THE EFFECT OF HEALTH SECTOR SUPPORT

ON THE FUNCTIONAL STATUS OF COMMUNITY HEALTH AGENTS

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LIST OF ABBREVIATIONS

CHA - Community Health Agent

CHS - Community Health Services

CHW - Community Health Worker

MOH - Ministry of Health

NDRP- National Democratic Revolution Programme

PAS - Peasants' Associations

PHC - Primary Health Care

TTBA- Trained Traditional Birth Attendant

WHO - World Health Organization

ABSTRACT

A comparative intervention study was conducted on 102 Community Health Agents (CHAs) in two Districts of Illubabor Administrative Region, south-western Ethiopia. The objective of the study was to look into the effect of health sector support, particularly of a refresher course and regular supervision, on the health service activities of CHAs. A total of 102 CHAs who were performing at least one activity specified in their job description were divided into two groups and designated by the lottery method as either intervention or control group. Baseline input to enhance community involvement was provided to both groups; a refresher course and monthly regular supervision were provided to the intervention group only. Both groups were followed for six consecutive months to collect data on 13 health service activities separately and as a composite, which represented the functional status of the CHA. The findings indicated that 60.7% of CHAs were initially performing at least one health service activity. A group x time analysis revealed that the composite functional score and most of the 13 activities increased after time 0 (T0) for CHAs in the intervention group but remained stable or declined in the control group. The mean composite score for intervention CHAs increased from 13.08 at time 0 (T0) to 19.26 at time 6 (T6); whereas for

control CHAs it declined from 12.17 at T0 to 9.58 at T6. The difference was attributed to the increase in health sector support, which in turn also helped to maintain community support.

INTRODUCTION

In developing countries health services coverage is estimated to be only 15% - 30 % (1). In Ethiopia, as in many developing countries, health services have traditionally been concentrated in urban areas and have tended to focus on expensive hospital based curative services. This placed 80% - 85% of the population which is rural beyond the reach of the modern health care system (2). In order to correct this imbalance and fulfill its commitment to provide adequate health services to all and to ensure full and meaningful life for all Ethiopians (3), the government took several important steps. One was to emphasize community involvement in health promotion and disease prevention. Another was to train and use two types of Community Health Workers (CHWs), namely Community Health Agents (CHAs) and Trained Traditional Birth Attendants (TTBAs). This was adopted as a policy and launched nationwide in 1978 (4). By training lower level health workers who could provide many of the health services needed by people, the government hoped to increase health manpower, improve coverage, and reach people at the community level.

Ideally, community health services are organized to serve a community of approximately one thousand people,

and each unit is supposed to be staffed by a CHA and a TTBA (5,6). The community health services units are expected to act as a link between the community and the conventional health services (5). The cost of training CHWs and the cost of services they give are the responsibility of the community which they serve.
The government,through the Ministry of Health (MOH), has the responsibility of conducting the training, providing the supervision, and continuing post-training education (5,7,8).

CHAs and TTBAs, through their direct contact with the community and with emphasis on prevention, are considered to be the backbone of Primary Health Care (PHC) in Ethiopia. However, in reality the outcome has been disappointing. Of the 11,915 CHAs and 11,743 TTBAs trained since the beginning of the program, 50% are estimated to be non- functioning (9). Perhaps too great a responsibility has been placed on people who are rather poorly trained, poorly respected, poorly supervised, and poorly rewarded.

Studies aimed at evaluating the functionality and utilization of CHAs in Ethiopia have reported 26% functionality and 46% utilization (10,11). Although the methods of evaluation were different, the studies concluded that there are weaknesses both in the training and support of CHWs (10,11,12). According to the PHC

Review in Ethiopia (13), the weaknesses have been identified in two major areas: lack of community support on the one hand, and lack of,or inadequate, health sector support on the other. In another study conducted in Arsi, strong associations were observed between the functionality of the CHAs and health sector support, such as supplying essential drugs, providing timely refresher courses, regular supervision and necessary materials (monthly report forms and registration books) (10). Functionality and utilization of CHAs services were also related to community knowledge and support (11). Due to the limitations in the design, these cross-sectional studies were unable to determine whether health sector support was a cause or a consequence of increased functionality.

The important issue for those interested in improving functionality is whether one can increase CHAs' activities by providing health sector support, and whether such support is sufficient on its own without any direct attempt to increase community support. In order to test this idea, an intervention study was designed. The present study employed a longitudinal design to compare changes in functionality of CHAs who received an intervention with those who did not. It is hoped that this study will provide information that can be used by Awraja (District) health teams and the health sector in

general, to promote the functional status of the CHAs and the sustainability of their activities.

WORKING DEFINITIONS

CHA - A community Health Agent is a male or female individual who is selected by the community and trained for three to six months in health and health related activities by the MOH and return back to his/her community. A CHA is expected to stay in the community and gives part-time health services to his community.

CHS - Community health services are health services units staffed by CHAs and TTBAs and organized to serve a community of 1000 people. The term is used interchangeably with health post.

CHWS - Community health workers are CHAs and TTBAs which have different names in different countries. It is a collective term to encompass all the different names used to mean people selected by the community trained for a while and then work in their community.

Kebele Peasant Association - The smallest rural administrative unit in which members are organized into a peasant association and administered by the executive committee of the peasant association.

Functioning CHA - A CHA who performs at least one activity as specified in his/her job description.

Functional Status of CHA - A CHA's level of performance which includes the whole range of functions as specified in the job description and measured by the activities performed per month.

Mean Functional Status - The mean of the sum of the scores of the selected criteria at different times of the intervention period.

Regular Supervision - Administrative and/or technical support interms of material, moral and on- the- job training. Assessing the performances of the CHA's using a check -list on monthly basis.

Regular Refresher Course - Post - training courses for the CHA to increase their skills and level of performances, to be provided at regular intervals.

Objectives

The general objective of this study was to determine the effect of health sector support on the health service activities and functional status of community health agents.

Specific Objectives

1. To identify variables influencing functionality of CHAs at baseline, that is, before any intervention.
2. To determine the effect of providing a refresher course and regular supervision on the functional status of CHAs in the intervention group over a period of six months.

Hypotheses

1. CHAs in the intervention group who receive a refresher course and supervision will show an increase in level of health activity sustained over a period of six months.
2. CHAs in the intervention group will show higher level of activity than the control group who received materials and help in increasing community awareness.

LITERATURE REVIEW

The health policy approach using Community Health Workers as the cornerstone of Primary Health Care is based on the assumption that health care should be made available to the large number of people presently without access. It is also believed that health care offered by CHWs is affordable and close to the community, and often more appropriate to people's needs (14,15,16). These minimally trained health workers are widely seen as the key persons to link the health care system to other developmental activities at the grass roots level.

Since the Alma-Ata conference on PHC in 1978, the extension of health care to the majority of the population using CHWs has been emphasized (15). The training and use of CHWs to carry out pHC tasks is a common feature of developing countries (15). Although the duration of training, the job description, and the technical and administrative management of CHWs vary widely among countries, there are many common features of their services. The main one is that CHWs are selected by the community and work in and with the community (10,17). As described by Ofosu (18), the CHWs have a key role in increasing access to the entire population, in reducing the cost of services, and in improving social relationships between health workers and the population. Despite the accepted importance of the CHWs in many

countries, the question of how best to improve their effectiveness has not been satisfactorily answered (14). In many countries CHWs are quite ineffective; in others they have varying degrees of success. For example, in Thailand, village health communicators were so inactive that doubts were raised about their value at all (19). In Tanzania, out of 130 CHWs who were trained in the 1970's, it was identified that 10 years later, only 30 were working (20). Performance was somewhat better in Peru where health promoters were found to be performing between 10 and 40 activities per month (21).

It is generally expected that the utilization of the health services by the community will improve with the presence of a CHW because of the greater accessibility and acceptability of the CHW's services. In Indonesia one study has claimed that over 75% of households reported at least one visit to a CHW for illness care in the past 18 months (22).

Similarly, surveys conducted in Ethiopia report that anywhere from 20% - 50% of those trained are still functioning. Their definition of functioning was that the CHA be performing 40% to 50% of their assigned duties. Studies conducted in 1988 found 26% were functioning in Arsi and 20% were functioning in Buno Bedele (10,11). Of the 1074 CHAs trained in Illubabor region, only 14.7% were reporting to their respective

health institutions in the last three months of 1990 (23). Reporting is only one of the duties of a CHA, but one that is a readily available index of CHA functioning. Given these figures, it is now necessary to examine in detail the strengths and weaknesses of the community health services system as it operates in Ethiopia.

A WHO review of national experience in the use of CHWs claims that the strengths and weaknesses of the CHWs are to be found in their role as intermediary between the health sector and the community. A weak relationship on one side or the other leads to failure in the sustained functioning of the CHW (18). Because most research has focused on these two key supportive relationships, namely with the health sector and with the community, this literature review will cover the following two issues: What is the role of the health sector in facilitating the effective functioning of the CHW? What is the role of the community in facilitating the effective functioning of the CHW?

The expected role of the health sector in Ethiopia is to provide technical supervision, a reliable referral system, refresher courses at regular intervals, and a simple and inexpensive means of communicating with the health stations. In addition, the MOH can help increase the awareness of the community as to its responsibilities toward the CHWs and their utilization of his/her services

(18,24). The community itself, however, has the primary responsibility to supervise and support the CHW in all non-technical areas because, officially, CHWs are accountable to the community and not to the MOH. The community is expected to form a health committee on which the CHW serves as secretary or chairman. It is also responsible for providing a health post in which the CHW can operate, and means of support to him/her in cash or in kind. The community is responsible for selecting the CHW and for supporting him/her during training.

Health Sector Support

Investigators from Botswana, Tanzania, China, India, Sri Lanka, Iran, Columbia, Peru, Ecuador, and Alaska have looked into the effect of refresher courses and regular supervision by the health sector. They invariably found that health activities performed by the CHW were sustained better when he/she was regularly supervised every month and given a refresher course every three months (7,11.20,21,25,26,27,28). Concerning supervision, many researchers demonstrated that the quality and frequency of supervision received from health professionals were important. This of course varies from place to place depending on the distance between the place of work of the CHW and the supervising health unit (29). To compensate for this, they recommend that more

frequent and regular refresher courses be given to those situated far from the supervising health unit. In the Saradidi project in Kenya, effectiveness of the CHW was improved when supervision was divided between the health sector and the community: technical support by the health sector and administrative support by the community (30,31).

Explanations as to why supervision and refresher courses are so beneficial are less precise. The people involved think that continuous supervision provides the CHW with reliable and valuable back-up in terms of referring patients and in terms of enhancing the CHWs credibility with the community.

Refresher courses improve his/her skills and status as an effective member of the health team (18,32). Both help the morale and motivation of the CHW and are necessary to sustain optimal activity, according to the Inter-regional workshop held in Jamaica (33).

