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Trends of stress and stress coping in patients with atopic dermatitis: Analysis using the brief coping orientation to problems experienced inventory

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Abstract

Background: The nature of the stress experienced by adult atopic dermatitis (AD) patients is not fully understood.

Objectives: We investigated the experience of stress in these patients and their coping methods using a questionnaire.

Methods: Fifty-one AD patients under the care of the Department of Dermatology at Shimane University Hospital and 50 AD patients under the care of the Department of Dermatology at Sapporo Medical University Hospital were surveyed. The Brief Coping Orientation to Problems Experienced (COPE) inventory was used to examine coping.

Results: The most common cause of stress associated with AD was work, followed by the presence of allergy symptoms and being ill. The patients reported using positive coping methods such as self-distraction and humor, and negative coping methods such as behavioral disengagement and self-blame. Women used coping methods significantly more often than men, and patients aged 30 years and older used alcohol as a coping strategy more often than younger patients. Patients with severe conditions used coping methods less frequently. A group that experienced stress often used positive reframing less frequently, but more often used methods such as emotional support, substance use, behavioral disengagement, and self-blame.

Conclusions: We observed differences in stress coping based on gender, age, severity of AD symptoms, severity of stress, and how stress was experienced, which highlights the importance of dealing with stress in ways that take the AD patient's characteristics into consideration.

KEYWORDS
atopic dermatitis, brief COPE, coping, regionality, stress

1 | INTRODUCTION

Atopic dermatitis (AD) is a common inflammatory skin disease that can have a substantial impact on quality of life.[1] It has long been known that AD is exacerbated by not only external factors, but also internal factors such as stress.[2]

For example, AD patients trend to get worse because of the mental stress of studying for university entrance examinations, physical stress due to lack of sleep, and chronic fatigue from studying.[3] AD patients are reported to be unable to deal appropriately with psychosocial stress.[4] It has been surmised that repeated scratching of itching sensations can turn into a behavior for coping with psychosocial stress.[5,6] Severe AD can be associated with a stress-scratch cycle, which is different from the itch-scratch cycle. Habitual itching becomes a form of abnormal behavior in response to psychosocial stress and causes this stress-scratch cycle. For this reason, approaches that focus on the stress-scratch cycle are seen as having great therapeutic importance.[2] In the present study, adult AD patients being seen at Shimane University and Sapporo Medical University were surveyed to examine the nature of stress in adult AD patients and how they cope with this stress.

2 | METHODS

2.1 | Subjects

The prospective study included 101 patients with AD (59 men, 38 women, and four unknown; mean age 31.65 years; age range 17-58) who were examined at the Department of Dermatology, Shimane University Hospital, and Sapporo Medical University School of Medicine Hospital between May 2016 and May 2017. Fifty-one patients with AD (31 men and 20 women; mean age 31.45 ± 8.72 years) were examined at Shimane University (SU) Hospital, and 50 patients with AD (28 men, 18 women, and four unknown; mean age 31.87 ± 10.9 years) were examined at SMU Hospital. They consented to participate in this study by opt-out method. The patients who participated in this experiment met the diagnostic criteria for AD proposed by the Ministry of Health, Labour, and Welfare Research Group.[7] Patient data were anonymized prior to the analyses. This study was approved by the ethics committee of SU and the Dean of the Faculty of Medicine (approval no. 2193), the ethics committee of Sapporo Medical University School of Medicine (SMU) and the Dean of the Faculty of Medicine (approval no. 272-165), and the ethics committee of the Graduate School of Medicine at Osaka University and the Dean of the Faculty of Medicine (approval no. 15476). During examinations, patients were given an explanatory document and a self-administered questionnaire with multiple-choice questions on age, gender, presence or absence of stress, factors that exacerbate stress, and stress coping skills (Brief COPE).[3,8] With regard to the cause of stress, a form was asked to choose whether the questions that were prepared in advance apply to the patient himself.

The physician in charge filled out the items on symptom severity. Returning a completed questionnaire to the examination room that day was taken as consent. For minors (≤20 years old), the subject and a guardian gave informed consent. The return of the questionnaire filled out by the minor was taken as consent.

