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Relationship between Anxiety, Depression, Trait Mindfulness and Psychological Well-being in People with Atopic Dermatitis: Theoretical Model and its Initial Test

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Abstract. People with atopic dermatitis (AD) have lower psychological well-being and experience symptoms of anxiety and depression, which are more prominent in the more severe form of the disease. Recent years have shown attempts to address psychological aspects of the disease, such as strengthening trait mindfulness (TM), which may be important for the successful management of AD. This study aims to propose a theoretical model identifying factors predicting psychological well-being in people with AD and to conduct initial empirical testing of this model. Participants were 52 adults aged 18-49 years with AD (84.6% women and 13.5% men). Instruments: Patient-Oriented Eczema Measure (POEM), Beck Anxiety Inventory (BAI), Beck Depression Inventory-II (BDI-II), Supplementary Lithuanian Psychological Well-being Scale (LPGS-P), and Five Facet Mindfulness Questionnaire (FFMQ). Correlational analysis was used to examine the relationships between the variables. The results revealed that anxiety and depression were negatively correlated with TM and psychological well-being, while TM was positively correlated with psychological well-being. TM plays an important role in predicting psychological well-being in people with AD.

Keywords: atopic dermatitis, anxiety, depression, trait mindfulness, psychological well-being.

Atopiniu dermatitu sergančių asmenų nerimo, depresiškumo, dėmesingo įsisąmoninimo kaip bruožo ir psichologinės gerovės ryšys: teorinis modelis ir pirminis empirinis bandymas

Santrauka. Atopiniu dermatitu (AD) sergantys asmenys pasižymi mažesne psichologine gerove ir nerimo bei depresiškumo simptomais, kurių išreikštumas didėja esant ūmesnei ligos formai. Pastaraisiais metais bandoma atkreipti dėmesį į psichologinius ligos aspektus, kurie gali būti svarbūs sėkmingam AD gydymui. Vienas iš jų galėtų būti dėmesingo įsisąmoninimo kaip bruožo (DĮB) stiprinimas. Tyrimo tikslas – pasiūlyti teorinį AD sergančių žmonių psichologinės gerovės prognostinių veiksnių modelį ir atlikti pirminį empirinį jo bandymą. Tyrime dalyvavo 52 18–49 metų AD sergantys suaugusieji (84,6 % moterų ir 13,5 % vyrų). Įrankiai: Paciento papildomas egzemos matas (POEM), Becko nerimo aprašas (BAI), Becko depresijos aprašas II (BDI-II), Papildomoji lietuviškoji psichologinės gerovės skalė (LPGS-P), Penkių aspektų dėmesingo įsisąmoninimo klausimynas (FFMQ). Tyrimui atlikti pasirinkta

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koreliacinė tyrimo strategija. Nustatyta, kad nerimas ir depresiškumas buvo neigiamai susiję su DĮB ir su psichologine gerove, o DĮB turėjo teigiamą ryšį su psichologine gerove. Prognozuojant AD sergančių asmenų psichologinę gerovę išryškėjo DĮB svarba.

Pagrindiniai žodžiai: atopinis dermatitas, nerimas, depresiškumas, dėmesingas įsisąmoninimas kaip bruožas, psichologinė gerovė.

Introduction

Atopic dermatitis (AD) is a chronic inflammatory skin disease characterised by alternating periods of remission and relapse, with symptoms including itching, skin dryness, and rashes (Dieris-Hirche et al., 2017). While medical intervention can help manage AD, not all patients achieve control, suggesting that psychological factors may also play a role. The **aim** of this study is to propose a theoretical model identifying factors predicting psychological well-being in people with AD and to conduct initial empirical testing of this model.

Individuals with AD face numerous challenges, including financial strain due to medical expenses, decreased productivity, and impaired social and daily functioning (Wittkowski et al., 2004), leading to reduced well-being and increased anxiety and depression. While many studies link AD severity to poorer psychological well-being (Wittkowski et al., 2004; Montgomery et al., 2016), others find no clear association between these variables (Haeck et al., 2011). Researchers found that adults with AD experience significantly more symptoms of anxiety and depression compared to other people (Montgomery et al., 2016). Other authors highlight that individuals with AD are characterised by higher levels of anxiety and depression, but there is no significant difference in the symptoms experienced by AD patients compared to the general population (Maksimovic et al., 2018). According to Slattery and Essex (2011), studies have mixed results, with some suggesting that higher levels of AD may be associated with anxiety, others with depression, and still others with both anxiety and depression.