In addition to the effect of supervision and continuing education, several studies have identified other contributing factors from the health sector. For example, a survey in the Yemen Arab Republic (34) revealed that 20% of the CHWs lacked a precise idea of what their duties were, and about 80% did not have a copy of their job description. This indicates how much they have been neglected by the health sector. Material

supplies such as a registration book and drugs are also important for the functioning of the CHW (35,36).

Inadequate community involvement in the CHW's programme often emerges from a lack of understanding of the role of the CHWs by the local community leaders. In many countries little or no effort is made to inform and educate the community about the activities of the CHWs and the strategies of PHC in general (18). Some countries like Costa Rica and Liberia have made repeated efforts through the health sector to increase the awarness of the community. They also tried to sensitize community leaders and members of the health committee about the role and functions of their CHWs on one hand, and their responsibility on the other hand (37).

Several studies conducted in Ethiopia have found the health sector support to be inadequate. Health station staff were not aware of the presence of a CHA in their catchment area. Only half the CHAs had a copy of their job description.

Supervision by the health institution was reported in only 14% of the cases. Other associations were found between CHA functionality and refresher courses and the availability of a registration book to keep records(10,11,12).

A sample survey conducted in 1984/85 in western Ethiopia showed an attrition rate of 83.0% (585/706), in

Wollega, 70.7% (355/502) in the former region of Illubabor, and 27% (160/594) in the former region of Kaffa (38). One of the reasons given for the high drop-out rate was the lack of regular supervision and refresher courses on the part of the health sector. Additionally, shortage of the standard MOH monthly report forms contributed to the dissatisfaction of CHA, gradually leading him/her to stop working.

Community Support

Findings that relate community support to CHW functionality are less numerous, either because it is considered less important or because such variables are less objectively measured. However, they do find that when the community is involved in selecting the CHW and knows the CHW and his/her activities, there is higher community utilization of community health services (11). Knowledge about the CHA and his/her activities had to be fairly extensive before it led to confidence in using the CHA's services (11). In Botswana, 30% of the households did not know what work the CHWs did and some considered them insufficiently qualified (19). In Thailand, those who were not members of the village health committee were performing far fewer activities than those who were well-placed members (19).

Although many factors have been proposed to explain why some CHW's services are frequently used and others rarely so, the importance of the community's provision of remuneration and participation in the CHW's selection were well documented. Community support may also depend on the ratio of curative to preventive services. The former are more visible and so tend to result in stroger support. The latter, by themselves, tend to be less appreciated by the community.

In Saradidi, Kenya, CHW utilization was said to be high because the programme was initiated, planned, implemented and evaluated by the community itself (30,31). It was stated in the same report that community participation was the kind of support that should not be overlooked in the implementation of CHS.

The involvement of the health personnel from the nearby health institution in the selection of the CHWs was also found to be an important determinant in Burma, India and Iran (18). Selection of CHWs by the community without the proper informing and understanding of his/her role after training may lead to failure as was observed in Afghanistan (18).

In Ethiopia, functionality of the CHA was related to community support generally, and specifically to remuneration by the community (10). The majority of community leaders (84.6%) either expected their CHAs to

be supported by the government (MOH) or were not aware that the CHA needed to be supported by the community. Other relevant community factors were the presence of a health committee, the place of the CHA in the committee and the construction of a health post (10).

Utilization by the community was positively associated with knowledge of the CHA's activities, though participation of the community in selection was less important (11). In the study of utilization of CHAs in Buno Bedele Awraja, 80 % reported having received a health service in the past year, although only 46% actually knew that the services came from a CHA (11).

Intervention Research

It is clear that in the Ethiopian context, as in many other countries, CHWs are not functioning as was expected. Many studies have identified factors that potentially contribute to CHW functionality, although they are limited by their cross-sectional design. These associated factors could be either determinants or consequences of the functional status of the CHW. The next step is, therefore, to conduct intervention studies where the effects of the intervention can be compared with those of a non-intervention group. One such intervention study was conducted in the Isok district in Zambia (39,40). The intervention consisted of continuous

regular supervision and on-the-spot problem solving by health centre personnel. Six months later the CHWs were doing a better job of treating cases and referring more serious ones, and of providing health education on environmental sanitation and personal hygiene.

In the Machakos (Kenya) programme, home visiting has been a major activity for all CHWs. Most spend two or three afternoons per week either visiting homes or with women's groups. When the CHW returns home, he/she records the visit in a book and notes any improvements made since the previous visit. The records are given to the local coordinator during regular monthly meetings of the CHWs. The figures for the month are then tabulated and sent to the health offices. Follow-up and support included three elements: an annual refresher workshop for all CHWs trained, monthly or bi- monthly visits by the training team to meet with the group of CHWs from a particular area, and yearly visits by team members to the community of every CHW. Three years after the start of the programme it was found out that the community has benefited from the CHW health services. The women's groups learned many things regarding health (41).

In Alaska, USA, (27) regular supervision of community health aides was provided by the public health nurses and occasionally by a physician at the hospital. Additionally, refresher courses were given at regular

intervals. On evaluation these intervention activities have helped the CHWs to maintain high standards of performance, created a team spirit and self-confidence and continuity in their works.

The present study also was designed to examine the effects of an intervention. As in the case of the Zambia study, we chose to make health sector support our primary intervention. There were several reasons for this. One is that past research has demonstrated the mere presence of association between the health sector support, particularly supervision and refresher courses,and functionality of the CHW. The second is a logistic reason; namely that the Awraja (district) health team is organized enough to carry out the required supervision and refresher courses. However, both groups were given an initial boost by initiating some community activities such as establishing a health committee and conducting group discussions about community health services with community members. Additionally, registration books and standard MOH report forms for CHAs were provided to all CHAs. Consequently, if both groups showed equal improvement over the six months, it could be attributed to improved community support. However, if the intervention group showed greater and sustained improvement, it would be attributed to the combination of health sector and community support.

MATERIALS AND METHODS

Design

This study employed a prospective design in which independent groups of CHA populations (intervention and control) were followed for a period of six consecutive months from June to December, 1990.

Population

The study was conducted in two Awrajas of Illubabor Administrative Region, South-Western Ethiopia.

The study population included all the community health agents who have been trained and deployed in those particular Awrajas since 1978 (n = 168). The selection hierarchy is presented in figure 1. Twenty-six CHAs were not found; thus 142 were interviewed in the census survey. The specific study sample included all CHAs who were found in a census survey to be performing at least one activity outlined in their job description (n = 102). This was determined at the time of the initial census in both Awrajas and, because of this, no sampling procedure was applied.

Inclusion Criteria

1. CHAs who have been working for at least one year before the beginning of the study

2. CHAs who were found performing at least one of the activities in their job description
3. CHAs working in Awrajas which have established an Awraja health management team and office and have a health center.
4. CHAs who are residing and working in the Awrajas under the Jimma Institute of Health Sciences team training programme, because of the availability of a health management team and supervisors.
5. Awrajas that have been supported by the Rural Integrated Basic services (RIBS/ UNICEF) to keep uniform the level of development of the Awraja.

Exclusion Criteria

1. CHAs who received a refresher course within the six months prior to the study
2. CHAs who work in Jimma town
3. Awrajas that receive additional financial support for their CHAs from Non-governmental Organizations (NGOs).

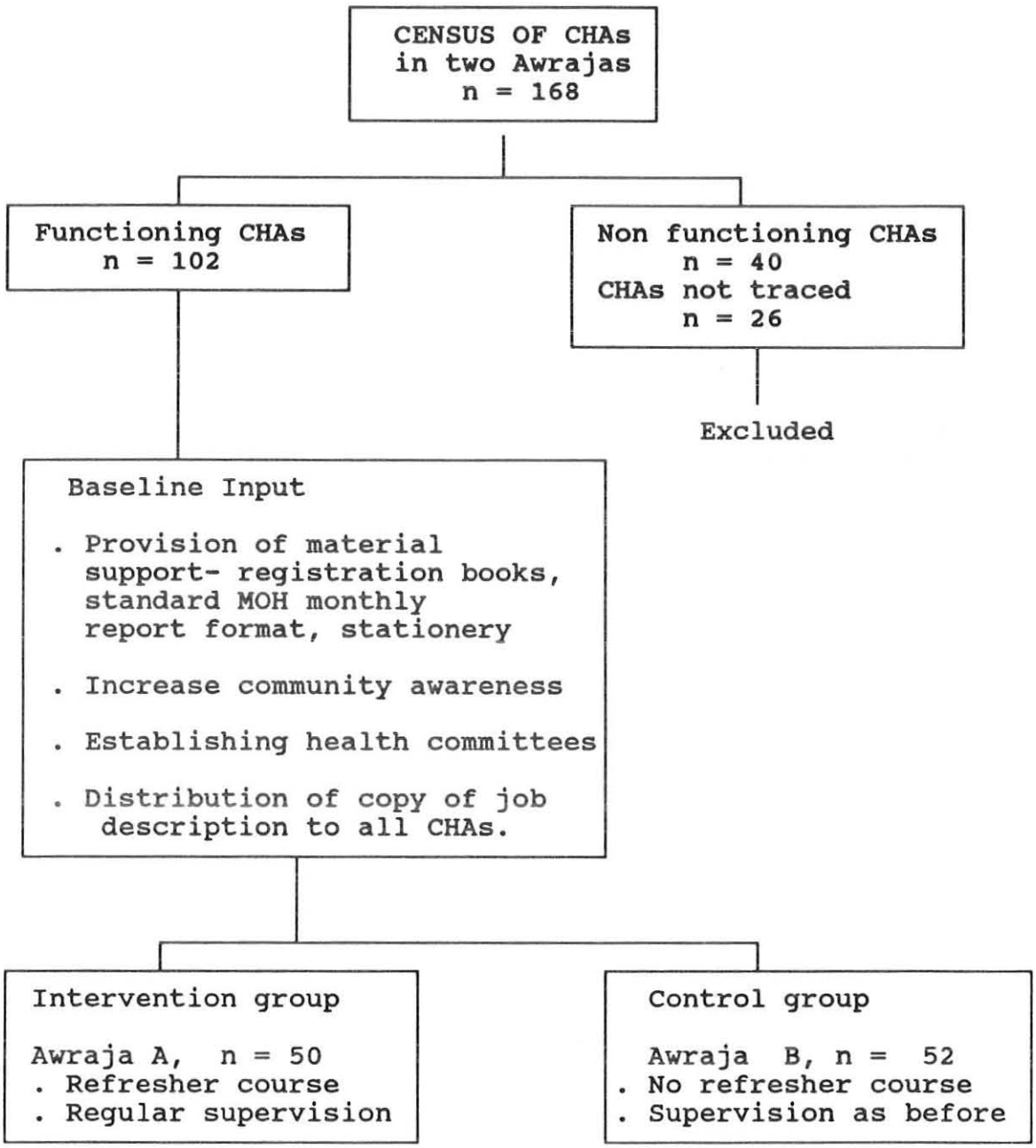

Figure 1. Selection hierarchy.