2.2 | Measurements of SCORing Atopic Dermatitis (SCORAD) index and objective SCORAD index

The SCORAD index consists of the interpretation of the extent of the disorder (A: according to the rule of nines; 20% of the score), the intensity composed of six items (B: erythema, edema/papules, effect of scratching, oozing/crust formation, lichenification, and dryness; 60% of the score; each item has four grades: 0, 1, 2, and 3), and subjective symptoms (C: itch and sleeplessness; 20% of the score).[9] The distribution of the score is achieved using the formula A/5 + 7B/2 + C. The maximum achievable score is 103. Objective SCORAD index was modified by excluding the subjective symptoms.[9] All scores were measured and recorded by a doctor during the questionnaire.

2.3 | Coping skills

Coping skills were assessed using the Brief Coping Orientation to Problems Experienced (COPE) inventory, which comprises 28 Likert-scaled items (refer to table 2) and assesses 14 coping skills (refer to tables 2 and 3).[8,10] For each of the 28 questions, the following four answers were made. Rating: "Not at all" is one point, "Not so much" is 2 points, "Roughly to do so" is 3 points, and "Always do so" is 4 points. The points of the 28 questions were grouped into 14 coping skills of the same element, and the points were added. The method of calculating the Brief COPE score was the same as the method of Otsuka's report.[8]

2.4 | Statistical analyses

The results are presented as mean ± SD. IBM SPSS Statistics ver. 22 (IBM Inc) was used for statistical analyses. A Student's t test was used for comparisons between two variables. Odds ratios were calculated for each of the Brief COPE scales. Probability values of <5% were considered significant.

3 | RESULTS

3.1 | Comparison between SU and SMU

Fifty-one patients with AD (31 men and 20 women; mean age 31.45 ± 8.72 years) were examined at SU Hospital, and 50 patients with AD (28 men, 18 women, and four unknown; mean age 31.87 ± 10.9 years) were examined at SMU Hospital. The mean rating of atopic dermatitis (SCORAD index) and mean objective SCORAD index for the SU patients were 32.9 ± 17.9 and 28.1 ± 16.4, respectively, and for the SMU patients, they were 38.2 ± 184 and 20.2 ± 15.3, respectively. No significant difference in severity was found between patients at the two hospitals.

Regarding the presence or absence of stress, 27 SU patients (52.9%) and 25 SMU patients (50%) said they rarely or occasionally experience stress, which is not a significant difference between the two groups (Figure 1). As to differences in the severity of stress, the odds ratio of the SU patients was 1.023 (P = .956) relative to the SMU patients, which indicates little difference between the hospitals.

Further, both the SU and SMU patients reported study and work as the most common sources of stress, followed by allergy symptoms and anxiety about the future (Table 1).

3.2 | Stress coping

The Brief COPE is used to survey how people deal with stress. Table 2 shows the results for the 28 questions. A significant difference between the SU and SMU groups was observed for one question.

The questions are categorized into 14 scales based on their characteristics. Of these, the subjects of this study scored higher than Japanese daytime workers on self-distraction, humor, behavioral disengagement, and self-blame (Table 3). SU patients scored higher than regular workers on venting, acceptance, and religion and lower on substance use (Table 3). The comparison with these regular workers was biased because only some of the patients with AD were regular workers, but considered it valuable.

We calculated odds ratios for the 14 Brief COPE scales based on gender, age, severity (SCORAD index), and tendency to experience stress (Figure 2).

3.2.1 | Gender

Relative to men, women used the following significantly more frequently: self-distraction, emotional support, instrumental support, venting, and religion.
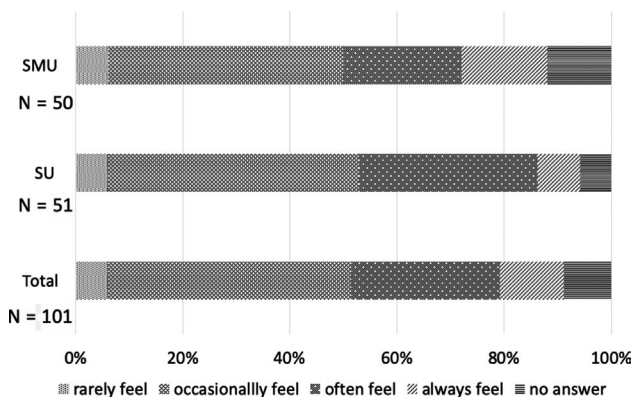
FIGURE 1 Differences in the ratings of stress between hospitals. Indicate "to what extent do you feel stressed?" in percentage. SMU, Sapporo Medical University School of Medicine; SU, Shimane University

3.2.2 | Age

Relative to patients under the age of age 30, substance use was observed more frequently in patients aged 30 years and older. The same results were observed when the patients were separated at age 20.

