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The Burden of Mild-to-Moderate Atopic Dermatitis In Europe: Analyses of the National Health and Wellness Survey

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Background and Objective

- Atopic dermatitis (AD) is a relapsing chronic inflammatory skin disease characterized by pruritus and eczematous lesions[1]
- Evidence describing the burden of mild-to-moderate AD is limited; therefore, a need exists for additional data to further define the extent of AD impact

Objective:
To describe the clinical and humanistic burden of mild-to-moderate AD in Europe from the patient perspective

AD, atopic dermatitis.
1. Weidinger S et al. *Nat Rev Dis Primers.* 2018;4:1.

Methods

- **Population**
  - Data from the 2017 National Health and Wellness Survey (NHWS), a global cross-sectional self-reported survey, were accessed to evaluate disease burden for patients in the EU-5: France, Germany, Italy, Spain, and the United Kingdom
  - Participants 18 years of age and older self-reporting AD and/or eczema were compared with respondents without AD/eczema using propensity score matching (ie, non-AD controls)
  - Self-reported data provided patient-centered assessments of disease burden

AD, atopic dermatitis.

Classification of AD Severity

- Analyses replicated using 2 different methods

Self-Assessed Severity

- For patients currently using therapies for treatment of AD, severity was defined based on their self-reported assessment when using their medication as “mild,” “moderate,” or “severe”
- For patients not currently using therapies for treatment of AD, their severity was defined based on their reported overall severity as “mild,” “moderate,” or “severe”
- Results in this presentation are based on the self-reported severity classification of AD (mild, moderate, severe)

DLQI Severity Bands

- Categorized using DLQI total score[1]

0-1	No effect	Mild-to-Moderate <11
2-5	Small effect	
6-10	Moderate effect	
11-20	Very large effect	Moderate-to-Severe ≥6
21-30	Extremely large effect	

- MCID for DLQI score for inflammatory skin diseases has been established as 4 points[2]

DLQI, Dermatology Life Quality Index; MCID, minimal clinically important difference.
1. Hongbo Y, et al. *J Invest Dermatol*. 2005;25:659-664. 2. Basra MK, et al. *Dermatology*. 2015;230(1):27-33.

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Methods

- **Statistical Analyses**
  - Demographics and clinical characteristics
    - Evaluated using Chi-square and ANOVA tests for categorical and continuous variables, respectively
  - Differences across AD severity (mild, moderate, severe) versus matched non-AD controls were evaluated for comorbidities, quality of life, work-related outcomes, and psychological burdens.
    - Assessed using Chi-square and ANOVA tests
  - Propensity score matching was used to identify a matched non-AD control group
    - Demographic and health characteristic variables that differed between groups (AD and non-AD control) as measured by $P<0.10$ were then entered into a logistic regression
    - The logistic regression predicted classification of participants as AD patients versus non-AD control group. The predicted values were saved as propensity scores
    - A propensity score matching process, using a greedy matching algorithm, was implemented to match each AD patient with a non-AD control whose propensity score was closest (i.e., “1:1 matched controls”)

AD, atopic dermatitis; ANOVA, analysis of variance; DLQI, Dermatology Life Quality Index.

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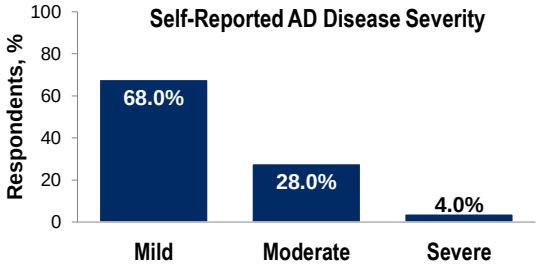
Results: Selected Demographic and Clinical Characteristics

- A total of 4,208 patients with AD/eczema were included
  - Mean age: 45.6 years
  - Females: 68.1%
- Selected clinical characteristics for AD respondents
  - Largest proportion had allergic rhinitis and/or asthma,1,570 (37.3%)
  - A large proportion were diagnosed with AD/eczema 16+ years ago, 1,721 (40.9%), providing further evidence for the chronicity of AD in this cohort