Measurement

Census survey measures. A census questionnaire was developed to include activities in the job description of the CHAs and in the standard MOH monthly report form for CHAs. Then an initial census was conducted to know the total number of CHAs trained, deployed and residing in the two awrajas where the CHAs were working. Additionally, the following information were collected at the initial census survey:

1. Demographic Indicators: Age, gender, educational status, marital status, and occupation of CHA and population served by CHA.

2. CHA - Related Information: Years since graduation, years since refresher courses, place of training as a CHA and presence of TTBAs.
3. Health Sector Support Indicators : Expectation of CHA from health institution: Supervision, refresher courses, organizing health post and presence of health committee.
4. Community Support Indicators: CHA position in the PAs leadership, membership of the CHA in the health committee, availability of registration book, frequency of administrative supervision by community leaders, sponsorship of the training,

remuneration of CHA, availability of health post, community acceptance of CHA services and expected support from community leaders and the community.

Intervention Measures.

a) Initial input: After the initial census, the 102 CHAs who were found to be performing at least one of the activities in their job description were included in the study. All were provided with materials including registration books, standard MOH monthly report forms for the CHAs, and stationery as well as other supplies to last a minimum of one year.

General meetings were held in each peasant association (Kebele) with the community leaders and the community at large. Issues related to the CHAs job description, roles and responsibilities were thoroughly discussed.

The responsibilities of the community leaders and of the community in providing administrative and logistic support to the CHAs were discussed in depth. In particular, attention was given to the importance of community leaders supervising their CHAs regularly and organizing financial support for the CHAs. Also the communities were encouraged and helped to establish or strengthen health committees in their respective kebeles.

b) Intervention : After the above baseline input was completed the study group was assigned by Awraja to be the intervention or the control group using the lottery method. Accordingly, Mana-Kersa Awraja was chosen as intervention and Nada-Dedo as the control group.

The CHAs in the intervention Awraja received a five-day refresher course which was based on the functions of the CHAs and other relevant responsibilities which they are supposed to carry out in the provision of the health care to their communities. (see annex A for job description and C for content of refresher course).

Outcome Measurement. The outcome measured in this study was the functional status of the CHAs. A total of 13 criteria were selected based on activities specified in the job description for CHA's, and the areas included in the standard MOH monthly CHAs report form. The selected criteria cover all the measurable activities of the CHAs while discharging their duties and responsibilities. Other activities in the job description of the CHAs which would not be quantified were excluded, eg. coordinating the community for health activities. The activities were scored as in table 1.

Table 1. Scores given to 13 activities when computing the composite score

Criteria	Activities	Score
1.	Out-of-post working days/month	
	none	0
	1 - 3 days	1
	4-6 days	2
	7 or more	3
2.	Health education session	
	none	0
	1-3 session	1
	4 or more	2
3.	Environmental health activities	
	none	0
	1 - 3 activities	1
	4-or more activities	2
4.	MCH activities/month	
	none	0
	1-2 activities	1
	3 or more	2
5.	EPI activities/month	
	none	0
	yes	2
6.	Number of births registered/month	
	none	0
	no births	1
	1 through highest	2
7.	Number of deaths registered/month	
	none	0
	was no death	1
	1 through highest	2
8.	Patients receiving first aid and treatment/month	
	none	0
	was no patient no drug	0
	1 to 50 patients	1
	51 through highest	2

9.	**Frequency of sending health activity reports to health institution**	
	none	0
	less than monthly	1
	monthly	2
10.	**School health activities/month**	
	none	0
	no school	1
	Yes	2
11.	**Referring patients to the next higher health facility/3 months**	
	none	0
	was no patient to refer	1
	yes	2
12.	**Reporting epidemics and taking control measures/ 3 months**	
	none	0
	was no epidemic	1
	yes	2
13.	**Home visits/month**	
	none	0
	1 to 3 visits	1
	4 or more	2
	Maximum score =	27

The assessment of a CHA's activities was made with a checklist to be completed monthly by both the CHA and the supervisor from the health station. For each of the 13 listed activities, the respondent was to indicate the number of activities, patients or sessions, according to the criterion. The checklist can be seen in Appendix E.

The performance scores for the 13 activities were subsequently standardized (see table 1) in order to reduce them to the same 3-point (or 4-point in the case of out-of-post) scale. Out-of-post activities were given more weight because of their importance as an index of community contact. Functionality was computed by summing the scores for the 13 activities. This composite functionality score as well as the performance scores for the 13 separate activities were collected and computed for each time period.

Data Collection

The questionnaires were prepared first in English and then translated into Amharic. It was pretested in a similar population of CHAs after which minor modifications were made. For the initial census, interviewers were selected from health personnel working in the Regional Health Department and from the Awraja health management team if they were knowledgeable about the areas and the native language. A one-day orientation was given on how to conduct the census of the CHAs and how to complete the questionnaire. The questionnaires used at the initial census survey were modified and used as a supervision checklist to collect data during the follow-up period. Regular supervision was conducted on monthly basis for six consecutive months using the supervision checklist.

The supervision checklist was completed on a monthly basis for six months by the supervising health unit staff and the CHA himself. The data were checked for completeness by the supervisors and the accuracy with the records of the CHAs and the monthly report sent to health institution. The supervisors were requested to record all their observations and the relevant discussions they had with the CHAs during the monthly supervision time. The information was then sent to the respective awraja health office from where the investigator collected the

completed questionnaires. The study groups and the supervising staff were kept blind as to the purpose of the study and the group assignments.

They were provided the financial support for supervision through the awrajas' health offices and the supervision checklist was sent with guidelines by the Regional Health Department.

Method of Analysis

Data analysis was done using an SPSS/PC+ computer package. Frequency distributions for the different variables assessed at the census survey and intervention period were calculated. Actual analysis was made using chi-square statistics for categorical variables and analysis of variance for the continuous variables to determine differences between groups and changes over time periods. Based on the hypotheses, an interaction effect was expected indicating that the two groups performed similarly at the beginning but diverged later. If this was confirmed by the repeated-measures ANOVA, t-tests would be conducted to compare the two groups at three time periods (T0,T3 and T6). Further analyses were carried out using paired sample t-test statistics to see the changes in activities for each group between T0-T3 and T3-T6.

Secondary analyses were done using multiple regression to determine which variables were best

predictors of CHA functional status at T0 and T6.

Composite functional status was computed by summing the scores of the 13 activities at each time period and mean performance across six time periods was calculated for each activity.

RESULTS

Census Findings at Time 0 (T0)

Of the 168 CHAs trained and deployed in the two awrajas since 1978, 142 (84.5%) CHAs were found and interviewed at T0. A total of 60.7% were performing at least one activity for which they had been trained.

The census results will be described for demographic, community support, and health sector support variables.

Table 2 shows the demographic variables scored on a continuous scale; namely, mean age, educational status, the average population served per CHA, years since graduation and since taking a refresher course, stratified by study group. Only age and years since graduation were significantly different for the two groups, with the intervention group being older and served more years.

Table 3 presents the characteristics of non-continuous variables. As indicated in the table, there were statistically significant differences in three variables only. The intervention group was less likely to have a position of leadership in the kebele, but more likely to expect help from the health sector and more likely to register activities in the books.

The majority of CHAs in both groups were male, married, farmers, had no position in their kebele

leadership, were trained by the health center, and were sponsored by their respective communities for training. Concerning expectations of health sector support, the majority of CHAs expected to receive supervision (70.6%), financial and material support (59.8%), and continuing education (76.5%). Help in organizing a health post was not expected by 70.6%. Although over one-third responded that they had a health committee, 46% of these committees were not functioning at T0.

The variables of special interest for this study concerned supervision by the health sector and years since the last refresher course. The frequency of supervision by a health institution at T0 showed that only 32.4% of the CHAs were supervised on a monthly basis; an equal number of CHAs had never been visited by their supervising health unit. There was no statistically significant difference between the two study groups in terms of the frequency of supervision by the health sector, or years since the last refresher course.

Table 2. Means (and standard deviation) of CHA Characteristics for Continuous Variables

Characteristics	Intervention	Control	t- Stat
Age of CHAs	33.07(7.7)	29.09(6.5)	2.72*
Educational status	5.05(1.8)	5.01(1.6)	1.27
Size of population served/CHA	2519.0 (1829)	2664.0(2021)	0.38
Years since graduation	7.46(3.36)	5.05(2.57)	2.73*
Years since refresher courses	2.46(1.84)	1.92(1.96)	1.42

* $p < 0.01$

Table 3. Frequency Distribution of the Study Population by Demographic, Health Sector and Community Support Indicators

Characteristics		Study Group: Intervention N	Intervention %	Control N	Control %	X^2	p Value
Demographic Factors:							
Marital status							
Single		6	12.0	5	9.6	1.10	ns
Married		44	88.0	46	88.5		
Divorced		0	0.0	1	1.9		
Occupation							
Farmer		46	92.0	48	92.3	0.00	ns
Other (merchant,student)		4	8.0	4	7.7		
Health Sector Support:							
CHA expectation re							
Supervision	No	17	34.0	13	25.0	0.61	ns
	Yes	33	66.0	39	75.0		
Financial/material	No	25	50.0	16	30.8	3.16	ns
	Yes	25	50.0	36	69.2		
Organize health post	No	29	58.0	43	82.7	6.34	p<.05
	Yes	21	42.0	9	17.3		
Continuing educ.	No	10	20.0	14	26.9	0.35	ns
	Yes	40	80.0	38	73.1		
Health committee							
Absent		7	14.0	14	26.9	3.46	ns
Present,not functioning		27	54.0	20	38.5		
Functioning		16	32.0	18	34.6		
Supervision: None		13	26.0	16	30.8	1.59	ns
by Health Station		37	74.0	25	48.1		
by Health Center		0	0.0	11	21.1		
Frequency of supervision							
None		14	28.0	19	36.5	1.59	ns
Less than monthly		17	34.0	19	36.5		
Monthly		19	28.0	14	26.9		

Table 3. continued

Community Support:						
CHA leadership position						
No position	41	82.0	32	61.5	4.29	<.05
Has position	9	18.0	20	38.5		
Training sponsorship						
Community	44	88.0	43	82.7	0.66	ns
Other (e.g.NGO)	6	12.0	9	17.3		
CHA on health committee						
No	9	18.0	15	28.8	3.37	ns
Simple member	11	22.0	7	13.5		
Secretary	30	60.0	29	55.8		
Chairman	0	0.0	1	1.9		
Registration book available						
No	9	18.0	33	63.4	21.85	<.001
Yes, unused	8	16.0	3	5.8		
Yes, used	33	66.0	16	30.8		
Remuneration						
No	33	66.0	36	69.2	0.19	ns
Yes	17	34.0	16	30.8		
Health post						
No	8	16.0	7	13.5	4.62	ns
Yes	38	76.0	45	86.5		
Closed	4	8.0	0	0.0		

Functional Status

The composite functional score (out of a maximum score of 27) and performance on each of the 13 criteria activities were subjected to 2 x 6 (groups x time) analyses of variance (ANOVA) with repeated measures on the time factor. When these effects were significant, subsequent t-tests were conducted to compare groups at T0, T3, and T6. Within each group, t-tests were used to compare functioning level at T0 with T3, and T0 with T6.

