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INVESTIGATIVE REPORT

Body Attention, Ignorance and Awareness Scale: Assessing Relevant Concepts for Physical and Psychological Functioning in Psoriasis

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A certain level of attention to bodily signals may be adaptive in the management of chronic skin conditions, as a lack of attention may lead to inadequate self-care behaviour and, consequently, may affect functioning and treatment outcomes. The purpose of this study was to develop a body awareness questionnaire and to investigate its psychometric properties and physical and psychological correlates in a cross-sectional study in patients with psoriasis ($n = 475$). The 16-item Body Attention, Ignorance and Awareness Scale demonstrated a 3-factor structure that could be interpreted as body ignorance, body attention, and body awareness (Cronbach's α of 0.73, 0.74, and 0.68, respectively). Higher body ignorance was significantly related to more physical symptoms and worse psychological functioning. Body attention and body awareness showed small significant correlations with coping and personality. Given the negative influence of impaired psychological functioning on treatment outcomes, it may be clinically important to screen for theses constructs of body awareness in chronic skin conditions. *Key words: psoriasis; body awareness; patient-reported outcome; chronic skin conditions; compliance and adherence; health psychology.*

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Having a chronic skin condition can have negative consequences for physical as well as psychological wellbeing (1–4). One of the major problems that patients have to cope with is itch, which accompanies the majority of dermatological diseases (5–10). The prevalence of itch ranges from 50% up to 92% in patients with chronic skin conditions (6–10). Physical symptoms such as itch are known to significantly affect patients' quality of life (5–7) and are associated with emotional distress (5, 7,

9, 10). In order to manage their chronic skin condition, patients are often required to take an active role in their treatment; the majority of patients need to use topical treatments on a regular basis to prevent deterioration. As better treatment adherence generally results in greater improvement, adequate self-care behaviour is very relevant in these patients (11). In order to respond to symptoms of the skin condition with appropriate self-care behaviour, patients should be aware of the bodily signals that indicate that self-care is required. Thus, the way in which people pay attention to and interpret bodily signals, which is an important aspects of body awareness, may be relevant, especially in patients with chronic skin conditions.

Body awareness can be defined as an attentional focus on, and awareness of, body sensations (12). In previous research, heightened body awareness has been viewed mainly as a mechanism that may be detrimental to health and wellbeing (13, 14) as it may lead to excessive worrying about physical symptoms and somatizing thoughts. These findings originated partly from findings regarding health anxiety (excessive concern about one's health; 15) and hyper-vigilance (heightened attention; e.g. 16) to bodily symptoms, both of which are associated with an increased attention to bodily signals, high levels of symptom reporting, and negative health outcomes (e.g. 17). Recently, however, an alternative view has emerged that perceives body awareness as an adaptive process that may be useful in the management of chronic conditions, as long as body awareness involves mindful attentiveness to the present moment and not excessive worrying about symptoms (12, 13, 18, 19).

Even though they are different constructs, both alexithymia, which is characterized by the inability to identify and verbalize emotions (20), and body awareness show similarities, in the sense that they share a focus on internal awareness processes. Previous research has found moderately negative associations between alexithymia and body awareness (21–23), suggesting that a lack of ability to identify and verbalize emotions may be related to a lack of awareness of physical sensations.

In samples of dermatological patients, a certain level of body awareness may lead to patients paying adequate

attention to bodily symptoms such as dry skin and, resultantly, to taking appropriate action, such as using moisturizing ointments. Subsequently, the lack of body awareness, especially, could be detrimental for patients with a chronic skin condition. For instance, patients who do not pick up subtle bodily signals, such as dry skin or itch, may not take care of their skin accordingly and thus are less able to control their skin condition through adequate skin care. Finally, there are some indirect indications that body awareness interventions may have positive effects on wellbeing for chronic skin conditions. For instance mindful awareness, which includes elements of body awareness, may be of relevance for chronic skin conditions; a brief attention intervention focusing on mindful meditation has shown to accelerate the rate of clearance in psoriasis patients undergoing photo(chemo)therapy (24, 25). Although these results are based on a small study in need of replication, they indicate that (mindful) aspects of body awareness may play a role in alleviating physical symptoms in chronic skin conditions such as psoriasis.

