

**ADHERENCE AND PSYCHOLOGICAL ATTRIBUTES IN DERMATOLOGY. THE  
ROLE OF REPRESENTATIONS AND ATTACHMENT STYLE IN TREATMENT  
AND THE EFFECT OF ELECTRONIC MESSAGES ON PROTECTIVE  
BEHAVIOUR**

Summary of PhD Thesis

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## List of publications providing the basis and related to the topic of the thesis

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## **1. Introduction**

### *1.1. Adherence in dermatology*

Adherence can be described as the extent to which a person's behaviour - taking medication, following a diet and/or executing lifestyle changes -, corresponds with agreed recommendations from a health care provider. The medical sub-speciality of dermatology is one of the fields in clinical care where treatment adherence has been reported as relatively low. The quality of the doctor-patient relationship has been increasingly regarded as an essential factor in dermatological adherence. In health care relationships the parties' views about the other's roles, and their expectations towards each other, are important factors in adherence. The recognition and co-management of distress of the patients, and helping them in working through their ambivalence about adherence is a requirement for effective clinical management of chronic skin diseases. Clinical psychologists can utilize practical strategies (e.g. eliciting self-motivational statements; or using patients' core beliefs and values to bring into focus discrepancies between current behaviour and goals) in everyday practice in the management of chronic skin patients' poor adherence to medication. Specialist nursing can also encourage higher rates of adherence, and other useful interventions could also be considered as models for improving adherence, e.g. manual telephone follow-up, reminders, family therapy and psychological therapy.

### *1.2. Adherence to sun protection counselling*

Intention to adhere to a certain behaviour has both motivational and knowledge aspects. Forgetfulness and carelessness are considered to be indicative of motivation, and understanding the long-term benefits of a particular health behaviour may be indicative of the knowledge aspect. Skin cancer is one of the most preventable groups of malignancies and therefore, it is important to induce behavioural changes regarding the major avoidable causative factor: sun exposure. Optimal use of routine sunscreen is strongly associated with decreased melanoma risk. One's personal behaviour is a result of knowledge, attitudes and beliefs. Message exposure has been shown to be associated with improvements in several sun protection behaviours, including increased use of sunscreen, lip balm, and face covering. Promoting both phone and Web-based components of an integrated program achieves the best

results in its effectiveness. A possible strategy for promoting positive health actions might be to create specific narrative messages. Personalization (a form of tailoring mechanism) can be defined by the inclusion of specific and personally identifiable information within the content (e.g. names, age, or specific behaviours) gathered during the assessment phase. Even such minimally tailored approaches have been found to be more effective than generic prompts. Being counselled by a physician regarding sun safety is associated with high adherence to sun-protective behaviours.

### *1.3. Psychodermatology*

Psychodermatology can be described as a discipline, a clinical and research-orientated awareness, and acceptance of the psychological and social implications of dermatological conditions. Skin diseases can affect patients in their health psychological functioning, e.g. the condition of our skin has an effect on our body image, self-esteem and the way others perceive us. Psychological stress plays an important role in triggering or exacerbating chronic skin diseases. Skin diseases can affect patients' relationships in the way that visible skin symptoms and treatment needs may lead to avoidance of social activities, therefore relationships with friends and close relationships may be affected, which can have an effect on self-esteem. Next to psychological disturbances, psychiatric disorders are also associated with chronic skin diseases. Psychiatric morbidity most frequently takes the form of mood and anxiety disorders in dermatology outpatients. Psychosocial and psychiatric comorbidities have been identified in several chronic skin diseases, e.g. in psoriasis, atopic dermatitis, acne and vitiligo. Attachment can be defined as an emotional bond that develops within the context of the early interactions between infants and their primary caregivers. The attachment towards caregivers has an effect on later interpersonal expectations, emotions, and behaviours towards significant others. Three different attachment styles were categorized by Ainsworth et al., which were secure attachment, and two types of insecure attachment: anxious-ambivalent, and avoidant. There are several differences between these attachment styles, e.g. individuals with secure attachment patterns feel competent in their ability to regulate affect in stressful situations with others, unlike people with insecure attachment styles. Bartholomew & Horowitz introduced a model which consisted of four styles of adult attachment (secure, preoccupied, dismissing, fearful). According to their model attachment styles vary along two dimensions: a model of the self and a model of others, and both of these models can be

positive or negative. Besides models of styles attachment can also be measured along point scores of three dimensions: comfort with closeness (closeness), capacity to depend on others (dependency) and fear of being abandoned (anxiety in relationships). Attachment styles and dimensions are related to many psychosomatic factors: depression, anxiety, somatisation, hypochondria and coping skills. It also plays an important role in psychodermatological factors: attachment can affect dermatological life quality, severity of symptoms, alexithymia traits and it has an important part in psychological intervention.

