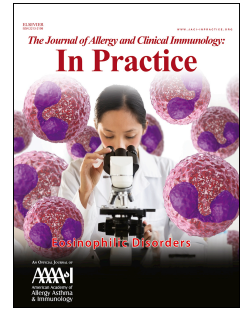


Journal Pre-proof

Patient-Reported Outcome Measures in Atopic Dermatitis and Chronic Urticaria are Underused in Clinical Practice

Ivan Cherrez-Ojeda, MD, Jean Bousquet, MD, Ana Giménez-Arnau, MD, PhD, Kiran Godse, MD PhD, Dorota Krasowska, MD, PHD, Joanna Bartosińska, MD, PHD, Paulina Szczepanik-Kułał, MD, PHD, Bartłomiej Wawrzycki, MD, PHD, Pavel Kolkhir, MD, Anastasiia Allenova, MD, PhD, Andrey Allenov, MD, PhD, Sergey Tkachenko, MD, PhD, Natasa Teovska Mitrevska, MD, Dragan Mijakoski, MD, PhD, Sasho Stoleski, MD, PhD, Marta Kolacinska-Flont, MD, PhD, Izabela Kupryś-Lipinska, MD, PhD, Joanna Molinska, MSc, Alicja Kasperska-Zajac, MD, PhD, Magdalena Zajac, MD, Mateusz Zamlynski, MD, PhD, Florin Mihaltan, MD, Ruxandra Ulmeanu, MD, PhD, FCCP, Anna Zalewska-Janowska, MD, PhD, Katarzyna Tomaszewska, MD, PhD, Mona Al-Ahmad, MD, Maryam Ali Al-Nesf, MD, MSs, ABHS, Tayseer Ibrahim, MD, MSc, Sami Aqel, MD, David Pesqué, MD, Mónica Rodríguez-González, MD, Guillermo Hideo Wakida-Kuzunoki, MD, German D. Ramon, MD, Gonzalo N. Ramon, MD, Sophia Neisinger, MD, Hanna Bonnekoh, MD, Maia Rukhadze, MD, Maryam Khoshkhui, MD, Daria Fomina, MD, Désirée Larenas-Linnemann, MD, Mitja Košnik, MD, Rabia Oztas Kara, MD, Chrystopherson Gengyny Caballero López, MD, Qiang Liu, MD, Carlos Ivancevich Juan, MD, Luis Felipe Ensina, MD, MSc PhD, Nelson Rosario, MD, PhD, Violeta Kvedariene, MD, PhD, Moshe Ben-Shoshan, MD, MSc, Roberta Fachini Jardim Criado, MD, MSc, Andrea Bauer, MD, MPH, Annia Cherrez, MD, Herberto Chong-Neto, MD, PhD, Maria Isabel Rojo-Gutierrez, MD, Michael Rudenko, MD, PhD FAAAAI, José Ignacio Larco Sousa, MD, Aleksandra Lesiak, MD, Edgar Matos, MD, Nelson Muñoz, MD, Ivan Tinoco, MD, Jaime Moreno, MD, Carolina Crespo Shijin, MD, Romina Hinojosa Logroño, MD, Juan C. Sagñay, MD, Marco Faytong-Haro, MA, Karla Robles-Velasco, MD, Torsten Zuberbier, MD, Marcus Maurer, MD



PII: S2213-2198(24)00349-0

DOI: <https://doi.org/10.1016/j.jaip.2024.03.050>

Reference: JAIP 5391

To appear in: *The Journal of Allergy and Clinical Immunology: In Practice*

Received Date: 20 November 2023

Revised Date: 25 March 2024

Accepted Date: 26 March 2024

Please cite this article as: Cherrez-Ojeda I, Bousquet J, Giménez-Arnau A, Godse K, Krasowska D, Bartosińska J, Szczepanik-Kułał P, Wawrzycki B, Kolkhir P, Allenova A, Allenov A, Tkachenko S, Teovska Mitrevska N, Mijakoski D, Stoleski S, Kolacinska-Flont M, Kuprys-Lipinska I, Molinska J, Kasperska-Zajac A, Zajac M, Zamlynski M, Mihaltan F, Ulmeanu R, Zalewska-Janowska A, Tomaszewska K, Al-Ahmad M, Al-Nesf MA, Ibrahim T, Aqel S, Pesqué D, Rodríguez-González M, Wakida-Kuzunoki GH, Ramon GD, Ramon GN, Neisinger S, Bonnekoh H, Rukhadze M, Khoshkhui M, Fomina D, Larenas-Linnemann D, Košnik M, Oztas Kara R, Caballero López CG, Liu Q, Ivancevich Juan C, Ensina LF, Rosario N, Kvedariene V, Ben-Shoshan M, Criado RFJ, Bauer A, Cherrez A, Chong-Neto H, Rojo-Gutierrez MI, Rudenko M, Larco Sousa JI, Lesiak A, Matos E, Muñoz N, Tinoco I, Moreno J, Crespo Shijin C, Hinojosa Logroño R, Sagñay JC, Faytong-Haro M, Robles-Velasco K, Zuberbier T, Maurer M, Patient-Reported Outcome Measures in Atopic Dermatitis and Chronic Urticaria are Underused in Clinical Practice *The Journal of Allergy and Clinical Immunology: In Practice* (2024), doi: <https://doi.org/10.1016/j.jaip.2024.03.050>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2024 Published by Elsevier Inc. on behalf of the American Academy of Allergy, Asthma & Immunology

1 **Patient-Reported Outcome Measures in Atopic Dermatitis and Chronic Urticaria are**
 2 **Underused in Clinical Practice**

3
 4 **Short Title:** PROMs are underused in AD and CU

5
 6 **Authors / Affiliations**

No	Family name	Given name(s)	Affiliation(s) (Clinic/University, Department, City, Country)	Email address	Degree
1	Cherrez-Ojeda	Ivan	1. Universidad de Especialidades Espíritu Santo, School of Medicine, Samborondón, Ecuador 2. RespiraLab, Research, Guayaquil, Ecuador	ivancherrez@gmail.com	MD
2	Bousquet	Jean	1. Charité - Universitätsmedizin Berlin, Institute of Allergology, Berlin, Germany 2. Fraunhofer Institute for Translational Medicine and Pharmacology ITMP, Allergology and Immunology, Berlin, Germany	Jean.bousquet@orange.fr	MD
3	Giménez-Arnau	Ana	Department of Dermatology, Hospital del Mar, IMIM, Universitat Pompeu Fabra , Barcelona, Spain	anamariagimenezarnau@gmail.com	MD, PhD
4	Godse	Kiran	Department of Dermatology, D Y. Patil University School of Medicine, Mumbai, India	drgodse@gmail.com	MD PhD
5	Krasowska	Dorota	Department of Dermatology, Venereology and Pediatric Dermatology, Medical University of Lublin, Lublin, Poland	dor.krasowska@gmail.com	MD, PHD
6	Bartosńska	Joanna	1. Department of Cosmetology and Aesthetic Medicine Medical University of Lublin Poland; 2. Department of Dermatology, Venereology and Pediatric Dermatology Medical University of Lublin, Poland	jbartosinski@gmail.com	MD, PHD
7	Szczepanik-Kułak	Paulina	Department of Dermatology, Venereology and Pediatric Dermatology, Medical University of Lublin, Lublin, Poland	paulinaszczepanikkulak@gmail.com	MD, PHD