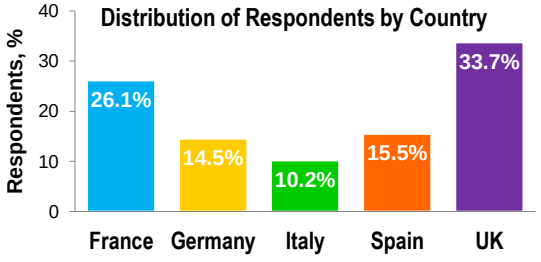


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Table 1. Increased Comorbidity Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Most Common: Allergies, Pain, and Allergic Rhinitis

Comorbidities, n (%)	AD cohort (N=4208)			Matched non-AD control cohort (N=4208)	*P* value (AD cohort vs matched non-AD control cohort)
	Mild AD (n=2862)	Moderate AD (n=1177)	Severe AD (n=169)		
Allergies	1146 (40.04)	567 (48.17)	87 (51.48)	933 (22.17)	<0.0001
Food allergies	389 (13.59)	201 (17.08)	40 (23.67)	258 (6.13)	<0.0001
Allergic rhinitis	746 (26.07)	294 (24.98)	48 (28.40)	949 (22.55)	0.0034
Asthma	632 (22.08)	281 (23.87)	46 (27.22)	849 (20.18)	0.0069
Hypertension	604 (21.10)	248 (21.07)	43 (25.44)	739 (17.56)	0.0001
High cholesterol	578 (20.20)	240 (20.39)	38 (22.49)	663 (15.76)	<0.0001
Type 2 diabetes	183 (6.39)	78 (6.63)	13 (7.69)	264 (6.27)	0.8768
Heart attack	38 (1.33)	22 (1.87)	4 (2.37)	60 (1.43)	0.4431
Congestive heart failure	27 (0.94)	17 (1.44)	2 (1.18)	36 (0.86)	0.3319
Atrial fibrillation	39 (1.36)	16 (1.36)	7 (4.14)	52 (1.24)	0.0164
Angina	315 (11.01)	137 (11.64)	25 (14.79)	322 (7.65)	<0.0001
Peripheral vascular disease	13 (0.45)	11 (0.93)	2 (1.18)	7 (0.17)	0.0006
Stroke	27 (0.94)	7 (0.59)	1 (0.59)	40 (0.95)	0.6596
Migraine	513 (17.92)	246 (20.90)	51 (30.18)	521 (12.38)	<0.0001
Attention deficit disorder	24 (0.84)	14 (1.19)	6 (3.55)	20 (0.48)	<0.0001
Attention deficit hyperactivity disorder	17 (0.59)	11 (0.93)	6 (3.55)	16 (0.38)	<0.0001
Pain	903 (31.55)	413 (35.09)	66 (39.05)	943 (22.41)	<0.0001

AD, atopic dermatitis.

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Figure 1. Increased Comorbidity Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Comorbidities Reported by ≥20% of Respondents in Severity Group

