

The Ethiopian SORT IT Course

Does training of Health Extension Workers reduce scabies load in district health facilities in rural Ethiopia?

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Abstract

Introduction: In 2017, Ethiopia included scabies management within the responsibility of health extension workers. In Kamba (the intervention district) workers were trained on scabies management. Whereas, in Arba Minch Zuria (the control district) there was no such training. This study assesses whether decentralization of scabies management to communities would reduce the load on health facilities and allow earlier scabies treatment access.

Methodology: All individuals presenting with scabies before (January – June 2018) and after (August 2018-January 2019) the introduction of training (July 2018) in Kamba district and the Arba Minch Zuria district were included. We compared between the two districts in the period before and after training, the numbers of scabies cases presenting to health facilities, their demography, clinical characteristics and treatment. **Results:** There were 1,891 scabies cases in the intervention district and 809 in the control district. Scabies cases declined in the intervention district from 7.6 to 1.6 per 1,000 population (a 4.8-fold reduction). In the control district, scabies cases increased from 1.3 to 2.4 per 1,000 population (a 1.8-fold increase). In intervention district, the proportion of scabies patients with secondary skin infections reduced from 1,227 (78%, n = 1,565) to 156 (48%, n = 326, P < 0.001). In the control district the difference was insignificant 39 (14%, n = 288) to 86 (17%, n = 521, P = 0.2).

Conclusions: Introducing trained health extension workers at community level were associated with reductions in health facility load for scabies and secondary infections. This is a wider community health benefit.

Key words: Operational research; capacity building; health systems.

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Introduction

Scabies is a Neglected Tropical Disease (NTD) which involves the skin and caused by the mite *Sarcoptes scabiei* var *hominis*. Its transmission occurs with person-to-person contact and prevalent in resource-poor conditions. Scabies is a common dermatological condition affecting around 200 million people globally. The disease is predominant in tropical and crowded living conditions [1,2]. Effective topical and oral treatments exist, but re-infestation is common.

In Ethiopia, scabies is one of the commonest endemic skin infections with outbreaks occurring during natural disasters such as floods and drought. In 2018, more than 800,000 cases were reported [3]. Scabies is one of the 16 NTDs in Ethiopia [4].

Following the 2015/2016 outbreaks of scabies in four regions of Ethiopia, the Federal Ministry of Health included scabies management within the realms of responsibility of health extension workers (HEWs), who are at the front-lines of primary health care. The aim of this study was that decentralization of household scabies management to community HEWs would reduce the load on busy health facilities and allow earlier access to scabies care.

The core scabies outbreak control strategies suggested by World Health Organization neglected tropical diseases department are preventive chemotherapy using mass drug administration (MDA) and innovative or intensified case management.

As a first step towards improving community scabies control, a formal training on the identification and reporting of scabies was organized in one endemic district. HEWs in this intervention district were trained on data collection, standardized reporting and scabies management. Such HEWs spend half-a-day in the community going house-to-house to screen for scabies and offer treatment for those infected and their contacts [2]. Therefore, HEWs engaged on awareness creation, identification and treatment of cases and household contacts in the community. Besides, they are responsible to send their reports to nearby health facilities and health offices.

A PubMed search revealed no studies from Ethiopia or Africa on whether devolving training and scabies management to HEWs who work in the community reduces the number of scabies cases seen in health facilities. The answer may help advocacy for scaling-up similar approaches.

The specific objectives of this study were to compare between an intervention (Kamba) and a control (Arba Minch Zuria) districts for a period before (January-June 2018) and after (August 2018-January 2019) training of HEWs on scabies management which is given in *July 2018*. The numbers of scabies cases presenting to health facilities standardized by 1000 population, their demography, clinical characteristics and treatment type were assessed.

Methodology

Study Design and period

A comparative cross-sectional study was conducted using routine health facility data in the period before (January – June 2018) and after (August 2018-January 2019) between the two districts.

General and specific setting

Ethiopia lies in the horn of Africa with the population of about 99 million. It is bordered by Eritrea, Djibouti, Somalia, Sudan, South Sudan and Kenya. Health coverage is low with only 39% of the population accessing health services [5].

The Ethiopian health care system is a tiered system which composes mainly health posts, health centers, primary hospitals (primary level), general hospitals (secondary level), and specialized hospitals (tertiary level).

Kamba and Arba Minch Zuria districts were the study sites and located in Gamo Gofa zone of the Southern Nations Nationalities and Peoples Region (SNNPR) of Ethiopia. Kamba district has 206,905 populations while Arba Minch Zuria district has

217,288 inhabitants. The two districts were chosen for comparison since they are endemic for scabies, have HEWs at community level for scabies control and have similar climate and rainfall patterns. 15 health centres (9 from Kamba and 6 from Arba Minch Zuria) and one hospital (in Kamba) were involved in this study.

