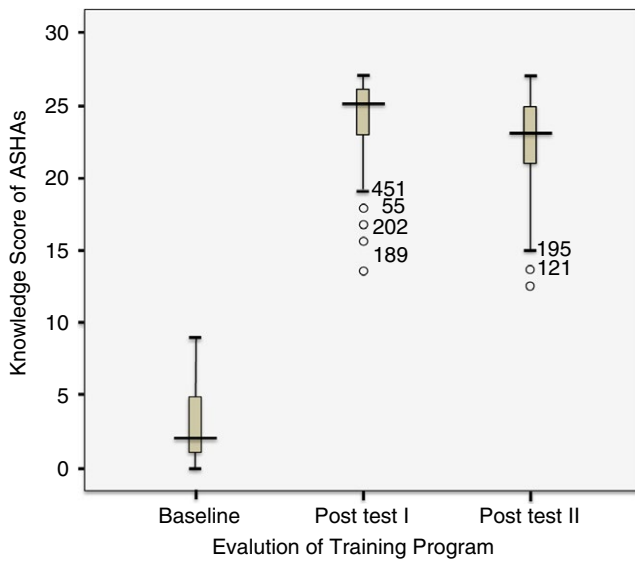
The evaluation feedback provided for the training program was a critically important component of the bleeding disorder training program. The training evaluation was performed using a feedback questionnaire that included adequacy of the content and organization, training program objectives, training methodology, training material provided, and group participation. The evaluation also included the logistic part of the training program. Most of the trainees (88.4%) reported that the content of the training program was simple and well

TABLE 3 Frequency and percentage distributions of the pre- and post-test knowledge score categories of the ASHAs

Knowledge category	f (%)			Friedman chi-square	df	P
	Pre-test	Post-test 1	Post-test 2			
Poor (0-9)	586 (100%)	–	–			
Average (10-18)	–	16 (3%)	39 (7%)	955.1	2	.001
Good (19-27)	–	570 (97%)	547 (93%)			

TABLE 4 Median and interquartile range (IQR) of the pre-test, post-test 1, and post-test 2 knowledge scores

Percentiles	Pre-test	Post-test 1	Post-test 2
Median	2	25	23
IQR	(1, 5)	(23, 26)	(21, 25)

**FIGURE 1** Box and whisker plot showing the median and IQR of the baseline, post-test 1, and post-test 2 knowledge scores

organized, and 83.5% of the participants reported that the training program objectives were met. Most (86.3%) of the participants reported that the training methodology was appropriate and adequate (86.3%), that the educative materials were useful and informative (82%), and that the group participation was good and involved themselves in group activities (83.4%). All (100%) of the participants used the skills from the training at their workplace. Almost all of the

participants agreed that the training instilled confidence in performing the required task (Table 5).

4.3.2 | Skill assessment

Role play was adopted to simulate the home visit performance by the ASHAs, who performed a family assessment for suspected cases with bleeding symptoms/disorders. Six to eight ASHAs were formed into groups, and the participants acted at the training center. The ASHA mentors evaluated the performances in the following areas: understanding the story and preparedness of the participants, interactions within the group, and interpersonal communication.

5 | DISCUSSION

The current study was performed to assess the effectiveness of a training program on gains in knowledge of the identification of cases with bleeding disorders by ASHAs. The present study reported that most (55%) of the ASHAs were 36-45 years of age, with a mean age of 38.1 ± 6 (SD) years. Similar findings were reported in previous studies.^{9,14} Most ASHAs had more than essential educational qualifications (ie, pre-university education). The effectiveness of the training program of the current study supports the study findings of the Department of Women and Child Development, Government of Odisha (2015), India. This study reported that knowledge in the areas of mother and child health (MCH) was significant ($P < .001$) after a 1000-day training program for ASHAs.¹⁵ Guleri et al. (2017) also reported significant improvement in the knowledge of ASHAs after undergoing training (paired *t* test, $P < .001$).¹⁴ The post-training mean scores of the ASHAs were significantly higher [ie, 15.2 (50% of the maximum score; SD ± 4.4), which was nearly double the pre-training score (8.6 ± 3.9).¹⁴

Response by the ASHAs

Percentage

1. Content was simple and well organized	88.4
2. Training program met the stated objectives	83.5
3. Method used for training was appropriate and adequate	86.3
4. Material provided was appropriate and adequate for the content	82.2
5. Group participation was good	83.4
6. Performance of job	100

TABLE 5 Training program evaluation

The researcher could not identify training effectiveness studies in the area of hemophilia and other bleeding disorders in India or other countries. ASHAs/community health workers (CHWs) were very much recognized in developing countries in numerous studies, where they provided a wide range of benefits,⁷ including increased access to care for diseases.

Training was helpful for the ASHAs by improving their knowledge and skills and developing confidence to undertake different activities, which they hesitated to perform prior to the training. The project was used in three more districts of the Karnataka state for more than 2000 ASHAs based on the evidence of feasibility of the present study in improving ASHA knowledge and skill in one district. Continuing training is ongoing as reinforcement and in combination with other training programs. The evidence reported on ASHA/CHW training outcomes in India and other developing countries included decreased maternal and child mortality, improved performance, referrals and health-care service utilization, and cost-effectiveness.^{8,9,16-21} Cases in India are identified through community engagement via the ASHAs alongside other practical uses to enhance screenings where detection of bleeding disorders may be achieved. ASHAs are uniquely situated in the rural community and are available at the primary health center level. Our study results confirmed that ASHAs acquired knowledge and needed skills to perform screening in the rural community. The latter part of the study findings on community screening and identification of suspected cases with bleeding symptoms will be reported in future publications.

This study has some limitations, including the lack of a control group. Even though there was no obvious reason for a change in knowledge score over time (without having training) reinforcement and feedback was present and thus it is plausible that repeated testing and reinforcement alone may have produced the desired change. The lack of a control group makes it difficult to confidently explain some of the changes in participants' responses as documented by the training test measurements. However we believe that the repeated assessments were appropriate for this study. A randomized control trial might be a better design to show that the impact of training on the self-confidence of the ASHAs would achieve the stated outcomes. Whether the education resulted in increased referrals to diagnostic centers is not covered by this paper and the outcome of training will be reported elsewhere.

6 | CONCLUSION

To the best of our knowledge, this report is the first study to provide an educational program for ASHAs and to evaluate knowledge acquisition in a systematized manner at a community training center. The training manual demonstrated potential to be an effective way to improve some aspects of bleeding disorder literacy among ASHAs. However, observations of skills would have been better assessed using an observed structured practical examination. ASHAs are trained in various areas of national

health importance under the national health mission (NHM) of the government of India. The government should also consider initiatives to strengthen the capacities of ASHA workers using capacity building in hemophilia and other bleeding disorders for early identification and referral. As a result of the intervention received, project beneficiaries gained knowledge of hemophilia and other bleeding disorders and acquired skills to identify cases with bleeding symptoms in the training programs conducted for ASHA workers. Integration of community health worker training into community programs is an effective method to enable health campaigns in underserved communities.

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RELATIONSHIP DISCLOSURE

The authors have no conflicts of interest to disclose.

AUTHOR CONTRIBUTIONS

S. Badagabettu, D.M. Nayak, A. Kurien, V. Kamath, B.S. Nayak, and L.S. George contributed to the study conception and design, collection and assessment of data, data analysis, and interpretation and manuscript writing/revisions. A. Kamath contributed to the data analysis and interpretation and manuscript/revisions. All authors provided final approval of the submitted manuscript.

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