



Validity and reliability of a questionnaire on atopic dermatitis recognition and management behaviors among medical practitioners in Thailand

Pinanya Pinitkit, and Panlop Chakkavittumrong*

Division of Dermatology, Chulabhorn International College of Medicine, Thammasat University,
Pathum Thani, Thailand

*Corresponding author, E-mail: panlop078@gmail.com

Abstract

Atopic dermatitis is a common chronic inflammatory skin disease commonly found in primary care worldwide. It is characterized by erythematous, eczematous, intense pruritic skin lesions that usually come and goes. The evolution of atopic dermatitis and its management remains difficult to appreciate over the years as its various aspects have been changing over the decades. To produce a standard quality of care, medical practitioners must be able not only to recognize the disease but also how to apply this knowledge into their practices. Therefore, this study aims to describe the development, validation, and reliability of a questionnaire assessing atopic dermatitis recognition and management behaviors among Thai medical practitioners. The questionnaire was developed into a set of 35 questions divided into two major sections, disease recognition, and management behavior. The content validity was examined by a panel of five experts, and item-objective congruence (IOC) was then calculated. Internal consistency reliability was assessed using Cronbach's alpha coefficient whereas Test-retest reliability was conducted using Pearson's correlation coefficient. The overall test item-objective congruence (IOC) was acceptable (0.91). The overall questionnaire Cronbach's alpha coefficients were good (0.87), and the overall questionnaire Pearson's correlation coefficient was very high (0.92). Our study's result proved that the questionnaire on atopic dermatitis was a valid and reliable tool to assess the sub-population ability to recognized and manage the disease.

Keywords: atopic dermatitis, disease recognition, management behavior, validity, reliability, medical practitioners

1. Introduction

Atopic dermatitis or Atopic eczema is a common chronic inflammatory skin disease commonly found in primary care worldwide. It is characterized by erythematous, eczematous, intense pruritic skin lesions that usually come and goes. Individuals with atopic dermatitis are often associated with asthma, allergic rhinitis, allergic conjunctivitis, and food allergy, also known as "Allergic March." Atopic dermatitis is usually developed during infancy or early childhood but can occur at any age. The condition is typically long-lasting with one-third of the patients having persistence until adulthood (Katoh et al., 2020). However, cases of atopic dermatitis manifesting later in life have gradually been increasing with the aging society. As a result, atopic dermatitis is now capable of being classified in four phases: infantile, childhood, adolescent/adult, and senile (Tanei, 2009).

Atopic dermatitis has a great impact on the quality of life of the sufferers. It is associated with mental stress, sleepless night, financial strain, and even suicidal ideas (Halvorsen et al., 2011; Langenbruch et al., 2014). Children with atopic dermatitis may have higher rates of developing attention-deficit/hyperactivity disorder, headaches, and short stature (Camfferman et al., 2010; Silverberg & Paller, 2015), which may impact the child's emotional and social development (Magin, 2013). However, these burdens do not only impact the affected individuals but also the caregivers and other individuals in the household as well (Zuberbier et al., 2006).

Research has shown that the prevalence of eczema worldwide is approximately 7.3% to 7.9% in children (Odhiambo et al., 2009) and 4.9% in adults (Barbarot et al., 2018). In Thailand, the prevalence of children and adolescents with atopic dermatitis has been reported at 9% (Vichyanond et al., 1998) and 9.4%



(Vichyanond et al., 2002), respectively. In recent decades, the prevalence of atopic dermatitis seems to be slowly increasing in every country (Odhiambo et al., 2009; Trakultivakorn et al., 2007).

The evolution of atopic dermatitis remains difficult to appreciate over years as eczema usually comes and goes at unpredictable frequencies, varying from one person to another, making it difficult to finalize the issue. Besides, various aspects of its management have been changing over the decades, thus, it is essential for medical practitioners to be able to recognize and manage the disease to prevent complications.

Furthermore, a limited number of studies have been conducted on medical practitioners regarding their atopic dermatitis knowledge and management. The results showed that the majority of the medical practitioners especially GPs are lacking knowledge, confidence, diagnosis, and management regarding atopic dermatitis (Ee et al., 2020; Kouotou et al., 2017; Le Roux et al., 2018). Identification of the existing knowledge and management behavior of the medical practitioners can unveil the deficient area and, thus, would aid in further improvement of the atopic dermatitis education.