Health extension workers (HEWs) and scabies case management training

HEWs are recruited by their communities and live in the community. They are generally females which have completed high school education and undergo a formal training of at least one year. They are government employees and receive a monthly salary. One health extension worker is designated to serve 500 households (approximately 2,500 population). There were 72 HEWs at Kamba and 74 in Arba Minch Zuria districts. The package of activities of the Health Extension Program is shown in Supplementary Table 1.

The training provided for HEWs had addressed the following issues to assure declined number of scabies cases in the community.

Introduction about human scabies mite, epidemiology, incubation period, pathogenesis, community settings which increase the risk of scabies outbreak and the transmission are clearly indicated. Regarding the clinical presentation, primary and reinfection manifestations and case definitions were included.

Possible complications, diagnosis and case management including drugs used for scabies were properly addressed using case scenarios. Prevention and control strategies including community awareness creation were discussed. The importance of proper follow-up, monitoring and reporting of cases were clearly mentioned. The role of HEWs in reducing the scabies outbreak burden in the community and health facilities were briefly discussed. The training was prepared and provided according to the guide lines prepared by federal ministry of health for scabies outbreak control which is shown in [6].

A scabies cases was defined as the presence of itching with typical lesion in the inter-digital areas of the hands, inter-gluteal and/or genitalia area and/or having had close contact with an individual who had itching or lesions in a typical distribution [7].

A scabies contact was defined as a person who did not fulfil the clinical criteria of a scabies case but had direct contact (skin-to-skin) with a suspected or confirmed case in the two months preceding the onset of scabies in the identified case.

Table 1. Scabies cases presenting to health facilities before (January – June 2018) and after (August 2018 – January 2019) training of health extension workers on scabies management in an intervention (Kamba) and control district (Arba Minch Zuria), Ethiopia.

	Intervention district (Kamba) Population = 206,905		Control district (Arba Minch Zuriah) Population = 217,288	
	Before training	After training	No training ¹	No training ¹
Number of scabies cases	1,565	326	288	521
Scabies cases per 1000 population	7.6	1.6	1.3	2.4

¹ The two periods of comparison in the control district were the same as the intervention district January - June 2018 and August 2018 - January 2019.

Study population and period

All individuals presenting with scabies to health facilities before (January - June 2018) and after (August 2018-January 2019) the introduction of training (July 2018) in Kamba district (the intervention district) and the Arba Minch Zuria district (control district where there was no training) were included in the study.

Data collection, sources of data and statistical analysis

Data were sourced from weekly reporting registers and patient records at the health facilities. Data variables included socio-demographic information (age, gender), clinical presentation (rash, itching, secondary skin infection) and type of treatment.

We used EpiData software for data entry and analysis (version 3.1 for entry and version 2.2.2.182 for analysis, EpiData Association, Odense, Denmark). Scabies cases presenting to health facilities were standardized by 1000 population. Differences between groups were assessed using the chi-square test. The level of significance was set as at $P \leq 0.05$ level of and 95% confidence intervals throughout.

Ethics considerations

Permission to conduct the study was obtained from the Zonal Health Offices of Gamo Gofa zone. Local ethics approval was obtained from institutional review board of college of medicine and health sciences, Arba Minch University. The study was also approved by the Ethics Advisory Group of the International Union against Tuberculosis and Lung Disease, Paris, France. As this was a record review study without patient identifiers, the issue of informed patient consent did not apply.

Results

Characteristics of the study population

There was a total of 2,700 (47% female) scabies cases reported, mean age was 15 years with 50% being under the age of eleven. There were 1891 scabies cases in the intervention district and 809 in the control district.

Numbers of scabies cases presenting to health facilities standardized by 1000 population in the intervention and control districts

Table 1 shows scabies cases presenting to health facilities before and after training of health extension workers on scabies management in Kamba (the intervention district) and Arba Minch (the control district) where there was no such training. Scabies cases declined in the intervention district from 7.6 to 1.6 per 1,000 population (a 4.8-fold reduction). In the control district scabies cases increased from 1.3 to 2.4 per 1,000 population (a 1.8-fold increase).

Clinical characteristics and treatment type of scabies cases

Table 2 shows the demographic and clinical characteristics as well as treatment types offered to patients presenting in the intervention and control districts.

Following training in the intervention district, the proportion of scabies patients presenting with secondary skin infections reduced from 1,227 (78%, $n = 1,565$) to 156 (48%, $n = 326$, $P < 0.001$). In the control district the increase was insignificant 39 (14%, $n = 288$) to 86 (17%, $n = 521$, $P = 0.2$). After the training, the intervention district shows significant reduction in scabies patients having clinical manifestation of itching (87%, $n = 283$) and rash (67%, $n = 221$). Whereas, in the control district patients visiting health facilities with rash showed significant increment (49%, $n = 140$ to 69%, $n = 361$). Number of scabies cases in the age group of ≤ 10 , showed significant increment in the control district (42%, $n = 122$ to 65%, $n = 341$).