#### *1.4. Patient adherence in the frame of psychodermatology*

Chronic dermatology outpatients' adherence to therapy is influenced by many factors, e.g. age, sex, marital status, acceptance of the disease, perception of the treatment, associated psychiatric disorders, quality of life and the relationship with the physician. Increased psychological distress of psoriasis patients and low patient satisfaction with care or therapy is associated with lower levels of adherence. According to Thorneloe et al. there is an urgent need to assess psychological factors of adherence, not only because they are important predictors but they are also amenable to intervention.

## **2. Aims**

Our aim was to explore adherence and psychodermatological factors in a three step study, which phases' objectives were the following:

- to identify representations about patient adherence among dermatologists and their patients,
- to improve sun protection habits of a volunteer sample, and to explore essential factors of adherence to sun protection counselling,
- to describe psychological attributes (e.g. attachment style) of patients with chronic skin diseases.

## **3. Identifying representations about adherence**

### *3.1. Methods*

We applied a combination of qualitative and quantitative methods in our research. We

followed the steps of the process of thematic text analysis. The first step was administering structured interviews with 40 dermatologists at the Clinical Department of Dermatology and Allergology at the University of Szeged in Hungary. The interview consisted of 11 questions about adherence (e.g. „What factors do you think adherence depends on?“) and information dissemination to patients. The interviews' length was 30-40 minutes. Transcripts were made from the answers and a text data file was created from them. Based on grounded theory methodology, content categories were not pre-prepared, but were created from the material of the dermatologists' interviews. Transcripts were coded into these categories by two independent coders. We calculated the interrater reliability coefficient, Krippendorff's alpha. For further examination, and for the design of our questionnaire, we used those items which were mentioned by at least 10% of the doctors. A 12-item attitude scale was created from the most typical statements in each content category, and a 7-grade Likert-type scale (7 = fully agree; 1 = fully disagree) was added to each item (Table 1). In the next phase of the study, this questionnaire was completed by 153 outpatients of the Clinic, all diagnosed with chronic skin diseases, most frequently with psoriasis (N=82). Other diagnoses were atopic dermatitis and vitiligo. Patients' average age was  $50.18 \pm 16.11$  years. The sample included both females (N=90) and males (N=63).

### *3.2. Results*

#### *3.2.1. Interviews with dermatologists*

Dermatologists (N=40) found good doctor-patient relationship (37.5%), information from the doctor (37.5%), background information (37.5%) and the patient's financial state (32.5%) to be the most important factors for adherence (Table 1). Intercoder reliability was 0.68, using Krippendorff's alpha.

Content category (frequency in the doctors' interviews N=40)	Description of category / Item of attitude scale
Information from the doctor (37.5%)	The doctor can help his patient to be adherent mostly by giving detailed information about the patient's disease.
Background information (37.5%)	Information from family members, television, newspapers, and the internet can significantly affect the patient's adherence with the treatment.
Good doctor-patient relationship (37.5%)	Those patients are the most adherent with the treatment who have a trusting relationship with their doctors.
Financial state (32.5%)	Expensive drugs may be the main obstacle of adherence.
Patient's personality (20%)	Basically patients' adherence depends on their personalities.
Doctor's personality (12.5%)	Characteristics and personal traits of the doctor affect the adherence of patients.
Understandable communication (12.5%)	It would be the best in improving adherence if the doctor talked to his patient in an understandable way.
Written handouts (12.5%)	Written handouts and brochures given by the doctor mean a great help in the healing process.
Comfortable medication (10%)	The comfortable use of medication plays a role in adherence with the treatment.
Time for consultation (10%)	Adherence would mostly improve if there was more time for consultation between the doctor and the patient.
Telephone/Internet contact (10%)	There should be an internet or telephone service for giving information and maintaining contact between doctor and patient.
Doctor's empathy (10%)	The doctor's empathetic concern for the patient's problem would affect the healing process in a positive way.