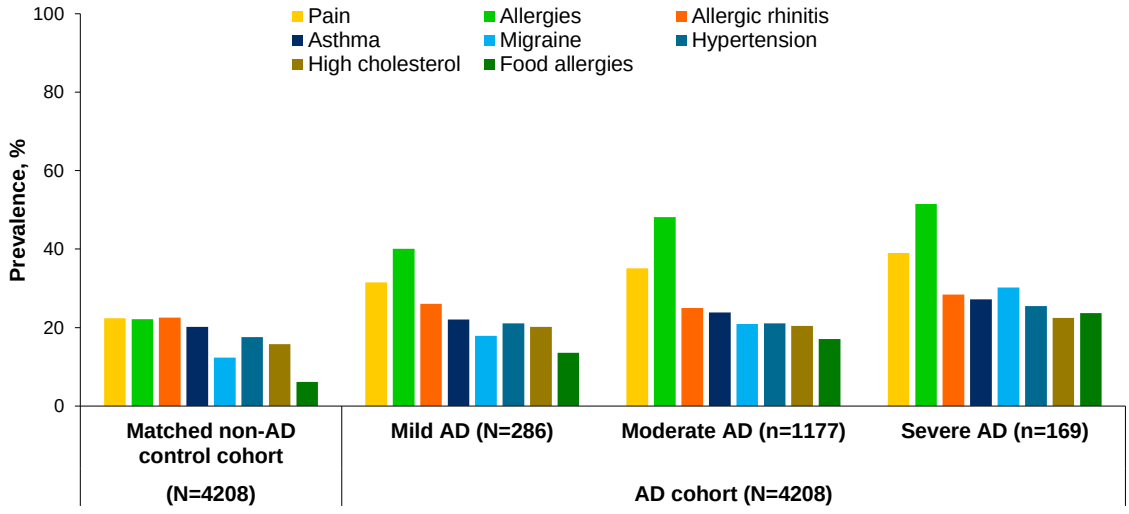

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Table 2. Increased Self-Reported Psychological Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Characteristic, n (%)	AD cohort (N=4208)			Matched non-AD control cohort (N=4208)	*P* value (AD cohort vs matched non-AD control cohort)
	Mild AD (n=2862)	Moderate AD (n=1177)	Severe AD (n=169)		
Anxiety					
Anxiety	1185 (41.40)	538 (45.71)	91 (53.85)	1355 (32.20)	<0.0001
Depression severity					
None-minimal	1,413 (49.37)	453 (38.49)	49 (28.99)	2320 (55.13)	
Mild	767 (26.80)	356 (30.25)	50 (29.59)	1,022 (24.29)	
Moderate	353 (12.33)	178 (15.12)	33 (19.53)	477 (11.34)	<0.0001
Moderately severe	211 (7.37)	118 (10.03)	21 (12.43)	229 (5.44)	
Severe	118 (4.12)	72 (6.12)	16 (9.47)	160 (3.80)	

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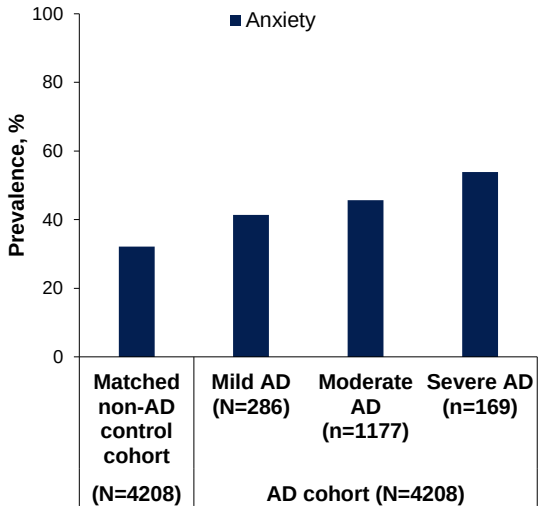
Figures 3 and 4. Increased Self-Reported Psychological Burden for Mild-to-Moderate AD versus Matched Non-AD Controls



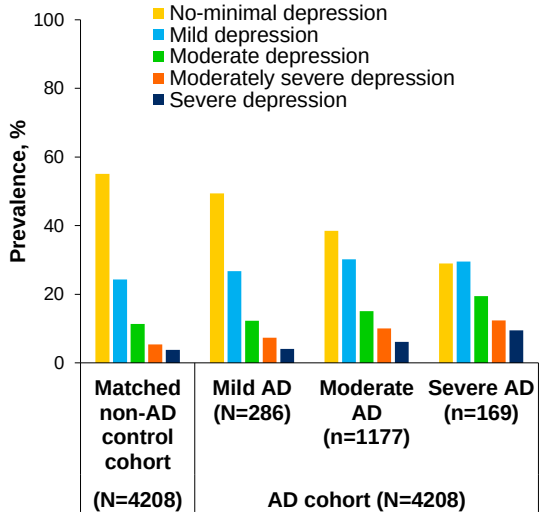


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Table 3. Increased Sleep Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Impact and Severity of Sleep Difficulties