Permethrin use hovered around 90% in the intervention district while in the control district this was considerably lower (28% in the before period and 69% thereafter).

Discussion

This study from Ethiopia shows that decentralizing household scabies management to trained health extension workers resulted in an almost five-fold reduction in numbers of scabies cases presenting to health facilities. It is also a reflection of reduced scabies

incidence in the community, as HEWs are engaged on household awareness creation, scabies screening and treatment.

Such reduction in case-load would be welcomed by health workers in busy health facilities who could then dedicate their precious time to addressing other conditions that require higher levels of clinical expertise. From a patient perspective, decentralisation would improve earlier access to scabies care and avoid the inconvenience and costs of visiting busy health facilities. This finding is in line with a report which shows that scabies imposes a considerable economic burden on individuals, families, communities, and health systems [8].

Infected children in the age group less than eleven visits health facilities more frequently in the control district than in the intervention district. This could be because of high prevalence of scabies among school-aged children [3].

The significant reduction in scabies patients having clinical manifestation of itching and rash might be due to increased awareness and early access to health facilities. Whereas, in the control district patients

visiting health facilities with rash showed significant increment. It might be due to late treatment and late access to health facilities. Permethrin have been used frequently in the intervention district than in the control district. This might be due to drug availability and preference.

Another significant finding was the 30 percent reduction in the proportion of scabies patients with secondary skin infections after training of HEWs in the intervention district. A possible reason for this finding is that scabies patients might have had earlier access to scabies care which would have a preventive effect on secondary skin infection. This is thus encouraging as it might also have a beneficial effect on preventing acute and chronic complications [9,10].

The study strengths are that we used a before-and-after design and included a control arm; the data comes from district facilities and thus reflects the operational reality and we adhered to STROBE guidelines for the reporting of observational studies in epidemiology [11]. The study also addresses an identified national operational research priority [12,7].

Table 2. Demographic, clinical characteristics and treatment type of scabies cases presenting to health facilities in an intervention (Kamba) and control districts (Arba Minch Zuria), Ethiopia.

	Intervention district (Kamba)			Control district (Arba Minch Zuria)		
	Before training	After training	<i>p</i> -value	No training	No training	<i>P</i> -value
	Jan-Jun 2018 n (%)	Aug 2018- Jan 2019 n (%)		Jan-Jun 2018 n (%)	Aug 2018- Jan 2019 n (%)	
Total	1,565	326		288	521	
Gender						
Male	821 (52)	172 (53)	0.9	135 (47)	298 (57)	0.004
Female	744 (48)	154 (47)		153 (53)	223 (43)	
Age (in years)						
≤ 10	726 (46)	170 (52)		122 (42)	341 (65)	
11-20	310 (20)	68 (21)	0.5	120 (42)	144 (28)	< 0.001
≥21	529 (34)	88 (27)		46 (16)	36 (7)	
Itching						
Yes	1,482 (95)	283 (87)	< 0.001	287 (100)	516 (99)	0.1
No	83 (5)	43 (13)		1 (< 1)	5 (1)	
Rash						
Yes	1,354 (87)	221 (68)	< 0.001	140 (49)	361 (69)	< 0.001
No	211 (13)	105 (32)		148 (51)	160 (31)	
Secondary skin infection						
Yes	1,227 (78)	156 (48)	< 0.01	39 (14)	86 (17)	0.2
No	338 (22)	170 (52)		249 (86)	435 (83)	
Scabies treatment						
Permethrin	1,435 (92)	294 (90)	0.3	81 (28)	360 (69)	< 0.01
Ivermectin	128 (8)	29 (9)		18 (6)	0	
Sulphur	2 (< 1)	2 (1)		129 (45)	51 (10)	
BBL ¹	0	1 (< 1)		49 (17)	25 (4)	
Traditional drugs	0	0		0	35 (7)	
Not treated	0	0		11 (4)	55 (11)	

¹ BBL: Benzyl Benzoate lotion.

A main limitation is that we were unable to report on the number of scabies cases managed by HEWs at community level. Although we had embarked on trying to collect this data, in practice, none of the health facilities had this data. We do not know the real reasons for this problem, but a combination of factors might be responsible. HEWs might not be equipped with the appropriate reporting forms and/or the chain of data transmission might not have been clear, or the health facility in the catchment area might not have felt responsible for capturing this data. As health facilities are fundamentally responsible for reporting of morbidity data in their population catchment area, data of scabies and other conditions managed by HEWs should ideally be available at the health facility level. This would also allow better future assessments of HEW contributions to decentralizing scabies care.