8	Wawrzycycki	Bartłomiej	Department of Dermatology, Venereology and Pediatric Dermatology, Medical University of Lublin, Lublin, Poland	bartekwawrzycycki@gmail.com	MD, PHD
9	Kolkhir	Pavel	1.Charité - Universitätsmedizin Berlin, Institute of Allergology, Berlin, Germany 2.Fraunhofer Institute for Translational Medicine and Pharmacology ITMP, Allergology and Immunology, Berlin, Germany	pavel.kolkhir@charite.de	MD
10	Allenova	Anastasiia	1.Laboratory of Immune-mediated skin diseases, Institute of Regenerative Medicine, Biomedical Science & Technology Park, I.M. Sechenov First Moscow State Medical University (SechenovUniversity), Moscow, Russian Federation 2.Medical Research and Education Center, M.V. Lomonosov Moscow State University, Moscow, Russian Federation	Erika-mma@yandex.ru	MD, PhD
11	Allenov	Andrey	1.Institute for Leadership and Health Management, I.M. Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russian Federation 2.State Budgetary Healthcare Institution of the City of Moscow "City Polyclinic No. 2 10 of the Department of Health of the City of Moscow", Moscow, Russian Federation 3.Federal State Budgetary Scientific Institution "N.A. Semashko National Research Institute of Public Health", Moscow, Russian Federation	allenovandrey@yandex.ru	MD, PhD
12	Tkachenko	Sergey	Russian Medical Academy of Continuous Professional Education of the Ministry of Health of the Russian Federation, Moscow, Russian Federation	doc4200@yandex.ru	MD, PhD
13	Teovska Mitrevska	Natasa	1.Remedika general hospital dermatology department, Skopje Republic of North Macedonia 2.International Balkan University (IBU), Skopje Republic of North Macedonia	nteovska@remedika.com.mk	MD
14	Mijakoski	Dragan	1.Institute of Occupational health of RNM-Skopje, Republic of North Macedonia 2.Faculty of Medicine, SS Cyril and Methodius, University in Skopje, Skopje Republic of North Macedonia	dmijakoski@yahoo.com	MD, PhD
15	Stoleski	Sasho	1.Institute of Occupational health of RNM-Skopje, Republic of North Macedonia 2.Faculty of Medicine, SS Cyril and Methodius, University in Skopje, Skopje Republic of North Macedonia	sstoleski@yahoo.com	MD, PhD
16	Kolacinska- Flont	Marta	Department of Internal Medicine, Asthma and Allergy, Barlicki Memorial Hospital, Medical University of Lodz, Poland	martakolacinskaflont@gmail.com	MD, PhD

17	Kuprys-Lipinska	Izabela	Department of Internal Medicine, Asthma and Allergy, Barlicki Memorial Hospital Medical University of Lodz, Poland	izabela.kuprys-lipinska@umed.lodz.pl	MD, PhD
18	Molinska	Joanna	Department of Internal Medicine, Asthma and Allergy, Medical University of Lodz, Poland	joanna.molinska@umed.lodz.pl	MSC
19	Kasperska-Zajac	Alicja	European Center for Diagnosis and Treatment of Urticaria/Angioedema (GA2LEN UCARE /ACARE Network) & Department of Clinical Allergology and Urticaria of Medical University of Silesia, Poland	alakasperska@gmail.com	MD, PhD
20	Zajac	Magdalena	European Center for Diagnosis and Treatment of Urticaria/Angioedema (GA2LEN UCARE /ACARE Network) & Department of Clinical Allergology and Urticaria of Medical University of Silesia, Poland	magdalenazajac1303@gmail.com	MD
21	Zamlynski	Mateusz	European Center for Diagnosis and Treatment of Urticaria/Angioedema (GA2LEN UCARE /ACARE Network) & Department of Clinical Allergology and Urticaria of Medical University of Silesia, Poland	m.zamlynski@hotmail.com	MD, PhD
22	Mihaltan	Florin	National Institute of Pneumology, Bucharest, Romania	mihaltan@starnets.ro	MD
23	Ulmeanu	Ruxandra	Institute of Pneumology "Marius Nasta" Bucharest, Romania	r_ulmeanu@yahoo.com	MD, PhD, FCCP
24	Zalewska-Janowska	Anna	Medical University of Lodz, Chair of Clinical Immunology and Rheumatology, Department of Psychodermatology, Lodz, Poland	anna.zalewska-janowska@umed.lodz.pl	MD, PhD
25	Tomaszewska	Katarzyna	Medical University of Lodz, Chair of Clinical Immunology and Rheumatology, Department of Psychodermatology, Lodz, Poland	katarzyna.tomaszewska@umed.lodz.pl	MD, PhD
26	Al-Ahmad	Mona	Microbiology Department, Faculty of Medicine, Kuwait University, Safat, Kuwait	Alahmadm@hsc.edu.kw monaalahmad@yahoo.com	MD
27	Al-Nesf	Maryam Ali	Allergy and Immunology Division, Medicine Department, Hamad Medical Corporation, Doha, Qatar	mariamali@hamad.qa mariam_alnisf@hotmail.com	MD, MSs, ABHS
28	Ibrahim	Tayseer	Allergy and Immunology Division, Medicine department, Hamad Medical Corporation, Doha, Qatar	tibrahim2@hamad.qa	MD, MSc
29	Aqel	Sami	Allergy and Immunology Division, Medicine department, Hamad Medical Corporation, Doha, Qatar	SAqel@hamad.qa	MD
30	Pesqué	David	1.Department of Dermatology, Hospital del Mar, Barcelona, Spain	pesquedavid@gmail.com	MD

			2.Universitat Autònoma de Barcelona (UAB). Barcelona (Spain)		
31	Rodríguez-González	Mónica	Hospital Español de México, Ciudad de México	mon.medley@gmail.com	MD
32	Wakida-Kuzunoki	Guillermo Hideo	Colegio Mexicano de Pediatras Especialistas en Inmunología Clínica y Alergia, México	guillewakida@yahoo.com.mx	MD
33	Ramon	German D.	Instituto de Alergia e Inmunologia del Sur, Bahia Blanca, Argentina, GA2LEN Ucare/Adcare/Acare center	germanramon2004@hotmail.com	MD
34	Ramon	Gonzalo N.	Instituto de Alergia e Inmunologia del Sur, Bahia Blanca, Argentina, GA2LEN Ucare/Adcare/Acare center	Gonza.ramon@hotmail.com	MD
35	Neisinger	Sophia	1.Charité - Universitätsmedizin Berlin, Institute of Allergology, Berlin, Germany 2.Fraunhofer Institute for Translational Medicine and Pharmacology ITMP, Allergology and Immunology, Berlin, Germany	sophia.neisinger@charite.de	MD
36	Bonnekoh	Hanna	1.Charité - Universitätsmedizin Berlin, Institute of Allergology, Berlin, Germany 2.Fraunhofer Institute for Translational Medicine and Pharmacology ITMP, Allergology and Immunology, Berlin, Germany	hanna.bonnekoh@charite.de	MD
37	Rukhadze	Maia	Center Allergy&Immunology, Tbilisi, Georgia / Geomedi Teaching University, Faculty of Medicine, Tbilisi, Georgia	maiarukhadze@gmail.com	MD
38	Khoshkhui	Maryam	Allergy Research Center, Mashhad University of Medical Science(MUMS), Mashhad, Iran	Khoshkhuim@mums.ac.ir	MD
39	Fomina	Daria	1.Moscow Practical and Research Center of Allergy and Immunology, Clinical City Hospital, Moscow, Russian Federation 2.Moscow Department of Clinical Immunology and Allergology, Sechenov First Moscow State Medical University, Astana Medical University, Moscow, Russian Federation	daria.s.fomina@gmail.com	MD
40	Larenas-Linnemann	Désirée	Hospital Médica Sur, Mexico City, Mexico	marlar1@prodigy.net.mx	MD
41	Košnik	Mitja	Allergy University Clinic of Respiratory and Allergic Diseases, Golnik, Slovenia Medical Faculty, University of Ljubljana, Slovenia	Mitja.Kosnik@klinika-golnik.si	MD
42	Oztas Kara	Rabia	Department of Dermatology, Sakarya University Faculty of Medicine, Sakarya, Turkey	r.oztas.kara@gmail.com	MD