Up to our current knowledge, there is no study conducted in the Thai population before. So, the authors developed a set of questionnaires to assess Thai medical practitioner's disease recognition and management behaviors based on the Thai and Asian clinical practice guidelines. To utilize this questionnaire in the general population, it is important to develop, validate, and characterize the reliability tools. Therefore, this study aims to generate and describe the development, validation, and reliability of the questionnaire assessing atopic dermatitis recognition and management behaviors among Thai medical practitioners.

2. Objectives

The objective of the study is to describe the development, validation, and reliability of the questionnaire assessing atopic dermatitis recognition and management behaviors among Thai medical practitioners.

3. Materials and Methods

Settings

The study is a cross-sectional online questionnaire-based study conducted across Thailand during February 2021. A questionnaire utilized the online data collection tool "Google Form." A link and Quick Response code (QR code) were distributed in closed medical doctor-related groups in Thailand using online platforms such as LINE, Facebook, and other social media applications.

Participants

The first 30 participants who responded to the questionnaire were chosen as the sample group. The participants were eligible for inclusion if they met the following criteria.

- Thai males and females
- General practitioners, Dermatologists/Residents/MSc, Allergist/Immunologists/Fellows, Pediatricians/Residents, or Internal medicine/Residents.
- Practice medicine in Thailand
- Able to read and understand Thai

Ethical consideration

Ethical clearance was obtained from the Ethical Review Board of the Faculty of Medicine, Thammasat University. The procedures complied with the current revision of the Helsinki declaration, The Belmont Report, CIOMS Guideline, and the International Practice (ICH-GCP). Before the data collection, the participants were given the same formal instruction and completed the informed consent. The authors only included the results from those who signed the consent form. The confidentiality and anonymity of the collected participants were respected.



Questionnaire development

On the basis of reviewing literature and practical guidelines related to atopic dermatitis and questionnaire development. The questionnaire was then decided to include 35 questions divided into two major sections apart from demographic data.

- i) Disease recognition, which consists of primary lesions, lesions based on recognition of iconography, and causes and exacerbating factors of AD. The total section consisted of 15 items. Each item had three possible responses (True/False/Don't know or Not sure). Each correct answer scores one point, and the maximum knowledge score was 15.
- ii) Management behavior, which consists of diagnosis, assessment of clinical associations and quality of life, and medical treatment and general care of AD. The total section consisted of 20 items. The responses were on a 5-point Likert scale (1-5). The Likert scale (1-5) was between never and always do. The maximum management score was 100.

Content Validity

To construct a questionnaire, the content validity of the questionnaire was reviewed and examined by a panel of five experts in dermatology. Each question was reviewed and selected based on the clarification of the wording, interpretation, and accuracy of the objective measured. Each expert was informed of the objective of the study and instructed to give +1 to the item that reached the criteria, 0 to the item that they were unsure of, and -1 to the item that did not reach the criteria. After the results were collected, the item-objective congruence (IOC) of each item was calculated. Each item must have the item-objective congruence (IOC) greater than or equal to 0.5. The items that had a score of lower than 0.5 were then revised according to the suggestions of the experts. Those revisions were repeated in the process until all the items' IOC were greater than 0.5.

Internal consistency reliability

Internal consistency assesses the correlation between the tested items that are intended to measure the same construct. The questionnaire reliability was tested internal consistency with 30 randomly selected participants. Cronbach's alpha (α) was chosen to calculate the reliability of the questionnaire. The Cronbach's alpha (α) ranges from 0 to 1. The questionnaire Cronbach's alpha score greater than or equal to 0.7 is considered sufficiently reliable.

Test-retest reliability

Test-retest reliability measures the consistency of the measured items over time. Two sets of questionnaires were given to the same participants at least 3-5 days apart. The participants were not informed in advance of the second administration. The results from the two sets of responses were used to calculate the correlation between the two-testing using a Pearson's correlation coefficient. The Pearson's correlation coefficient ranges from no correlation (0) to perfect correlation (1).

Statistical analysis

Collected data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS, Inc., Chicago, IL, USA) version 26.

4. Results

Demographic data

A total of Thirty-six medical doctors completed the questionnaire for the first session. Of them, thirty medical doctors completed the questionnaire twice. Out of 36 participants, 26 were female (72.22%) and 10 were male (27.78%). The majority of the participants were general practitioners (N=22) (61.11%) and had working experience of fewer than 5 years (N=31)(86.11%). More detailed results of demographic data and experiences of the participants are shown in Table 1.