A systematic review examined existing self-report measures for body awareness and concluded that they often lacked adequate psychometric properties and were often unidimensional, leaving out key aspects of body awareness (12). The authors of this review recently constructed a new, relatively elaborate measure of body awareness consisting of 8 subscales as an alternative (18, 26). However, this measure does not include items regarding a specific lack of attention to, or ignorance of, bodily signals, which is hypothesized to be important in dermatological patient samples. The current study aims to: (*i*) assess a conceptualization of body awareness including ignorance of bodily signals in psoriasis patients by means of a new brief scale suitable for dermatological patient groups; and (*ii*) examine its psychometric properties and correlations with measures of physical and psychological functioning, personality characteristics, coping, and illness cognitions.

MATERIALS AND METHODS

Participants and procedure

In order to prevent selection bias, patients were recruited from both academic (Radboud university medical center, Nijmegen, The Netherlands) and non-academic (Canisius-Wilhelmina Hospital, Nijmegen; Rijnstate Hospital, Velp; Ziekenhuis Groep Twente, Almelo, The Netherlands) hospitals, as well as from the Dutch Psoriasis Association. Inclusion criteria were: a minimum age of 18 years and a dermatologist-confirmed psoriasis diagnosis. Exclusion criteria were: illiteracy, pregnancy, presence of other physical conditions that had a larger perceived impact on the daily life than psoriasis, presence of psychiatric comorbidity (according to the Diagnostic and Statistical Manual of Mental Disorders; 27) and/or current psychological treatment. The study protocol was approved by the regional medical ethics committee and written informed consent was obtained from each participant. The current study was part of a

larger study examining the effectiveness of E-health cognitive behavioural therapy for patients with psoriasis, and made use of questionnaires that were assessed as part of the screening procedure. All participants who completed questionnaires in the period March 2010–May 2013 were included. The resulting sample size of 475 can be considered (highly) sufficient according to often-cited sample size guidelines for factor analysis (28). Sociodemographic characteristics of participants are shown in Table I. Participants' mean $\pm$ SD age was 52 ± 13 years and gender was approximately evenly distributed (56% male). Disease severity was mild to moderate (29). Approximately half of our sample (46%) reported medical conditions in addition to psoriasis, of whom 32% indicated more than one other medical condition. Most commonly reported conditions were: rheumatic disease (100 of 220 patients; 45%), high blood pressure ($n = 27$; 12%), heart disease ($n = 28$; 13%), lung disease ($n = 26$; 12%), diabetes ($n = 26$; 12%), chronic back/muscle/tendon pain ($n = 21$; 9.5%), skin disease besides psoriasis ($n = 20$; 9%), and thyroid disease ($n = 14$; 6%).

Item generation and scale construction

Based on a review of the literature, an item pool was generated with (adjusted) items of the following questionnaires: Bermond-Vorst Alexithymia Questionnaire (BVAQ; 20), Toronto Alexithymia Scale (TAS-20; 30), Body Awareness Questionnaire (BAQ; 31), Kentucky Inventory of Mindfulness Skills (KIMS; 32), Mindful Attention Awareness Scale (MAAS; 33) and Amplification Questionnaire (APQ; 34). Items were adjusted to suit the revised conceptualization of body attention and ignorance (12). For instance, suitable items from the identifying, analyzing, and verbalizing dimensions of the alexithymia questionnaires were rephrased to reflect (a lack of) body awareness instead of a lack of emotional awareness (e.g. "I don't know what's going on inside my body" instead of "I don't know what's going on inside me" (TAS-20)). In 4 cases, original items were used. Initial item selection was conducted by 3 medical psychologists with a research and/or clinical focus on psychodermatology. The resulting item pool was sent to 5 other clinicians and researchers involved in the field of psychodermatology and to 3 patients involved in patient participation for dermatological research, with the instruction to evaluate the items on relevance, clarity and readability. This process led to a 23-item scale comprising 14 indicative (positively formulated)

Table I. *Sociodemographic characteristics of the study population* (n = 475)

Characteristics	
Sex, *n* (%)	
Male	266 (56)
Female	209 (44)
Age, years, mean $\pm$ SD (range)	52.08 $\pm$ 13.06 (18–84)
Marital status, *n* (%)	
Single	56 (12)
Married/living together	380 (80)
Divorced	22 (5)
Widowed	17 (4)
Educational level, *n* (%)	
Primary education	72 (15)
Secondary education	226 (48)
Tertiary education	175 (37)
Missing	2 (0.4)
Disease severity (SAPASI), mean $\pm$ SD (range)	5.12 $\pm$ 4.03 (0–33)
Disease duration, years, mean $\pm$ SD (range)	16.00 $\pm$ 14.95 (0–64)

SAPASI: Self-Administered Psoriasis Area and Severity Index; SD: standard deviation.