43	Caballero López	Chrystopher son Gengyny	Universidad Autónoma de Puebla, Hospital Universitario de Puebla, Servicio de Alergia e Inmunología Clínica, Puebla, Puebla, México.	drcgcaballero@gmail.com	MD
44	Liu	Qiang	2nd Hospital of Hebei Medical University, Shijiazhuang City, Hebei Province, China	beidadocliu@163.com	MD
45	Ivancevich	Juan Carlos	Servicio de Alergia e Inmunologia Clinica Santa Isabel Buenos Aires Argentina	ivancev@gmail.com	MD
46	Ensina	Luis Felipe	Division of Allergy, Clinical Immunology and Rheumatology, Department of Pediatrics, Federal University of São Paulo and CPAAlpha Clinical Research Center., São Paulo, Brazil.	100alergia@gmail.com	MD, MSc PhD
47	Rosario	Nelson	Urticaria Center of Reference and Excellence (UCARE), Federal University of Parana, Rua General Carneiro, Curitiba, Brazil	nrosario@ufpr.br	MD, PhD
48	Kvedariene	Violeta	1.Institute of Biomedical Sciences, Department of Pathology, Faculty of Medicine, Vilnius University, Vilnius, Lithuania 2.Institute of Clinical Medicine, Clinic of Chest diseases, Immunology and Allergology, Faculty of Medicine, Vilnius, Lithuania	kv.violeta@gmail.com	MD, PhD
49	Ben-Shoshan	Moshe	Division of Allergy, Immunology and Dermatology, Department of Pediatrics, McGill University Health Center, Montreal, QC, Canada	moshebenshoshan@gmail.com	MD, MSc
50	Criado	Roberta Fachini Jardim	Faculdade de Medicina do ABC (FMABC), Santo André (SP), Brazil	roberta.criado@fmabc.br	MD, MSc
51	Bauer	Andrea	Department of Dermatology, University Allergy Center, University Hospital Carl Gustav Carus, Technical University, Dresden, Germany	andrea.bauer@ukdd.de	MD, MPH
52	Cherrez	Annia	Department of Dermatology and Allergy, Charité- Universitätsmedizin Berlin, Berlin, Germany.	annia.cherrez.e@gmail.com	MD
53	Chong-Neto	Herberto	Department of Pediatrics, Hospital de Clínicas, Federal University of Paraná (UFPR), Curitiba, Brazil	h.chong@uol.com.br	MD, PhD
54	Rojo-Gutierrez	Maria Isabel	Hospital Juarez De Mexico	mi_rojo@yahoo.com.mx	MD
55	Rudenko	Michael	London Allergy and Immunology Centre, London United Kingdom	consultation@ukallergy.com	MD, PhD FAAAAI

56	Larco Sousa	José Ignacio	Clinica San Felipe, Lima, Peru	jilarco@gmail.com	MD
57	Lesiak	Aleksandra	Department of Dermatology, Pediatric Dermatology and Dermatological Oncology, Medical University of Lodz, Poland	aleksandra.lesiak@umed.lodz.pl	MD
58	Matos	Edgar	Instituto Nacional de Salud del Nino, Lima, Peru.	ematben@hotmail.com	MD
59	Muñoz	Nelson	Specialist Centre: Muñoz Alergias y Pediatría, Riobamba - Ecuador	impenm@yahoo.es	MD
60	Tinoco	Ivan	Centro de Alergia Tinoco, Machala, Ecuador	ivantinoco11@hotmail.com	MD
61	Moreno	Jaime	Centro Particular de Alergias	jmorenoo1@hotmail.com	MD
62	Crespo Shijin	Carolina	Respiralab Research Group, Guayaquil, Ecuador	carocrst@gmail.com	MD
63	Hinostroza Logroño	Romina	Respiralab Research Group, Guayaquil, Ecuador	rominahinostroza14@gmail.com	MD
64	Sagñay	Juan C.	Respiralab Research Group, Guayaquil, Ecuador	jcspinilla@gmail.com	MD
65	Faytong-Haro	Marco	1.Sociology and Demography Department, The Pennsylvania State University, University Park, PA, USA. 2.Ecuadorian Development Research Lab, Daule, Guayas, Ecuador. 3.Universidad Espíritu Santo, Samborondon, Ecuador 4.Respiralab Research Group, Guayaquil, Ecuador	mfaytong@gmail.com	MA
66	Robles-Velasco	Karla	1.Universidad Espíritu Santo, Samborondon, Ecuador 1.Respiralab Research Group, Guayaquil, Ecuador	karlaroblesvelasco@gmail.com	MD
67	Zuberbier*	Torsten	1.Charité - Universitätsmedizin Berlin, Institute of Allergology, Berlin, Germany 2.Fraunhofer Institute for Translational Medicine and Pharmacology ITMP, Allergology and Immunology, Berlin, Germany	torsten.zuberbier@charite.de	MD
68	Maurer*	Marcus	1. Charité - Universitätsmedizin Berlin, Institute of Allergology, Berlin, Germany 2. Fraunhofer Institute for Translational Medicine and Pharmacology ITMP, Allergology and Immunology, Berlin, Germany	marcus.maurer@charite.de	MD

8 **Corresponding authors:**

9 Ivan Cherrez-Ojeda, MD

10 Universidad Espiritu Santo

11 Samborondon 0901952, Ecuador

12 Respiralab Research Group

13 Guayaquil, Ecuador

14 Phone: +593999981769

15 Email: ivancherrez@gmail.com

16

17 Marcus Maurer, MD

18 Charité – Universitätsmedizin Berlin

19 Institute of Allergology

20 Hindenburgdamm 30

21 12203 Berlin, Germany

22 Phone: +49-30-450-518 043

23 Fax: +49-30-450-7518 972

24 Email: marcus.maurer@charite.de

25

26 **Funding:** This study was funded by UCARE

27 **AI:** During the preparation of this work, the author(s) did not use any AI programs.

