

Research Article

Scabies Training for Improving Non-Medical Personnel Knowledge in High-Risk Population in Indonesia

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Abstract

Scabies elimination is always challenging, as treatment alone is not sufficient to stop the transmission. To stop the transmission in places such as boarding schools, a community-based approach and cooperation with the teacher and managerial team are important. This study aims to evaluate the effectiveness of scabies detection training for non-medical personnel (NMP) in improving knowledge about scabies. This cross-sectional study was conducted in an Islamic boarding school in Bogor. NMPs in boarding school were trained to detect and prevent scabies in their communities. The training consists of expert lectures, group discussions and simulation training. All the participants were required to fill out the pre-test and post-test questionnaires. In 60 participants, there was a significant improvement from pre-test to post-test scores ($p < 0.001$), and 85% showed an improvement in post-test. The knowledge about scabies' symptoms and signs had the best improvement, while the knowledge improvement about the elimination of mites and scabies prevention was still poor after the training. The improvement of scabies knowledge after training was significant. Training models focused on NMP knowledge in recognizing scabies for early detection in the community have the potential to be used by collaboration of health practitioners and boarding school management to eradicate the scabies problem.

Keywords: boarding school, community empowerment, non-medical personnel, scabies detection, scabies training.

Pelatihan Skabies untuk Meningkatkan Pengetahuan Tenaga Non-Medis pada Populasi Risiko Tinggi di Indonesia

Abstrak

Program eliminasi skabies selalu menantang, karena tata laksana yang hanya pemberian obat tidak cukup untuk menghentikan transmisi. Untuk menghentikan transmisi di tempat padat penghuni seperti sekolah asrama, pendekatan berbasis komunitas dan kerja sama dengan guru serta manajemen sekolah menjadi penting. Studi ini bertujuan untuk mengevaluasi efektivitas pelatihan deteksi dini skabies bagi tenaga non medis (TNM) dalam meningkatkan pengetahuan mengenai skabies. Studi ini menggunakan desain potong lintang yang dilakukan di pesantren di Bogor. Tenaga non-medis yang berasal dari pesantren dilatih untuk mendeteksi dan mencegah skabies di komunitasnya. Pelatihan terdiri atas kuliah dari para ahli, diskusi kelompok dan simulasi. Semua peserta diminta untuk mengisi kuesioner pre-test dan post-test. Dari 60 peserta, terdapat peningkatan bermakna antara skor pre-test dan post-test ($p < 0,001$), 85% menunjukkan peningkatan pada skor post-test. Pengetahuan terkait gejala dan tanda skabies memiliki peningkatan terbaik, sedangkan peningkatan mengenai eliminasi tungau dan pencegahan skabies masih kurang setelah pelatihan. Pengetahuan skabies meningkat bermakna. Model pelatihan yang berfokus pada TNM dalam mengenali skabies untuk deteksi dini di komunitas sangat potensial untuk berkolaborasi dengan tenaga kesehatan dan manajemen pesantren untuk eradikasi skabies.

Kata kunci: sekolah asrama, pemberdayaan masyarakat, tenaga non medis, deteksi skabies, pelatihan skabies.

Introduction

Scabies is a parasitic infestation caused by *Sarcoptes scabiei*. It has been recognized as a neglected tropical disease by the World Health Organization. Indonesia is one of five countries with the greatest scabies burden, with age-standardised DALYs of 153.86.¹ The prevalence of scabies in boarding schools is especially higher; the prevalence of scabies in one of the boarding schools in Bogor was 76.9%.² Scabies elimination is challenging as scabies treatment should be followed by treatment of close contacts and environmental management to avoid reinfestation and transmission.³ Cooperation with the teacher and managerial team is important to stop transmission in places such as boarding schools. A previous study identified that some practices in boarding schools support scabies transmission, such as sharing clothes/prayer attire among students, infrequent washing of clothes, availability of hot water, sharing beds, lack of bed sheets, and the presence of scabies among friends and siblings at home.²