Another limitation is that although we chose districts that were similar in geographic features, there might have been differences in health-seeking behaviour or awareness of scabies which may have influenced the number of cases presenting to health facilities.

The major implication of this study is that district with reduced case-load at health facility has trained and equipped HEWs to perform their expected duty, which is reducing scabies case in the community and case flow to health facilities.

Conclusion

In a rural setting of Ethiopia, introducing trained health extension workers to manage scabies at the community level was associated with reductions in health facility load for scabies and secondary skin infections. It has a wider community health benefits and could be one of the scabies control approaches for scaling-up. Improving monitoring and reporting of HEW activity requires focused attention and is an area that needs further operational research.

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References

1. Hay RJ, Steer AC, Engelman D, Walton S (2012) Scabies in the developing world -its prevalence, complications, and management. *Clin Microbiol Infect* 18: 3313-3323.
2. Engelman D, Steer AC (2018) Control strategies for scabies. *Trop Med Infect Dis* 3: 98.
3. Sara J, Haji Y, Gebretsadik A (2018) Scabies outbreak investigation and risk factors in east Badewacho district, Southern Ethiopia: unmatched case control study. *Dermatol Res Pract* 1: 10.
4. Deribe K, Meribo K, Gebre T, Hailu A, Ali A, Aseffa A, Davey G (2012) The burden of neglected tropical diseases in Ethiopia, and opportunities for integrated control and elimination. *Parasit Vectors* 5: 240.
5. Ethiopian Central Statistical Agency (2013) Population projections for Ethiopia 2007-2037 Addis Ababa July. Available: <http://ICPS-%20Population%20Projection%202007-%202037%20produced%20in%202012.pdf>. Accessed: 3 May 2019.
6. Federal Democratic Republic of Ethiopia, Ministry of Health (2015) Interm-Guideline For Multi-Sectorial Scabies Outbreak Emergency Response Ethiopia Available:https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/final_ethiopia_interim_guideline_for_multisectroal_scabies_out_break_response_final_14_dec15.pdf
7. Federal Democratic Republic of Ethiopia, Ministry of Health (2016) Ethiopia National Master Plan for Neglected Tropical Diseases. Available: http://espen.afro.who.int/system/files/content/resources/ETHI_OPIA_NTD_Master_Plan_2016_2020.pdf Accessed: 3 May 2019.

8. Engelman D, Kiang K, Chosidow O, McCarthy J, Fuller C, Lammie P, Hay R, Steer A (2013) members of the International Alliance for the Control of Scabies (IACS) Toward the global control of human scabies: introducing the International Alliance for the Control of Scabies. *PLoS Negl Trop Dis* 7: 2167.
9. World Health Organization Africa (2016) Ethiopia - Scabies outbreak response in Amhara regional state. Available: <https://www.afro.who.int/news/ethiopia-scabies-outbreak-response-amhara-regional-state>. Accessed: 3 May 2019.
10. Federal Democratic Republic of Ethiopia, Ministry of Health (2015) Scabies Outbreak Preparedness and Response Plan. Available: https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/fmoh_scabies_response_plan-29_dec_2015.docx_.pdf Accessed: 23 may 2019.
11. Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP (2007) The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Ann Intern Med* 147: 573-577.
12. United Nations (2015) Transforming our world: The 2030 agenda for sustainable development. Sustainable development knowledge platform. Available: <https://sustainabledevelopment.un.org/post2015/transforming-ourworld>. Accessed: 4 May 2019.

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Annex – Supplementary items**Supplementary Table 1.** Major Activities of Health Extension Workers, Kamba and Arba Minch Zaria Districts, Ethiopia.

Health domains	Activities
Hygiene and environmental sanitation	<ul style="list-style-type: none"> • Proper and safe excreta disposal system • Proper and safe disposal of solid and liquid waste • Water supply safety measures • Food hygiene and safety measures • Healthy home environment • Personal hygiene and hand washing • Arthropod and rodent control
Disease prevention and control	<ul style="list-style-type: none"> • Prevention and control of HIV/AIDS • Prevention and control of tuberculosis • Prevention and control of malaria • First aid
Family health services	<ul style="list-style-type: none"> • Maternal and child health • Family planning • Immunization • Adolescent reproductive health • Nutrition
Health education, awareness raising	<ul style="list-style-type: none"> • Health education and communication
Surveillance, reporting and scabies treatment	<ul style="list-style-type: none"> • Scabies screening, reporting and treatment • Surveillance and reporting of other outbreak related diseases
The training offered to HEWs on scabies	<ul style="list-style-type: none"> • Introduction (scabies transmission, prevention and control) • correct identification of scabies cases • prompt treatment • proper reporting of cases using the prepared format
Duration and approach to scabies training	<ul style="list-style-type: none"> • offered for 2 days • lecture and demonstration • pictures and videos