Assessing knowledge of scabies among physicians working in primary health care setting

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ABSTRACT

Background: Outbreaks of scabies have been documented in 2018 among school children in Western and Central regions of Saudi Arabia. There have been concerns about the awareness of healthcare providers. Objective: The objective of the current study was to evaluate the knowledge of primary health care physicians about scabies diagnosis and management, as well as the factors influencing such knowledge. Methods: An observational cross-sectional study was conducted between September and October 2019. The target population was physicians working in primary care centers in Riyadh. Filling either hard or soft copies of the study questionnaire was used for data collection. The knowledge score was calculated from the answers for 16 knowledge questions. Results: A total of 216 physicians were included in the final analysis, mainly general practitioners (56.5%) and registrars (31.5%). The overall knowledge score was 67.5%± 13.9%. The highest level of knowledge was associated with age susceptibility (80.6%), followed by clinical presentation and diagnosis (78.1%), mode of transmission (75.8%), pathogen cause & incubation period (66.9%), and finally management (61.7%). In multivariate logistic regression models, a shorter time since last time information about scabies was reviewed was significantly associated with better knowledge (defined as score > median), with odds ratio = 5.84 (95% confidence interval = 2.43–14.01). Similarly, older age and higher qualification were significantly associated with better knowledge. Discussion: As expected, the knowledge about scabies among primary care physicians was generally inadequate. The current findings highlight the need for educational and training programs lead by health care authorities, targeting these physicians.

Keywords: Knowledge, outbreak, primary health care, pruritus, Saudi Arabia, scabies

Introduction

Scabies is a skin infestation by the mite Sarcoptes scabiei. Scabies is a worldwide public health problem affecting approximately 200–300 million individuals annually. There is wide variability in the prevalence of scabies across countries (0.2–71%), being endemic in many resource-limited countries. Even in high-income countries, sporadic cases and sometimes outbreaks in health institutions and disadvantaged communities are not uncommon. Scabies is transmitted by close contact with infected people. The main clinical picture is characterized by burrows in interdigital web spaces of the hands, flexor surfaces of the wrists and elbows, axillae, male genitalia, and women’s breasts along with severe pruritus. The detection of mites or their products (eggs, feces) confirms the diagnosis. Dermoscopy may facilitate the diagnosis of scabies by ensuring better visualization of pathognomonic scabies lesions.
Scabies is considered as one of the neglected tropical diseases, mainly due to inadequate awareness of the public and healthcare providers. This is manifested by the worldwide distribution and outbreaks in vulnerable groups, such as nurseries, retirement homes, schools, and healthcare institutions. For example, unawareness of healthcare providers regarding the epidemiology and atypical presentations, diagnostic delay, poor management, and incomplete monitoring can contribute to nosocomial transmissions and outbreaks. Additionally, the increasing occurrence of human immunodeficiency virus disease and widespread use of immunosuppressive agents led to increased incidence of crusted (Norwegian) scabies.

In the last few years, there has been an increase in the number of cases diagnosed with scabies in Saudi Arabia. Actually, outbreaks have been documented in 2018 among school children in the Western and Central regions. As the primary care system is considered the frontline in managing such outbreaks, there has been international concern about the awareness of primary care physicians about scabies. In Saudi Arabia, Primary healthcare centers are the most visited clinics in Saudi Arabia. By 2018, there were 51,948,033 visits to primary healthcare centers, which are easily accessible and free of charge, compared to 12,875,057 visits to hospitals’ outpatient clinics. Although the awareness of scabies among medical students in Saudi Arabia has been examined, there is a lack of studies examining such awareness among primary care physicians. Additionally, it has been observed that the majority of primary health care physicians had insufficient knowledge to manage common skin disorders. The objective of the current study was to evaluate the knowledge of primary health care physicians about scabies diagnosis and management, as well as the factors influencing such knowledge.