Scabies are prone to recurrences and outbreaks. Thus, its management needs a multidisciplinary approach.⁴ A community-based approach to scabies in endemic areas is important and has proven effective in controlling scabies.⁵ With appropriate knowledge on how to prevent scabies, perform a healthy lifestyle, and properly manage personal and environmental hygiene, scabies prevalence is supposedly decreased.⁶ An approach has been used to empower non-medical personnel (NMP) to become health cadres in boarding schools. These non-medical health personnel were trained to detect and prevent scabies in their communities. An instrument called DeSkab was developed for non-medical personnel to actively detect suspected scabies cases based on the cardinal signs, consisting of three major signs, which are the presence of nocturnal pruritus and its location, the presence of papule/excoriation/crust and its location and history of itching in roommates/housemates/family.⁵

The appropriate knowledge of scabies could also be spread with the help of local

community leaders through lectures, discussions, and peer education. Previous research explained how peer education could influence disease prevention behaviour since individuals tend to behave like their peers.⁵ We conducted a training for NMP (teachers and senior students) consisting of lectures, discussion about scabies and communication skills on educating others in their community. The end goal of the training is to improve the knowledge and skills about scabies to develop the ability of non-medical personnel to detect lesions suspicious of scabies. This research related to community engagement aims to evaluate the effectiveness of scabies detection training for NMP in improving knowledge about scabies.

Methods

This study is a quasi-experimental study using one group pre-test and post-test design. This study is approved by the ethical committee of the Faculty of Medicine Universitas Indonesia (KET-120/UN2.F1/ETIK/PPM.00.02/2020). Samples were collected by purposive sampling. We included non-medical personnel such as teachers, management staff and senior students at an Islamic boarding school in Bogor, Indonesia, who will be assigned as health cadres in their community (boarding school) and attend our training. We excluded subjects who did not complete the pre-test and post-test questionnaires.

The training consists of lectures from experts, group discussions and simulation training. The training started with an ice-breaking session with each group of NMP/cadres who introduced themselves and ended with a specific chant of the training and mentioned 'Free from itched - increased achievement'. The lectures were given in class arrangement, while the simulation and practice were done in small groups of 5-10 NMP/cadres. The lecture topics provided to the subjects were general knowledge about scabies (etiology, symptoms and signs, transmission, prevention and slightly about treatment), how to do scabies early detection using 'Deskab' form and how to

communicate with patients and also with patients' families. The lectures followed simulation and practice on detecting scabies early and educating others using the provided flipchart (communication skill). Each participant was asked to be actively involved and act as a cadre, patient, or observer in the role play. One doctor/supervisor supervised each group. Training was held on two consecutive days.

Before the training started, the subjects were asked to fill out the informed consent and pre-test questionnaire, and then after the training, the subjects were asked to fill out the same post-test questionnaire. The questionnaire contains 12 questions developed by dermatologists and community medicine experts. There was one question about the cause of scabies, three questions about scabies symptoms, four questions about scabies treatment, four questions about scabies transmission prevention and one question about health-cadres attitude. Each question is valued at one point, and the maximum score is 12.

Data were analysed using SPSS for Windows version 20.0. The questionnaire was validated using the item total correlation test, and its reliability was measured using Cronbach alpha. The Cronbach alpha >0.6 was used for good reliability value. Numerical data will be presented as means and standard deviation if

normally distributed and as median with minimum and maximum values if not normally distributed. Categorical data will be presented as percentages. A related T-test is used to determine the improvement of pre-test and post-test scores after training if data is normally distributed or otherwise using the Wilcoxon test. The value of $p < 0.05$ was considered statistically significant.

Results

In this study, 111 persons attended the training. However, only 60 participants filled out the pre-test and post-test questionnaires and were included in this study. Of 60 participants, 35 (58.3%) were male and 25 (41.7%) were female. The participants comprise 41 students, ten boarding school management staff, five boarders, three teachers, and one school's health staff.

