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Short communication

# The role of activation level and emotion regulation strategies in skin-picking behaviours. Findings in non-clinical sample

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## 1. Introduction

Skin picking disorder (SPD) is a disabling psychiatric condition in which individuals repeatedly pick their skin to the extent leading to tissue damage and distress or impairment in important areas of functioning (APA, 2013). SPD is common in the general population with prevalence rating from 1.4% to 5.4% (Keuthen, Koran, Aboujaoude, Large, & Serpe, 2010; Leibovici, Murad, Cooper-Kazaz, Tetro, Keuthen et al., 2014) however, mild, non-clinical forms of skin picking are much more frequent with the prevalence rate ranging from 62.7% in the general community (Hayes, Storch, & Berlanga, 2009) to 91.7% in the university sample (Bohne, Wilhelm, Keuthen, Baer, & Jenike, 2002). Skin picking is not a homogenous condition and two separate dimensions of skin picking have been distinguished regarding the awareness of picking: focused skin picking which is performed with full consciousness mostly in response to tension, urge of picking or negative emotions, and automatic skin picking which occurs mainly outside of awareness (Walther, Flessner, Conelea, & Woods, 2009). Some individuals may pick the skin both automatically and with retained consciousness, thus presenting a mixed style (Pozza, Giaquinta, & Dèttore, 2016).

Despite the relatively high prevalence of skin picking and its heterogeneity suggesting that several distinct factors may contribute to SPD, data regarding skin picking mechanisms are limited. Existing theoretical accounts considered skin picking in a framework of emotion regulation models as a dysfunctional regulation strategy aimed at decreasing the unpleasant tension associated with negative emotional states (Snorrason, Smári, & Ólafsson, 2010). Indeed, the role of skin picking in emotion regulation has received general support in a large body of studies showing that individuals with skin picking experience tension and negative emotions before picking episodes and gain relief from these negative internal states as a result of skin picking (e.g., Arnold et al., 1998; Neziroglu, Rabinowitz, Breytman, & Jacofsky, 2008; Prochwicz, Kałużna-Wielobób, & Kłosowska, 2016; Wilhelm et al., 1999). However, evidence also exists that many skin picking sufferers deny experiencing tension before picking and report only a small decrease in tension or claim that they do not experience relief as an effect of picking (Neziroglu et al., 2008). This finding suggests that factors other than tension reduction may also be involved in skin picking development and maintenance. Penzel (2003) proposed that self-injurious behaviours such as skin picking occur since they help regulate both increased and decreased arousal. This assumption has been confirmed by findings showing that not only exaggerated tension (e.g., associated with anxiety), but also abnormally low stimulation (e.g., produced by boredom) may trigger skin picking (Bohne et al., 2002; Prochwicz et al., 2016).

Recently, preliminarily evidence has been provided suggesting that a tendency to apply specific emotion regulation strategies may affect skin picking behaviours (Prochwicz, Kłosowska, & Kałużna-Wielobób, 2018). In particular, it was found that the use of cognitive reappraisal decreased skin picking severity in a non-clinical sample. Cognitive reappraisal involves the reinterpretation of emotionally valenced events in the early stages of emotion processing (Gross & John, 2003; Gross, 1998, 2002), thereby preventing the increase of negative emotions and physiological arousal, and as a result reducing the probability for an individual to apply emotion regulation strategies aimed at tension reduction, such as skin picking. Regarding emotion regulation strategies, the role of expressive suppression (a tendency to inhibit behavioural expression of emotions) was also investigated in the context of skin picking. Since applying suppression exaggerates the level of arousal, this strategy was hypothesized to trigger picking behaviours, however, the predictive role of expressive suppression in skin picking has not been confirmed (Prochwicz et al., 2018).

Previous studies concerning the interplay between emotion regulation and picking behaviours examined skin picking as a unidimensional condition and did not take into account skin picking subtypes, therefore we are not able to conclude on the basis of their findings whether focused and automatic skin picking are associated with different levels of arousal. As has already been suggested focused skin picking is often preceded by heightened tension (Twohig, Hayes, & Masuda, 2006; Walther et al., 2009) therefore, it is plausible that picking with full awareness plays a role in tension reduction. However, it has also been noted that in some sufferers skin picking does not reduce tension effectively (Neziroglu et al., 2008). It implies that skin picking may be

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also maintained by a different mechanism from tension reduction. Moreover, the link between automatic skin picking and the level of arousal is still vague and understudied. Since automatic skin picking is rarely reported to be preceded by increased tension and is performed mostly during sedentary activities (Walther et al., 2009), it seems plausible that it may be associated with a lowered level of arousal rather than with a heightened one.