The results of the ANOVA are presented in table 4 and the means in appendix D. Group differences were observed for the composite and for 10 of the 13 criteria activities. Time differences were noted for the composite and for seven of the 13 activities. Interactions were found for the composite and 11 activities. The means for the composite functional scores are shown in table 5 and in figure 2.

At T0, no differences were found between the intervention and control groups, t (100)=1.40, ns. However, the mean of the composite score from T1 to T6 was significantly higher for the intervention than for the control group (means = 17.52 and 10.81, respectively). The groups differed at T3 and T6 using t-tests (see table 6). Considering the time factor, the mean functional score for the intervention group increased from 13.08 at T0 to 18.18 at T3 to 19.26 at T6.

T-tests were significant for the T0-T3 pair and for the T3-T6 pair. For the control group the mean score declined from 12.17 at T0 to 11.62 at T3 to 9.58 at T6. T-tests were not different for T0-T3, but were for T3-T6 pairs.

Table 4. F-Statistics and Significance Levels for Group by Time Analysis of Functional Scores

	Sources of Effect		
Functional Status Variable	Study Group	Time Period	Group x Time
Composite	81.12***	8.44***	32.74***
Out-of-post working days	27.48***	21.70***	15.75***
Health education sessions	38.80***	4.82***	16.39***
Environmental health	59.86***	1.61 ns	17.86***
Maternal & child health	16.46***	8.60***	14.51***
EPI activities	27.92***	1.41 ns	4.65***
Birth registration	46.23***	3.17*	4.15***
Death registration	27.85***	5.69***	7.22***
Treatment of common diseases	0.64 ns	1.83 ns	2.23**
Report frequency	37.29***	0.84 ns	6.30***
School health activities	8.34*	7.68***	4.64***
Referral of serious cases	0.12 ns	1.07 ns	2.48 ns
Epidemic control measures	2.91 ns	0.32 ns	0.14 ns
Home visits	39.05 ***	7.54***	15.01***

* p< .05 ** p< .005 *** p< .0001

Table 5. Mean (and Standard Deviation) of Composite Functional Score of the Study Groups

Time	Intervention Group n = 50		Control Group n = 52	
	Mean	(Sd)	Mean	(Sd)
Time 0	13.08	(5.63)	12.17	(4.76)
Time 1	14.84	(3.87)	12.31	(4.41)
Time 2	18.36	(3.94)	11.04	(4.40)
Time 3	18.18	(5.04)	11.62	(4.12)
Time 4	17.18	(3.43)	10.69	(4.35)
Time 5	17.32	(3.15)	9.63	(4.55)
Time 6	19.26	(3.23)	9.58	(4.39)

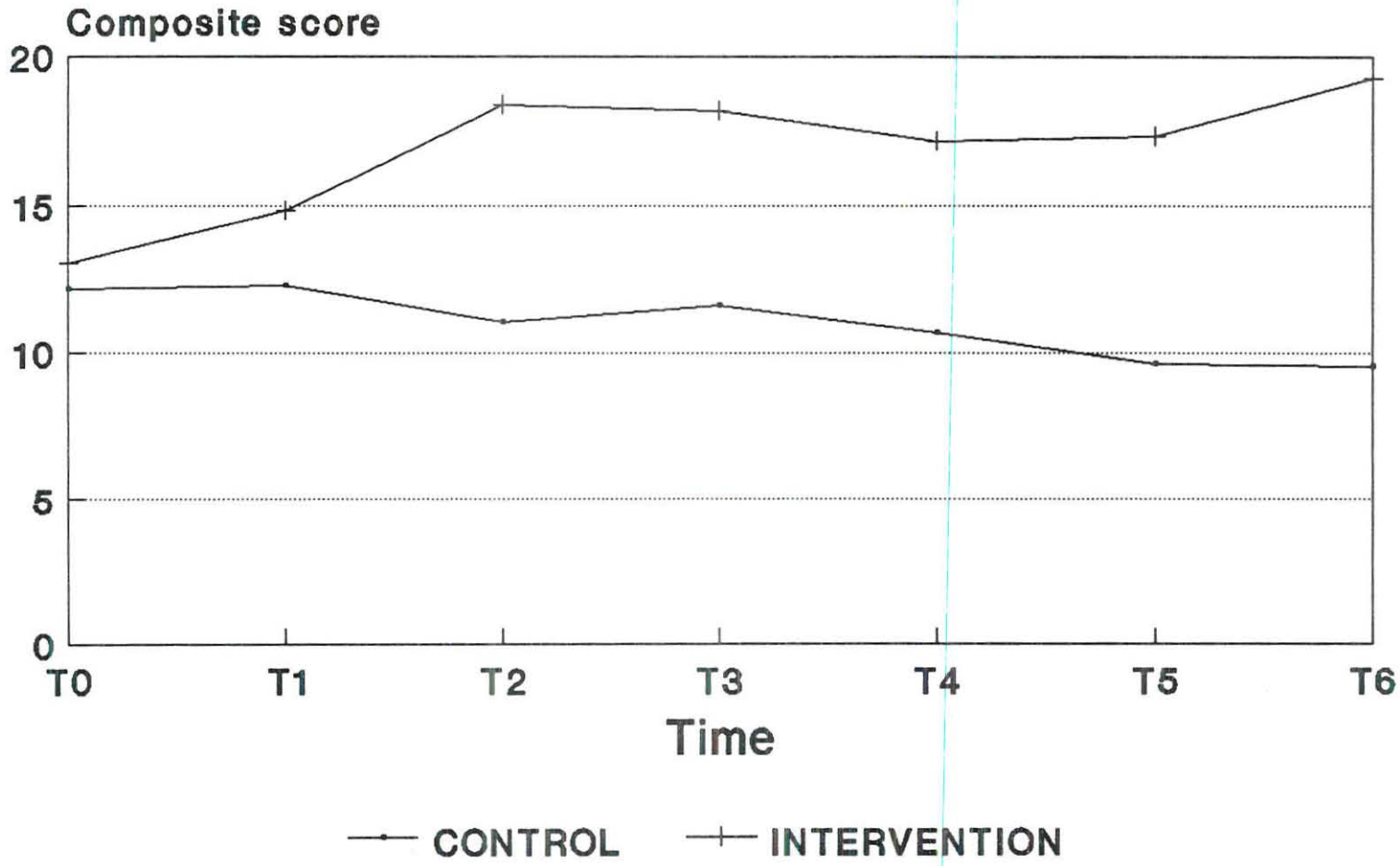

Figure 2. Mean functional composite score from T0 to T6

When the 13 criteria activities were analyzed, their original uncategorized scores were used. At T0 the groups did not differ on any activity according to t-tests (table 7). However, in 10 of the 13 activities, the intervention group performed significantly more activities than the control group from T1 to T6. The means averaged across T1 to T6 are presented in table 8. The two groups did not differ on the following activities: number of patients treated per month, number of patients referred over 3 months, and epidemic measures taken over 3 months (table 4). In the other activities, the groups differed at T3 and T6 (table 6). Considering the time factor, the intervention group increased their performance in most of the 13 activities from T0 to T3 and again from T3 to T6, whereas the control group did not. Mean activities performed at each time period for each of the 13 criteria activities and for the composite are presented in appendix D.

Table 6. T-Statistics for Group and Time Comparison for the Composite and 13 Activities

Activities	Group Comparison (df = 100)			Time Comparison Intervention (df=49)		Control (df=51)		
	T0	T3	T6	T0 - T3	T3 - T6	T0 - T3	T3 - T6	
Composite	ns	9.13	12.96	7.31	5.02	0.82	4.77	Out-of-post
working days ns	4.83	6.61	7.07	1.94	2.24	2.10		
Health education	ns	5.74	8.62	5.43	1.53	1.43	1.36	
Environmental health	ns	6.85	11.49	4.45	2.20	2.99	1.84	
MCH activities	ns	2.70	7.10	3.67	3.07	1.90	4.03	
EPI activities	ns	5.68	5.76	1.94	1.43	2.52	1.00	
Birth registraion	ns	3.56	5.89	3.00	1.30	0.98	2.11	
Death registration	ns	4.26	5.49	6.03	0.60	1.43	2.60	
Reporting to HIs.	ns	NV	NV	2.94	NV	1.73	0.50	
Treatment of diseases	ns	0.09	2.43	1.00	2.85	0.72	1.11	
School health activities	ns	3.05	3.79	2.22	2.82	1.40	1.27	
Referring patients	ns	0.79	1.16	2.44	0.00	0.23	0.77	
Epidemic control	ns	0.91	0.44	0.58	0.24	0.55	1.15	
Home visiting	ns	5.89	8.08	5.25	2.68	1.71	1.10	

t < 2.00 ,ns

t >2.10-3.00 ,p<0.05

t >3.00-5.00, p<0.001

t >5.00 ,p<0.0001

NV =no variance

Table 7. Means (and Standard Deviations) of Performance for the 13 activities at Time 0

Criteria at time 0	Intervention Gp. n = 50		Control Gp. n = 52	
	Mean	(sd)	Mean	(sd)
Out-of-post working days/mo.	3.02	(2.74)	3.15	(2.14)
Health education sessions/mo.	1.76	(1.55)	2.06	(1.77)
Environ. health activities/mo.	2.06	(1.32)	1.98	(1.38)
MCH activities/mo.	1.22	(1.39)	1.08	(1.17)
EPI activities/mo.	0.82	(0.39)	0.67	(0.47)
No. of births registered/mo.	2.04	(2.07)	1.67	(2.05)
No. of deaths registered/mo.	1.10	(1.49)	1.10	(1.59)
No. of patients treated/mo.	39.84	(33.60)	37.08	(34.16)
Report frequency/mo.	0.78	(0.62)	0.83	(0.38)
School health activities/mo.	0.88	(0.85)	0.67	(0.76)
Referring patients/3 mo.	0.76	(0.43)	0.88	(0.32)
Epidemic measures/mo.	0.72	(1.32)	0.44	(0.83)
Home visits/mo.	2.04	(2.26)	1.71	(1.64)

Note. t-tests not significant on any activity

Predictors of Functionality

Multiple regression analyses were performed on T0 and T6 composite functional scores to determine which of the community support and health sector support variables contributed to functionality. Analyses were conducted on both groups combined at T0 and on groups separately for T6. The predictor variables were as follows: presence of registration books, remuneration, presence of health post, health committee, membership on the health committee, and health sector supervision.

At T0 the availability of a registration book and health unit supervision were positively associated with functional status (betas= .49 and .23, ps<.001). The effect of these two variables can be seen in figure 3. A 2 X 3 ANOVA confirmed that the main effects were significant but not the interaction. Supervision increased functionality as did having and using a registration book.