**Table 1** Demographic data and experiences of the participants

	Number (n=36)	Percentage (%)
Gender		
Male	10	27.78
Female	26	72.22
Number of years of working experiences		
<5 years	31	86.10
5-10 years	2	5.56
10-<15 years	1	2.78
15-<20 years	1	2.78
>20 years	1	2.78
Specialty		
General Practitioner	22	61.11
Internal Medicine/Resident	2	5.56
Pediatrician/Resident	0	0
Dermatologist/Resident/Msc	12	33.33
Pediatric dermatologist/Fellow	0	0
Allergist/Immunologist/Fellow	0	0
Amount of clinical experience diagnosing and treating atopic dermatitis		
Very inexperienced	2	5.56
Inexperienced	10	27.78
Experienced	4	11.10
Very experienced	20	55.56
Amount of referral to specialists		
Never	12	33.34
Rarely	20	55.56
Sometimes	4	11.10
Often	0	0
Always	0	0
When to refer patients to specialists (multiple choices possible)		
Upon patient's request	11	14.86
Severe symptoms	19	25.68
Does not respond to standard treatment	22	29.73
Suspected of food allergy and/or other allergens	11	14.86
Concurrent immunodeficiency	11	14.86
Immediately after diagnosis	0	0
Other (Please specify).....	0	0
Adequacy of atopic dermatitis training		
Very inadequate	3	8.33
Inadequate	17	47.22
Adequate	16	44.44
Very adequate	0	0
Diagnostic criteria used		
Diagnostic criteria of Hanifin and Rajka	5	13.89



	Number (n=36)	Percentage (%)
UK working party's diagnostic criteria	1	2.78
American Academy of Dermatology diagnostic criteria	10	27.78
Diagnostic criteria for atopic dermatitis by the Japanese Dermatological association	4	11.10
Not sure	15	41.67
Other (Please specify).....	1	2.78

Content Validity

Content Validity was conducted by 5 experts. After the first round of content validation, 1 item from experiences, 3 items from disease recognition, and 1 item from management behavior were scored less than 0.5. Those items were adjusted according to the expert's recommendations. The second round of validation was then conducted for adjusted items. The final result shows that the content validities for all three main sections were 0.975, 0.84, and 0.94 (Demographic data and experiences, Disease recognition, and Management behaviors, respectively). The overall test item-objective congruence (IOC) was 0.91 which means they were acceptably congruent with the objective of the study. More details showed in Table 2.

Table 2 Content validity by 5 experts

	Item-Objective congruence (IOC)
Demographic data and experiences	
Demographic data	1
Experiences	0.96
Disease recognition	
Primary lesions	1
Lesion based on iconography	0.77
Causes	0.75
Management behavior	
Diagnosis	0.8
Assessment of clinical association and quality of life	1
Medical treatment	0.97
General care	0.92
Total	0.91

Internal consistency reliability

The internal consistency reliability was conducted using Cronbach's alpha on 30 randomly selected participants. The Cronbach's alpha coefficients values of ≥ 0.9 , $0.7 \leq \alpha < 0.9$, $0.6 \leq \alpha < 0.7$, $0.5 \leq \alpha < 0.6$, and $\alpha \leq 0.5$ were regarded as indicating excellent, good, acceptable, poor, and unacceptable (Glen, 2014). The Cronbach's alpha coefficients of each main section were 0.59 for disease recognition and 0.85 for management behavior. The overall questionnaire's Cronbach's alpha coefficients were 0.87, which means the questionnaire had a good correlation between items. More details are shown in Table 3.

**Table 3** Internal consistency reliability

	Internal consistency reliability (Cronbach's alpha) (n=30)
Disease recognition	0.59
Management behavior	0.85
Total	0.87

Test-retest reliability

Test-retest reliability was done on 30 randomly selected participants who answered the questionnaire twice. The correlation between the scores from the first and the second testings was calculated using Pearson's correlation coefficient. The Pearson's correlation coefficient values of 0.90-1.00, 0.70-0.90, 0.50-0.70, 0.30-0.50, and 0.30-0.00 were regarded as indicating very high, high, moderate, low, and negligible correlations (Glen, 2016). The Pearson's correlation coefficients of each main section were 0.85 for disease recognition and 0.90 for management behavior. The overall questionnaire's Pearson's correlation coefficient was 0.92, which means the questionnaire had a very high positive correlation. More details are shown in Table 4.