Table 1. Content categories and their frequencies in the interviews with the doctors (N=40), and items of the attitude scale which were created from the most typical statements under the content categories.

### 3.2.2. Patients' questionnaire results

On a 7-point scale, patients (N=153) found the doctor's understandable communication (M=6.75, SD=0.58), information from the doctor (M=6.78, SD=0.65) and patient's personality (M=6.24, SD=1.19) to be the most essential factors for adherence. These were followed by the importance of a good doctor-patient relationship (M=6.1, SD=1.65), the doctor's personality (M=5.91, SD=1.64) and the doctor's empathy (M=5.88, SD=1.6). In the next step, multidimensional scaling was applied to the data from patients' questionnaires, to organize information and to understand group similarities. The result, a "cognitive map", is a spatial representation of how the ideas are considered to be similar to or different from each other. Points are positioned so that distances reflect the dissimilarities between the corresponding items (Figure 1).

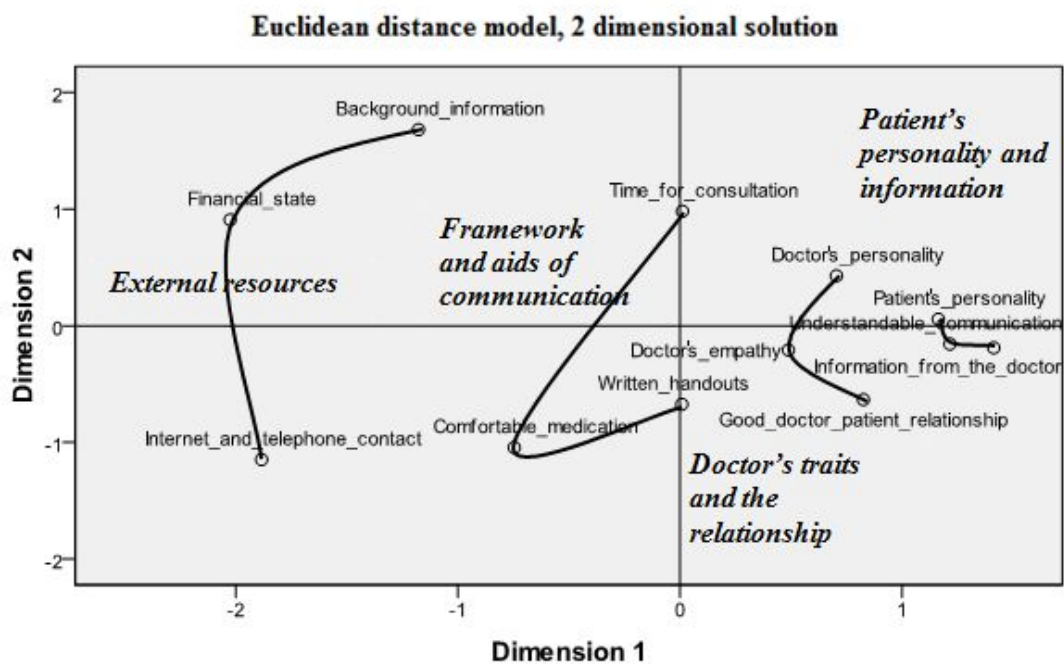


Figure 1. Results of the multidimensional scaling of chronic skin patients' answers to the questionnaire, with the four major content groups indicated (N=153).

Items from the questionnaire can be grouped into four major content groups according to the patients' answers. The "External resources" group contains the following categories: patient's



financial state, background information, and internet/telephone contact. The “Framework and aids of communication” group includes the categories of time for consultation, comfortable medication and written handouts. The “Doctor’s traits and the relationship” contains the categories doctor’s personality, doctor’s empathy and good doctor-patient relationship. The “Patient’s personality and information” group includes patient’s personality, understandable communication and information from the doctor. The results of the multidimensional scaling are in accordance with the identified cluster structure of patients’ answers based on hierarchical cluster analysis (Ward’s method).