3.2.3 | SCORAD index

Relative to patients with SCORAD index of <32, patients with higher scores used the following significantly more frequently: self-distraction, emotional support, and venting.

3.2.4 | Stress

Relative to the group that reported rarely or occasionally experiencing stress, the group that reported often experiencing stress used positive reframing and planning significantly less frequently. In addition, this group used the following more frequently: emotional support, substance use, behavioral disengagement, and self-blame.

4 | DISCUSSION

Coping methods are ways that people deal with problems. Coping is broadly divided into positive and negative coping. Regardless of working time, instrumental support and positive reframing have

TABLE 1 Factor that feels stress (multiple answers allowed)

Factor	Total (n = 101)	SU (n = 51)	SMU (n = 50)
Study/work	71	40	31
Admission/graduation	0	0	0
Relocation	1	1	0
Relationship with friends	7	3	4
Relationship with parents	19	10	9
Parent's divorce	0	0	0
Bereavement with a close person	0	0	0
Broken heart	0	0	0
Future anxiety	42	20	22
My other illness	11	3	8
Physical fatigue	28	15	13
Allergic symptoms	44	21	23
Job hunting	3	1	2
Lack of sleep	20	8	12

Note: With regard to the cause of stress, a form was asked to choose whether the questions that were prepared in advance apply to the patient himself.

Abbreviations: SMU, Sapporo Medical University School of Medicine; SU, Shimane University.

TABLE 2 Differences in coping skills among hospitals

| 28 Likert-scaled items	14 coping skills	SU (n = 51) Mean ± SD	SMU (n = 50) Mean ± SD	SU vs SMU P value
I've been turning to work or other activities to take my mind off things	Self-distraction	2.48 ± 0.74	2.44 ± 0.64	.773
I've been concentrating my efforts on doing something about the situation I'm in	Active coping	2.52 ± 0.74	2.66 ± 0.72	.338
I've been saying to myself "this isn't real"	Denial	1.42 ± 0.60	1.38 ± 0.60	.735
I've been using alcohol or other drugs to make myself feel better	Substance use	1.48 ± 0.84	1.74 ± 1.05	.173
I've been getting emotional support from others	Using emotional support	2.36 ± 0.78	2.31 ± 0.89	.749
I've been giving up trying to deal with it	Behavioral disengagement	2.08 ± 0.63	2.12 ± 0.52	.731
I've been taking action to try to make the situation better	Active coping	2.96 ± 0.67	2.86 ± 0.65	.438
I've been refusing to believe that it has happened	Denial	1.53 ± 0.62	1.56 ± 0.67	.822
I've been saying things to let my unpleasant feelings escape	Venting	2.46 ± 0.76	2.28 ± 0.86	.270
I've been getting help and advice from other	Using instrumental support	2.70 ± 0.84	2.66 ± 0.82	.810
I've been using alcohol or other drugs to help me get through it	Substance use	1.36 ± 0.83	1.72 ± 0.95	.046
I've been trying to see it in a different light, to make it seem more positive	Positive reframing	2.72 ± 0.83	2.62 ± 0.78	.537
I've been criticizing myself	Self-blame	2.44 ± 0.79	2.48 ± 0.84	.806
I've been trying to come up with a strategy about what to do	Planning	2.76 ± 0.82	2.70 ± 0.74	.701
I've been getting comfort and understanding from someone	Using emotional support	2.64 ± 0.75	2.57 ± 0.82	.664
I've been giving up the attempt to cope	Behavioral disengagement	2.00 ± 0.61	1.98 ± 0.51	.861
I've been looking for something good in what is happening	Positive reframing	2.58 ± 0.70	2.51 ± 0.92	.671
I've been making jokes about it	Humor	2.42 ± 0.93	2.20 ± 0.74	.203
I've been doing something to think about it less, such as going to movies, watching TV	Self-distraction	2.92 ± 0.80	3.00 ± 0.81	.621
I've been accepting the reality of the fact that it happened	Acceptance	3.26 ± 0.53	3.28 ± 0.78	.875
I've been expressing my negative feelings	Venting	2.41 ± 0.76	2.41 ± 0.76	1.00
I've been trying to find comfort in my religion or spiritual beliefs	Religion	1.66 ± 0.85	1.60 ± 0.86	.726
I've been trying to get advice or help from other people about what to do	Using instrumental support	2.58 ± 0.86	2.49 ± 0.82	.594
I've been learning to live with it	Acceptance	2.94 ± 0.71	2.82 ± 0.63	.374
I've been thinking hard about what steps to take	Planning	2.90 ± 0.84	2.98 ± 0.84	.636
I've been blaming myself for things that happened	Self-blame	2.56 ± 0.86	2.49 ± 0.89	.691
I've been praying or meditating	Religion	1.76 ± 0.92	1.53 ± 0.68	.161
I've been making fun of the situation	Humor	1.98 ± 0.77	1.98 ± 0.88	.998