Characteristic, n (%)	AD cohort (N=4208)			Matched non-AD control cohort (N=4208)	*P* value (AD cohort vs matched non-AD control cohort)
	Mild AD (n=2862)	Moderate AD (n=1177)	Severe AD (n=169)		
At Least One Sleep Difficulty					
At Least One Sleep Difficulty	1418 (49.55)	647 (54.97)	105 (62.13)	1677 (39.85)	<0.0001
Severity of sleep difficulties					
No sleep difficulties	1444 (50.45)	530 (45.03)	64 (37.87)	2531 (60.15)	<0.0001
Mild	758 (26.48)	241 (20.48)	30 (17.75)	883 (20.98)	
Moderate	524 (18.31)	294 (24.98)	41 (24.26)	609 (14.47)	
Severe	136 (4.75)	112 (9.52)	34 (20.12)	185 (4.40)	
Impact of sleep difficulties					
No report of sleep difficulties	1444 (50.45)	530 (45.03)	64 (37.87)	2531 (60.15)	<0.0001
Sleep difficulties have no impact	151 (5.28)	58 (4.93)	11 (6.51)	190 (4.52)	
Little impact	423 (14.78)	145 (12.32)	19 (11.24)	503 (11.95)	
Mild impact	376 (13.14)	171 (14.53)	18 (10.65)	470 (11.17)	
Moderate impact	349 (12.19)	214 (18.18)	38 (22.49)	392 (9.32)	
Severe impact	119 (4.16)	59 (5.01)	19 (11.24)	122 (2.90)	

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Table 4. Increased Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Mean SF-36 Mental and Physical Components Summary Scores

SF-36 Summary Score	AD cohort (N=4208)			Matched non-AD control cohort (N=4208)	*P* value (AD cohort vs matched non-AD control cohort)
	Mild AD (n=2862)	Moderate AD (n=1177)	Severe AD (n=169)		
Mental Component Summary Score					
Mean (SD)	44.17 (10.76)	41.69 (10.35)	40.52 (10.28)	45.66 (10.26)	<0.0001
Physical Component Summary Score					
Mean (SD)	49.40 (9.66)	47.91 (10.03)	46.54 (10.37)	50.07 (9.36)	<0.0001

AD, atopic dermatitis; SD, standard deviation.

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Table 5. Trend for Increased Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Shown for Mean Scores for ALL 8 SF-36 Domains

SF-36 Domain Scores Mean (SD)	AD cohort (N=4208)			Matched non-AD control cohort (N=4208)	*P* value (AD cohort vs matched non-AD control cohort)
	Mild AD (n=2862)	Moderate AD (n=1177)	Severe AD (n=169)		
Bodily pain score	47.18 (10.16)	44.73 (10.66)	42.68 (11.25)	48.08 (10.14)	<0.0001
Vitality score	48.13 (9.54)	46.83 (9.60)	46.97 (10.47)	49.52 (9.71)	<0.0001
General health score	46.79 (10.06)	45.42 (10.47)	45.13 (11.09)	48.00 (10.00)	<0.0001
Physical functioning score	50.14 (9.32)	48.45 (9.98)	47.42 (10.72)	50.73 (9.26)	<0.0001
Physical role functioning score	46.73 (9.73)	44.82 (9.82)	42.36 (10.52)	47.79 (9.60)	<0.0001
Emotional role functioning score	43.77 (11.64)	40.90 (11.83)	38.69 (12.23)	45.18 (11.57)	<0.0001
Mental health score	45.45 (9.90)	43.26 (9.52)	42.28 (10.23)	46.80 (9.68)	<0.0001
Social functioning score	45.64 (10.03)	42.85 (10.07)	40.95 (10.45)	46.64 (9.86)	<0.0001

AD, atopic dermatitis, SD, standard deviation.

