**Methods**

*Study Population*

The study population consisted of consecutive adult AD patients who had been referred to the outpatient clinics of Italian dermatology centers of the Catholic University of Rome, University of L’Aquila, Humanitas University in Milan, and University of Verona, during the period from March 15 to May 15, 2019. Male and female individuals aged >18 years were included in this study if AD had been diagnosed at least 6 months prior to the enrollment, according to the consensus criteria of the American Academy of Dermatology [18]. Subjects were excluded from the study in case of: (1) suffering from any other chronic skin disease; (2) diagnosis of a psychiatric disorder (i.e., depression); or (3) any addiction (namely to alcohol or drugs).

For each patient, demographic and clinical data (age, body mass index, presence of comorbidities, age at disease onset, disease duration, and disease severity) were recorded. For the control group, adult subjects were randomly selected from healthy individuals who had undergone routine screening visits for skin cancer, matched for age and gender with the patient population, during the same time interval. The study was approved by the local ethical committee of each university department and was carried out in accordance with the 1964 Helsinki Declaration.

*Assessment Tool for AD Severity*

Severity of disease was evaluated considering both AD-related symptoms and skin involvement. The Eczema Area and Severity Index (EASI), classifying mild (EASI value ≤7.0), moderate (EASI values ranging from 7.1 to 21), and severe disease (EASI >21.1) [19], was used as physician assessment tool for AD skin lesional features and body surface area involvement. Conventionally, we also considered EASI values ≥16 to identify moderate-to-severe forms of AD [20]. Itch was assessed using a numeric rating scale (itch NRS) with values ranging from 0 to 10. Another 0–10 NRS was used to assess sleep deprivation and disturbances (sleep NRS).

*Assessment Tool for Alexithymia*

The 20-item Toronto Alexithymia Scale (TAS-20), a validated self-reporting scale, was used to detect alexithymia [21]. The TAS-20 consists of 20 items. Each item is rated using a 5-point Likert scale: 1 = strongly disagree, 2 = neither agree nor disagree, 3 = undecided, 4 = agree, 5 = strongly agree. The TAS-20 analyzes 3 dimensions characterizing alexithymia: (1) difficulty in identifying feelings (7 items); (2) difficulty in describing feelings (5 items); and (3) externally oriented thinking (8 items). Dimension 1, named “difficulty identifying feelings,” is used to determine “difficulty in identifying the correct words for one’s own emotions” and includes items 1, 3, 6, 7, 9, 13, and 14; dimension 2, named “difficulty describing feelings,” is used to determine “difficulty in describing one’s own emotions” and includes items 2, 4, 11, 12, and 17; and dimension 3, named “externally oriented thinking,” is used to determine whether an individual has “a preference to talk about people’s daily-life activities rather than their emotions” and includes items 5, 8, 10, 15, 16, 18, 19, and 20. The total alexithymia score, ranging from 20 to 100, represents the sum of the responses to all 20 items, whereas the score for each subscale was the sum of the response items used for each subscale. A total TAS-20 score equal to or greater than 61 indicates alexithymia; a TAS-20 score ranging from 51 to 60 is considered borderline alexithymia (possible alexithymia); a TAS-20 score lower than 50 indicates no alexithymia. Overall, the alexithymic personality trait was attributed to patients scoring ≥51.

*Statistical Analysis*

Continuous variables were presented as means ± standard deviation, and categorical variables as absolute values and percentage. The *t* test or Mann-Whitney test for continuous variables and the χ2 or Fisher exact test for categorical variables were used, as appropriate, to compare differences between the AD group and control group. The association between disease characteristics and alexithymia was evaluated through several logistic regression models. In all cases, disease characteristics were first tested as independent variable in univariate regression models. Then, only variables associated with the outcome with *p* > 0.10 were considered for the inclusion in the final multivariable model. Assumptions for each regression type and interaction studies were performed. The types of regression models that were built were: (1) a multivariable ordered logistic regression model having alexithymia as outcome (categorized as no alexithymia, borderline score, and alexithymia), (2) a multivariable linear regression model having TAS-20 score as outcome, and (3) a logistic regression model having alexithymic personality trait (yes/no) as outcome. All models were run a second time with adjustment for age and sex. *p* < 0.05 was considered statistically significant. Statistical analysis was performed using STATA 16.0 software (Statacorp LP Inc., College Station, TX, USA).