Material and Methods

The study was conducted among physicians working in primary care setting in Riyadh, Saudi Arabia. The Ministry of Health (MOH) provides three levels of largely free health services to the population in Saudi Arabia: primary, secondary, and tertiary. Primary health services focus on both preventive and curative health services. According to the 2018 statistical book of MOH, Riyadh had 447 primary care centers run by approximately 2,500 physicians, 3,900 nurses, and 3,200 other healthcare providers. The study was an observational cross-sectional study that has been conducted between September 2019 and October 2019. The study received all required ethical approvals from the Institutional Review Board committee at the corresponding author’s university. The target population was physicians working in primary care centers in Riyadh during the time of the study. The following specialties were included: general medical practitioners, family physicians, and dermatologists. Dentists and physicians working in secondary or tertiary care hospitals were excluded. According to studies that examined the knowledge of scabies diagnosis and treatment, the prevalence of satisfactory knowledge (≥75%) of scabies or other dermatologic diseases ranged between 8.6% in Saudi Arabia and 36% in Pakistan. Assuming a satisfactory knowledge of 15–20% with two-sided confidence limits of 5%, 182–224 physicians would be required, using 80% power level and 95% two-sided significance level.

The target physicians were recruited using a convenience sampling technique. They were reached directly and using phone calls and emails. Both hard copy and soft copy of the study questionnaire were allowed. Physicians were asked to sign informed consent after explaining the objectives of the study and before data collection. The data were collected using a structured study questionnaire that was self-filled by target physicians. The questionnaire included data on socio-demographic and professional characteristics as well as knowledge questions covering pathogen, incubation period, transmission, susceptibility, clinical presentation, diagnosis, and management of scabies. The face (how much questions cover the study objectives) and content (scientific merit of questions) validity of the questionnaire were evaluated by three expert dermatologists. The questionnaire was considerably modified based on the expert suggestions. A pilot study was conducted on a sample of 15 physicians with very positive feedback. This pilot study was used to test the clarity and validity of data collection tool, to test the logistics of data collection, and to estimate the duration of data collection.

All knowledge questions were multiple-choice questions with only one correct answer allowed, except the mode of transmission question that had three possible correct answers and one wrong answer. The answers for 16 knowledge questions were evaluated with one point given for each correct answer (a maximum total of 18 points). The score was then transformed into a 100 point scale for easy interpretation. Additionally, subscores were created for different aspects of scabies knowledge: including pathogen & incubation period (two questions), transmission (two questions), age susceptibility (one question), presentation and diagnosis (five questions), and management (six questions). Out of 218 physicians who filled the questionnaire, two physicians were excluded due to missing knowledge data.

All categorical variables were presented as frequencies and percentages while continuous variables were presented as means and standard deviations. Socio-demographic and professional characteristics were compared between physicians with low and high knowledge levels (≤ median and > median overall knowledge score, respectively). Chi-square or Fisher’s exact test, as appropriate, were used to examine differences in categorical variables. To detect factors independently associated with high knowledge level, multivariate logistic regression analysis models were run after adjusting for the variables that were significantly associated (P-value up to 0.010) with knowledge level in univariate analysis [Table 1]. Backward elimination was used to allow nonsignificant variables to leave the model. All P values were two-tailed. P value < 0.05 was considered as significant. SPSS software (release 23.0, Armonk, NY: IBM Corp) was used for all statistical analyses.
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Results

A total of 216 physicians were included in the final analysis. Table 1 shows the demographics and professional characteristics of the study physicians. Various age groups were presented in the study sample: < 30 years (14.8%), 30–39 years (41.2%), 40–49 years (26.4%), and ≥50 years (17.6%). The majority of physicians were general practitioners (56.5%) and registrars (31.5%). Senior registrars (7.4%) and consultants (4.6%) represented approximately 10% of the study sample. Close to half (46.5%) of the physicians had a Bachelor of Medicine and Surgery, while the remaining physicians had additionally a diploma/Master (29.3%) or were board-certified (18.1%). Most of the physicians were general practitioners (44.0%), family medicine physicians (43.5%), or other specialties (12.5%). Close to half (47.4%) of the physicians had more than 10 years of experience. The majority of physicians reported dealing with clinical cases of scabies (78.1%), mainly (80.4%) in a small number (<10) of patients. Only 36.6% of the physicians read about the Saudi MOH guidelines for scabies.