Evidence indicates that heightened depression and anxiety symptoms intensify itching and scratching in people with AD (Vinh et al., 2022). This suggests a cycle where increased anxiety and depression severity exacerbate AD, further diminishing psychological well-being (Wittkowski et al., 2004). As a result, AD severity may serve as a mediating variable between anxiety and psychological well-being as well as between depression and psychological well-being. The relationship between anxiety, depression and psychological well-being is not only limited to AD: more pronounced symptoms of anxiety and depression are associated with lower psychological well-being (Wersebe et al., 2018). Moreover, anxiety and depression are known to be related (Beck et al., 1996).

Research suggests that psychological interventions, particularly mindfulness-based meditation, may reduce psychological distress and symptom severity in individuals with AD (Montgomery et al., 2016). Mindfulness, which varies in state and trait characteristics across individuals, involves maintaining present-moment awareness (Brown & Ryan,

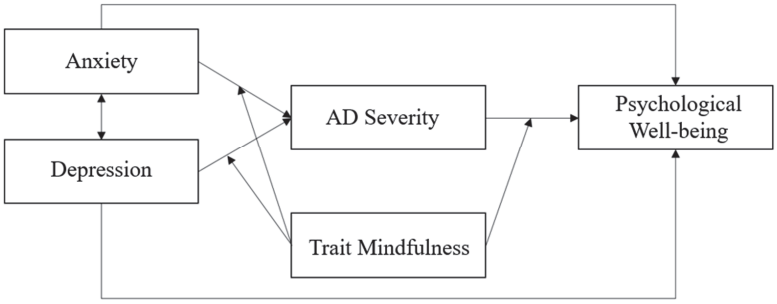
2003). Trait mindfulness (TM) or dispositional mindfulness reflects a person's tendency towards such mindfulness-related behaviours (Vago & Silbersweig, 2012), and practising mindfulness meditation leads to a stable change in the level of TM (Kiken et al., 2015).

Studies link TM to enhanced psychological well-being, improved social relationships, positive emotions, and reduced stress, anxiety, and depression (Hanley et al., 2017; McLaughlin et al., 2019). Specifically, individuals with AD, who exhibit higher TM levels, report less anxiety and depression and higher well-being. TM may play a crucial role in both potentially alleviating symptoms of anxiety, depression, and AD, and increasing psychological well-being (Montgomery et al., 2016). Given the very nature of TM – the tendency to focus attention in a specific way (on purpose, in the present moment, and non-judgmentally) (Vago & Silbersweig, 2012) – it is plausible that TM may be a moderator, changing the nature of the relationship between anxiety/depression and AD severity or the relationship between AD severity and psychological well-being, rather than directly affecting these variables.

The literature review suggests a possible model of the relationship between anxiety, depression, AD severity, TM, and psychological well-being (Figure 1), in which AD severity may act as a mediator between anxiety/depression and psychological well-being, and TM may moderate the relationship between anxiety/depression and AD severity or the relationship between AD severity and psychological well-being.

Figure 1

A model of the relationship between anxiety, depression, AD severity, TM, and psychological well-being



Method

Participants and procedure

Fifty-two adults with AD participated in the study. The study used convenience non-probability sampling. The total sample consisted of 44 (84.6%) women and 7 (13.5%) men. The age of the participants ranged from 18 to 49 years (M=28.43, SD=6.66). Most subjects had a high education degree (80.8%) and were employed (67.3%). 63.5% of the subjects reported no other chronic disease besides AD.

The study was conducted between December 2018 and April 2019. Participants were first asked to read the consent and then fill out instruments and a questionnaire in the form of "paper and pencil".

Instruments

Patient-Oriented Eczema Measure (POEM) was used to measure AD severity (Charman et al., 2004). The instrument was translated from English into Lithuanian by two separate translators, with additional consultation from a dermatologist and a patient with AD to ensure accurate translation of AD-specific terminology. The independent translator carried out the back translation of POEM from Lithuanian into English.

POEM consists of 7 questions measuring symptoms of AD: itching, sleep disturbance, skin bleeding, weeping/oozing, cracking, flaking and skin dryness/roughness. The respondents were asked to rate the number of days in the past week that they experienced each of the AD symptoms on a 5-point Likert scale. The scores for the individual questions were summed to an overall score (Charman et al., 2004).