28 **Source Funding:** There was no source funding provided for this MS

29 **Target Journal:** *JACI: In Practice* (abstract: 249/250; body copy 2900/3500 words)

30 **COIs:**

31 **Ana Giménez-Arnau** is or recently was a speaker and/or advisor for and/or has received
32 research funding from Almirall, Amgen, AstraZeneca, Avene, Celldex, Escient Pharmaceuticals
33 , Genentech, GSK, Instituto Carlos III- FEDER, Leo Pharma, Menarini, Novartis, Sanofi–
34 Regeneron, Thermo Fisher Scientific, Uriach Pharma / Neucor; **Pavel Kolkhir** received
35 Honoraria (advisory board, speaker) from Novartis, Roche and ValenzaBio , outside of submitted
36 work; **Anastasiia Allenova** is a speaker for Novartis (outside of submitted work); **Marta**
37 **Kolacinska-Flont** is a lecturer for Novartis; **Izabela Kuprys-Lipinska** is a lecturer for Novartis,
38 Astrazeneca and GSK; **Hanna Bonnekoh** has received honoraria (advisory board, speaker)
39 from AbbVie, Intercept Pharma, Novartis, Sanofi-Aventis and Valenza Bio Inc. outside the
40 submitted work; **Juan Carlos Ivancevich** reports personal fees and non-financial support from
41 Laboratorios Casasco, personal fees from Abbott Ecuador, personal fees from Laboratorios
42 Bago Bolivia, personal fees from Faes Farma, outside the submitted work; **Luis Felipe Ensina**
43 received financial support for lectures and clinical research from Novartis and Sanofi; **Violeta**
44 **Kvedariene** reports non-financial support from Noramedia, and Berlin CHemie
45 Menarini, outside the submitted work; **Moshe Ben-Shoshan** is a consultant for Novartis and
46 Sanofi; **Roberta Fachini Jardim Criado** has received Payment or honoraria for lectures,
47 presentations, speaker's bureaus, manuscript writing or educational events: Takeda, Novartis,
48 Sanofi, Pfizer, support for attending meetings and/or travel: Novartis, Sanofi, Abbvie, Pfizer,
49 participation on a Data Safety Monitoring Board or Advisory Board: Pfizer, Lilly, Novartis,
50 Abbvie; **Marcus Maurer** is or recently was a speaker and/or advisor for and/or has received
51 research funding from Allakos, Alvotech, Amgen, Aquestive, Aralez, AstraZeneca, Astria, Bayer,
52 BioCryst, Blueprint, Celldex, Celltrion, Centogene, CSL Behring, Evoemune, GSK, Ipsen,
53 Kalvista, Kyowa Kirin, Leo Pharma, Lilly, Menarini, Mitsubishi Tanabe Pharma, Moxie, Noucor,
54 Novartis, Orion Biotechnoloy, Pharvaris, Resonance Medicine, Sanofi/Regeneron, Septerna,
55 Takeda, Teva, Trial Form Support International AB, Third HarmonicBio, Valenza Bio, Yuhan

56 Corporation, Zurabio. **The following authors have declared no conflicts of interest:** Drs
57 Cherrez-Ojeda, Bousquet, Godse, Krasowska, Bartosińska, Szczepanik-Kułak, Wawrzycki,
58 Allenov, Tkachenko, Teovska Mitrevska, Mijakoski, Stoleski, Sasho, Molinska, Kasperska-
59 Zając, Zając, Zamlynski, Mihaltan, Zalewska-Janowska, Tomaszewska, Al-Ahmad, Al-Nesf,
60 Maryam, Ibrahim, Aqel, Pesqué, Rodríguez-González, Wakida-Kuzunoki, Both Drs Ramon,
61 Neisinger, Rukhadze, Khoshkhui, Fomina, Larenas-Linnemann, Košnik, Mitja, Oztas Kara,
62 Caballero López, Liu, Rosario, Bauer, Chong-Neto, Rojo-Gutierrez, Rudenko, Larco, Sousa,
63 Lesiak, Aleksandra, Matos, Edgar, Muñoz, Nelson, Tinoco, Ivan, Moreno, Jaime, Crespo,
64 Shijin, Hinostroza, Logroño, Sagñay, Faytong-Haro, Robles-Velasco, Zuberbier

65 **Abstract** (249/250 words)

66 **Background:** Patient-reported outcome measures (PROMs) are validated and
67 standardized tools that complement physician evaluations and guide treatment
68 decisions. PROMs are crucial for monitoring atopic dermatitis (AD) and chronic urticaria
69 (CU) in clinical practice, but there are unmet needs and knowledge gaps regarding their
70 use in clinical practice.

71 **Objective:** We investigated the global real-world use of AD and CU PROMs in
72 allergology and dermatology clinics as well as their associated local and regional
73 networks.

74 **Methods:** Across 72 specialized allergy and dermatology centers and their local and
75 regional networks, 2,534 physicians in 73 countries completed a 53-item questionnaire
76 on the use of PROMs for AD and CU.

77 **Results:** Of 2,534 physicians, 1,308 were aware of PROMs. Of these, 14% and 15%
78 used PROMs for AD and CU, respectively. Half of physicians who use PROMs do so
79 only "rarely" or "sometimes". AD and CU PROM usage is associated with being female,
80 younger, and a dermatologist. POSCORAD and UAS were the most utilized PROMs for
81 AD and CU, respectively. Monitoring disease control and activity are the main drivers of
82 the use of PROMs. Time constraints were the primary obstacle to using PROMs,
83 followed by the impression that patients dislike PROMs. AD and CU PROM users would
84 like training in selecting the proper PROM.

85 **Conclusion:** Even though PROMs offer several benefits, their use in routine practice is
86 suboptimal, and physicians perceive barriers to their use. It is essential to attain higher
87 levels of PROM implementation in accordance with national and international standards.

88 **Highlights:**

- 89 1. **What is already known about this topic?** The significance of PROMs in
90 managing AD and CU is well recognized; however, from the limited data
91 available, it is evident that their utilization rates are very low.
- 92 2. **What does this article add to our knowledge?** It highlights the considerable
93 global underuse of PROMs, identifies the barriers to their wider adoption, and
94 underlines the strong demand for clinician training in their proper use.
- 95 3. **How does this study impact current management guidelines?** The findings
96 advocate for a revision of current management guidelines to incorporate
97 validated PROMs like UAS7, UCT, CU-Q2oL for CU, and PO-SCORAD, DLQI,
98 NRS for AD, emphasizing the urgent need for educational initiatives to enhance
99 clinician proficiency in these tools.

100

101 **Key words:** allergy, atopic dermatitis, chronic urticaria, dermatology, patient reported
102 outcome measures.

103 **List of Abbreviations:**

104 AAS= Angioedema Activity Score

105 ACARE= Angioedema Centers of Reference and Excellence

106 AD= Atopic Dermatitis

107 ADCARE= Atopic Dermatitis Centers of Reference and Excellence

108 ADCT= Atopic Dermatitis Control Tool

109 AECT= Angioedema Control Test

110 AE-QoL= Angioedema Quality of Life Questionnaire

- 111 AR= Allergic Rhinitis
- 112 ARIA= Allergic Rhinitis and its Impact on Asthma
- 113 CDLQI= Children's Dermatology Life Quality Index
- 114 CEISH= Comité de ética e Investigación en Seres Humanos
- 115 CholUAS = Cholinergic Urticaria Activity Score
- 116 CholU-QoL= Cholinergic Urticaria Quality of Life Questionnaire
- 117 CIndU= Chronic Inducible Urticaria
- 118 ColdUAS= Cold Urticaria Activity Score
- 119 CRUSE= Chronic urticaria Self-Evaluation app
- 120 CSU= Chronic Spontaneous Urticaria
- 121 CU= Chronic Urticaria
- 122 CU-Q2oL= Chronic Urticaria Quality of Life Questionnaire
- 123 DLQI= Dermatology Life Quality Index
- 124 EMA= European Medicines Agency
- 125 GA2LEN= Global European Allergy and Asthma Network
- 126 HOME= The Harmonising Outcome Measures for Eczema initiative
- 127 HRQoL= Health-related Quality of Life
- 128 IDQOL = Infants' Dermatitis Quality of Life Index
- 129 NRS= Numeric Rating Scale
- 130 POEM= Patient-Oriented Eczema Measure (POEM)
- 131 PO-SCORAD= Patient-Oriented Scoring Atopic Dermatitis Index
- 132 PROMIS= Patient-Reported Outcomes Measurement Information System
- 133 PROMS= Patient-reported outcome measures

