Development of "Deskab" as an instrument to detect scabies for non-medical personnel in Indonesia

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Abstract

Scabies is one of the most prevalent infectious skin diseases in Indonesia, especially in boarding schools. Diagnosis of scabies can be made using the four cardinal signs through anamnesis and simple physical examination. The high incidence of scabies requires collaboration between various parties to diagnose and treat scabies. "DeSkab" (scabies detection form) is a form containing questions for non-medical personnel to detect scabies before being confirmed by trained medical personnel. Face and content validity of "DeSkab" is first established by boarding school's supervisors, experts in community medicine, and dermatovenereologists. To establish reliability, study is conducted in Al-Hidayah Islamic Boarding School, Indonesia. Six non-medical personnel were chosen to examine 81 students of the boarding school using "DeSkab". Each student is examined by three non-medical personnel, then confirmed through an examination by dermatovenereologists. Result of McNemar test shows that scabies detection by five non-medical personnel have no statistically significant difference compared to the dermatovenereologist (McNemar test value of P>0.05). Based on this result, "DeSkab" proves to be an option for non-medical personnel to use as an instrument for detecting scabies in Indonesia.

Introduction

Scabies is a skin disease caused by an infection of *Sarcoptes scabiei*, whose transmission mostly occurs through contact between one person and another, such as sleeping together in a dense bed room.[1] Based on Ministry of Health of the Republic of Indonesia data from all Indonesian primary healthcare centers in 2008, the incidence of scabies is 5.6-12.95%. The number ranks third among the 12 most common diseases in Indonesia.[2] Scabies often strikes a group of people, such as children living in dormitories or boarding schools because the condition of a group of people living together makes it easy for the occurrence of various skin infections, including scabies.[3] Prevalence of scabies in boarding school with high density and poor hygiene is reported to be as high as 78.7%.[4]

There are four cardinal signs that can be found in the scabies used for diagnosis. Diagnosis can be established by the discovery of two of the four cardinal signs, including nocturnal pruritus, itching of a group of people, white or gray tunnel lesions, and gold standard diagnosis by finding mites on the skin through microscopic examination.[5] One study showed a diagnosis of scabies by medical personnel in primary healthcare center through anamnesis by finding itch along with appropriate lesions and at least involving two typical locations of scabies and family members who lived in the same house, had a sensitivity of 100% and a specificity of 97%.[6]

A rapid and comprehensive history and physical examination is important to ensure that patients are not treating themselves inappropriately which may lead to other serious medical complications.[5] Untreated lesions can cause complications of secondary infections, abscesses, enlarged lymph nodes, and post-infective glomerulonephritis streptococcus.[7] In addition, prolonged infection can also lead to a decrease in quality of life caused by itching, one of which is insomnia and decreased learning achievement in children.[8] For non-medical personnel to obtain appropriate knowledge of scabies, dissemination of information through counseling could be done, with support from local community leaders. Methods that can be done include lectures, discussions, or peer education.[9] Community-based management approaches in scabies endemic areas have proven to be the most effective method of controlling scabies in the area. In addition, this also impacts on significant improvements in the incidence of secondary bacterial infections.[10] Until now, there hasn't been any assisting tools that can be used by non-medical personnel to help detect scabies cases. For that reason, researchers decide to conduct a study on the detection of scabies by non-medical personnel in boarding school using specific instruments for scabies detection.

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Materials and methods

The first stage of the study is creating an instrument used by non-medical personnel to detect scabies. "DeSkab" (scabies detection form) is a form containing questions to help non-medical personnel detect scabies before being confirmed by trained medical personnel. The content of "DeSkab" itself is the result of discussion between researcher and six other dermatovenereologists. The diction and language used in "DeSkab" is being validated by experts in community medicine and supervisors of the boarding school. The instrument is also shown to the non-medical personnel to see if the interface is easily understood and feasible to use. The validated "DeSkab" is then duplicated and used for the study in the boarding school.