#### 4. Improving adherence to sunscreen use

##### 4.1. Methods

##### 4.1.1. Sample population

We conducted a randomised, non-blinded, investigator-initiated trial of the effect of an electronic text-message system on sun protection behaviours. 149 participants constituted a volunteer sample from the staff members of the Clinical Department of Dermatology and Allergology at the University of Szeged in Hungary and the members’ relatives (Table 2).

		Group 1 (N=50) N (%)	Group 2 (N=50) N (%)	Group 3 (N=49) N (%)	All participants (N=149)
Gender	Male	12 (24%)	11 (22%)	20 (40.8%)	43 (28.9%)
	Female	38 (76%)	39 (78%)	29 (59.2%)	106 (71.1%)
Age	Mean±SD	35.98±11.29	39.73±9.35	35.07±9.59	36.94±10.25

Table 2. Descriptive characteristics of the participants (N=149).

The participants were randomised into three intervention groups. All three groups were given sun protection advice orally by a dermatologist at the beginning of the study. A psychologist made adherence-related and psychological assessments, and the dermatologist made medical examinations throughout the study. Assessments were made at 0, 6 and 12 weeks. The trial was carried out from 1st June to 31st August in 2011. Group 1 (N = 50) received prize money

(4000 HUF) at 12 weeks. Volunteers in Group 2 (N = 50) were given free sun protection factor (SPF) 50+ sunscreen. Volunteers in Group 3 (N = 49) were also given SPF 50+ sunscreen, and they were sent educational e-mails and mobile messages every week of the study.

#### 4.1.2. Electronic messages

We used SMS messages and e-mails as tools to facilitate participants' frequency of sunscreen use and to reduce sun exposure. All of the messages were tailored to the individuals, in the form of personalizing, which meant greeting the participant by their full names at the beginning of each message. The members of Group 3 were sent 9 e-mail packages and 3 SMS messages in our study. Our e-mail message packs consisted of 2 e-mails: a text containing tips about sun protection and a text detailing the level of the UV-radiation in Hungary on the day following the message was sent.

#### 4.1.3. Measures

We assessed the following factors that are related to sun protection behaviours.

To determine the stage of behavioural change we used the Readiness to Change Ruler - which is a simple, straight line that represents a continuum ranging from 0 (not prepared to change) to 10 (ready to change) - modified to measure the readiness to regularly use sunscreen at 0 and 12 weeks,

Health locus of control and self-efficacy were also measured, but the methods of examining these are not described in this PhD Thesis Summary,

Adherence to sunscreen use was measured with the Modified Morisky Scale (MMS). The scale's motivation and knowledge domains' (both domains' scores range from 0 to 3) questions were modified for assessing adherence to sunscreen use. The rate of adherence with sunscreen use was assessed by adding two extra interview questions ("In what percentage of the cases have you used sunscreen when you were sunbathing in the last 12 weeks?" "In what percentage of the cases have you used sunscreen when you were in the sun for more than 15 min in the last 12 weeks?") at 12 weeks.

We used The Mexameter® MX 18 (Courage and Khazaka, Germany) to assess changes in melanin and erythema levels at 0 and 12 weeks. These assessments could strengthen the

validity of the self-reported interview results of our adherence with sunscreen use. The analysed area was the volar forearm.

A sun exposure diary was also used in this study, which was a record of frequency of daily sun exposure, sunbathing, use of sunscreen, fish consumption and consumption of milk and eggs.

#### *4.2. Results*

The participants of Group 3 (N = 49) were sent three minimally personalized educational e-mails and mobile messages every week of the study, and their sun protection habits differed in certain dimensions. According to their sun exposure diary, members of Group 3 ( $3.21 \pm 2.37$ ) used sunscreens on more days per week ( $F=8.173$ ,  $p<0.05$ ) than participants of Group 1 ( $1.47 \pm 1.91$ ) and Group 2 ( $2.09 \pm 1.85$ ). Compared to Group 1 and 2, only Group 3 members' knowledge scores improved significantly ( $t=-2.206$ ,  $p=0.033$ ) between week 6 ( $2.17 \pm 0.62$ ) and week 12 ( $2.33 \pm 0.53$ ) in the adherence to sunscreen use domain. We found a significant difference ( $F=3.44$ ,  $p=0.035$ ) in the rates of adherence to sunscreen use when being in the sun for more than 15 min. Group 3 gave the highest rates ( $55.27 \pm 33.59$ ), which were followed by Group 2 ( $51.63 \pm 34.11$ ), and Group 1 answered with the lowest rates ( $37.86 \pm 35.41$ ) of sunscreen use.