When asked about

| Table 1: Demographics and professional characteristics of the study physicians by knowledge group |
|---------------------------------------------------------------|
| **Overall** | **Knowledge score level** | **P** |
| Age | | | |
| <30 | 32 (14.8%) | 21 (65.6%) | 11 (34.4%) | 0.009 |
| 30-39 | 89 (41.2%) | 57 (64.0%) | 32 (36.0%) |
| 40-49 | 57 (26.4%) | 22 (38.6%) | 35 (61.4%) |
| ≥50 | 38 (17.6%) | 18 (47.4%) | 20 (52.6%) |
| SCFHS position | | | |
| General practitioner | 122 (56.5%) | 70 (57.4%) | 52 (42.6%) | 0.693 |
| Registrar | 68 (31.5%) | 36 (52.9%) | 32 (47.1%) |
| Senior Registrar | 16 (7.4%) | 8 (50.0%) | 8 (50.0%) |
| Consultant | 10 (4.6%) | 4 (40.0%) | 6 (60.0%) |
| Qualification | | | |
| MBBS/MD/MBBCh | 100 (46.5%) | 64 (64.0%) | 36 (36.0%) | 0.018 |
| As above plus Diploma/Master | 63 (29.3%) | 31 (49.2%) | 32 (50.8%) |
| Board certified | 39 (18.1%) | 19 (48.7%) | 20 (51.3%) |
| Others | 13 (6.0%) | 3 (23.1%) | 10 (76.9%) |
| Specialty | | | |
| General practitioner | 95 (44.0%) | 58 (61.1%) | 37 (38.9%) | 0.081 |
| Family medicine | 94 (43.5%) | 50 (53.2%) | 44 (46.8%) |
| Others | 27 (12.5%) | 10 (37.0%) | 17 (63.0%) |
| Years of experiences | | | |
| <5 | 46 (21.4%) | 30 (65.2%) | 16 (34.8%) | 0.137 |
| 5-10 | 67 (31.2%) | 38 (56.7%) | 29 (43.3%) |
| >10 | 102 (47.4%) | 49 (48.0%) | 53 (52.0%) |
| Ever seen a clinical case of scabies | | | |
| No | 45 (20.9%) | 30 (66.7%) | 15 (33.3%) | 0.065* |
| Yes | 169 (78.6%) | 87 (51.5%) | 82 (48.5%) |
| Don’t know | 1 (0.5%) | 0 (0.0%) | 1 (100.0%) |
| Number of clinical case seen | | | |
| <10 | 74 (80.4%) | 37 (50.0%) | 37 (50.0%) | 0.672 |
| ≥10 | 18 (19.6%) | 8 (44.4%) | 10 (55.6%) |
| Awareness of Saudi Ministry of Health guidelines for scabies outbreak | | | |
| No | 121 (56.0%) | 71 (58.7%) | 50 (41.3%) | 0.337 |
| Yes | 79 (36.6%) | 38 (48.1%) | 41 (51.9%) |
| Don’t know | 16 (7.4%) | 9 (56.3%) | 7 (43.8%) |
| Last time information about scabies has been reviewed | | | |
| Within last month | 49 (22.7%) | 15 (30.6%) | 34 (69.4%) | <0.001 |
| Within last year | 110 (50.9%) | 64 (58.2%) | 46 (41.8%) |
| More than one year | 57 (26.4%) | 39 (68.4%) | 18 (31.6%) |
| Sources of information about scabies that have been reviewed | | | |
| Websites | 110 (50.9%) | 58 (52.7%) | 52 (47.3%) | 0.568* |
| Continuing medical education | 40 (18.5%) | 23 (57.5%) | 17 (42.5%) |
| Textbook | 48 (22.2%) | 24 (50.0%) | 24 (50.0%) |
| Journal articles | 12 (5.6%) | 9 (75.0%) | 3 (25.0%) |
| Others | 6 (2.8%) | 4 (66.7%) | 2 (33.3%) |

MBBS/MD/MBBCh, Bachelor of Medicine and Surgery.*Fisher exact rather than Chi square test was used.
the last time information about scabies has been reviewed, 20.7% said last month, 50.9% within last year, and 26.4% more than one year age. Sources of information about scabies that have been used included websites (50.9%), textbooks (22.2%), and continuing medical education activity (18.5%).