At T6, functional score at T0 was added to the analyis as a predictor variable. The functional status of control CHAs was best predicted by their functional status at T0 (beta=0.45, t=3.53, p <0.001), indicating that their activities remained fairly stable over the observed time periods. The functional status of intervention CHAs was best predicted by their membership in the kebele health committee (beta=0.34, t=2.47, p

<0.05). Those who were given positions of secretary or chairman on the committee performed more activities at T6. The factors instituted as part of the intervention, namely, health sector supervision and

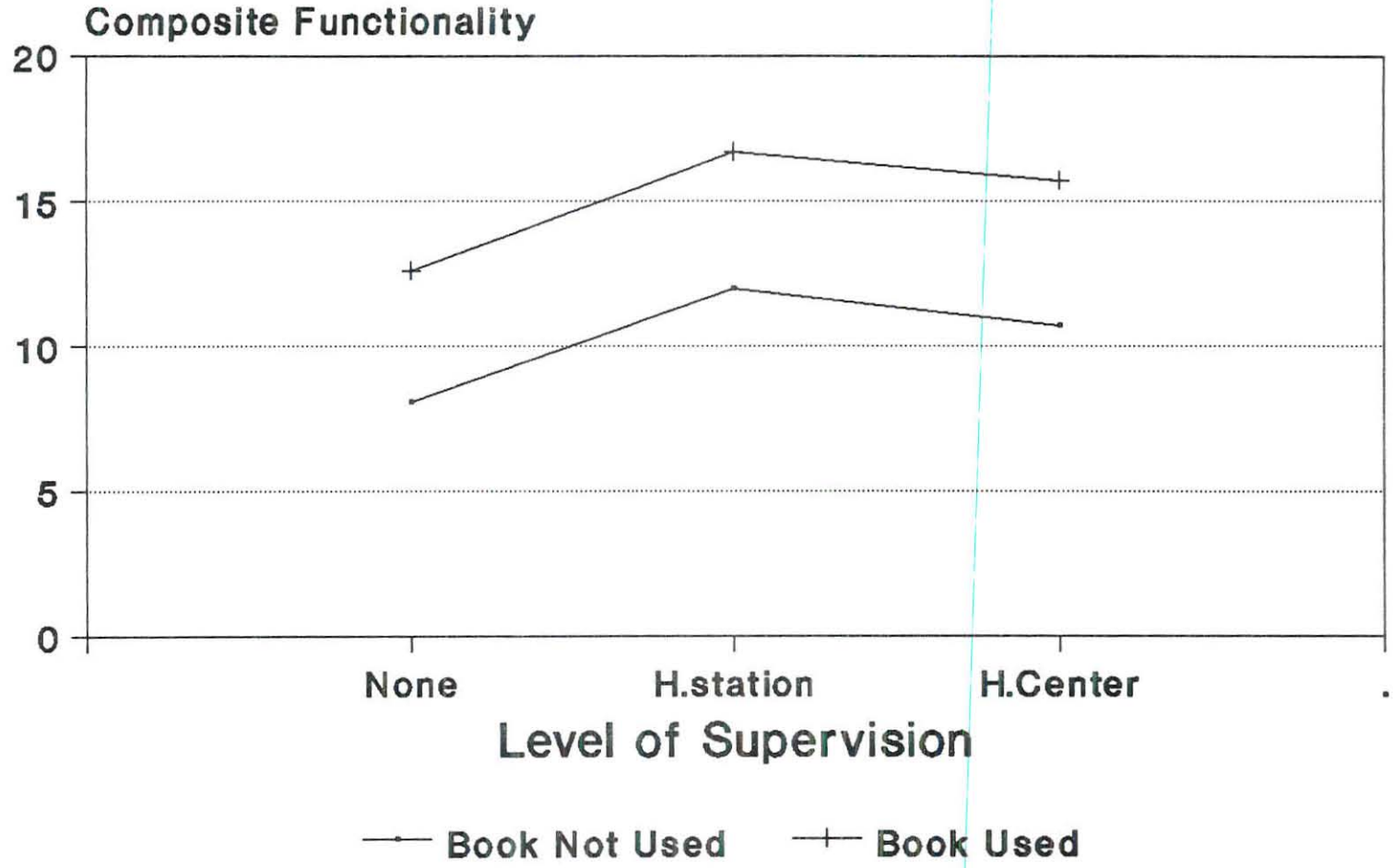

Fig. 3. Mean Composite Functional Score
For Three Levels of Supervision

Table 9. Change in the Number, Percentage and Significance of Selected Factors at T0 And T6

Factors	Worse		Same		Better		
	No.	%	No.	%	No.	%	p value*
I. T0 to T3 comparison							
Supervision by community							
leader: Intervention	0	0.0	29	58.0	21	42.0	<0.005
Control	9	17.3	34	65.4	9	17.3	
Remuneration:Intervention	0	0.0	47	94.0	3	6.0	ns
Control	0	0.0	48	92.0	4	8.0	
Health post available:							
Intervention	3	6.0	44	88.0	0	0.0	ns
Control	0	0.0	50	96.0	2	4.0	
II. To to T6 comparison							
Supervision by community							
leader: Intervention	0	0.0	19	38.0	31	62.0	<0.0001
Control	10	19.0	32	62.0	10	19.0	
Remuneration:Intervention	0	0.0	46	92.0	4	8.0	ns
Control	0	0.0	46	88.0	6	12.0	
Health Post: Intervention	3	6.0	43	86.0	4	8.0	ns
Control	0	0.0	50	96.0	2	4.0	

* Using Fisher exact test to compare intervention and control groups on frequencies in the Worse and Better categories, a value of 1 was given for 0 values

DISCUSSION

The major findings of the study revealed that the intervention group of CHAs performed more community health activities than the control group, and that these activities were sustained over a six-month period. This demonstrates that the functional status of CHAs and the sustainability of their health activities can be enhanced by improving health sector support, particularly refresher courses and regular monthly supervision.

The study also revealed that community support could be improved indirectly by sustained support from the health sector. In the following sections the major findings of the study are discussed under three headings: baseline functional status, functional status of the intervention group and functional status of the control group during the intervention period.

Baseline Functional Status

The initial census revealed that 60.7% of the CHAs interviewed were functioning in that they were performing at least one activity as specified in their job description. Many cross-sectional studies have shown between 20% to 50% of CHAs are functioning (5,6,8,14,38). The discrepancy is partly due to our lower criterion for defining functionality; others defined functionality in

terms of performing at least 40% to 50% of their duties.

The lower criterion was adopted here because the intention was to improve the level of functioning of any CHA who was available in the role of a CHA. Also, as a part-time volunteer worker any health activity of a CHA should receive credit.

One of the main reasons for the training of CHWs is that they are supposed to spend much of their time on preventive and promotive health activities. This also varies from country to country. For example, in China, Guatemala, Nepal and Ethiopia the tasks of the CHW are mainly preventive and promotive (18, 42, 43). These preventive and promotive activities can be measured indirectly by the number of out-of-post working days of the CHWs (in-post time is usually spent on curative services). In the present study the mean out-of-post community contact at the initial census was a mere three days per month, similar to that observed in Colombia. The survey done in Colombia showed that the number of days spent for health activities other than curative services was as low as two days per month (24). Similarly, a study done in the southern part of Ethiopia (44) showed that over 35% of the CHAs interviewed spent more than three days of the week in their health post rendering curative services. On average only 10% of their time was spent out of the health post doing

community health services. It seems that the concept of the CHW's functions as preventive and promotive are neglected.

The CHAs in the study group served a mean population of over 2,500 people which is more than double of what was expected of them (44). Over half had been serving for more than five years and almost two-thirds had never attended a refresher course. Similarly two-thirds had never or very infrequently been supervised by their respective health unit staff. This shows that the CHAs have been forgotten by the health sector. These weaknesses on the side of the health sector have been repeatedly anticipated (15, 16). Similarly administrative and supportive supervision on a monthly basis from community leaders was present for only 22.5% of the CHAs. Such a low frequency of administrative and supportive supervision on top of the infrequent contact with the health personnel undoubtedly affects the functional status of CHWs and the sustainability of their activities.

In Iran, Jamaica, Papua New Guinea and the Sudan, both technical and administrative supervision are provided by the health sector, while in China, India and Thailand such supervision is provided jointly with the community. Although it is not yet known which model works best, Ethiopia has decided to follow the latter

model. Thus the place of community leaders in supervising their respective CHWs should not be overlooked.

Factors determining the number of activities performed by CHAs at baseline were educational status, presence of registration books, and monthly supervision by the health sector. Similar studies have also found such demographic, community and health sector factors to be strongly associated with the functional status of CHAs. In this study, other characteristics were not influential. The major community support appeared to be providing registration books. As will be discussed in a later section, community support itself is enhanced by health sector support.

Functional Status of the Intervention Group

The significant increase in the composite functional scores, a mean increment of 6.18 (32.1%) over that of the initial census could be explained by the combined effect of the intervention and the baseline input or by the intervention itself. The effect of the baseline input by itself on CHA functional status can be seen in the control group where it was slightly increased at T1, but was not sustained. This shows that community support alone will do little to increase and sustain the functional status of CHAs. The intervention which had

the most effect was a refresher course and the monthly supervision. The effect of such intervention was also observed in an immunization coverage project in Jamil Nadu, India (45). A similar conclusion was reached by the study in Sri Lanka where the investigators believed that visits by health personnel brought credibility to the CHWs and thus improved their status in the eyes of the community (19,46).

Impact of Intervention on Preventive Services. Provision of health education concerning major health problems of the community, and environmental sanitation and water supply activities are the two repeatedly emphasized tasks of the CHWs in many countries. In the training curriculum for CHAs in Ethiopia (4) both of these PHC components receive priority. Despite such emphasis, the activities performed by CHAs in these two areas were not encouraging (13, 22, 38, 47, 48). The mean number of monthly health education sessions given at baseline was 1.8. This doubled to 3.6 by the end of the follow-up period, approximately one session per week. The maximum number given by any CHA was eight a month. With such a low number of health education sessions, it would be very hard to anticipate any change in the behaviour of the community.

In China, Guatemala and Ethiopia (18,24,43)

environmental health activities such as water source protection with local materials, pit latrine and garbage pit constructions, and organizing clean-up campaigns are priority tasks for CHWs. The CHAs in the intervention group performed a mean of 3.0 environmental health activities. The maximum score by any CHA was 5.0. The change across the six time periods was a 30.6% increase in the number of activities carried out by the CHAs in the intervention group.

The out-of-post working days per month increased from 3.0 at baseline to a mean of 6.0 in the intervention group over the following six months. The statistically significant increase observed within the intervention group across six time period and between the groups could be attributed to the emphasis made on preventive and promotive health activities during the provision of refresher course and subsequent monthly supervision. Additionally, the simultaneous increase in the frequency of administrative supervision by the community leaders might help and motivate the CHAs to spend much of their time in out-of-post health activities.