Readiness to regularly use sunscreen did not differ significantly at 0 ( $8.22 \pm 2.26$ ) and 12 weeks ( $8.025 \pm 2.42$ ). There were significant positive correlations between readiness to regularly use sunscreen scores and total motivation scores for adherence to sunscreen use values. Health locus of control and self-efficacy results are not described in this PhD Thesis Summary.

The results of the MMS scales calculating adherence to sunscreen use showed that the knowledge scores ( $2.23 \pm 0.51$ ) were significantly higher ( $t=-5.173$ ,  $p<0.05$ ) than total motivation scores ( $1.8 \pm 0.8$ ) for the 12 weeks of the study. Total motivation scores for adherence to sunscreen use improved at a nearly significant level ( $t=-1.954$ ,  $p=0.054$ ) between week 6 ( $1.75 \pm 0.89$ ) and week 12 ( $1.9 \pm 0.9$ ). Motivation scores for adherence to sunscreen use when being in the sun for more than 15 min improved from week 6 ( $1.36 \pm 1.07$ ) to week 12 ( $1.52 \pm 1.02$ ) at a nearly significant level ( $t=-1.783$ ,  $p=0.077$ ).

Melanin values measured on the volar forearm were higher at week 12 ( $238.47 \pm 64.39$ ) than at week 0 ( $227.25 \pm 62.39$ ) at a nearly significant level ( $t=-1.893$ ,  $p=0.061$ ). Erythema values

measured on the volar forearm were significantly lower ( $t=2.13$ ,  $p<0.05$ ) at week 12 ( $280\pm54.97$ ) than at week 0 ( $290.87\pm69.08$ ). There were no significant differences between the three groups in changes of melanin levels and erythema levels in the 12 weeks of the study. There were significant negative correlations between results of total motivation scores for adherence to sunscreen use and both melanin and erythema values at week 0 at week 12.

## 5. Investigating psychological attributes of dermatology outpatients

### 5.1. Methods

#### 5.1.1. Sample population

We conducted an investigator-initiated trial within the framework of a multicenter study entitled 'A European multicenter study on depression, anxiety, quality of life and attachment among adult patients with common skin disorders' in cooperation with members of the European Society of Dermatology and Psychiatry. The Hungarian study had an observational case-control design. There were 414 participants, 275 adult outpatients and 139 healthy volunteer participants were assessed at the Clinical Department of Dermatology and Allergology at the University of Szeged in Hungary (Table 3). The patients' most frequent skin diseases were: psoriasis (15%), venous ulcer (15%), atopic dermatitis (9%), lymphoedema (9%).

		Patients (N=275) N (%)	Controls (N=139) N (%)	All participants (N=414) N (%)
Gender	Male	104 (38%)	34 (24%)	138 (33%)
	Female	169 (61%)	104 (75%)	273 (66%)
Age	Mean±SD	49.35±18.01	39.53±12.01	45.95±16.87

Table 3. Descriptive characteristics of the participants (N=414).

A psychologist ensured the professional informing of the participants. Patients were examined clinically by a dermatologist. The volunteer sample were recruited from among the staff

members of the Clinical Department of Dermatology and Allergology at the University of Szeged in Hungary and the members' relatives.

### 5.1.2. Measures

Attachment style was measured with the Adult Attachment Scale (AAS), distinguishing secure and insecure attachment styles. Besides describing the styles, point scores of three attachment dimensions can also be calculated with the AAS: Closeness (comfort with closeness), Dependency (capacity to depend on others) and Anxiety in relationships (fear of being abandoned).

Patient satisfaction with the dermatologist was assessed with a 11-degree scale (0=not satisfied at all; 10=extremely satisfied).

Quality of life was measured using the Dermatology Life Quality Index (DLQI).

Health status was assessed using the EQ-5D-3L, which consists of two parts: the EQ-5D descriptive system and the EQ visual analogue scale. The EQ-5D-3L descriptive system includes the following five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression (each dimension has 3 levels: no problems, some problems, extreme problems). The EQ VAS records participants' self-rated health on a vertical, visual analogue 100-degree scale (0=„worst imaginable health state”; 100=„best imaginable health state”).