Table II. *Rotated factor loadings of the 3-factor solution for the Body Attention, Ignorance and Awareness Scale (BAIAS)*

Items	Body ignorance	Body attention	Body awareness
Factor I			
1. I do not know what is happening inside my body[a]	**0.68**	−0.05	0.00
2. When I am not feeling well physically, I do not know the reason[b]	**0.64**	0.17	0.10
3. I have physical sensations that I can't quite identify[a]	**0.63**	−0.22	0.02
4. I do not know what is going on in my body[b]	**0.62**	0.16	−0.16
5. I am often confused about what I observe in my body[a]	**0.62**	−0.11	−0.14
6. I find it difficult to describe my physical sensations[b]	**0.59**	0.23	0.09
7. I tend not to notice feelings of physical tension or discomfort until they really grab my attention[c]	**0.55**	0.19	0.17
Factor II			
8. I notice changes in my body, such as whether my breathing slows down or speeds up[d]	−0.04	**0.72**	0.12
9. I notice when my physical sensations are beginning to change[d]	0.17	**0.69**	0.17
10. I pay attention to whether my muscles are tensed or relaxed[d]	0.03	**0.67**	0.19
11. I know in advance when I am getting the flu[e]	0.02	**0.66**	0.10
12. I know I am running a fever without taking my temperature[e]	0.08	**0.65**	0.09
Factor III			
13. I think that you should pay attention to your body[b]	0.01	0.05	**0.76**
14. When my body feels tense, I want to know where this feeling comes from[b]	−0.11	0.08	**0.68**
15. In general I pay attention to my physical sensations[d]	0.21	0.31	**0.68**
16. It is important that you are aware of your body[a]	0.01	0.28	**0.64**
% of variance explained	23.0	16.0	8.4

Item adapted from: [a]TAS-20 (Toronto Alexithymia Scale), [b]BVAQ (Bermond-Vorst Alexithymia Questionnaire), [c]MAAS (Mindful Attention Awareness Scale), [d]KIMS-obs (Kentucky Inventory of Mindfulness Skills – observe subscale), [e]BAQ (Body Awareness Questionnaire). Factor loadings ≥0.55 printed in bold.

and 9 contra-indicative (negatively formulated) items (Table II). Respondents were asked to indicate on a 4-point Likert scale to what extent they agree with each statement (1 = not at all, 2 = somewhat, 3 = to a large extent, 4 = completely).

Measures of physical and psychological functioning

The following commonly-used and well-validated self-report questionnaires were used to examine correlations of body awareness with physical and psychological functioning and provide first indications of construct validity:

Physical and psychological wellbeing. The Impact of Chronic Skin Disease on Daily Life (ISDL; 35) was used to measure physical functioning (itch, pain, and scratching behaviour). Symptoms of itch were assessed by means of a 4-item subscale measuring the intensity and duration of itch during the past 4 weeks (Cronbach's α in current study = 0.92). The answers are indicated on a 4-point Likert scale (ranging from "not at all" to "completely") and higher scores indicate higher levels of itch. Pain was assessed on a 10-point VAS scale (0 = no pain, 10 = worst pain ever experienced). Scratching behaviour was assessed with 2 subscales: a 3-item conscious scratching subscale that assesses the frequency and duration of scratching behaviour (Cronbach's α = 0.79) and a 3-item automatic scratching subscale that evaluates scratching behaviour to non-itching stimuli and scratching in the absence of itch or without being aware of it (Cronbach's α = 0.71). In both scales, higher scores reflect more scratching behaviour.

The 8-item fatigue subscale of the Checklist Individual Strength (CIS; 36) was used to assess fatigue. The subscale consists of 8 items that are responded to on a 7-point Likert scale (ranging from "yes, that is true" to "no, that is not true"), with higher scores reflecting more fatigue (Cronbach's α = 0.94).