Table 2 shows the responses to knowledge items. The majority of physicians correctly identified the answers for the following knowledge items: common presentations (97.7%), possibility of clinical diagnosis (96.3%), the use of permethrin cream (5%) for treatment of uncomplicated cases (95.8%), pathogenic cause (89.4%), proper management of infested environment (81.0%), susceptible age group (80.6%), the treatment of asymptomatic close contact (77.3%), pathognomonic feature (73.5%), inability to rule out diagnosis with lack of mites (73.5%), and the nonlocalized skin application of permethrin (71.6%). On the other hand, less than 50% of the physicians correctly identified the answers for the following knowledge items: post-treatment infectivity time (21.8%), sulfur ointment as the drug of choice in children less than 2 months (23.1%), unlike possibility of spread from pets (32.4%), incubation period (44.2%), and Norwegian scabies (49.5%). For transmission, the majority of physicians correctly identified the direct contact (96.8%) and contaminated cloths (82.4%) modes of transmissions while only 44.0% correctly identified sexual transmission.

As shown in Figure 1, the overall knowledge score was 67.5%± 13.9%. The highest level of knowledge was associated with age susceptibility (80.6%), followed by clinical presentation and diagnosis (78.1%), mode of transmission (75.8%), pathogen cause & incubation period (66.9%), and finally management (61.7%).

The median knowledge score was 66.7%. This divided the sample into two groups: ≤ median (54.6%) and > median (45.4%). Additionally, 17.1% of physicians had a knowledge score of ≥75%. As shown in Table 1, older age groups (P = 0.009), higher qualification (P = 0.018), and shorter time since last time information about scabies have been reviewed (P < 0.001) were significantly associated with better knowledge level. Additionally, there was a trend of association (P > 0.05 and P < 0.010) between better knowledge level and specialty and dealing with cases of scabies.

Table 3 shows the univariate and multivariate logistic regression analysis of potential predictors for better knowledge level, which was defined as score > median. Univariate models showed results that were very similar to Table 1. In multivariate models adjusted for age groups, qualification, specialty, dealing with cases of scabies, and last time information about scabies has been reviewed; only three variables remained significantly associated with better knowledge level (independent factors). Shorter time since last time information about scabies was reviewed (last month) was significantly (P < 0.001) associated with better knowledge level, with odds ratio (OR) = 5.84 (95% confidence interval [CI] = 2.43–14.01). Similarly, older age (OR = 2.50, 95% CI 1.36–4.59, P = 0.003) and higher qualification (OR = 2.41, 95% CI 1.16–5.01, P = 0.018) were significantly associated with better knowledge level.

**Discussion**

The current study examined the awareness of scabies diagnosis and management among a sample of primary care physicians working in Riyadh, the capital city of Saudi Arabia. The current finding showed generally inadequate knowledge about scabies with a median knowledge level of 66.7% and only 17.1% of physicians had adequate knowledge (defined as score ≥75%). Comparing current findings with similar studies is challenging due to the lack of similar studies locally and scarcity of comparable studies internationally. Moreover, there was no standard knowledge questionnaire used in these studies to ensure fair comparisons. Nevertheless, the current knowledge level is somewhat similar to international studies that showed a low frequency of adequate knowledge of scabies among family physicians.[17,18] For example, the knowledge of scabies among general practitioners working in Belgium was 59%, which is slightly lower than the current levels.[19] On the other hand, 36% of the general practitioners working in Pakistan had a satisfactory level of awareness (defined as score ≥75%).[17] Consistent with these findings, only 30% of primary care physicians working in the southwestern part of Saudi Arabia had sufficient knowledge (defined as >60%) about common dermatological diseases, including scabies.[21] Furthermore, if the 75% knowledge level used in other studies was replicated, the prevalence of adequate knowledge in that study would be only 8.6%.[21]

The current findings showed variable knowledge levels by different aspects of scabies diagnosis and treatment. For example, it was the highest with common presentations, clinical diagnosis, direct transmission, and the use of permethrin treatment. These represent typical cases of scabies. On the other hand, the knowledge level was the lowest with post-treatment infectivity,
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The inadequate knowledge observed in the current study was consistent with the fact that only one-third of the physicians were aware of the Saudi MOH guidelines for scabies, and approximately one-fourth of the physicians were unexposed to scabies information for a long period. Consistent with these findings, lack of guidelines, training, and educational materials were reported as barriers for local physicians and dermatologists to diagnose and manage dermatological disorders.\[21\] Actually, a shorter time since last exposure to scabies information was an independent predictor for better scabies knowledge among healthcare professionals.\[22\] The inadequate knowledge observed in the current study was consistent with the fact that only one-third of the physicians were aware of the Saudi MOH guidelines for scabies, and approximately one-fourth of the physicians were unexposed to scabies information for a long period. Consistent with these findings, lack of guidelines, training, and educational materials were reported as barriers for local physicians and dermatologists to diagnose and manage dermatological disorders.\[21\] Actually, a shorter time since last exposure to scabies information was an independent predictor for better scabies knowledge among healthcare professionals.\[22\]