- 134 QoL= Quality of Life
135 RECAP= Recap of Atopic Eczema
136 TARC= Thymus and Activation-Regulated Chemokine
137 UAS= Urticaria Activity Score
138 UCARE= Urticaria Centers of Reference and Excellence
139 UCT= Urticaria Control Test

140

141 **Introduction**

142 Atopic Dermatitis (AD) and Chronic Urticaria (CU) are common and disabling chronic
143 inflammatory skin diseases. AD and CU come with a significant burden on the life of
144 patients, affect mental health and sleep, impair the ability to perform daily tasks, and
145 reduce performance at work and school.(1,2)

146 Disease activity, impact, and control, in AD and CU, fluctuate, and both diseases
147 are characterized by recurrent exacerbations. In AD, flare ups are common and often
148 unpredictable. In CU, physicians rarely see a representative picture of patients' disease
149 due to the transient nature and fluctuating occurrence of signs and symptoms.

150 Furthermore, it should be noted that some biomarkers, such as D-dimer(3) for CU and
151 thymus and activation-regulated chemokine (TARC) for AD,(4) have been suggested as
152 indicators of disease activity. However, these biomarkers are less practical and more
153 costly to perform.(5,6)

154 Thus, patient-reported outcome measures (PROMs) are necessary to determine
155 the disease status of AD and CU patients, can aid in improving the quality of patient,
156 and, importantly, are guideline recommended.(7–9) PROMs are usually standardized

157 and validated instruments completed by patients that critically educate and complement
158 physician-based assessments and guide treatment decisions.(5) Generally, CU PROMs
159 are used to obtain information on disease activity (i.e., symptom burden), disease
160 impact (i.e., impairment of QoL), and the control that patients have over their disease.
161 The use of PROMs was first proposed by the European Medicines Agency (EMA) in
162 2005(10) and the U.S. Food and Drug Administration in 2006 to "*report the status of a*
163 *patient's condition that comes directly from the patient, without interpretation of the*
164 *patient's response by a clinician or anyone else*".(11) Validated PROMs are available for
165 various disorders,(12) including allergic and dermatological conditions such as AD(5)
166 and CU.(13,14)

167 For AD, the Harmonising Outcome Measures for Eczema (HOME) initiative
168 recently provided guidance on the scope of PROMs recommended for use in clinical
169 practice.(8) The Patient-Oriented Eczema Measure (POEM) and the Patient-Oriented
170 Scoring Atopic Dermatitis Index (PO-SCORAD) are recommended for measuring signs
171 and symptoms. AD control should be assessed by the use of the Recap of Atopic
172 Eczema (RECAP) or the Atopic Dermatitis Control Tool (ADCT), and three PROMs are
173 recommended for assessing itch intensity: a peak 24-hour numeric rating scale (NRS)-
174 itch, as well as 1-week NRS-itch instruments from the Patient-Reported Outcomes
175 Measurement Information System (PROMIS) Itch Questionnaire, measuring average
176 and peak itch. As for quality of life (QoL) assessments, adults and children with AD
177 should use the Dermatology Life Quality Index (DLQI) and the Children's Dermatology
178 Life Quality Index (CDLQI) or the Infants' Dermatitis Quality of Life Index (IDQOL),
179 respectively.

180 CU type and manifestation are important for the correct selection of PROMs for
181 the assessment of CU activity, impact, and control. Chronic Spontaneous Urticaria
182 (CSU), the most common type of CU, presents with wheals, angioedema, or both. In
183 CSU, patients with wheals, with or without angioedema, the weekly Urticaria Activity
184 Score (UAS7)(15–18) the Chronic Urticaria Quality of Life Questionnaire (CU-
185 Q2oL),(19–22) and the Urticaria Control Test (UCT)(23–27) are the PROMs of choice.
186 In CSU patients with predominant angioedema, with or without wheals, the Angioedema
187 Activity Score (AAS) (28,29), the Angioedema Quality of Life Questionnaire (AE-
188 QoL)(30–32), and the Angioedema Control Test (AECT) should be used.(33–35)

189 In patients with chronic inducible urticaria (CIndU), the UCT and AECT should
190 also be used by patients, but the UAS7 and the AAS as well as the CU-Q2oL and AE-
191 QoL are not suited for assessing disease activity or impact in patients with CIndU.
192 Instead, CIndU-specific PROMs should be used, which include the Cold Urticaria
193 Activity Score (ColdUAS) and the Cholinergic Urticaria Activity Score (CholUAS),(36,37)
194 for measuring disease activity, and the Cholinergic Urticaria Quality of Life
195 Questionnaire (CholU-QoL).(38)

196 There are unmet needs and knowledge gaps in the use of these tools in clinical
197 practice (39). For example, physicians need training on the utility of these PROMs,
198 including how to utilize, evaluate, and interpret results.(40) Similarly, the amount of time
199 necessary to complete these PROMs is a significant factor.(41) The absence of
200 integration of these tools within the healthcare systems itself has been firmly
201 established as a need.(42,43) While PROMs for AD and CU are commonly used in
202 clinical trials, little is known about their use in routine clinical practice.(5) To address

203 these gaps, we explored the real-world use of PROMs in AD and CU care across
204 allergy and dermatology centers worldwide, as well as their corresponding local and
205 regional networks.

206 **Material and Methods**

207 *Study participants and conduct*

208 A 53-item questionnaire on the use of PROMs for AD and CU was developed and
209 distributed to 72 medical centers across 73 countries that provide treatment for allergic
210 diseases (See **Table E1** for more information). Of these centers, 45 were specialized
211 centers of the UCARE Network - Urticaria Centers of Reference and Excellence,(44)
212 ADCARE Network – Atopic Dermatitis Centers of Reference and Excellence, and
213 ACARE Network - Angioedema Centers of Reference and Excellence, (45) while the
214 remaining 28 centers were physicians affiliated with the ARIA Network – Allergic Rhinitis
215 and its Impact on Asthma and Latin American centers. As the survey was designed to
216 explore PROMs' use in AD and/or CU, only ARIA physicians who were allergists and
217 pulmonologists and treated AD and/or CU during consultation were included in this
218 study. The centers disseminated the survey to their physicians and those of local and
219 regional networks, encompassing not only allergology and dermatology clinics but also
220 various healthcare facilities and professionals; participants across these network
221 centers and extended networks completed the survey.

222 While this sampling strategy does not represent all the medical doctors or
223 specialists in specific geographic areas, it is an expert sampling that collected
224 information from worldwide medical providers, who treat mostly common allergic and
225 related diseases like urticaria, angioedema, allergic rhinitis, allergic conjunctivitis, atopic
226 dermatitis, rhinosinusitis, and asthma.

227

228 *Questionnaire*

229 The questionnaire was developed following Passmore et al. guidelines.(46) A steering
230 committee for the PROMUSE project, which was composed by four experts and heads
231 from four specialized allergy centers worldwide, reviewed the literature and developed
232 the survey items which integrated eight constructs to be assessed: demographics,
233 knowledge about PROMs, frequency of use, PROM preferences, as well as satisfaction,
234 physician training, attitudes, and barriers of using PROMs. This questionnaire consisted
235 of fifty-three questions, which included multiple-choice questions, Likert and rating
236 scales, and visual analogue scales. For the AD and CU questions, we asked about
237 PROMs described in **Figure E1**. A pilot study was performed by the steering committee
238 with colleagues and a sample of twenty physicians. After drafting the survey, it was
239 administered through formal invitation using email.