The Self-Administered Psoriasis Area and Severity Index (SAPASI; 37) was used to assess disease severity. On anterior and posterior silhouettes, patients mark the areas that are currently affected by psoriasis. Below the silhouettes, patients can note the redness, thickness, and scaliness of their psoriasis on 3 analogue scales. Scores on the SAPASI can range from 0 (complete remission) to 72 (most severe psoriasis). The SAPASI has shown good reliability and validity (37, 38).

The Dermatology Life Quality Index (DLQI; 39) is a dermatology-specific instrument used to measure quality of life. The questionnaire assesses the impact of chronic skin conditions on several physical, psychological, and social aspects of daily life. It consists of 10 items that are responded to on a 4-point scale (ranging from "very much" to "not at all"). Higher scores reflect poorer quality of life (Cronbach's α = 0.85).

The Hospital Anxiety and Depression Scale (HADS; 40) was used to assess anxiety (7 items; Cronbach's α = 0.82) and depression (7 items; Cronbach's α = 0.80). The questions refer to the mood in the last week and they are responded to on a 4-point scale. Higher scores reflect higher levels of anxiety and depression.

Coping. Two subscales of the Utrecht Coping List (UCL; 41) were used to assess active coping (problem-focused coping, 7 items, Cronbach's α = 0.83) and passive coping (avoidance strategies, 8 items, Cronbach's α = 0.71) related to handling everyday stressful events. Respondents answer on a 4-point Likert scale (from "seldom or almost never" to "very often/ frequently"). Higher scores reflect a stronger tendency to use that specific coping strategy.

Illness cognitions. The Illness Cognition Questionnaire (ICQ; 42) was used to measure illness cognitions related to chronic diseases: helplessness (concentration on aversive aspects of the disease), acceptance (positive adaptation to chronic illness with emphasis on decreasing its negative aspects), and perceived benefits (assigning positive meaning to illness). Each subscale consists of 6 statements answered on a 4-point Likert scale (from "not at all" to "completely"), with higher scores indicating higher levels of the illness cognition. The ICQ was found to be highly reliable in the current sample (Cronbach's α = 0.88 for each scale).

Personality traits. The Eysenck Personality Questionnaire (EPQ; 43) was used to evaluate the personality traits neuroticism (Cronbach's α = 0.92) and extraversion (Cronbach's α = 0.87). It consists of 41 items with a dichotomous response format (yes/no), with higher scores reflecting higher levels of the personality trait.

Statistical analysis

Exploratory factor analysis (EFA) with Varimax rotation and Kaiser normalization was performed to assess the underlying structure of the new questionnaire (44). Selection of the number of factors for the most optimal solution was based on conjunctive criteria requiring the eigenvalue of a factor being at least 1.0 and a clear bend in Cattell's scree test (45). To assess the reliability of the new questionnaire, Cronbach's α were computed for the 3 scales. To examine associations between body awareness and measures of physical and psychological functioning and sociodemographic characteristics, Pearson correlation coefficients were computed for measures of physical and psychological wellbeing, personality characteristics, coping, illness cognitions, and sociodemographic characteristics. Statistical significance was accepted at $p < 0.05$ in two-tailed tests. All analyses were performed using Statistical Packages for the Social Sciences version 20.0 (46).

RESULTS

The newly developed 23-item questionnaire was sent to 682 psoriasis patients, 475 of whom returned the questionnaire (70% response rate). Missing values on this questionnaire were present in 1% of data and were randomly distributed. Missing values were present in 1.6% of data in the entire dataset of included questionnaires (excluding the DLQI, as this scale was not distributed to the entire sample). Due to their low percentage and random distribution, the impact of these missing values is considered to be negligible. No cases with extreme values on one or more variables were observed; all values were within 3 standard deviations of the mean and all variables were normally distributed (skewness and kurtosis < 1.1).

Exploratory factor analysis of the Body Attention, Ignorance and Awareness Scale

The 23 items of the original questionnaire were reduced to 16, based on examination of item loadings and cross-loadings (i.e. primary factor loadings > 0.50 and at least 0.20 difference in cross-loadings; 6 items removed based on these criteria), meaningfulness and usefulness for the corresponding factor (1 additional item removed). Based on these 16 items, 3 factors were extracted, explaining a total of 47.4% of the variance. The resulting questionnaire was termed the Body Attention, Ignorance and Awareness Scale (BAIAS). The first component, "Body Ignorance" (not recognizing and/or ignoring bodily signals), explained 23.0% of the variance, the second component, "Body Attention" (being aware of and paying mindful attention to bodily signals), added 16.0% and the third component, "Body Awareness" (self-perceived importance of and general attitude towards body awareness), added 8.4%.