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| Knowledge item                          | Number (%) | Knowledge item                          | Number (%) |
|-----------------------------------------|------------|-----------------------------------------|------------|
| Pathogen cause of scabies              |            | Possibility of clinical diagnosis       |            |
| Bacterial                               | 10 (4.6%)  | No                                      | 7 (3.2%)   |
| Viral                                   | 6 (2.8%)   | Yes*                                   | 208 (96.3%)|
| Fungal                                  | 5 (2.3%)   | Don’t know                              | 1 (0.5%)   |
| Parasitic*                              | 193 (89.4%)| Lack of mites rules out scabies         |            |
| Don’t know                              | 2 (0.9%)   | No*                                    | 158 (73.5%)|
| Incubation period                       |            |                                        |            |
| <24 hours                               | 11 (5.1%)  | Don’t know                              | 28 (13.0%) |
| 1-3 days                                | 22 (10.2%) | Treatment of uncomplicated scabies      |            |
| 1-2 weeks                               | 68 (31.6%) | Fluconazole                            | 3 (1.4%)   |
| 2-6 weeks*                              | 95 (44.2%) | Permethrin cream 5%*                    | 206 (95.8%)|
| Don’t know                              | 19 (8.8%)  | Permethrin tablets                      | 4 (1.9%)   |
| Mode of transmission                    |            |                                        |            |
| Direct*                                 | 209 (96.8%)| The drug of choice in children less than 2 months |            |
| Sexual*                                 | 95 (44.0%) | Do not know                             | 0 (0.0%)   |
| Contaminated clothes*                   | 178 (82.4%)| Ivermectin                             | 17 (7.9%)  |
| Swimming pools                          | 33 (15.3%) | Lindane lotion 1%                       | 19 (8.8%)  |
| Possibility of spread from pets         |            |                                        |            |
| No*                                     | 70 (32.4%) | Permethrin cream 5%                     | 85 (39.4%) |
| Yes                                     | 103 (47.7%)| Don’t know                              | 45 (20.8%) |
| Don’t know                              | 43 (19.9%) | Treatment should be given to asymptomatic close contact |            |
| Most susceptible age                    |            |                                        |            |
| Infant                                  | 7 (3.2%)   |                                        |            |
| Children and young adult*               | 174 (80.6%)|                                        |            |
| Adult                                   | 14 (6.5%)  | Permethrin should be applied on itchy lesion only to avoid toxicity |        |
| Elderly                                 | 17 (7.9%)  | No*                                    | 154 (71.6%)|
| Don’t know                              | 4 (1.9%)   | Yes                                    | 40 (18.6%) |
| Common presentations                    |            |                                        |            |
| Bruises                                 | 1 (0.5%)   | Proper management of infested environment |            |
| Hair loss                               | 1 (0.5%)   | Spray or fumigate                       | 6 (2.8%)   |
| Nocturnal itching and rashes*          | 210 (97.7%)| Washing sheets and clothes at 30°C      | 9 (4.2%)   |
|                                        |            | Washing sheets and clothes at 60°C or covering items with a plastic bag for more than 2-3 days* | 175 (81.0%)|
| Do not know                             | 3 (1.4%)   |                                        |            |
| Pathognomonic feature                  |            |                                        |            |
| Burrow*                                 | 158 (73.5%)| Washing sheets and clothes with soap    | 11 (5.1%)  |
| Herald patch                           | 25 (11.6%) | Do not know                             | 15 (6.9%)  |
| Umbilicated papule                     | 14 (6.5%)  | Duration after treatment for a patient to be not infectious | 47 (21.8%) |
| Vesicles                               | 13 (6.0%)  | 24 h*                                   | 55 (25.5%) |
| Don’t know                              | 5 (2.3%)   | 48-72 h                                 | 36 (16.7%) |
| Norwegian scabies severity             |            |                                        |            |
| Mild scabies                            | 2 (0.9%)   |                                        |            |
| Self-limited scabies                   | 3 (1.4%)   |                                        |            |
| Nodular scabies                         | 8 (3.7%)   |                                        |            |
| Severe scabies*                         | 107 (49.5%)|                                        |            |
| Do not know                             | 96 (44.4%) |                                        |            |