Anxiety and depression were measured with The Hospital Anxiety and Depression Scale (HADS).

### 5.2. Results

In patients' results, there was a higher rate of reporting some or extreme problems than controls in the five dimensions of the EQ-5D scale. Patients ( $66.73 \pm 21.47$ ) reported significantly lower ( $p < 0.01$ ,  $t = -6.005$ ) point scores on the EQ VAS (visual analogue 100-degree scale) than controls ( $80.12 \pm 17.76$ ) when asked about their health status.

Patients' average satisfaction scores were  $9.29 \pm 1.69$  (assessed with a 11-degree scale (0=not satisfied at all; 10=extremely satisfied)).

The mean value of the quality of life scores of the patients was  $6.99 \pm 7.22$  (ranging from 0 to 30). 78 patients (28.4%) reported that their skin disease had no effect on their quality of life,

68 (24.7%) reported a small effect, 56 (20.4%) reported a moderate effect, 56 (20.4%) reported a very large effect and 17 (6.2%) reported an extreme large effect. Patients' anxiety scores ( $5.93 \pm 4.59$ ) were significantly higher ( $p < 0.05$ ,  $t = 2.537$ ) than controls' ( $4.9 \pm 3.22$ ). Patients ( $5.7 \pm 4.59$ ) also had higher depression scores ( $p < 0.05$ ,  $t = 2.454$ ) than controls ( $4.71 \pm 3.13$ ).

Patients' attachment scores ( $18.56 \pm 3.88$ ) were significantly higher ( $t = 2.23$ ,  $p < 0.05$ ) than controls' ( $17.59 \pm 3.81$ ) among the Dependency dimension. Patients' results ( $19.95 \pm 3.56$ ) were lower at a nearly significant level ( $t = -1.783$ ,  $p = 0.076$ ) than healthy volunteers' ( $20.69 \pm 3.76$ ) among the Closeness dimension. Patients' ( $12.86 \pm 4.35$ ) and controls' ( $12.75 \pm 3.95$ ) scores didn't differ significantly among the Anxiety in relationships dimension. There were no significant differences between patients and controls among frequencies of the four attachment styles (secure, preoccupied, dismissing, fearful). AAS point scores make it possible to divide participants into two groups: who have secure attachment and who have insecure attachment styles. There were no significant differences between patients and controls among frequencies of the two attachment styles.

We would like to highlight the following correlations: there were significant negative correlations between health status scores and the following variables' results: anxiety, depression, quality of life and anxiety in relationships; and health status was positively related to scores of closeness and dependency dimensions of attachment.

## **6. Discussion**

As it is reflected in the results of the interviews in the first step of our study, dermatologists found good doctor-patient relationship, information from the doctor, background information, and the patient's financial state as the strongest determinants of patient adherence. Their patients found understandable communication and information from the doctor to be particularly essential in establishing adherence, but in contrast to their doctors, they did not consider background information, and their financial state as strong determinants. We wanted to understand the deeper structure of these results, so we used multidimensional scaling, which is based on a principle that people make judgements based on their mind's hidden, or latent, inner processes. The spatial representation of the multidimensional scaling method presents the possibility that these differences are not primarily disparities of how important these factors are, but rather indicate the role of these factors in adherence.

In the second step of our study we aimed to improve sun protection habits of a volunteer sample, and to explore essential factors of adherence to sun protection counselling. Our educational messages had two main goals: to facilitate the frequency of participants' sunscreen use and to reduce sun exposure. Total motivation scores to use sunscreen were higher at the end of the study than at 6 weeks, this may be the positive effect of our intervention. Measurements of melanin and erythema scores might also confirm the positive impact of our messages, because the higher the motivation scores for adherence, the lower the erythema- and melanin- index, indicating less time staying in the sun. Readiness to regularly use sunscreen and adherence to sunscreen use (both in the motivation and knowledge domains) results showed significant correlations with many aspects of sun protection behaviours, thus they proved to be essential variables of sun protection habits. Participants who received our personalized e-mails and SMS messages used sunscreens more often and their knowledge score improved significantly in the adherence to sunscreen use domain as compared to participants who did not receive messages. Based on the interview answers, Group 3 (the intervention group) reported overall 3.64% more sunscreen use (when they were in the sun for more than 15 min) than Group 2, and 17.41% more sunscreen use than Group 1. These results are in line with a meta-analysis of studies on interventions to improve medication adherence, which revealed an increase in adherence of 4–11%.