Impact of Intervention on Curative Services. The other activity of interest is curative services rendered by CHAs. Almost all CHAs who had a health post treated patients on a daily basis. There was no decline in the

number of patients visiting the health post during the follow-up period. If anything the intervention CHAs treated slightly more patients toward the end of the six month period, in addition to the increase in preventive and promotive services.

The difficulty of establishing an effective balance between curative and preventive care is well recognized. In Botswana and Asia (20,24) for example, CHWs spent 60% - 85% of their time on curative services. Investigators claim that CHWs have less credibility in the community if they do not have curative skills; yet if they have them, the tendency is always to give preference to treatment rather than to routine preventive activities (18, 49). This was also thought to be more exacerbated where the supervisors of CHWs are clinically oriented (24).

The few number of patients referred over the study period shows, perhaps, that patients' illnesses were within the capability of the CHA to treat, or the CHA did not want to refer them for one reason or another. The observations of the supervisors showed that CHAs may not want to refer patients because it lowers their standing in the eyes of community members who were primarily interested in rapid relief of their illnesses, and who could not often afford transportation for a referral.

As was discussed previously, the availability of a health post was not found to be a significant predictor

of the functional status of the CHAs in this study. However, from this study and other studies on CHWs, curative services by CHWs should not be discouraged merely because they are curative. Health sectors should support and facilitate CHWs' curative services in order to increase their credibility in the community. In the long run this enhances preventive and promotive health activities.

Impact of Intervention on the Information System. Another major area that the CHWs are expected to deal with is collecting, recording and reporting health information. In many developing countries, the lack of health information on vital events is a crucial problem. This often hinders feasible health planning. Birth and death registration by CHWs is an important task that should be implemented. In our study one CHA was responsible for an average of 2500 people. The crude birth and death rates per 1000 population per year for the study areas were 47 and 18, respectively (48). If we assume the births and deaths to be uniform in all the months of the year, the maximum births and deaths per month will be ten and four, respectively.

During the follow- up period a significant increase was observed in collecting this information. This could be attributed to the refresher course and sustained by

the frequent regular supervisory contact with the health personnel.

Possible explanations for success of the intervention. The health sector support may have enhanced CHA activity for a number of reasons. One is that the community was motivated to support the CHA when they perceived support from the health sector, and this in turn enhanced community utilization of the CHA's services. This explanation is consistent with the finding that the intervention group received more supervision from community leaders than did the control group. The peasant associations executives were more involved in the administrative supervision of their respective CHAs during the follow-up period. Also the remuneration given to CHAs and the construction of a health post increased. These changes indicate that community leaders gave more effort to enhancing the position of the CHA.

Continuous, educative supervision may also have improved the skills of the CHW in providing better curative and preventive services (18,32). This would undoubtedly strengthen his/her credibility in the community and his/her status as a health worker.

The final explanation is that the morale and interest of the CHAs were enhanced by contact with other health workers. If the supervision is continuous and

educative, CHAs working in rural communities that are distant from any health facility will feel less isolated.

Functional Status of the Control Group

The composite functional status of the CHAs in the control group at the baseline census was similar to the intervention group with a mean score of 12.2, i.e., less than half the maximum possible score of 27. During the following six time periods the composite functional score remained the same from 12.2 at T0 to 11.6 at T3 and declined to 9.6 at T6. This marked decline in the last three months might be explained by the fact that the functional status was sustained for a while by the baseline input. The subsequent decline may be due to number of causes, such as the declining effect of the initial input which enhanced community support. Also it may be simply a manifestation of the gradual decline in activities evidenced by many CHAs. As other studies indicated (18, 24,) the gradual decline in the number and level of activities performed by the CHAs are early signs of them stopping their job.

Community support remained or slightly improved for a while and then declined. This shows that the one-shot effort to increase the awareness of the community did not result in sustained community support. Also the baseline input alone was not effective to bring about the desired level of functional status of the CHAs and the

sustainability of their activities.

Methodological Limitations

1. Unit of randomization: In this study no unit of randomization was done. Individual randomization was not undertaken, in order to avoid interactions among subjects (CHAs) that might lead to contamination. However, it is unlikely that there was some characteristic in common among CHAs in one awraja that made them different from those in the other awraja, and which therefore could account for the outcome. The selection, training curriculum, duration of training and the tasks of CHAs are the same througohout Ethiopia. Moreover, the selected awrajas were part of the former Jimma awraja and have the same health services coverage, similar community organization and community support to the CHWs. This uniformity was also confirmed by the findings of the pre-intervention census of this study.

2. Sample size determination: A census survey was conducted on all the CHAs in the two awrajas, except for those who were not functioning and those who could not be traced. Thus the conclusions apply to CHAs in these awrajas, but have limited generalizability to the population of CHAs in Ethiopia. Also the six month period of the study might not be long enough and sufficient to draw conclusions concerning sustainability of the

activiities of the CHAs and needs further investigation.

The main reasons for selecting the two awrajas were: (1) they were accessible and hence the cost and time incurred were low, (2) both have well organized awraja health offices, health management teams and a health centre, (3) both have been the team training centres for the Jimma Institute of Health Sciences team training programme, (4) one of the awrajas was where the investigator was assigned for the residency programme. It can be argued that, to the extent that CHAs in different regions of the country have many similarities, the present findings also apply to CHAs outside the two selected awrajas.

CONCLUSION AND RECOMMENDATIONS

The study has strengthened the assumption that the linkage between the CHS the conventional health system are important in sustaining the activities of CHAs. Regular supervision and refresher courses are sufficient to maintain their activities. These two kinds of input may have been important because they legitimized and gave credibility to the CHAs' role in the eyes of community members, and because they raised the morale, interest, and competence of the CHA. The health sector support not only increased and sustained the performance of health services of the CHAs, but also positively enhanced community support to the CHAs. Given the limitations in human resources in the country, it would be a sound strategy to try to increase health services coverage and accessibility by putting more effort into the development of community health services. This study has shown that the health sector support which is within the capability of the MOH can improve the existing situation of the CHWs programme in the country, through minimal effort of monthly regular supervision and periodic continuing education.

Therefore, based on the results of this intervention study it is recommended that:

1. Regular supervision of CHAs be a top priority among health personnel, particularly those in health

stations, and that a manual with guidelines for supervisors be developed and distributed.

2. Refresher courses preferably be given to all CHAs twice a year to improve their skills and performance of health service activities.
3. More effort should be made to increase the awareness of the community about its roles and responsibilities on one hand and that of the CHA on the other hand.
4. An effective balance between curative and preventive care by CHAs should be established. One suggestion is that eight days a month be spent in the health post giving curative services, and 12 days a month doing preventive and promotive activities.
5. Although some of the problems stem from financial constraints and logistic difficulties in the regular supervision of CHAs, the health personnel of the health stations should be made aware through their job description of their responsibilities to CHAs. This includes when and how to conduct supervision and on-the-spot training of CHAs. All EPI outreach sites should be located where a CHA is working so that supervision and other health activities are integrated at less cost and time.

6. Clear guidelines should be issued by the MOH concerning the following areas:

   6.1. The recommended number of CHAs to be supervised by one health station should not exceed 10. Presently, many health stations are overextended by having to supervise many more than 10 CHAs.

   6.2. Guidelines should be drawn up to establish health committees in all communities (kebeles) and the role and the responsibilities of this committee should be stated.

   6.3. there should be a more effective policy regarding community support (remuneration and supplies) to CHAs.

7. This study has attempted to demonstrate the effect of health sector support on the functional status of CHAs, measured by the level of performance of the CHAs on monthly basis. Thus, it is recommended that further research should be done to determine the longterm outcome of interest, which is change in the health status of the community and the feasibility of the monthly regular supervision.

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APPENDIX A

CHAs' Job Description *

A CHA is accountable to the kebele peasant association administratively and to the nearby health station technically.

A CHA will perform the following activities

1. Maternal and Child Health

1.1 Antenatal care

1.2 High risk identification and referral

1.3 Delivery service

1.4 Physical check-up and weighing of the new born

1.5 Advises the importance of birth spacing and refers to the HI those who need.

1.6 Under five children physical check-up

1.7 Education on the importance of immunization of children and registration of unvaccinated and defaulter tracing

1.8 Coordinates the activities of TTBAs

1.9 Health services at the schools ad kindergarten

2. Health Education

2.1 Health education on the importance of PHC, its strategies

2.2 Health education based on common local health problems

2.3 Health education on personal domestic and environmental sanitation

2.4 Health education on the importance and necessities of safe and adequate water supply

2.5 Health education on balanced diet, food hygiene and back - yard fruits & vegetables

2.6 Health education on EPI, ANC

2.7 Health education harmful health practices

2.8 Health education communicable diseases

2.9 Health education prevention common on injuries

2.10 Health education on the importance of utilization of health care services

2.11 Health education the importance and dangers of medicines.

3. Environmental Sanitation and Water Supply

3.1 Pit latrine construction

3.2 Garbage pits construction

3.3 Drainage of marshy areas

3.4 Clean up campaigns

3.5 Protection of water supply sources

3.6 Improving housing condition

3.7 Inspection of local food & drink establishments

4. Control & Prevention of Communicable and Epidemic Diseases

5. Treatment and First Aid for Common Diseases and Injuries

6. Administrative Activities

6.1 Member & secretary of health committee.

6.2 Runs health post

6.3 Coordinates & supervise the activities of TTBAs

6.4 Participate in health related meetings and discussions

7. Health Information

7.1 Census

7.2 Birth registration

7.3 Death registration by age & sex

7.4 Reports locally endemic diseases and epidemics

7.5 Reports regularly his health activities to the nearest HI

* Source: MOH, Training manual for CHAs in Ethiopia, Amharic version, October 1977

APPENDIX B

CHA Training Course Outline *

S.No	Subject	Time Allocated (Hours)		
		Theory	Practical	%
1	General concept of health	8	-	1.4
2	Primary health care	8	6	2.4
3	Health education	18	10	4.7
4	Personal & environmental heat	24	24	8.1
5	Prevention and control of communicable diseases	24	24	8.1
6	Nutrition and balanced diet	12	12	4.1
7	Family welfare	18	26	7.5
8	MCH	36	36	12.2
9	Anatomy & functions of human body	16	10	4.4
10	Patient examination and treatment	32	44	12.9
11	Handling medicine and medical equipments	16	12	4.7
12	Traditional medicine	8	8	2.7
13	Collection & competing health information	10	10	3.4
14	Administration management	6	6	2.0
15	Field practical	-	102	17.3
16	Oral, written, practical exam	12	12	4.1
	Total	248	342	100

Source. MCH: Training manual for CHAs in Ethiopia. Amharic version, 1977.

APPENDIX C

Topics Covered by the Refresher Course for Community Health agents

Introduction to PHC - Components.