Table 4 Test-retest reliability

	Test-retest reliability (Pearson's correlation) (n=30)
Disease recognition	0.85
Management behavior	0.90
Total	0.92

5. Discussion

Atopic dermatitis is a burden to the life of the sufferers because of its chronic and unpredictable course, not only to the patients themselves but also their related family members. It is essential for medical practitioners as a person who closely gives professional care and advice to be able to adequately treat and manage the disease. For a medical practitioner to do so, the assessment of the current knowledge and management was needed. A few studies were conducted on the medical practitioners' knowledge, attitude, and management regarding AD, and the results showed that the majority of doctors had insufficient to moderate level of knowledge to recognize, diagnose, and manage as far as AD is concerned (Kouotou et al., 2017; Le Roux et al., 2018), which suggests a poor quality of care delivered towards the AD patients. However, to our knowledge, such studies had never been conducted in the Thai population before. Therefore, this study was conducted in form of a questionnaire with the goal to assess the knowledge and management of the medical practitioners in Thailand. However, before doing so, the assessment tool must be validated and had a good level of reliability to be able to utilize in the general population.

This study demonstrated that each main section and the overall test (0.91) IOC value was high, which suggested that the items in the questionnaire had an acceptable level of congruence with the objective of the study. The test-retest reliability result of each section of the questionnaire showed high and very high at 0.85 and 0.90, respectively, while the overall questionnaire result was very high (0.92). The findings suggested that the questionnaire items can be used to measure both knowledge and management consistently over time. The overall Cronbach's alpha value was 0.87, suggesting a good correlation between items in the questionnaire to accurately measure the objective of the study. However, the alpha score in the disease recognition section alone was poor (0.59), which might be due to the number of items in the disease recognition section. It was composed of 15 questions which were further divided into 3 smaller subgroups, and the alpha was known to be sensitive to the number of items on the test. A higher Cronbach's alpha can be achieved by increasing the number of questions. Also, a redundancy of the questions would produce the



same effect. While a lower number of questions on the test would reflect a lower value of the alpha (Glen, 2014), meaning that adding more questions would, therefore, increase the alpha. However, increasing the length of the questionnaire might not always be a solution. As many participants might get fatigued and be less likely to complete the questionnaire with accuracy. Vesta's research (Joe Hopper, 2012) suggested about 20 minutes of a web-based survey and 5 minutes when mobile phones are contacted. Due to the COVID-19 situation in Thailand, our main method of questionnaire distribution was via social media. Undeniably, a good number of participants would, therefore, use the mobile phone to complete the questionnaire form. Therefore, assessing the Cronbach's alpha as a whole might as well be suitable in this situation.

6. Conclusion

The result of this study proved that the questionnaire on atopic dermatitis was a valid and reliable tool to assess the sub-population ability to recognize and manage the disease. This set of questionnaires can be implemented in the general population. This questionnaire will help to identify the aspects where the medical practitioners might be insufficient. Hopefully, it would further lead to an effort put into an improvement of knowledge and management regarding atopic dermatitis of the medical practitioners in Thailand, hence, optimizing the management towards the patients and improving and their quality of life.

7. Acknowledgements

First of all, I would like to show my gratitude towards family and friends who have always been there from the beginning until the end. The most important one of all, Chong Ieyern, M.D., I would not have accomplished this whole process without him. Rosalyn Kupawiwat, M.D., a person who contributes to the ideas and support in many aspects. Also, I wish to thank the expert panel and every professor at the Department of Dermatology, Chulabhorn international college of Medicine, Thammasat University, whose advice had been so generously. Furthermore, I appreciate all the participants who kindly spare their precious time to participate in the study. There is no conflict of interest in this study.