According to results of the third step of our study chronic skin patients' anxiety and depression scores were significantly higher than controls' measured with the HADS. Picardi et al. suggest that it is important to assess these emotional problems of dermatological patients on a regular basis. There was a higher rate of reporting some or extreme problems in patients' results than controls in the five dimensions of the EQ-5D scale: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Patients reported significantly lower point scores on the EQ VAS than controls when when they were asked to indicate their health status with the visual analogue 100-degree scale. This difference in health status ratings may be the effect that skin diseases had on the participating patients' quality of life. Our attachment results show that Hungarian chronic skin outpatients were more able to depend on others, were less comfortable with closeness and intimacy and experienced similar rates of anxiety in relationships as the control groups' members. There were no significant differences between patients and controls among frequencies of secure and insecure attachment styles. In patients' results 66% showed secure and 34% showed insecure attachment styles. In a psychotherapy session it is likely that patients who have the capacity to quickly form a secure attachment to

their therapist seem more willing than patients with insecure attachment to engage in deep exploration of their issues, form an interpersonal bond with their therapist, and collaborate on the goals and tasks of therapy. Knowledge of this phenomenon may be useful for professionals who would like to explore psychosocial stressors of chronic skin patients. This is relevant in dermatological care because psychological stress plays an important role in triggering or exacerbating chronic skin diseases.

In our results dermatological outpatients reported high levels of satisfaction with their dermatologists. 74% of the patients that gave an answer to the scale were extremely satisfied with their dermatologists. Assessing and improving patient satisfaction is important as it may lead to improved adherence with treatment and consequently to optimal health outcomes. In patients' results increased scores of health status were associated with lower depression and anxiety scores, increased quality of life, lower anxiety in relationships, and increased scores of closeness and dependency dimensions of attachment. These results draw attention to the need of an integrated assessment of dermatological outpatients, described by Vari et al., which uses instruments of the fields of dermatology, psychology and psychiatry.

## **7. Conclusion and implications for practice**

### 7.1. Conclusion

The aim of the first step of our study and the choice of the mixed methods approach were to explore the similarities and discrepancies of doctors' and patients' representations of adherence. It is important to emphasize that the content groups we identified by multidimensional scaling represent conscious components of the cognitive structure of representations, but also refer to more hidden, unintentional belief systems or automatic thoughts. Therefore, it is important to further examine these representations of adherence, and to improve communication in order to make the 'contract' with the patient clear and fit the expectations of both sides. The advantages of our intervention demonstrated in the second step of our study are that it is a cost-effective method and it can easily be implemented at worksites (particularly the use of the Readiness to Change Ruler's, which takes a very brief time, but its scores correlated with many aspects of sun protection behaviour). Successful modification of one behavioural domain can affect changes in the other domain, possibly by transfer. In our study, improving sun protection behaviour may have effected other examined



habits, for example paying more attention to healthy food consumption. The results of the third step of our study showed many psychological attributes of Hungarian dermatological outpatients. This analysis implied that symptoms of anxiety and depression, attachment, quality of life and health status are closely intertwined psychological attributes of dermatological outpatients.

## 7.2. Implications for practice

In dermatological adherence research dermatologists' opinions about factors of adherence are often overlooked. With our results dermatologists' and their patients' views of important factors of adherence became comparable, and mutual representations of adherence could be identified. Readiness to change scores correlated with many aspects of sun protection behaviour, therefore the measurement of this construct proved to be useful at examining health behaviours. Our electronic messages (e-mail and mobile messages) used in the second step of our study could be an advantageous tool in programs promoting sunscreen use. Attachment has an important part in psychological intervention, and our results indicate which dimensions of attachment need special attention when working with chronic skin outpatients. Furthermore, attachment styles of patients can influence their consultations with their dermatologists, and our assessments can prove helpful in identifying the mechanisms of these effects.

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