Body Attention, Ignorance and Awareness scale: means and associations with sociodemographic variables

Based on the above-mentioned components, mean scores on the 3 scales were calculated by adding the scores of the items and dividing them by the total number of items of that scale. If more than one-third of the items on 1 particular scale were missing, the mean score of the scale was not calculated. Mean scores on BAIAS scales for the total sample, and stratified by age, gender, educational level, and marital status are shown in Table III. Women scored slightly higher than men on Body Awareness ($t(469) = -2.61$, $p < 0.01$), no gender differences were found for the other 2 scales. Patients with a higher educational level scored lower on Body Ignorance ($F(2,452) = 13.98$, $p < 0.001$) and higher on Body Attention ($F(2,452) = 8.78$, $p < 0.001$) and Body Awareness ($F(2,453) = 3.78$, $p = 0.02$). No differences according to age group or marital status were found for any of the 3 scales, nor were the subscales of the BAIAS significantly correlated with age (continuous scores; p-values ≥ 0.36).

Table III. *Mean scores on the Body Attention, Ignorance and Awareness Scale (BAIAS), stratified by age, gender, education, and marital status*

	Body ignorance Mean ± SD	Body attention Mean ± SD	Body awareness Mean ± SD
Total sample	13.59 ± 3.51 (*n* = 470)	12.32 ± 3.31 (*n* = 470)	11.61 ± 2.26 (*n* = 471)
Stratified by age			
18–44	13.40 ± 3.45 (*n* = 127)	12.02 ± 3.35 (*n* = 127)	11.67 ± 2.17 (*n* = 126)
45–64	13.49 ± 3.61 (*n* = 261)	12.52 ± 3.31 (*n* = 260)	11.54 ± 2.30 (*n* = 262)
65–84	14.18 ± 3.27 (*n* = 82)	12.15 ± 3.23 (*n* = 83)	11.74 ± 2.28 (*n* = 83)
Stratified by gender			
Male	13.76 ± 3.67 (*n* = 262)	12.35 ± 3.28 (*n* = 261)	11.37 ± 2.24** (*n* = 263)
Female	13.37 ± 3.30 (*n* = 208)	12.28 ± 3.35 (*n* = 209)	11.91 ± 2.25** (*n* = 208)
Stratified by education			
Primary	15.00 ± 2.93*** (*n* = 71)	10.85 ± 3.42*** (*n* = 72)	10.93 ± 2.43* (*n* = 72)
Secondary	13.82 ± 3.32*** (*n* = 219)	12.61 ± 3.26*** (*n* = 218)	11.69 ± 2.29* (*n* = 219)
Tertiary	12.59 ± 3.61*** (*n* = 165)	12.58 ± 3.16*** (*n* = 165)	11.75 ± 2.13* (*n* = 165)
Stratified by marital status			
Married/long-term relationship	13.51 ± 3.53 (*n* = 398)	12.24 ± 3.21 (*n* = 399)	11.61 ± 2.22 (*n* = 400)
Single	14.07 ± 3.42 (*n* = 71)	12.67 ± 3.79 (*n* = 70)	11.61 ± 2.52 (*n* = 70)

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
SD: standard deviation.

Table IV. *Correlations between the Body Attention, Ignorance and Awareness Scale (BAIAS) and measures of physical and psychological functioning*

Measure	Body ignorance		Body attention		Body awareness	
	r	n	r	n	r	n
Physical and psychological wellbeing						
Itch	0.20***	466	0.00	465	0.06	466
Pain	0.24***	461	–0.05	461	0.03	462
Fatigue	0.32***	468	–0.04	468	0.01	469
Conscious scratching	0.18***	451	–0.05	451	0.03	452
Automatic scratching	0.12*	451	–0.05	451	0.06	451
Quality of life	0.25***	362[a]	0.02	362[a]	0.03	362[a]
Disease severity	0.06	448	0.00	449	0.05	449
Depression	0.33***	467	–0.04	467	–0.07	469
Anxiety	0.34***	468	0.01	468	0.11*	469
Coping						
Active	–0.24***	465	0.27***	465	0.18***	466
Passive	0.29***	466	–0.07	466	–0.06	467
Illness cognitions						
Helplessness	0.30***	467	0.04	466	0.02	467
Acceptance	–0.24***	467	0.10*	466	0.02	467
Perceived benefits	0.10*	464	0.07	463	0.07	464
Personality traits						
Neuroticism	0.33***	469	–0.05	469	0.12**	470
Extraversion	–0.23***	468	0.12**	468	0.14**	469

[a]Quality of life was not assessed in the whole study sample.
*$p<0.05$; **$p<0.01$; ***$p<0.001$.