1. Communicable Diseases
   - 1.1 EPI diseases
   - 1.2 Diarrhoeal diseases — 1st Day
   - 1.3 Respiratory diseases
   - 1.4 Epidemics
2. Maternal health
   - 2.1 Pregnancy
   - 2.2 Delivery — 2nd Day
   - 2.3 Post natal care
   - 2.4 Family planning
3. Child health
   - 3.1 Feeding the child. and problems of malnutrition
   - 3.2 Growth monitoring
   - 3.3 Vaccination, registration, defaulter tracing
4. Accidents/ Treatment of common diseases
   - 4.1 Burns
   - 4.2 Wounds
   - 4.3 Fractures
   - 4.4 Bites

1. Intestinal parasites
2. Diarrhoea — 3rd Day
3. Malaria

Referral . of patients

5. Village and home sanitation

   5.1 Water supply

   5.2 Excreta and waste disposal — 4th Day

   5.3 Food protection

6. Health record Keeping and reporting
   6.1 Birth and Death registration
   6.2 Monthly reporting of activities

7. Emphasis on preventive and promotive health activities. Health education, home visiting,& school health services.

8. Duties and responsibilities of CHAs

9. Closing Ceremony — 5th Day

APPENDIX D

Mean Functional Scores for Group by Time Analysis for the Composite and 13 Activities

Functional status	Means						
Variable	T0	T1	T2	T3	T4	T5	T6
Composite							
Intervention	13.08	14.90	18.42	18.40	17.24	17.38	19.48
Control	13.17	12.31	11.04	11.62	10.69	9.63	9.58
Out- of- post working days /mo.							
Intervention	3.02	5.50	5.48	5.96	6.26	6.14	6.22
Control	3.15	3.88	3.88	3.83	3.52	3.21	3.29
Health education sessions/mo.							
Intervention	1.76	2.78	3.20	3.48	3.98	3.88	4.10
Control	2.06	2.37	2.06	1.52	1.90	1.48	1.12
Environmental health activities/mo.							
Intervention	2.06	2.64	2.78	2.96	2.98	3.16	3.28
Control	1.98	1.81	1.54	1.52	1.69	1.33	1.19
Maternal & child health activities/mo.							
Intervention	1.22	1.46	1.92	2.12	2.26	2.50	2.54
Control	1.08	1.35	1.40	1.44	1.33	1.04	0.79

Appendix D Cont'd...

EPI activities/mo.							
Intervention	0.82	0.92	0.94	0.92	0.90	0.94	0.96
Control	0.67	0.67	0.56	0.46	0.62	0.56	0.52
Birth registration/mo.							
Intervention	2.04	3.78	3.81	3.90	3.22	3.46	4.14
Control	1.67	2.40	2.50	2.04	1.83	2.29	1.06
Death registration/mo.							
Intervention	1.10	1.92	3.68	4.46	2.64	2.76	3.26
Control	1.10	2.98	1.50	1.75	1.40	1.60	0.56
Treatment of pts/mo.							
Intervention	40	34	43	41	45	46	50
Control	37	39	40	41	39	39	36
Report frequency/mo.							
Intervention	0.78	0.90	0.98	1.00	1.00	0.98	1.00
Control	0.83	0.83	0.73	0.69	0.58	0.60	0.65
School health activities/mo.							
Intervention	0.88	0.92	0.90	1.04	1.14	1.18	1.18
Control	0.67	0.62	0.56	0.58	0.69	0.63	0.65
Referral of pts/3mo.							
Intervention	0.76			0.94			0.94
Control	0.88			0.87			0.83

Appendix D Cont'd...

Epidemic control							
measures/ 3mo.							
Intervention	0.72			0.58			0.66
Control	0.44			0.38			0.56
Home visits /mo.							
Intervention	2.04	3.18	3.90	3.78	4.02	4.20	4.60
Control	1.71	1.73	1.67	1.44	1.38	1.46	1.23

APPENDIX E

Questionnaire to be filled by the CHA's

Date _____

* Directions:

Use Pencil

Fill in the blanks and/or choose the appropriate answer(s).

* Awraja_____ * Kebele _____ Population in Kebele _____

* Name of CHA _____ Age _____ Sex _____

1. Educational level of the CHA
   1. Illiterate
   2. Literate, Last grade completed _____
2. Marital status of the CHA
   1. Single 2. Married
   3. Widowed 4. Divorced
   5. Separated
3. Occupation of the CHA (anther than health activates)
   1. Farmer 2. Merchant
   3. Craftsman 4. Student
   5. Other, Specify _____
4. Current position of the CHA in the kebele leadership
   1. No 2. Yes
5. Place of training as CHA
   1. Hospital 2. Health centre
   3. Agarfa 4. Other, Specify _____
6. When did you finish training ?

   19 _____

7. Who subsidized /Sponsored/ your training ?

   1. Your kebele / Community)
   2. Health institute
   3. Others, Specify _____

8. How long have you been working as CHA ?

   _____ Month or _____ Years

9. Did you receive a refresher course ?

   1. No 2. Yes

   If yes, when did you receive ? _____

   Month or _____ Years ago

10. Do you think you need a refresher course ?

    1. No 2. Yes

    If yes, on what topics and why ?

    _____ _____ _____ _____

    _____ _____ _____ _____

11. What kind of support do you expect from the health institution?

    _____ _____ _____ _____

    _____ _____ _____ _____

12.* Do you get supervision ?

    1. No 2. Yes

    If yes, by whom ? _____ How often _____

13.* Have you ever been supervised by your community leaders ?

    1. No 2. Yes

    If yes, how often _____ (in months)

14. Is there a health committee ?

1. No 2. Yes, but not functioning

3. Yes, functioning

15. Are you a member of the health committee ?

1. No 2. Yes, simple member

3. Yes, chairman/ vice chairman

4. Yes, member and secretary

16.* Do you receive any financial /in kind or cash/ support for your service

1. No 2. Yes if yes, from whom ? _____

17.* Is there a health post ?

1. No 2. Yes, functioning

3. Yes, but closed

18.* How many days of a week do you spend for health activities

1. At the health post _____

2. At the field work _____

19. Do you have registration book(s) ?

1. No 2. Yes

If yes, do you register/ record all your health activities ?

1. No 2. Yes

20. Do you have a copy of your job description ?

1. No 2. Yes

Do you carry out the following health activities ?

21.* Health education

1. No 2. Yes If yes,

No. of sessions last month _____

22.* Environmental health activities

1. No 2. yes If yes,

No. of springs protected last month _____

No. of pit latrines dug last month _____

No. of garbage pit dug last month _____

No. of garbage pit dug last month _____

No. of cleanliness camping last month _____

No. of health education sessions on environmental and personal hygiene last month _____

23.* Maternal and child health activities

1. No 2. Yes If yes,

No. of pregnant women checked last month _____

No. of children checked/ or treated for diarrhoeal disease last month _____

24.* Immunization /Vaccination/ activities.

1. No 2. Yes If yes

No. of children registered for vaccination last month _____

25.* Birth registration

1. No 2. Yes If yes, No. of births registered last month _____

26.* Death registration

1. No 2. Yes If yes, No. of deaths registered last month _____

27.* First aid treatment

1. No 2. Yes If yes, No. of patients last month _____

28.* Treatment of simple ailments

1. No 2. Yes If yes, No. of patients treated last

treated last month_____

How do you get drugs

1. Free 2. Purchased 3. Other, specify

_____ from here do you get drugs _____

29.* Sending health activities report to health institution

1. No 2. Yes, If yes how often _____

(month) every w month, every three, month, every 5 - 6 month

Did you send report last month ?

1. No 2. Yes

30.* Visiting local schools /kinder gartens/

1. No 2. Yes 3. No school. If yes, how

often ? _____

31.* What do you do when you can not treat a patient ?

1. Refer him/her to next health unit
2. Refer him/her to another CHA
3. Refer him to local healer
4. To other places, specify _____
5. Do nothing

No. of patients referred to health units last three month ____

32.* Was there epidemic last three month ?

1. No 2. Yes

What do you do when epidemics occur ? _____

_____ _____ _____

33.* Home visiting

1. No 2. Yes If yes, how often?

_____(in a month) Number of visits last month

_____

34. Do you think regular supervision is helpful for your health activity ?

1. No 2. Yes

How is it helpful ? _____ _____ _____

35.* Does the community accept / appreciate your health services?

1. No 2. Yes

36. Which one is important for your health activity ?

1. Regular supervision 2. Refresher cors

3. Both 4. None

37.* Is there a TTA in your kebele ?

1. No 2. Yes if yes do you work together_____

38.* Please list the support you expect from the community

_____ _____ _____

_____ _____ _____

39.* List the support you expect from the community leaders ?

_____ _____ _____

_____ _____ _____

40. Any other you wish to tell?

_____ _____

_____ _____

_____ _____

* Completed by :
Interviewer (name)_____
Signature _____
Date _____

* CHA (name) _____

Signature _____
Date _____

* questions used as part of checklist for collecting data on a monthly basis for six consecutive months.

*ማስጠንቀቂያ:- 1/ በአርሳስ ይጠቀሙ

2/ ትክክለኛውን መልስ በተሰጠው ባዶ ቦታ ላይ በመጻፍ ወይም አማራጭ በተሰጠበት ትክክለኛውን መልስ የያዘውን ፊደር በመክበብ ይመልሱ::

*አውራጃ ---------- ቀበሌ ---------- የቀበሌው ሕዝብ ብዛት ----

*የጤና ተጠሪው ስም ---------- ዕድሜ ---------- ጾታ -------

1. የትምህርትዎ ሁኔታ ?

1. ማንበብና መጻፍ የማይችሉ
2. መሠረተ ትምህርት ያጠናቀቁ
3. መደበኛ ትምህርት በት ገዝተው የተማሩ --------- ያጠናቀቁትን የክፍል ደረጃ ይገለጹ ----------

2. የጋብቻዎ ሁኔታ /

1. ያላገቡ
2. ያገቡ
3. ያገቡ
4. አገብተው የፈቱ
5. አገብተው የተለያዩ

3. ከቀበሌ ጤና ተጠሪነት ሌላ ●ደበኛ ሥራዎ ምንድነው?

1. ገብርና
2. ንግድ
3. የአጭ ጥበብ ባለሙያ
4. ተማሪ
5. ሌላ /ይገለፅ/ ----------

4. የቀበሌዎ ገበሬ ማህበር ሥራ አመራር አባል ነዎትን?

1. አይደለሁም 2. አዎን ነኝ

5. ለጤና ተጠሪነት የመለጠጦት የት ነው?

1. በጤና ጣቢያ 3. በክሊኒክ 5. ሌላ /ይገለጽ/
2. በሆስፒታል 4. በአጋርፋ

6. የቀበሌ ጤና ተጠሪነት ሥልጠናውን የወሰዱበት ዓመት ምህረት መቼ ነው?

19------

7. ለሥልጠናው የገንዘብ ድጋፍ ያደረገልዎ ማነው?