240

241 *Ethics Review*

242 This study complied with the World Medical Association Declaration of Helsinki on
243 Ethics and was approved by the IRB "Comité de ética e Investigación en Seres
244 Humanos (CEISH)" from Guayaquil-Ecuador (#HCK-CEISH-21-002). Informed consent
245 was obtained from all participants before their voluntary participation in the survey. All
246 participant data was de-identified and remained confidential.

247

248 *Statistical analysis*

249 In **Table 1**, we present results of descriptive analyses of data from 1,308 physicians
250 who are aware of PROMs. This table provides a summary of the sample descriptive
251 statistics, including the demographic characteristics (such as sex, age group, and type
252 of consultation), PROM use, specialty status, and years of specialty, for the total sample
253 and broken down by providers who use PROMs for AD and CU. **Table 2** focuses on the
254 frequency of specific variables related to PROM use and presents the results separated
255 by providers who employ AD PROMs (N=344) and those who employ CU PROMs
256 (N=376). The variables analyzed include PROM use frequency, reason(s) for use, areas
257 of training, barriers to PROM use, access methods, and specific PROM use. **Table 3**
258 presents the percentage of PROM-aware physicians who reported using AD or CU
259 PROMs in their clinical practice, across different variables of interest (N=1,308). The
260 variables of interest in the table include sex, age group, type of consultation, years the
261 provider has been a specialist, and specialty status. For each variable of interest which
262 include the proportion of physicians who reported using AD or CU PROMs out of the
263 total number of physicians in each category. For example, the table shows that 20% of
264 male physicians who were aware of PROMs reported using AD PROMs in their
265 practice, out of the total number of male physicians who responded to the survey.

266 **Results**

267 *Physician Demographics and Distribution*

268 Of 2,534 surveys, 1,308 were included in the main analysis according to the criterion of
269 having knowledge about PROMs (**Table 1**). Most participants were between 30-49
270 years old and worked in the public sector. About 80% were specialists (28% allergists;
271 18% pediatricians, 18% dermatologists, and 14% pulmonologists).

272

273 *Only half of physicians know PROMs, and only one of seven uses PROMs for AD and*
274 *CU.*

275 Out of the total 2,534 physicians who participated in the survey, 1,308 (52%) knew what
276 PROMs are. Of these 1308 physicians, 338 used PROMs in AD (26%) and 370 used
277 them in CU (28%; **Table 1**). Of the physicians who use PROMs for AD or CU, only 48%
278 (AD) and 52% (CU) use them often or always (**Table 2**).

279

280 *AD and CU PROM use is linked to being female, young, and a dermatologist.*

281 Female physicians more often used PROMs for AD and CU than male physicians (AD:
282 30% vs 20%, $p < 0.001$; CU: 31% vs 25%, $p < 0.001$; **Table 2**). Rates of PROM users
283 were highest in the youngest physicians 20-29 years old (AD: 28%; CU: 30%) and in the
284 oldest physicians 60+ years old (AD: 22%; CU: 24%). Across medical specialties,
285 dermatologists used PROMS the most (AD: 51%, CU: 55%) followed by allergists (AD:
286 33%; CU: 44%).

287

288 *The most commonly used PROM for AD and CU is the POSCORAD and the UAS7,*
289 *respectively.*

290 Physicians who use AD PROMs most often used the POSCORAD (61%), followed by
291 the DLQI (48%) and the NRS (29%). They employed, on average, 3 (SD: 2) AD
292 PROMs. The most often used CU PROMS were the UAS7 (73%), the UCT (47%), and
293 the CU-Q2oL (29%). On average, physicians used two CU PROMs (SD: 1). These rates
294 were similar in male and female physicians and across age groups and specialties.

295

296 *Monitoring of disease control is the most common reason for using PROMS for AD and*
297 *CU*

298 The most common reasons physicians use PROMs in AD and CU were to monitor
299 disease control (94% AD; 95% CU) and severity (92% AD; 94% CU), followed by
300 monitoring performance and therapeutic approach (89% for both AD and CU) and
301 facilitating decision making (87% and 90% in AD and CU, respectively). Other common
302 reasons include the improvement of consultation efficacy (AD: 78%, CU: 80%),
303 facilitation of communication with patients (AD: 71%, CU 74%), and research (66% in
304 both AD and CU; **Table 2**).

305

306 *“Time constraints” is the main barrier to PROM use, and “choice of PROMs” is the most*
307 *common training need.*

308 For AD and CU, the main barriers to using PROMs were “time constraints” (83% and
309 80%, respectively), the perception that patients dislike PROMs (52% and 60%), and the
310 lack of integration into clinical systems (58% and 60%; **Table 2**). When asked what

311 topics physicians would like training, “how to choose which PROMs to use” for AD and
312 CU was most often reported (83% and 80%, respectively). Other common treatment
313 needs were “how to interpret PROM scores” (75% and 71%, respectively) and “how to
314 administer PROMs” (62% and 58%, respectively).

315

Journal Pre-proof

316 Discussion

317 Our study shows that many physicians who treat patients with AD and CU are not
318 aware of PROMs and that most -->80%--do not use them. These results indicate that
319 more physician information and education on AD and CU PROMs are urgently needed.

320 Published data regarding the use of PROMs by physicians in dermatology and
321 allergy clinical practice are limited and may not be as widespread as in other disease
322 states. A recent international study with 362 oncologists showed that one quarter were
323 high frequency PROM users who conducted PRO assessments on >80% of
324 patients.(47) A 2019 survey of 449 US oncologists found that 92% reported using ≥1
325 PROM in their practice (48). In a 2020 survey of 262 orthopedic surgeons in Saudi
326 Arabia, almost 70% did not use PROMs and only 5% used them regularly in daily
327 clinical work.(49) In our study, <20% of physicians used PROMs for AD or CU, and of
328 those, < 20% used them always.

329 Our study identified and confirmed important barriers to PROM use, including
330 time constraints, lack of integration into clinical systems, and the perception that
331 patients dislike questionnaires. These findings were, in part, similar to those of a
332 previous study, which also identified other barriers such as lack of physicians resources
333 and additional workload when using PROMs.(40) Of note, the perception of physicians
334 and patients regarding longitudinal assessments using PROMs appears to differ.
335 Abernathy et al. examined patients' willingness to employ a longitudinal e/Tablet data-
336 collection system to assess symptoms and quality of life; 88% of patients felt satisfied
337 using PROMs and would suggest them to other patients and 74% said the system
338 helped them remember symptoms they needed to report.(50)

339 Patients and physicians appear to also differ in their assessment of disease
340 impact. Schatz et al. conducted a prospective, cross-sectional, international survey
341 among patients and physicians to identify symptom perception and the impact of allergic
342 rhinitis (AR) on health-related quality of life (HRQoL).(51) Patients rated their disease as
343 more severe than physicians in all types of AR.(51) A systematic review by Ta et al.
344 showed that objective tests that assess physiological parameters and treatment
345 effectiveness did not correlate with patients' appreciation of their disease.(52) This
346 disparity in perceptions may limit or even impair the use of PROMs.(50) Given that
347 clinicians systematically underestimate patients' symptoms and their impact, which often
348 go unrecognized,(42) the longitudinal use of PROMs may help to improve patients' QoL,
349 enhance patient-physician communication, reduce emergency visits, and play a role in
350 shared decision-making.(41) Thus, Brunelli et al. proposed integrating health
351 information technology for collecting PROMs to ensure real-time clinical decisions
352 making.(42,43)