The research was conducted at Al-Hidayah Islamic Boarding School, West Java, Indonesia. Researchers started the study by giving a presentation containing information about scabies and "DeSkab" to 16 non-medical personnel at the boarding school. Pre-tests and post-tests were distributed before and after the presentation to

determine the improvement of knowledge of non-medical personnel on scabies. After the presentation, practice test was performed by the non-medical personnel with the assistance of medical personnel.

After the practice trial, six non-medical personnel with the best post-test scores were selected, consisting of three men and women. The six non-medical personnel then examined 81 students of the boarding school using "DeSkab" as an assisting instrument. Due to the rules and regulations in the boarding school, each student will be examined by three non-medical personnel of the same gender, then confirmed through an examination by a dermatovenereologist.

The researcher then distributed feedback sheets to non-medical personnel to learn inputs from non-medical personnel related to the use of "DeSkab" in assisting them in detecting scabies. The data collected is then processed to assess the reliability of "DeSkab" in detecting scabies by comparing the results of the tests performed by non-medical personnel with that of medical personnel.

Results

"DeSkab" is made consisting of patient's identity, anamnesis, physical examination, and examination result that indicates whether the patient has no scabies or suspected of scabies. The anamnesis part of "DeSkab" contains four main questions, asking the subjects regarding the nocturnal pruritus and its location, complaint of itching in subject's surroundings, history of current medication, and history of previous diseases that are similar to the current one the subjects are experiencing. The physical examination part contains questions regarding the type (papules, pustules, or erosions/excoriations/ulcers) and location of the lesions. An illustration of typical location of body parts that may be affected by scabies is included in the form to help non-medical personnel in pointing out the location of the lesions.

The patient is suspected of scabies if two out of three cardinal signs are found, which are nocturnal pruritus, itching on a group of people, and skin lesions on the predilection areas of patient's skin. The dermatovenereologist will then make the final diagnosis of scabies or non-scabies. Results of both the non-medical personnel and the dermatovenereologist can be found on the bottom part of the form. A detailed information on scabies and instructions for use are also included in the back of the form.

Based on the demographical characteristic, the male-female ratio between the non-medical personnel are spread almost evenly, with most belong in the age group of 20 to 30 years old. The education background of the non-medical personnel is mostly high education except one person in particular only went through elementary school (Table 1).

Three supervisors of the boarding school were being asked of the language and diction being used in the "DeSkab". The first question is regarding the examination being performed to the students by the non-medical personnel (teachers). The researcher asked if students can be examined by teachers of the different gender. The responses from the supervisors are:

'It is better for the examiner to be the same gender with the patient' – Supervisor A.
'Same, it would be better if male and female teachers are trained to match the gender of the students' – Supervisor B.
'Female students should be examined by female teachers' – Supervisor C.

Next questions are regarding the terminologies being used in the form. The researcher asked if the question can contain certain terminologies related to genital area, such as genital shaft, nipple, and testicle and if it would be accepted by both the teachers and the students. The responses are:

'Yes, because it is related to medical examination, it is fine to use it' – Supervisor A.
'No problem, because it is for health matters' – Supervisor C.

Last questions being asked is about the willingness of the teachers in the boarding school to perform examination of students' skin health. The supervisors' responses are:

'Yes, they would, because there are many skin diseases in the boarding school' – Supervisor A.
'They would like to' – Supervisor C.

Result of McNemar test shows that scabies detection by all three male non-medical personnel have no statistically significant difference compared to the dermatovenereologist (McNemar test value of p = 0.500, 0.625, and 1.000). For female non-medical personnel, there is one personnel who has statistically significant different results compared to the dermatovenereologist (McNemar test value of p=0.027). The other two female non-medical personnel obtained similar result with the dermatovenereologist although the McNemar p value is lower than their male counterparts and approaching p value of 0.05 (Table 2).