1. የቀበሌያ ሕዝረተሰብ /አገልገሎት ሕዝረት ሥራ ማህበር አመራች አ ሉ
ሥ ላ /

2. የጤና ድርጅት 3. ሌላ ድርጅነ /ይገለጽ / ----------

8. በቀበሌ ጤና ተጠሪነት ምን ያህል ጊዜ አገለገሎ? ይገለጹ /
----------ወራት ወይም -------ዓመት

9. የተህዱብ ትምህርት ተሰጥተያታልን?
1. አልተሰጠኝም 2. ተሰጥተኛል
ከተሰጠያት መቼ ነበር? ከ-------- ወራት ወይም ከ----ዓመት በፊት

10. የተህዱብ ትምህርት ያስፈልገኛል ብለው ያምናሉ?
1. አያስፈልገኝም 2. ያስፈለገኛል 3. አላውቅም
የተህዱብ ትምህርት ካሉ በምን ምን የትምህርት ርዕሰች ላይ አንደሆነ ይገለጹ
1 ---------- 4 ----------
2 ---------- 5 ----------
3 ---------- 6 ----------

11. ከጤና ድርጅት ምን ምን ድጋፍ ይጠብቃሉ? ይዘርዝሩ
1 ---------- 4 ----------
2 ---------- 5 ----------
3 ---------- 6 ----------

*12. ድጋፉ ቶጥር ይደረገልያታልን? 1. አይደረገም 2. ይደረጋል
ይደረጋል ካሉ በማን አንደሆኑ ይጥቀሱ ----------
ይደረጋል ካሉ በየስንት ጊዜው ነው? ----------

13. በቀበሌያ ገበረ ማህበር አመራር አነሳት ድጋፉ ቶጥር ይደረጋልያታልን?
1. አይደረገም 2. ይደረጋል
ይደረጋል ካሉ በየስንት ጊዜው ----------

14. በቀበሌያ የጤና ኮሚቴ ተቋቁማልን?
1. አልተቋቋመም 2. ተቋቁማል ገን አይሠራም 3. ተቋቁሟል ይሠራል

15. አርስያ የጤና ኮሚቴው አባል ነያትን ?
1. አይደለሁም 2. አያ ተራ አባል ነኝ 3. አያ አባልና ዐቢይ ነኝ
4. አያ ሊቀመንበር /ምክትል ሊቀመነበር ነኝ
ለሚሰጡት የጤና አገልገሎት ሥራ በገንዘብ ወይም በዓይነት ድጎማ ያገኛሉን?
1. አላገኝም 2. አገኛለሁ
አገኛለሁ ካሉ በማን አንደሆነ ይገለጹ ----------

*17. በከሰልያ የጤና ክላ ተቋቁሟልን?
1 / አልተቋቋመም 2. ተቋቁሟል 3. ተቋቁሞ ነበር ለሆነ ገን ተዘግቷል

*18. ከቢሮዎ ተናት በጤና ክሊ ውስጥ ሥር ሰንት ተናት ያስፈራሉ?

---------- ባለፈው አንድ ወር ሰንት ቀናት አስለፊ ----------

በመስክ የጤና ሥራስ ስንት ተን? በሳምንት --------- ባለፈው ወር ----

19. የጤና ሥራ መዛገብት አለዎትን ?

1. የለኝም 2. አለኝ

አለኝ ካሉ የሚሰሬትን የጤና ሥራ ይመዘገባሉን?

1. አልመዘገብም 2. አመዘገባለሁ

20. የሥራ ድርሻዎ ዝርዝር መገለጫ ትጽ አለዎትን?

1. የለኝም 2. አለኝ

የሚከተሉትን የጤና አጠባበቅ ሥራዎች ይሠራሉን፣ የሚሠሬ ከሆነ ባለፈው አንድ ወር የሠሬትን የሥራ መጠን በተስጠው ባዶ ቦታ ላይ ይሙሉት

*21. የጤና አጠባበቅ ትምህርት መስጠት

1. አልሰጥም 2. አሰጣለሁ

አሰጣለሁ ካሉ ባለፈው አንድ ወር ምን ያህል ጊዜ ሰጡ? ----------

ለምን ያህል ሰዎች ? ----------

*22. የአካባቢ ጤና አጠባበቅ ሥራዎች መሥራት /ማስተባበር /

1. አልሠራም 2. አሠራለሁ

አሠራለሁ ካሉ ባለፈው አንድ ወር

በቢሚነቱ የተገነቡ ሥንሮች ብዛት ----------

በአካባቢ ቁጥጥስ የተጠቡቁ ሥንሮች ብዛት ---------

የተቀፈረ /የተሸሸሉ / ሽንት ቤቶች ብዛት ---------

የተቀፈረ ቀሸሸ መጣያ ጉድጓዶች ብዛት ----------

የተደረጉ የጽዳት ዘመቻዎች ብዛት ----------

*23. የአናቶችና ሕፃናት ጤና አገልገሎት

1. አልሰራም 2. ሰሠራላሁ

አሠራለሁ ካሉ ባለፈው አንድ ወር

የተመረመሩ ነፍሰጡሮች ብዛት ----------

የተመረመሩ ሕፃናት ብዛት ----------

ያዋለዷቸው አናቶች ብዛት ----------

ወደ ከፍተኛ ሕክምና የተላኩ ነፍሰጡሮች ብዛት ----------

የወሊድ መቆጣጠሪያ የወሰዱ /ያስገቡ የተበጣጠሱ/ ብዛት --------

*24. የክትባት መርሃ ግብር ሥሪዎችን መሥራት

1. አልሠራም 2. ሰሠራለሁ

አሰራለሁ ካሉ ባለፈው አንድ ወር ክትባት የተመዘገቡ ሀናት ብዛት -------

*25. በክልልዎ የተወሰዱ ሕፃናትን መመዝገብ

1. አልመዘገብኩም 2. አመዘገባለሁ

አመዘገባለሁ ካሉ ባለፈው አንድ ወር የተመዘገቡ ሕፃናት ብዛት ----------

*26. በክልልዎ የሞቱ ሰዎችን መመዝገብ

1. አልመዘገብኩም 2. አመዘገባለሁ

አመዘገባለሁ ካሉ ባለፈው አንድ ወር የተመዘገቡ ብዛት ----------

*27 የመጀመሪያ የሕክምና አርዳታ መስጠት

1. አልሰጥም 2. አሰጣለሁ

አሰጣለሁ ካሉ ባለፈው አንድ ወር ለሰንት ሰዎች ሰጡ? ----------

*28. ለቀላል በሽታዎች ሕክምና መስጠት

1. አልሰጥም 2. አሰጣለሁ 3. መድኃኒት የለኝም

አሰጣለሁ ካሉ በአለፈው አንድ ወር ለሰንት ሰዎች ሰጡ? ----------

መድኃኒት ከየት ያገኛሉ? /ይጥቀሱ/ ----------

መድኃኒት የሚያገኙት አንዳት ነው? 1. በነጻ /ለአርዳታ/ 2. በገቢ

*29. በክልልዎ ለሚገኝ የጤና ጽርጅት ወርሃዊ ሪፖርት ይልካሉን?

1. አልክም 2. አላካለሁ

አልካለሁ ካሉ በየሰንት ወሩ ----------

ያለፈውን ወር ወርሃዊ ሪፖርት ልከዋልን? 1. አላኩም 2. ልኬአለሁ

*30. በክልልዎ የሚገኙትን ትምህርት ቤቶች ወይም መዋለሕፃናት ለጤና ሥራ ይጎበኛሉን?

1. አልጎበኝም 2. አጎበኛለሁ 3. ችግሮች /መዋለሕፃናት/ የለም

አጎበኛለሁ ካሉ በየሰንት ጊዜው----------

*31. ከአቅምዎ /ከችሎታዎ/ በላይ የሆነ በሽተኛ ቢደጋጥምዎ ምን ያደርጋሉ?

1. ወደሚቀጥለው የጤና ድርጅት ይልኩታል

2. ወደ ሌላ ጤና ተቋሪ ይልኩታል

3. ወደ ባህል መድኃኒት አዋቂ ይልኩታል

4. ሌላ የሚልኩበት ቦታ ካለ ይገለጹ

5. ምንም አላደርግም

ወደ ከፍተኛ የሕክምና በአለፈው አንድ ወር የተላኑ በሽተኞች ብዛት ---------

*32. በአለፈው አንድ ወር ተላላፊ በሽታ በክልልዎ ተነስቶ ነበርን?

1. አልተነሳም 2. አዎ ተነስቶ ነበር

ተነስቶ ነበር ካሉ ምን ዓይነት በሽታ ይዘርዝሩ

1---------- 2 ---------- 3 ----------

4 ---------- 5 ---------- 6 ----------

*33. የበት ለበት ዝዘገት ያደርጋሉን?
1 አላደርገም 2. አደርጋለሁ

አደርጋለሁ ካሉ ዘየሰንት ጊዜው ለሰመንት --------- በወር ---------

34.. ቋሚ ድጋፉዊ ቴፕተር ጠቃሚ ነው ብለው ያሥናሱ

1. ጠቃሚ አይደለም 2. ጠቃሚ ነው

ጠቀሚታውን ይገለጹ ---------- ----------
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35.. ለጤና አጠባበቅ ሥራያ ለጨቅሙያት የሚፕለው የትኛው ነው?

1. ድጋፉቱ ቴፕተር 2. የተሀድሶ ትሥርት 3. ሁለቱም
4. ሁሉም አይጠቅመም

*36. ሕብረተሰቡ የሚጠውን የጤና አጠባበቅ አገልገሎት በሚገባ ይጠቀማልን?

1. አይጠቀምም 2. ይጠቀማል

*37. በክልልያ የበለጠነች ልምድ አየላጅ አለችን?

1.. የለችም 2. አለች

አለች ካሉ አብራችሁ ትሠራላችሁን?

1. አንሠራም 2.. አንሠራለን

*38. ከቀበሌያ ሕብረተሰብ የሚጠብቱትን /የሚፈልጉትን / ድጋፍ ይዘርዝሩ

1 ---------- 5 ----------
2 ---------- 6 ----------
3 ---------- 7 ----------
4 ---------- 8 ----------

*39. ከቀበልያ አመራር አካላት የሚጠብቱትን /የሚፈለጉትን / ድጋፍ ይዘርዝሩ

1 ---------- 5 ----------
2 ---------- 6 ----------
3 ---------- 7 ----------

40.. የቀበሌ ጤና አገልገሎትን በተመለከተ የሚጠሙት አስተያየት ሀላያት ይጥቀሱ

1 ---------- 4 ----------
2 ---------- 5 ----------
3 ---------- 6 ----------

* መጠይቁን የሞላው

. ጤና ተጠሪ ስም ----------
ፊርማ ----------
ቀን ----------
. የጤና ባለሙያ ስም ----------
ፊርማ ----------
ቀን ----------

DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been prersented for a degree in this or any other University, and that all sources of material used for the thesis have been duly acknowledged.

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Signature 

Place Addis Ababa University

Date of submission 11 March 1991

This thesis has been submitted for examination with our approval as University Advisor(s).

Dr. Asfaw Desta

Advisor