Reliability and intercorrelations of the Body Attention, Ignorance and Awareness Scale

The internal consistency was satisfactory for the Body Ignorance ($\alpha=0.73$), Body Attention ($\alpha=0.74$) and Body Awareness ($\alpha=0.68$) scales of the BAIAS. The subscale Body Attention showed a moderate correlation with the subscale Body Awareness ($r=0.43$, $p<0.001$), and the Body Ignorance and Body Attention subscales were slightly, but significantly, negatively correlated ($r=-0.16$, $p<0.001$). No significant correlation was found between the Body Awareness and Body Ignorance subscales ($r=-0.08$, $p=0.09$).

As reported in Table IV, higher levels of Body Ignorance were associated with higher levels of itch, pain, and fatigue, more scratching, a decreased quality of life, higher levels of anxious and depressive symptoms, more avoidant coping, less active coping, higher levels of neuroticism and helplessness, and lower levels of extraversion and acceptance. Correlations between the Body Attention subscale and measures of physical and psychological wellbeing were mostly non-significant, with the exception of small correlations of higher Body Attention with higher levels of active coping, acceptance, and extraversion. Similarly, small correlations were found for higher Body Awareness, with higher levels of active coping and higher levels of anxiety, neuroticism and extraversion.

DISCUSSION

The aims of the current study were to develop a measure to assess body awareness and to examine its physical and psychological correlates in patients with psoriasis. The results showed that body awareness can be measured adequately in patients with psoriasis by means of the BAIAS. In addition, body ignorance and, to a lesser extent, body awareness and attention were related to physical and psychological functioning. In particular, patients who do not recognize and/or ignore their bodily signals experience lower levels of physical and psychological wellbeing. The BAIAS showed a 3-factor structure, with 3 reliable scales – body ignorance (not recognizing and/or ignoring bodily signals), body attention (being aware of and paying mindful attention to specific internal bodily signals) and body awareness (self-perceived importance of and general attitude towards body awareness). In line with our hypothesis, the aspect of the BAIAS reflecting a low level of body awareness demonstrated associations with poorer physical and psychological wellbeing. Higher levels of body attention and body awareness were not related to physical and psychological wellbeing, but slightly to aspects of coping and personality that are generally perceived as adaptive (active coping and extraversion). We explicitly added items in the BAIAS that assess the failure to recognize bodily signals, which was shown to be only slighly negatively correlated with body attention. Results suggest that body awareness is not a unidimensional construct, but rather consists of multiple aspects that may be independently associated with physical and psychological functioning. The concepts of body awareness and body ignorance seem to have inherently different meanings. While body awareness refers to the general tendency to be aware of and pay attention to bodily signals, body ignorance is related more to not recognizing or to actively ignoring bodily signals. Several mechanisms can be suggested to play a role in both concepts. For example, parallels can be drawn between body ignorance and the emotion regulation strategies of avoidance and suppression, which were found to be related to psychopathology in meta-analysis with moderate to large effect sizes (47). Body ignorance may also be related to the maladaptive emotion regulation construct of "experimental avoidance"; the suppression or avoidance of a broader range of psychological experiences, including bodily signals, but also, for instance, cognitions, emotions, memories and sensations (48, 49). Body ignorance might be related to problems with adherence; bodily signals often have a certain threat value due to signals of disease, and are therefore potentially avoided or ignored in patients who score high on body ignorance.

In contrast, the construct body attention is hypothesized and operationalized to be more related to mindfulness and perhaps a broad awareness of, or sensitivity to, signals in general. When this sensitivity is accompanied by excessive worrying about bodily signals, this process may become maladaptive, as in health anxiety (15). Future research should examine these hypotheses and constructs further. The body ignorance subscale was found to be associated with more physical symptoms of itch, pain, and fatigue, as well as more scratching behaviour. Because treatment of chronic skin conditions relies heavily on adequate self-care behaviour and treatment compliance (11), being aware of bodily sensations and taking appropriate action may be especially important in this population. In addition, not being conscious of bodily sensations such as itch could also lead to unaware, automatic ways of dealing with these sensations, for instance through more frequent automatic scratching behaviour. Scratching may cause further damage to the skin and lead to more itch, a process called the itch-scratch cycle.