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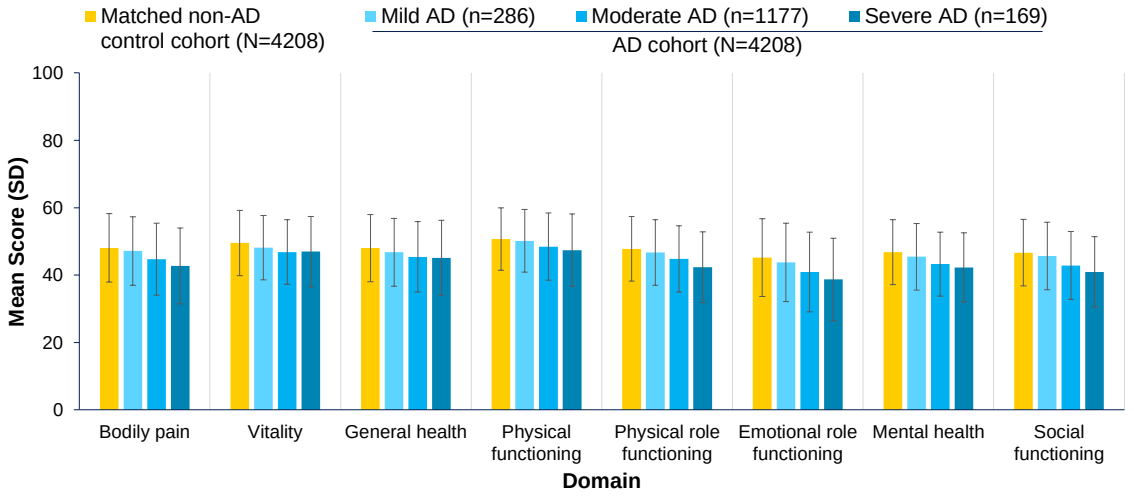
Figure 2. Trend for Increased Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Mean Scores for ALL 8 SF-36 Domains



AD, atopic dermatitis, SD, standard deviation.

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Table 6. Increased Utilities Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Mean EQ-5D-5L Index and VAS

	AD cohort (N=4208)			Matched non-AD control cohort (N=4208)	*P* value (AD cohort vs matched non-AD control cohort)
	Mild AD (n=2862)	Moderate AD (n=1177)	Severe AD (n=169)		
EQ-5D-5L Index					
Mean (SD)	0.78 (0.22)	0.72 (0.26)	0.67 (0.29)	0.81 (0.22)	<0.0001
EQ-5D-5L VAS					
Mean (SD)	72.45 (20.59)	66.64 (22.73)	60.32 (23.73)	74.73 (20.37)	<0.0001

AD, atopic dermatitis; EQ-5D-5L, EuroQol 5-Dimensions 5-Levels; SD, standard deviation.

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Table 7. Increased Mean Work and Activity Functioning Burden for Mild-to-Moderate AD versus Matched Non-AD Controls

Work and Activity Functional Measures[1]	AD cohort (N=4208)			Matched non-AD control cohort (N=4208)	*P* value (AD cohort vs matched non-AD control cohort)
	Mild AD (n=2862)	Moderate AD (n=1177)	Severe AD (n=169)		
Absenteeism					
Mean (SD)	8.82 (22.80)	11.95 (24.98)	12.22 (23.60)	7.67 (21.22)	0.0002
Presenteeism					
Mean (SD)	21.25 (25.45)	28.88 (27.49)	36.43 (28.40)	20.63 (25.96)	<0.0001
Overall work impairment					
Mean (SD)	23.51 (27.79)	32.02 (30.33)	40.55 (30.24)	22.48 (28.21)	<0.0001
Activity impairment					
Mean (SD)	28.86 (28.52)	36.94 (29.91)	42.84 (30.18)	26.25 (28.49)	<0.0001

[1]Absenteeism (% of work time missed because of one's health in the past 7 days), presenteeism (% impairment experienced while at work in the past 7 days because of one's health), overall work impairment (combination of absenteeism and presenteeism), and activity impairment (% impairment in daily activities because of one's health in the past 7 days).
AD, atopic dermatitis; SD, standard deviation.

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Conclusions

- Increased clinical and humanistic burden was consistently observed for patients with **mild-to-moderate AD** in Europe
  - Compared to matched non-AD controls
  - Across multiple self-reported assessments:
    - Comorbidities
    - Sleep difficulties
    - Psychological assessments
    - Quality of life/functional status
    - Work productivity
  - For some measures, the burden in mild disease was comparable to that for moderate disease
- These findings highlight the importance of improving disease management in patients with **mild-to-moderate AD** and providing more effective treatments to reduce the disease burden for these patients
- Study limitations: Clinician-confirmed diagnoses and severity assessments were not available

AD, atopic dermatitis.