8. References

- Barbarot, S., Auziere, S., Gadkari, A., Girolomoni, G., Puig, L., Simpson, E., Margolis, D., de Bruin-Weller, M., & Eckert, L. (2018). Epidemiology of atopic dermatitis in adults: results from an international survey. *Allergy*, 73(6), 1284-1293.
- Camfferman, D., Kennedy, J. D., Gold, M., Martin, A. J., Winwood, P., & Lushington, K. (2010). Eczema, sleep, and behavior in children. *Journal of Clinical Sleep Medicine*, 6(6), 581-588.
- Ee, S., Tay, Y.-K., Chu, C.-Y., Hon, K.-L. E., Leong, K.-F., & Wananukul, S. (2020). A study on the knowledge, attitudes, and practices of Asian dermatologists in the management of atopic dermatitis. *Dermatologica Sinica*, 38(2), 67.
- Glen, S. (2014). Cronbach's Alpha: Simple definition, use and interpretation. *Statistics How To: Elementary Statistics for the rest of us!* <https://www.statisticshowto.com/probability-and-statistics/statistics-definitions/cronbachs-alpha-spss/>
- Glen, S. (2016). *Test-Retest Reliability / Repeatability*. StatisticsHowTo.com: Elementary Statistics for the rest of us! Retrieved July 17, 2016 from <https://www.statisticshowto.com/test-retest-reliability/>
- Halvorsen, J. A., Stern, R. S., Dalgard, F., Thoresen, M., Bjertness, E., & Lien, L. (2011). Suicidal ideation, mental health problems, and social impairment are increased in adolescents with acne: a population-based study. *Journal of investigative dermatology*, 131(2), 363-370.
- Joe Hopper, P. D. (2012). *Rules of Thumb for Survey Length* Verstar research. Retrieved February 15, 2012 from <https://verstarresearch.com/blog/rules-of-thumb-for-survey-length/>
- Katoh, N., Ohya, Y., Ikeda, M., Ebihara, T., Katayama, I., Saeki, H., Shimojo, N., Tanaka, A., Nakahara, T., & Nagao, M. (2020). Japanese guidelines for atopic dermatitis 2020. *Allergology International*, 69(3), 356-369.



- Kouotou, E. A., Nansseu, J. R. N., Engome, A. D. N., Tatah, S. A., & Bissek, A. C. Z.-K. (2017). Knowledge, attitudes and practices of the medical personnel regarding atopic dermatitis in Yaoundé, Cameroon. *BMC dermatology*, *17*(1), 1-7.
- Langenbruch, A., Radtke, M., Franzke, N., Ring, J., Foelster-Holst, R., & Augustin, M. (2014). Quality of health care of atopic eczema in Germany: results of the national health care study AtopicHealth. *Journal of the European Academy of Dermatology and Venereology*, *28*(6), 719-726.
- Le Roux, E., Powell, K., Banks, J. P., & Ridd, M. J. (2018). GPs' experiences of diagnosing and managing childhood eczema: a qualitative study in primary care. *British Journal of General Practice*, *68*(667), e73-e80.
- Magin, P. (2013). Appearance-related bullying and skin disorders. *Clinics in dermatology*, *31*(1), 66-71.
- Odhiambo, J. A., Williams, H. C., Clayton, T. O., Robertson, C. F., Asher, M. I., & Group, I. P. T. S. (2009). Global variations in prevalence of eczema symptoms in children from ISAAC Phase Three. *Journal of Allergy and Clinical Immunology*, *124*(6), 1251-1258. e1223.
- Silverberg, J. I., & Paller, A. S. (2015). Association between eczema and stature in 9 US population-based studies. *JAMA dermatology*, *151*(4), 401-409.
- Tanei, R. (2009). Atopic dermatitis in the elderly. *Inflammation & Allergy-Drug Targets (Formerly Current Drug Targets-Inflammation & Allergy)(Discontinued)*, *8*(5), 398-404.
- Trakultivakorn, M., Sangsupawanich, P., & Vichyanond, P. (2007). Time trends of the prevalence of asthma, rhinitis and eczema in Thai children—ISAAC (International Study of Asthma and Allergies in Childhood) Phase Three. *Journal of asthma*, *44*(8), 609-611.
- Vichyanond, P., Jirapongsananuruk, O., Visitsuntorn, N., & Tuchinda, M. (1998). Prevalence of asthma, rhinitis and eczema in children from the Bangkok area using the ISAAC (International Study for Asthma and Allergy in Children) questionnaires. *Journal of the Medical Association of Thailand= Chotmaihet thangkaet*, *81*(3), 175-184.
- Vichyanond, P., Sunthornchart, S., Singhirannusorn, V., Ruangrat, S., Kaewsomboon, S., & Visitsunthorn, N. (2002). Prevalence of asthma, allergic rhinitis and eczema among university students in Bangkok. *Respiratory medicine*, *96*(1), 34-38.
- Zuberbier, T., Orlow, S. J., Paller, A. S., Taïeb, A., Allen, R., Hernanz-Hermosa, J. M., Ocampo-Candiani, J., Cox, M., Langeraar, J., & Simon, J. C. (2006). Patient perspectives on the management of atopic dermatitis. *Journal of Allergy and Clinical Immunology*, *118*(1), 226-232.