353 Valderas et al. have proposed that using PROMs in daily clinical practice to
354 facilitate patient-clinician communication about important issues which could result in
355 shared-decision making, accurate monitoring disease progression and response to
356 treatment, identification of vulnerable patients, while enabling continuous assessment of
357 the quality of care (53). Moreover, the real world use of PROMs can also help capture
358 high-quality data and provide evidence for health policy.(54,55)

359 Our results show that physician information, training, and education on PROMs
360 are needed, especially regarding optimal selection of a PROM and then interpretation of
361 the data they provide. For this, leadership and clinician engagement are key.(56) The

362 Global European Allergy and Asthma Network (GA²LEN) and its Centers of Reference
363 and Excellence in Urticaria, Angioedema, and Atopic Dermatitis (UCARE, ACARE, and
364 ADCARE, respectively) should promote--with a global perspective and through its
365 educational programs--the implementation of PROMs in routine clinical practice.(57)

366 Integrating PROMs into clinical care workflows presents challenges, as it can be
367 difficult to avoid overloading staff or requiring additional personnel. However, studies
368 show that clinical systems that integrate PROM held effectively monitoring of patients'
369 symptoms and provide valuable feedback to physicians during follow-up appointments.
370 For example, Cleeland et al. demonstrated that using automated PROMs led to
371 improved symptom management in postoperative patients.

372 Real-time digital tools used by patients prior to their visits could also counter time
373 restraints. Examples include the success of the Mask-Air app for rhinitis and asthma
374 and of the CRUSE app for chronic spontaneous urticaria.(58) The CRUSE app assists
375 patients with CSU in tracking symptoms and treatment progress, enabling them to share
376 valuable data with healthcare providers during appointments Additionally, there are
377 tools like the calculators available at Sanofi Campus for Atopic Dermatitis, which not
378 only incorporate PROMs but also Clinical Reported Outcomes
379 (<https://www.campus.sanofi/qa/patient-support/Atopic-Dermatitis>) This pre-visit data
380 collection streamlines consultations, allowing physicians to review patient progress and
381 make informed decisions quickly, ultimately improving patient care and saving time for
382 both patients and providers.

383 While this study significantly adds to the available data on real-world PROM use
384 in AD and CU, more research is needed , specifically, on the use of health information

385 technology for collecting PROMs(43) (ie, CRUSE mentioned earlier (UCARE chronic
386 urticaria self-evaluation app; (<https://cruse-control.com>). To better understand the
387 patient perspective, further research is needed on patient knowledge, attitudes,
388 perceptions, experiences, and satisfaction with the use of PROMs. This, together with
389 medical education on the advantages of employing PROMs, may help to counteract the
390 belief held by physicians that the use of PROMs is disliked by patients.

391 This study has some limitations. The results may not entirely reflect all allergic
392 practice, especially in less specialized or research-oriented settings. The survey was
393 conducted mainly with physicians from specialized centers that treat patients with
394 allergic and dermatological diseases, which probably employ PROMs more often than
395 primary care physicians or specialists who do not work at specialized centers.
396 Additionally, the limited representation of dermatologists in the study, who are the
397 primary healthcare professionals responsible for treating moderate-to-severe AD and
398 CU, may result in either overestimation or underestimation of the utilization of AD and
399 CU patient-reported outcome measures (PROMs). Our questionnaire was not validated.
400 It also did not include questions about PROMs use according to disease severity. Future
401 questionnaires should include questions about circumstances for PROM use.

402 Furthermore, our questionnaire did not differentiate between Patient-Reported
403 Outcome Measures (PROMs) for Chronic Spontaneous Urticaria (CSU) and Chronic
404 Inducible Urticaria (CIndU). At the time of questionnaire design, the distinction between
405 these subtypes was not fully addressed due to the limited availability and validation of
406 specific PROM tools for CIndU. This represents a significant limitation of our study, as it
407 may have impacted our ability to capture nuanced differences in PROM utilization

408 between these urticaria subtypes. Recognizing this gap, future studies should aim to
409 incorporate distinct measures for CSU and CIndU to better understand the specific
410 needs and outcomes of patients within these distinct groups.

411 Additionally, the geographic and cultural diversity of the survey participants may
412 not be representative, limiting the generalizability of our findings to other regions. The
413 predominance of respondents from certain countries might not accurately mirror the
414 diagnostic and treatment practices employed in diverse healthcare contexts across the
415 globe. Recognizing this, future studies should strive for a more varied international
416 participation to ensure broader applicability of the results.

417 Although PROMs for allergic and dermatological diseases have been shown to
418 improve treatment outcomes, management, and prognosis for patients when routinely
419 applied in clinical settings, this study demonstrated that their utilization in AD and CU is
420 still suboptimal due to adoption barriers. For the assessment of chronic urticaria and
421 atopic dermatitis, we advocate for the employment of established and validated
422 instruments, specifically the UAS7, UCT, and CU-Q2oL for chronic urticaria, and the
423 PO-SCORAD, DLQI, and NRS for atopic dermatitis. These tools are both extensively
424 utilized and rigorously validated, ensuring their indispensability in achieving precise and
425 dependable evaluations in clinical and research contexts. Furthermore, the importance
426 of training patients and carers in accurately completing PROMs cannot be overstated,
427 as it significantly enhances the reliability of the data collected. Additionally, the
428 integration of digital applications designed to assist with PROM collection in the clinical
429 setting can streamline this process, making it more efficient and user-friendly. Achieving

430 higher levels of implementation of these PROMs in routine clinical care for AD and CU
431 is crucial for enhancing patient-centered outcomes and the overall quality of care..

432

433 **Acknowledgements**

434 This study was made possible by the network of Urticaria Centers of Reference and
435 Excellence (UCAREs; <https://ga2len-ucare.com>) of GA²LEN, the Global Allergy and
436 Asthma European Network. Leonard Lionnet, PhD provided writing support for this
437 manuscript, funded by UCARE. Special thanks to all members of Respiralab Research
438 Group for their initial input regarding this project. Finally, we want to express our
439 gratitude to Universidad Espiritu Santo, Ecuador for its continuous support in our
440 research endeavors.