To assess whether POEM questions can form a single factor, a confirmatory factor analysis was conducted. Based on the model fit indices, the model was found to fit the data unsatisfactorily (χ^2=38.68, df=14, p<0.001, CFI=0.801, RMSEA=0.186). After three error terms were correlated, the new model was found to be a good fit to the data (χ^2=12.38, df=11, p=0.336, CFI=0.989, RMSEA=0.050) and proved to be significantly better than the original one ($\Delta\chi^2$=26.29, Δdf=3, p<0.05). The internal consistency of the instrument in the present study was good (Cronbach's α=0.82).

Beck Anxiety Inventory (BAI) was used to measure anxiety (Beck & Steer as cited in Beck et al., 1996). BAI consists of 21 statements reflecting the most common emotional, physiological, and cognitive symptoms of anxiety. The subjects were asked to rate each symptom in terms of how much it had bothered them in the last week on a 4-point scale. The scores for each statement were added together for an overall anxiety score (Cronbach's α=0.82).

Beck Depression Inventory-II (BDI-II) was used to measure depression (Beck et al., as cited in Beck et al., 1996). BDI-II consists of 21 groups of statements, assessing symptoms and severity of depression. The subjects were asked to choose one statement from each group that best described how they felt in the last two weeks. Each statement was scored on a 4-point scale from 0 to 3. The scores for the rated statements were added together for an overall score (Cronbach's α=0.85).

Supplementary Lithuanian Psychological Well-being Scale (LPGS-P) was used to measure psychological well-being (Kairys et al., 2013). LPGS-P scale consists of 17 statements, measuring satisfaction in different areas of life on a 10-point Likert scale. The total score of LPGS-P was used in the study (Cronbach's α=0.92).

Five Facet Mindfulness Questionnaire (FFMQ) was used to measure TM (Baer et al., 2006). FFMQ consists of 39 statements measuring 5 components or skills of mindfulness. The participants were asked to rate how often they used each of the mindfulness skills on a 5-point Likert scale. The rates were added together to form an overall score (Cronbach's α=0.87).

Questionnaire. The questionnaire was designed to capture the demographic characteristics of the respondents and aspects related to AD.

Data analysis

The data was processed using SPSS 20.0 and AMOS 21 software packages. Pearson correlation coefficients were used to determine the relationships between study constructs. Hierarchical linear regression was used to analyse the predictors of psychological well-being. AMOS 21 was used to perform confirmatory factor analysis to assess the validity of the POEM instrument.

Results

The severity of AD was not strongly expressed (M=12.65, SD=6.12), and the duration of AD ranged from 2 months to 35 years (M=17.05, SD=9.9). Descriptive statistics for the other variables measured in the study are presented in Table 1.

Table 1 shows that the following correlation patterns are observed: anxiety and depression are negatively associated with psychological well-being and TM, whereas TM is positively associated with psychological well-being. AD severity was not related to any psychological variables; there was only one weak positive correlation between AD severity and AD duration.

Table 1

Descriptive statistics and Pearson correlation coefficients between AD severity, AD duration, anxiety, depression, psychological well-being, and TM

Variable	*M*	*SD*	1	2	3	4	5	6
AD severity	12.65	6.12						
AD duration	17.05	9.9	0.28*					
Anxiety	11.18	6.97	-0.02	-0.12				
Depression	11.98	7.45	-0.00	0.02	0.02			
Psychological well-being	127.63	21.11	-0.04	0.1	-0.4**	-0.61***		
TM	125.54	16.03	0.09	-0.07	-0.29*	-0.65***	0.68***	

Note. $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. N = 52. AD – atopic dermatitis, TM – trait mindfulness.

Hierarchical linear regression analysis was used to show how much of the variance in psychological well-being is explained by a block of factors, controlling for the preceding factors. Based on demographic factors (see Table 2), it is possible to predict about 6% of the variance in psychological well-being. Demographic characteristics and AD-related aspects explained 9% of the variance in the well-being ($F(5, 43)=0.85$, $p=0.524$, $R^2=0.09$), and the addition of psychological variables explained a total of 57% of the variance of the well-being making the model statistically significant ($F(8, 40)=6.69$, $p<0.001$, $R^2=0.57$). The most significant predictor in the final model was TM ($\beta=0.59$, $p<0.001$).