Note: Rating: "Not at all" is one point, "Not so much" is 2 points, "Roughly to do so" is 3 points, and "Always do so" is 4 points. The underlined part is where significant differences can be seen (Student's *t* test).

Abbreviations: SMU, Sapporo Medical University School of Medicine; SU, Shimane University.

TABLE 3 Differences in coping skills among hospitals and Japanese daytime workers

Coping skills	SU (n = 51) Mean ± SD	SMU (n = 50) Mean ± SD	Otsuka* (n = 1758) Mean ± SD	SU vs Otsuka* P value	SMU vs Otsuka* P value	SU vs SMU P value
Self-distraction	5.4 ± 1.2	5.4 ± 1.3	4.8 ± 1.3	.001	.001	.871
Active coping	5.5 ± 1.1	5.5 ± 1.1	5.7 ± 1.0	.175	.277	.820
Using emotional support	5.0 ± 1.3	4.9 ± 1.5	4.6 ± 1.4	.034	.189	.659
Using instrumental support	5.3 ± 1.6	5.1 ± 1.5	5.0 ± 1.4	.223	.516	.664
Venting	4.9 ± 1.3	4.7 ± 1.4	4.4 ± 1.3	.016	.161	.557
Positive reframing	5.3 ± 1.3	5.1 ± 1.5	5.2 ± 1.3	.585	.65	.482
Planning	5.7 ± 1.4	5.7 ± 1.3	5.8 ± 1.2	.49	.534	.943
Humor	4.4 ± 1.5	4.2 ± 1.3	3.7 ± 1.3	.002	.011	.508
Acceptance	6.2 ± 1.1	6.1 ± 1.2	5.8 ± 1.1	.013	.077	.658
Religion	3.4 ± 1.4	3.1 ± 1.3	3.0 ± 1.3	.042	.453	.312
Denial	3.0 ± 1.0	2.9 ± 1.0	3.0 ± 1.2	.784	.725	.926
Substance use	2.8 ± 1.6	3.5 ± 1.9	3.4 ± 1.6	.018	.825	.081
Behavioral disengagement	4.0 ± 1.0	4.1 ± 0.9	3.7 ± 1.1	.02	.002	.753
Self-blame	5.0 ± 1.5	5.0 ± 1.6	4.4 ± 1.4	.008	.014	948

Note: The underlined part is where significant differences can be seen (Student's t test). Otsuka*: mean of Japanese daytime workers.[8]