Body ignorance was also found to be correlated with psychological wellbeing; patients not recognizing or ignoring bodily signals were found to be more anxious and depressed. In addition, they scored higher on generally maladaptive personality traits and coping styles. These findings may suggest that patients who do not recognize or pay attention to their bodily signals may be at risk for psychological problems. This may be relevant not only for patient wellbeing, but also for dermatological treatment outcomes, as it is known that psychological distress plays a significant role in the exacerbation of psoriasis (50). An alternative explanation could be that patients with high levels of psychological distress may be less aware of their bodily signals as they are focused on exaggerated worries of, for example, health anxiety. Further research is needed on the association between body awareness in its current conceptualization and these distress-related constructs of health anxiety and hyper-vigilance, which are known to be associated with both increased symptom reporting and increased attention to bodily signals (e.g. 17).

The BAIAS was also found to be correlated with sociodemographic variables; women scored slightly higher than men on the body awareness subscale, and a higher educational level was slightly associated with lower levels of body ignorance and higher levels of body attention. These results correspond with the notion that women (51) and individuals with a higher educational level (52) have also been found to score lower on the related emotion regulation construct alexithymia.

The findings of this study should be considered in light of its limitations, which may be addressed in future research. Firstly, as this is the first study on this newly developed questionnaire, the BAIAS should be further validated based on these results. Also, this study was conducted in a sample of psoriasis patients with relatively mild to moderate disease severity from various hospitals, which raises the issue of representativeness and possible floor effects in the development of the questionnaire. However, all 3 body awareness subscales showed a normal distribution and few participants scored the highest or lowest possible values, indicating that floor effects were not likely to be a problem. Moreover, none of the 3 body awareness scales correlated with disease severity. In addition, disease severity in psoriasis is known to be, on average, mild to moderate in general practice (e.g. 6, 53). However, in order to generalize beyond this group, studies need to be conducted that replicate these results in patients with more severe disease activity, other chronic conditions, such as atopic dermatitis, and healthy participants. The developed questionnaire should also be administered to other independent samples to confirm its factor structure and further test its psychometric properties, such as test-retest reliability and sensitivity to change. In addition, it would be informative to perform a qualitative assessment on comprehension of the scale for respondents with diverse educational levels and cultural backgrounds, in order to examine whether the scale is equally comprehensible for all respondents.

Secondly, a substantial part of our sample had a comorbid medical condition. As research clearly suggests that psoriasis patients are at an increased risk for several other chronic somatic conditions, such as diabetes and cardiovascular conditions (see for an overview: 54), excluding these patients would leave us with a sample that would probably not be very clinically representative. However, this leaves the possibility that differences in body awareness according to medical conditions may have influenced our results. For example, diabetics are taught to be attuned to physiological sensations as they need to detect possible hypoglycaemia in an early stage. Even though in the current study no differences in body awareness between patients with and without these medical conditions were observed, future studies should shed more light on this matter.

Thirdly, while correlations between the body ignorance scale and psychological and physical functioning were consistently in the same direction, the magnitude of the correlations was generally small to moderate. This corresponds with the knowledge that a multitude of factors can contribute to poor physical and psychological wellbeing, with body awareness being one of these factors. Lastly, the cross-sectional nature of this study precludes causal conclusions. While it could be hypothesized that a low awareness of bodily signals leads to poorer self-care behaviour and, therefore, poorer skin status and lower physical and psychological wellbeing, alternative hypotheses cannot be ruled out. Future prospective studies should disentangle the causal pathways between body awareness and wellbeing.

In conclusion, the current study provided new insights into the potential relevance of body ignorance, body attention, and body awareness, which can be reliably measured with the BAIAS. Body ignorance was found to be associated with worse physical and psychological functioning. If it is proven that body ignorance is predictive of worse functioning in longitudinal studies, the BAIAS may be useful in assessment and screening for body ignorance in patients with psoriasis. Subsequently, psychological interventions, such as mindfulness or body awareness training, may be helpful in reducing body ignorance and improving body attention and awareness in an adequate manner (55–59).

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