* Correct answers
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Our physicians. Older age, which usually indicates prolonged experience, was also an independent predictor for better scabies knowledge in this study and some previous studies.\(^\text{18,23}\) However, age and years of experience were not associated with scabies knowledge in some studies.\(^\text{17}\) Limited physician knowledge about scabies can lead to delayed recognition, suboptimal management, and more spread of the disease in the community\(^\text{6}\) together with under-reporting to healthcare authorities.\(^\text{18,26}\) Therefore, the inadequate knowledge observed in the current study may have contributed to some degree to the recent scabies outbreaks reported in Saudi Arabia.\(^\text{14,15}\)

The current findings highlight the critical need for educational and training programs about scabies targeting primary care physicians. Previous studies showed that attending such training programs improves physician knowledge toward dermatologic diseases.\(^\text{21}\) The unacceptably low number of physicians aware of the Saudi MOH guidelines for scabies, and the higher number of those using nonauthenticated sources of information as websites are other evidences for the critical need for urgent organized continuing medical education activities.

The current study is considered the first study to examine scabies knowledge among primary care physicians in Saudi Arabia. Additionally, the sample was recruited from different primary care centers in Riyadh. Moreover, the questionnaire was more comprehensive than those used in previous similar studies. Nevertheless, some study limitations should be acknowledged. The cross-sectional design does not prove causation. The convenience sampling may limit the generalizability of the findings to all primary care physicians in Saudi Arabia.

In conclusion, the knowledge about scabies among primary care physicians working in Saudi Arabia was generally inadequate. Shorter time since last exposure to scabies information was an independent predictor for better scabies knowledge among our physicians. Only one-third were aware about the MOH guidelines about scabies, which could have contributed to some degree to the recent scabies outbreaks reported in Saudi Arabia. The current findings highlight the critical need for educational and training programs lead by the Saudi Ministry of Health targeting these physicians about scabies and other communicable disease.

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Declaration of participant consent
The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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| Table 3: Univariate and multivariate\(^\ast\) logistic regression analysis of potential predictors for better knowledge (score > median) |
|---------------------------------------------------------------|
| **Univariate analysis** | **Multivariate analysis\(^\ast\)** |
| **Odds ratio (OR)** | **95% confidence interval of OR** | **P** | **Odds ratio (OR)** | **95% confidence interval of OR** | **P** |
| | Lower | Upper | | Lower | Upper | 
| Age group (reference: <40 years) | | | | | | |
| ≥40 years | 2.49 | 1.44 | 4.33 | 0.001 | 2.50 | 1.36 | 4.59 | 0.003 |
| Qualification (reference: MBBS/MD/MBBCh) | | | | | | |
| MBBS plus Diploma/Master | 1.84 | 0.97 | 3.48 | 0.063 | 1.30 | 0.64 | 2.64 | 0.471 |
| Board certified/others | 2.42 | 1.22 | 4.81 | 0.011 | 2.41 | 1.16 | 5.01 | 0.018 |
| Specialty (reference: general practitioner) | | | | | | |
| Family medicine | 1.38 | 0.77 | 2.46 | 0.275 | | | | |
| Other specialty | 2.67 | 1.10 | 6.45 | 0.030 | | | | |
| Dealing with cases of scabies (reference: never) | | | | | | |
| Ever | 1.77 | 0.90 | 3.48 | 0.100 | | | | |
| Last time information about scabies has been reviewed (reference: more than a year) | | | | | | |
| Within last month | 4.91 | 2.15 | 11.21 | <0.001 | 5.84 | 2.43 | 14.01 | <0.001 |
| Within last year | 1.56 | 0.79 | 3.06 | 0.198 | 1.71 | 0.84 | 3.46 | 0.138 |

\(^\ast\)Adjusted for age groups, qualification, specialty, dealing with cases of scabies, and last time information about scabies has been reviewed. The adjusted \(R^2\) of the multivariate model was 0.215.
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