Abbreviations: SMU, Sapporo Medical University School of Medicine; SU, Shimane University.
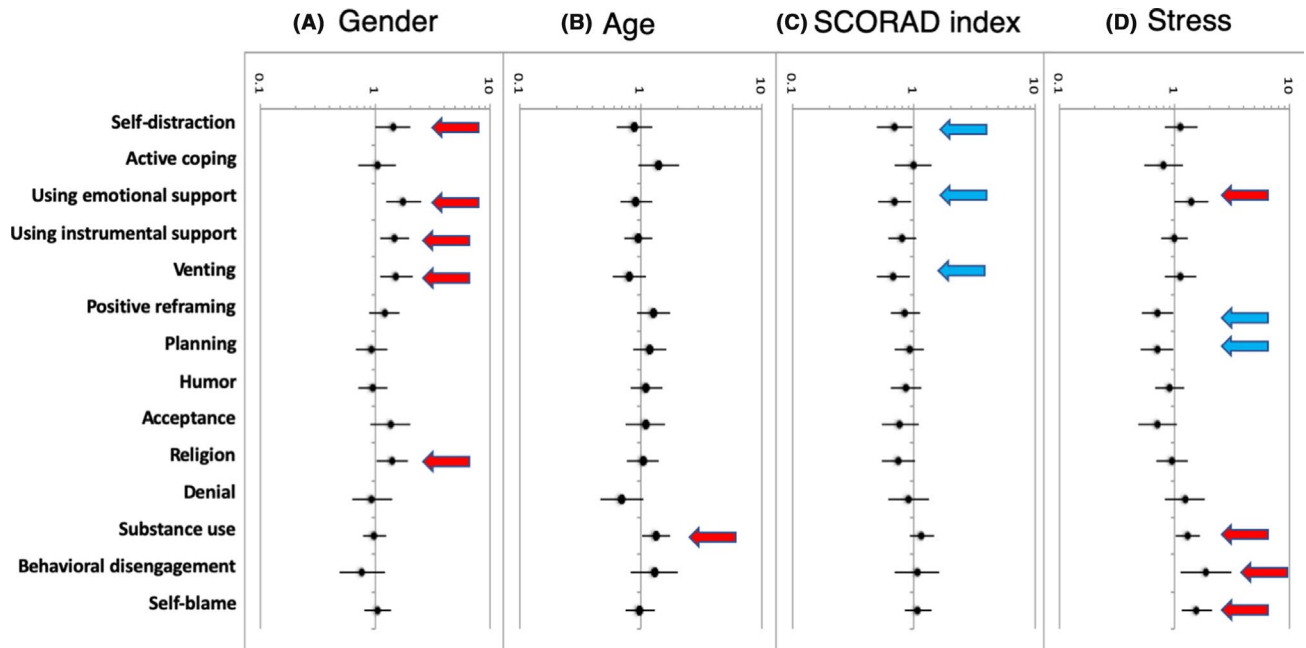
FIGURE 2 Differences in coping skills for each element. A, Red arrows indicate significant use by females. B, A red arrow indicates significant use by patients over 30. C, A blue arrow indicates that people with scores of 32 or more did not report significant use. D, Blue arrows indicate that patients with stress did not report using the skill, and red arrows indicate that patients with stress reported using those skills significantly

been linked to good subjective health status, while self-blame, self-distraction, denial, substance use, behavioral disengagement, venting, and religion have been linked to poor subjective health status.

In the present study, we reported on the main stress-related factors among patients at SU (n = 51) and SMU (n = 50) who participated in the Adolescent Allergy Survey.[3] The results showed no differences between the universities in terms of how adult AD patients experience stress. The greatest percentage (80%) experienced stress from work and study, followed by their allergy symptoms, anxiety about the future, and other factors. Some studies have shown a

link between stress and AD severity.[11] Chromogranin A in saliva as a stress marker is well known[12] and has been found to be related to stress and the severity of AD.[7] Additionally, changes in the subjective severity scores have been found to be correlated with changes in salivary CgA.[13] Such correlations between stress and clinical symptoms is one of the keys to the treatment of stress.

Shimane University is located in western Japan, in a tourist city with a population of 170 000; Izumo Taisha (shrine) is also located there. SMU is located in northern Japan, in the center of a city of 2 million people, and at the prefectural capital of Hokkaido. Since SU is in a religious district while SMU has many downtown areas and drinking opportunities, it may be that such a difference is reflected in the coping skills reported. SU's climate is short in summer, warm and humid, almost cloudy in winter, very cold in winter, windy, partly cloudy, and humid throughout the year. Throughout the year, temperatures change from 2 to 30°C, but rarely below −0°C or above 33°C. SMU's climate is pleasant in summer, humid, partly cloudy in winter, freezing cold in winter, heavy snowfall, windy, almost cloudy. Throughout the year, temperatures change from −12 to 26°C, but rarely below −18°C or above 30°C. By comparing two different regions, we were able to clearly identify whether there was a difference in coping with each region or whether there was a disease-specific difference.

Regarding their stress coping methods, the Brief COPE results showed that AD patients used negative coping methods significantly more often than regular workers. It has been reported that stress is negatively correlated with itching-related coping.[14] Coping differences were observed based on university status, gender, age, severity, and how stress was experienced, which highlights the importance of addressing stress according to a patient's characteristics. It is thought that better treatment for AD could be achieved by stress measures that take into account differences in stress management among individual patients.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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