The validity and reliability of each question of the pre-test and post-test questionnaire are shown in Table 1. The reliability of the questionnaire based on Cronbach's alpha is 0.673. Several questions have an item-total correlation <0.3. Those questions were not deleted, considering the questions are important to assess the participants' knowledge, and Cronbach's alpha does not change much even after the items were deleted.

Table 1. Validity of Each Question Using Item-total Correlation in the Pre-test and Post-test for Early Detection of Scabies Training by Non-medical Personnel (n=60)

Questions	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1 The cause of scabies	0.299	0.660
Q2 Scabies symptoms	0.439	0.644
Q3 Scabies itch characteristic	0.000	0.677
Q4 Formulation of scabies treatment	0.000	0.677
Q5 How to use scabies treatment	0.308	0.661
Q6 Repetition of scabies treatment	0.340	0.652
Q7 The importance of close contact treatment	0.650	0.609
Q8 Prevention of scabies transmission	0.369	0.645
Q9 Attitude of health cadres towards scabies	0.257	0.663
Q10 Prevention of scabies transmission (2)	0.046	0.681
Q11 Scabies signs/lesions	0.000	0.677
Q12 Elimination of mites from fomites	0.513	0.628

Notes: Reliability Cronbach's Alpha = 0.673

There was a significant improvement from the pre-test to the post-test score ($p < 0.001$). Most participants (85%) showed an

improvement, while 5% had a post-test score lower than the pre-test. The answer to each question in the pre-test and post-test is shown in

Table 2. There were 11 of 12 questions showed an increased proportion of correct answers on the post-test. Most of the participants showed improvement on the questions regarding scabies symptoms and signs as two of the three questions were answered 100% correctly in the post-test. There was one question about the elimination of mites from fomites (question number 12), where the post-test score still

showed a low proportion of correct answers in the post-test (25%) and another question about scabies prevention (question number 8), where the improvement was not satisfying as only 56.7% of participants answer correctly in the post-test. After analysis with the McNemar test, four questions showed an increment in proportion and were statistically significant, as shown in Table 2.

Table 2. The Answer for Each Question in the Pre-test and Post-test for Early Detection of Scabies Training by Non-medical Personnel (n=60)

Questions	Subject with the correct answer		p value*
	Pre-Test n, %	Post-Test n, %	
Q1 The cause of scabies	27 (45)	55 (91.7)	<0.001
Q2 Scabies symptoms	45 (75)	52 (86.7)	0.143
Q3 Scabies itch characteristic	42 (70)	60 (100)	n/a
Q4 Formulation of scabies treatment	58 (96.7)	60 (100)	n/a
Q5 How to use scabies treatment	20 (33.3)	56 (93.3)	<0.001
Q6 Repetition of scabies treatment	41 (68.3)	50 (83.3)	0.078
Q7 The importance of close contact treatment	18 (30)	45 (75)	<0.001
Q8 Prevention of scabies transmission	25 (41.7)	34 (56.7)	0.064
Q9 Attitude of health cadres towards scabies	34 (56.7)	55 (91.7)	<0.001
Q10 Prevention of scabies transmission (2)	50 (83.3)	53 (88.3)	0.549
Q11 Scabies signs /lesions	47 (78.3)	60 (100)	n/a
Q12 Elimination of mites from fomites	13 (21.7)	15 (25)	0.815

*McNemar test

Discussion

In this study, the scabies training given to non-medical personnel (NMP) was proven effective in increasing the scabies knowledge. Most of this study's participants were senior students assigned as health cadres in their community (boarding school). The younger generation was chosen as they were closer to their peers. Thus, we expect the approach would be more effective in spreading information about scabies, performing early detection of scabies and helping environmental management. A previous study evaluated the diagnostic accuracy of non-expert examiners in detecting scabies and found the sensitivity was 55.3% and the specificity was 89.9%. The performance was better for moderate to severe scabies, with a sensitivity of 93.5% and a specificity of 74%.⁸ WHO also suggested this task-shifting approach to maximise human resources by reallocating specific tasks to health workers.⁷

In this study, we arranged lecture and simulation training for NMP. Simulation

facilitates learning through immersion, reflection, feedback, and practice in a similar real-life experience.⁸ Maddy et al compared simulation-based education and lecture-based education for emergency medicine residents and concluded that the simulation-based education group showed more excellent retention at three months than the lecture-based education.⁹ Thus, we integrate the lecture and simulation into our training to increase the effectiveness and retention of the topics given. Using a questionnaire, we evaluate the scabies knowledge of NMP in boarding school before and after training.