Table 2

Results of hierarchical linear regression analysis

Independent variables		*Dependent variable Psychological well-being*			
		Beta (β)	*F*	*p*	R^2
First model			1.45	0.242	0.06
Demographics	Age	0.23			
	Gender	-0.12			
Second model			0.85	0.524	0.09
Demographics	Age	0.19			
	Gender	-0.13			
Aspects related to AD	AD duration	0.12			
	AD severity	- 0.09			
	Adherence to recommendations	0.15			
Third model			6.69*	<0.001	0.57
Demogra-phics	Age	-0.05			
	Gender	-0.07			
Aspects related to AD	AD duration	0.19			
	AD severity	-0.21			
	Adherence to recommendations	0.08			
Psychological variables	Anxiety	-0.12			
	Depression	-0.13			
	TM	0.59**			

Note. *statistically significant F change. ** statistically significant predictors. AD – atopic dermatitis, TM – trait mindfulness.

Due to the lack of correlations between anxiety, depression, psychological well-being, and AD severity, testing of mediational and moderational effects is not meaningful. Therefore, the model presented in Figure 1 was not tested and, consequently, was not confirmed in the present study.

Discussion

This study aimed to analyse predictors of psychological well-being in people with AD. The importance of psychological variables, especially TM, in predicting psychological well-being has become apparent.

Both anxiety and depression had negative correlations with psychological well-being. This result is supported by other studies: symptoms of anxiety and depression are associated with lower psychological well-being (Wersebe et al., 2018). This outcome is predictable, as both anxiety and depression disrupt an individual's daily functioning and affect many areas of their life: work, emotions, and interpersonal relationships.

Psychological well-being was strongly positively associated with TM. Other authors' studies have confirmed an identical relationship, with TM being positively associated with psychological well-being (Hanley et al., 2017). TM is related to other positive outcomes, such as positive emotions and better emotion regulation (McLaughlin et al., 2019). Thus, if people have higher TM and have developed more mindfulness-related skills, they will naturally rate their psychological well-being as more positive. In this study, TM had a strong negative correlation with depression, reinforcing the idea that higher levels of TM are linked to lower levels of depression. This finding is supported by evidence that mindfulness-based interventions are frequently and successfully used for alleviating symptoms of depression and preventing its relapse (Hofmann & Gómez, 2017; Piet & Hougaard, 2011). The negative associations of TM with depression and anxiety and the positive associations of TM with psychological well-being suggest the potential importance of TM in helping people with AD to cope with their symptoms of anxiety and depression, and perhaps to better recognise AD-related symptoms and take appropriate treatment actions.

Psychological variables such as anxiety, depression and TM were found to explain most of the variance in the psychological well-being data when controlling for demographics and AD-related aspects. Similar results were found by Wittkowski and colleagues (2004), who attempted to assess the influence of psychological and disease-related clinical factors on psychological well-being in AD patients, and found that psychological factors were significant predictors of well-being even when controlling for disease severity.

TM was highly significant in predicting the psychological well-being of people with AD. It can be hypothesised that TM is a consistent and significant predictor of psychological well-being and satisfaction in various domains of life, and that having a higher level of TM increases the likelihood of experiencing greater psychological well-being. According to Montgomery and Thompson (2018), practising mindfulness involves learning alternative ways to control both one's thoughts and feelings. Through mindfulness, one also moves away from conventional interpretations and ways of thinking and by paying attention to all experiences in the present moment, both positive and negative, denial of the current state is reduced, and the present state is better accepted.

AD severity was not associated with other variables (except for AD duration), suggesting that our hypothesized model did not hold, as there is no basis to assert mediational

and moderational effects. Further research should identify other plausible mechanisms for the relationships among the constructs studied.

Limitations and future studies

The study faces limitations due to its small and homogeneous sample size, primarily comprising employed women with higher education, and variations in the duration and severity of AD among participants, limiting result generalizability. A larger, more diverse sample could enhance the study's applicability and statistical power. Additionally, the presence of other chronic diseases in some participants could have influenced well-being, but the sample size restricted in-depth analysis of comorbidities. As the moderating effect of TM is theoretically possible but not confirmed by this initial cross-sectional study, future research might explore the hypothesized TM's moderating effects on the mental health of AD patients through experimental methods, for example, training patients in mindfulness meditation to potentially increase TM expression, as indicated by Kiken et al. (2015).

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