Discussion

Face validity is evaluated based on the instrument's interface and the appropriateness to what is being measured. An instru-

Table 1. Demographical characteristic of non-medical personnel in Al-Hidayah Islamic Boarding School, 2017 (n=16).

Variable	Category	n	%
Sex	Male	7	43.75
	Female	9	56.25
Age	≤ 20	3	18.75
	20-30	8	50.00
	≥ 30	5	31.25
Education	Elementary school	1	6.25
	High school	6	37.50
	Diploma	2	12.50
	Bachelor	7	43.75

Table 2. Comparison of scabies diagnosis by non-medical personnel and dermatovenereologist using "DeSkab" at Al-Hidayah Islamic Boarding School, 2017.

Non-medical Personnel		Dermatovenereologist Non-scabies n	%	Scabies n	%	p (McNemar test)
Male Personnel 1	Non-scabies	1	100	0	0	0.500
	Suspected of scabies	2	6.1	31	93	
Male Personnel 2	Non-scabies	0	0	1	100	0.625
	Suspected of scabies	3	9.1	30	90.9	
Male Personnel 3	Non-scabies	1	50	1	50	1.000
	Suspected of scabies	2	6.2	30	93.8	
Female Personnel 1	Non-scabies	2	28.6	5	71.4	0.027
	Suspected of scabies	16	40	24	60	
Female Personnel 2	Non-scabies	12	44.4	15	55.6	0.078
	Suspected of scabies	6	30	14	70	
Female Personnel 3	Non-scabies	14	58.3	10	41.7	0.180
	Suspected of scabies	4	17.4	19	82.6	

ment with high face validity will provoke the individual's motivation to do it seriously.[11,12] To establish face validity, researcher asks for feedback from experts of community medicine and supervisors of the boarding school as well as the non-medical personnel as the user candidates. Overall, all the feedbacks stated that "DeSkab" is acceptable and can be used for this study, based on the diction and language it uses.

Content validity is used to measure how far the elements or questions in in the instrument in measuring the substance being measured. Evaluation is performed to obtain a logical as well as comprehensive and balanced instrument that covers all characteristics being measured. Content validity is performed by asking experts in the field of study to give inputs and feedbacks to the content of the instrument being used.[11,12] Content validity is established through discussion of dermatovenereologist and according to various literatures on scabies. Based on the literatures, scabies is diagnosed by fulfilling two out of four cardinal signs,[5] but in this form two out of three is considered acceptable because skin scrapping to find the mites is not performed by non-medical personnel. If at least two out of three cardinal signs are fulfilled, the non-medical personnel can establish the subject as suspected of scabies.

Reliability is established using McNemar test by evaluating the examination result of three non-medical personnel from each gender compared to the diagnosis made by the dermatovenereologist.[13] Male non-medical personnel's result in detecting scabies is better compared to their female counterparts. All three male non-medical personnel have non-significant difference in scabies detection results compared to the dermatovenereologist, while one female non-medical personnel has statistically significant difference with the dermatovenereologist's result. Female non-medical personnel need more extensive training regarding scabies detection. The lacking result of the female non-medical personnel are most likely due to lower education (high school graduates) and feelings of shame in performing physical examination to the subjects.

Limitation of this study is concerning the high proportion of students diagnosed with scabies because it is done in boarding school that has high prevalence of scabies. Similar studies performed on other centers are required to further assess the reliability of "DeSkab" for detecting scabies by non-medical personnel.

Conclusions

"DeSkab" as an assisting tool to detect scabies can be used by non-medical personnel in boarding schools. Non-medical personnel are capable in assisting medical personnel in detecting scabies by using a measured form. Other studies in centers other than boarding school need to be conducted to evaluate the use of "DeSkab" in a place with lower population of scabies. In the end, "DeSkab" remains an option for non-medical personnel to use as an instrument for detecting scabies in Indonesia.

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