The focus of our training was to improve knowledge about scabies to develop the ability of non-medical personnel to detect lesions suspicious of scabies. There are three questions regarding scabies symptoms, the answers to which were improved well after the training session. These results about scabies clinical symptoms are in line with research conducted at Islamic boarding schools in East Jakarta after

health education was provided that showed the total amount of students with good level of knowledge increased by almost tenfold from 7.67% to 73.1% while students with poor level of knowledge decrease significantly from 64.2% to 4.8%.¹⁰ Clinically, scabies were diagnosed using a combination of itch worsening at night, characteristic lesion and their distribution, and identification of mites and eggs. The pathognomonic signs of scabies are burrow, erythematous papules, and pruritus with nocturnal predominance. But, in practice, the burrow is often obliterated and hard to find. The predilection area is the interdigital spaces of the hand, flexural aspect of the wrists, elbows, penis shaft, nipples, buttocks, axillae, and periumbilical area.¹¹ The same concept was adapted in Deskab form and introduced in the training. The Deskab form consists of three cardinal signs: pruritus at night, pruritus symptoms on close contacts, and characteristic lesions on the predilection area.⁵

The questions about the cause of scabies, how to use scabies treatment, the importance of close contact treatment and the attitude of health cadres towards scabies showed improvement and are statistically significant. The question about the cause of scabies showed that participants were eager to know about scabies and its cause. This was related to their enthusiasm to understand how to treat scabies. Based on the health belief model theory, perceived knowledge can influence their perceived behaviour on this topic, and their perceived behaviour might be shown initially by their higher proportion of correct answers on scabies treatment. Based on the question about the attitude of health cadres (NMP) towards scabies, an improvement on the post-test could mean that they knew their role based on the trainer's explanation.

Two questions on the post-test did not give satisfying results, even after the training. Those two questions were about transmission prevention (56.7% answered correctly) and mite eradication (25% answered correctly). This showed that the training on those topics needs improvement and adapted to the local

community situation, in this case, boarding school. Another reason might be that the participants did not fully understand the questions given. The most common source of transmission is skin-to-skin contact with infected individuals. There are several practices in boarding schools that are prone to support the transmission of scabies.² Several habits, such as exchanging headscarves, combs, and praying tools in boarding schools, might contribute to spreading scabies.¹² In tropical regions, fomites (clothing, bedding, towels, and other items) are also an important transmission source since female mites are known to survive outside the host for 55-67 hours.¹³ The role of NMP in guiding the environmental management in boarding schools is also expected.

Overall improvement on scabies treatment questions was quite good even though the training was not focused on those topics. Topical treatment with permethrin requires application from the neck to the soles of the feet for 8-12 hours and can be repeated after one week.¹⁴ The NMPs are expected to be able to guide the correct application of topical treatment in their community (boarding school). In the current guidance, other than individual diagnoses with scabies, all contacts should be treated with the same regimen.¹¹ Thus, the cooperation of NMP is vital in helping to identify the contacts and referring them to the medical officer. Mass population treatment is also recommended to control scabies in endemic areas. All individuals with symptoms should be treated. The common regimen for mass drug therapy is oral ivermectin 200 µg/kg single dose with a follow-up visit after two weeks.¹⁵

Conclusion

The improvement of scabies knowledge after training was significant. This training model was focused on NMP knowledge in recognizing the symptoms of scabies for early detection in the community, and this model has the potential to be used by a collaboration of health practitioners and boarding school management to eradicate the scabies problem.

Conflict of Interest

The author declares that no significant competing financial, professional, or personal interests might have affected the performance or presentation of the work described in this manuscript.

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