The aim of our study was to examine the association between the level of arousal and skin picking behaviours in a non-clinical sample of healthy adults. Based on the Thayer theory (Thayer, 1986), we analysed the link between different activation states (energy, tiredness, tension and calmness) and two different types of skin picking: focused and automatic. We predicted that focused skin picking is associated with experience of tension whereas automatic skin picking is more likely to occur with low activation, such as tiredness. In the study we also examined the impact of emotion regulation strategies on the link between arousal and skin picking. Since applying cognitive reappraisal was confirmed to decrease the general level of skin picking severity (Prochwicz et al., 2018), we predicted that it might moderate the association between activation and focused skin picking. In particular, we predicted that enhanced cognitive reappraisal may diminish the link between tension and focused skin picking. Based on previous findings showing that the tendency to suppress behavioural expression of emotions exaggerates physiological arousal (Gross & John, 2003) and that heightened arousal exaggerates focused picking behaviours (Twohig et al., 2006; Walther et al., 2009) we assumed that increased expressive suppression may strengthen the impact of tension on picking performed with full awareness. Regarding automatic skin picking which is more likely to be performed in order to increase activation in conditions of abnormally low arousal, we expected expressive suppression to decrease the strength of positive association between lowered arousal (deactivation related to tiredness) and automatic skin picking, since it increased the level of arousal.

## 2. Methods

### 2.1. Participants

The initial study sample consisted of 225 graduate and postgraduate students. All participants completed study questionnaires during regular classes under the supervision of a researcher. All participants took part in the study voluntarily after being provided informed consent forms and a short introduction explaining their rights and the purpose of the research. On the basis of the data provided by participants we selected 108 individuals who confirmed skin picking resulting in skin damage. From this sample we excluded 19 participants who reported that they pick the skin due to dermatological problems. The final sample consisted of 89 responders, most of them (83; i.e., 93,25%) were female aged between 18 and 39 years (M = 21.36, SD = 3.39).

The study was approved by the local Ethic Committee.

### 2.2. Measurements

#### 2.2.1. The Milwaukee Inventory fo the Dimensions od Adult Skin Picking, MIDAS (Walther et al., 2009)

The MIDAS is a 12-item scale which allows one to assess the focused and automatic skin picking styles. It contains two 6-item subscales: the focused style of picking subscale, and the automatic style of picking subscale. The Polish translation of MIDAS was used with the Cronbach's alphas calculated for the current sample: $\alpha = 0.83$ for the focused skin picking subscale; $\alpha = 0.75$ for the automatic skin picking subscale.

#### 2.2.2. The Activation–Deactivation Adjective Checklist, AD ACL (Thayer, 1986)

The AD ACL is a 20-item self-report measure which assesses multidimensional subjective experiences of arousal using four subscales distinguished on the basis of factor analysis labelled as: general activation (energy), high activation (tension), general deactivation (calmness), deactivation-sleep (tiredness). Each subscale contains 5 adjectives referring to energetic arousal or tense arousal rating on 4-point scale. In the current sample we used the Polish version of AD ACL with the following internal consistency of subscales: $\alpha = 0.86$ for the general activation subscale; $\alpha = 0.81$ for the high activation subscale; $\alpha = 0.66$ for the general deactivation subscale and $\alpha = 0.70$ for the deactivation-sleep subscale.

#### 2.2.3. Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)

The ERQ is a self-administered questionnaire developed to measure emotion regulation strategies. It contains ten items divided into two subscales measuring expressive suppression (four items) and cognitive reappraisal (six items). The Polish version of the scale was used in the current study. Cronbach's alphas calculated for the study sample were as follows: 0.88 for the cognitive reappraisal subscale; 0.74 for the expressive suppression subscale.

## 3. Results

### 3.1. Analysis plan

Firstly, the Saphiro-Wilk's test was utilized to assess distributions of study variables. Then, a correlation analysis was conducted to evaluate relationships between variables. Next, a series of linear regression analyses was performed to check whether the level of activation/deactivation predicts automatic and focused skin-picking. Finally, moderation analyses were conducted to examine the interactive effect of activation/deactivation level and emotion regulation strategy on automatic/focused skin-picking. Interaction effects were examined separately for each predictor, moderator and dependent variable in parallel models. Each model examined the main effects of one of the predictors (general activation-energy/deactivation-sleep/high activation-tension/general deactivation-calmness) and one of the moderator variables (expressive suppression/cognitive reappraisal), as well as their interaction; 16 moderation analyses were conducted in total. Continuous predictor variables were grand mean centred prior to creating interaction terms. To explore significant interaction effects the Johnson-Neyman technique was utilized. Before conducting regression analyses we verified that regression assumptions were met. Cases with missing data were excluded from the analyses. Age and gender were controlled for in all regression analyses. The Bonferroni correction was not used because it could not be assumed that the results of separate analyses were independent. All calculations were conducted using SPSS version 22. Interaction analyses were performed using PROCESS macro for SPSS.

### 3.2. Correlation analysis

Results of Saphiro-Wilk's test showed that scores of all measured variables deviated from the normality ($p < 0.05$). Therefore, Spearman's correlation coefficients were calculated. Correlation coefficients are presented in Table 1.

### 3.3. Predictive role of activation/deactivation on focused and automatic skin-picking

Six independent linear regression analyses were performed to examine the relationship between activation/deactivation and styles of skin picking. High activation turned out to be a significant predictor of focused skin-picking ($B = 0.57$; $SE = 0.17$; $\beta = 0.34$; $p = 0.001$; $R^2 = 0.15$) as well as automatic skin-picking ($B = 0.76$; $SE = 0.18$; $\beta = 0.41$; $p < 0.001$; $R^2 = 0.19$). The greater level of high activation the more individuals pick the skin. Additionally, general activation (energy) was a significant predictor of automatic skin-picking ($B = -0.50$, $SE =$