441

442

443

444

445

446

447

448

449

450

451

452

453 **References**

- 454 1. Langan SM, Irvine AD, Weidinger S. Atopic dermatitis. *Lancet Lond Engl*. 2020 Aug
455 1;396(10247):345–60.
- 456 2. Gonçalo M, Giménez-Arnau A, Al-Ahmad M, Ben-Shoshan M, Bernstein JA, Ensina LF, et al. The
457 global burden of chronic urticaria for the patient and society. *Br J Dermatol*. 2021 Feb;184(2):226–
458 36.
- 459 3. Fok JS, Kolkhir P, Church MK, Maurer M. Predictors of treatment response in chronic spontaneous
460 urticaria. *Allergy*. 2021;76(10):2965–81.
- 461 4. Himadri, George R, Mathew L, Shanmugam V, Mani T, Jeyaseelan L. The role of thymus and
462 activation-regulated chemokine as a marker of severity of atopic dermatitis. *J Am Acad Dermatol*.
463 2021 Feb 1;84(2):545–7.
- 464 5. Barrett A, Hahn-Pedersen J, Kragh N, Evans E, Gnanasakthy A. Patient-reported outcome measures
465 in atopic dermatitis and chronic hand eczema in adults. *Patient-Patient-Centered Outcomes Res*.
466 2019;12(5):445–59.
- 467 6. Thijs J, Krastev T, Weidinger S, Buckens CF, de Bruin-Weller M, Bruijnzeel-Koomen C, et al.
468 Biomarkers for atopic dermatitis: a systematic review and meta-analysis. *Curr Opin Allergy Clin*
469 *Immunol*. 2015 Oct;15(5):453–60.
- 470 7. Zuberbier T, Abdul Latiff AH, Abuzakouk M, Aquilina S, Asero R, Baker D, et al. The international
471 EAACI/GA²LEN/EuroGuiDerm/APAAACI guideline for the definition, classification, diagnosis, and
472 management of urticaria. *Allergy*. 2022;77(3):734–66.
- 473 8. Leshem YA, Chalmers JR, Apfelbacher C, Furue M, Gerbens LAA, Prinsen CAC, et al. Measuring atopic
474 eczema symptoms in clinical practice: The first consensus statement from the Harmonising
475 Outcome Measures for Eczema in clinical practice initiative. *J Am Acad Dermatol*. 2020
476 May;82(5):1181–6.
- 477 9. Weller K, Siebenhaar F, Hawro T, Altrichter S, Schoepke N, Maurer M. Clinical Measures of Chronic
478 Urticaria. *Immunol Allergy Clin North Am*. 2017 Feb;37(1):35–49.
- 479 10. EMA. European Medicines Agency. 2018 [cited 2023 Feb 1]. Regulatory guidance for the use of
480 health-related quality life (HRQL) measures in evaluation medicinal products - Scientific guideline.
481 Available from: [https://www.ema.europa.eu/en/regulatory-guidance-use-health-related-quality-
482 life-hrql-measures-evaluation-medicinal-products](https://www.ema.europa.eu/en/regulatory-guidance-use-health-related-quality-life-hrql-measures-evaluation-medicinal-products)
- 483 11. U.S. Department of Health and Human Services FDA Center for Drug Evaluation and Research, U.S.
484 Department of Health and Human Services FDA Center for Biologics Evaluation and Research, U.S.
485 Department of Health and Human Services FDA Center for Devices and Radiological Health.
486 Guidance for industry: patient-reported outcome measures: use in medical product development to
487 support labeling claims: draft guidance. *Health Qual Life Outcomes*. 2006 Oct 11;4:79.
- 488 12. Krogsgaard MR, Brodersen J, Christensen KB, Siersma V, Kreiner S, Jensen J, et al. What is a PROM
489 and why do we need it? *Scand J Med Sci Sports*. 2021;31(5):967–71.

- 490 13. Maurer M, Weller K, Bindslev-Jensen C, Giménez-Arnau A, Bousquet P, Bousquet J, et al. Unmet
491 clinical needs in chronic spontaneous urticaria. A GA2LEN task force report 1. *Allergy*.
492 2011;66(3):317–30.
- 493 14. Maurer M, Ortonne J, Zuberbier T. Chronic urticaria: an internet survey of health behaviours,
494 symptom patterns and treatment needs in European adult patients. *Br J Dermatol*.
495 2009;160(3):633–41.
- 496 15. Hawro T, Ohanyan T, Schoepke N, Metz M, Peveling-Oberhag A, Staubach P, et al. The Urticaria
497 Activity Score-Validity, Reliability, and Responsiveness. *J Allergy Clin Immunol Pract*. 2018;6(4):1185-
498 1190.e1.
- 499 16. Hawro T, Ohanyan T, Schoepke N, Metz M, Peveling-Oberhag A, Staubach P, et al. Comparison and
500 interpretability of the available urticaria activity scores. *Allergy*. 2018 Jan;73(1):251–5.
- 501 17. Hollis K, Proctor C, McBride D, Balp MM, McLeod L, Hunter S, et al. Comparison of Urticaria Activity
502 Score Over 7 Days (UAS7) Values Obtained from Once-Daily and Twice-Daily Versions: Results from
503 the ASSURE-CSU Study. *Am J Clin Dermatol*. 2018 Apr;19(2):267–74.
- 504 18. Mathias SD, Crosby RD, Zazzali JL, Maurer M, Saini SS. Evaluating the minimally important difference
505 of the urticaria activity score and other measures of disease activity in patients with chronic
506 idiopathic urticaria. *Ann Allergy Asthma Immunol Off Publ Am Coll Allergy Asthma Immunol*. 2012
507 Jan;108(1):20–4.
- 508 19. Baiardini I, Fasola S, Maurer M, Weller K, Canonica GW, Braido F. Minimal important difference of
509 the Chronic Urticaria Quality of Life Questionnaire (CU-Q2oL). *Allergy*. 2019 Dec;74(12):2542–4.
- 510 20. Baiardini I, Pasquali M, Braido F, Fumagalli F, Guerra L, Compalati E, et al. A new tool to evaluate the
511 impact of chronic urticaria on quality of life: chronic urticaria quality of life questionnaire (CU-Q2oL).
512 *Allergy*. 2005;60(8):1073–8.
- 513 21. Brzoza Z, Badura-Brzoza K, Młynek A, Magerl M, Baiardini I, Canonica GW, et al. Adaptation and
514 initial results of the Polish version of the GA(2)LEN chronic urticaria quality of life questionnaire (CU-
515 Q(2)oL). *J Dermatol Sci*. 2011 Apr;62(1):36–41.
- 516 22. Młynek A, Magerl M, Hanna M, Lhachimi S, Baiardini I, Canonica GW, et al. The German version of
517 the Chronic Urticaria Quality-of-Life Questionnaire: factor analysis, validation, and initial clinical
518 findings. *Allergy*. 2009 Jun;64(6):927–36.
- 519 23. Irani C, Hallit S, Weller K, Maurer M, Haber CE, Salameh P. Chronic urticaria in most patients is
520 poorly controlled. *Saudi Med J*. 2017 Dec;38(12):1230–6.
- 521 24. Kocatürk E, Kızıltaç U, Can P, Öztaş Kara R, Erdem T, Kızıltaç K, et al. Validation of the Turkish version
522 of the Urticaria Control Test: Correlation with other tools and comparison between spontaneous
523 and inducible chronic urticaria. *World Allergy Organ J*. 2019 Jan 1;12(1):100009.
- 524 25. Kulthanan K, Chularojanamontri L, Tuchinda P, Rujitharanawong C, Maurer M, Weller K. Validity,
525 reliability and interpretability of the Thai version of the urticaria control test (UCT). *Health Qual Life*
526 *Outcomes*. 2016 Apr 14;14:61.

- 527 26. Ohanyan T, Schoepke N, Bolukbasi B, Metz M, Hawro T, Zuberbier T, et al. Responsiveness and
528 minimal important difference of the urticaria control test. *J Allergy Clin Immunol*. 2017
529 Dec;140(6):1710-1713.e11.
- 530 27. Weller K, Groffik A, Church MK, Hawro T, Krause K, Metz M, et al. Development and validation of
531 the Urticaria Control Test: a patient-reported outcome instrument for assessing urticaria control. *J*
532 *Allergy Clin Immunol*. 2014 May;133(5):1365–72, 1372.e1-6.
- 533 28. Kulthanan K, Chularojanamontri L, Rujitharanawong C, Weerasubpong P, Weller K, Maurer M.
534 Angioedema Activity Score (AAS): A Valid and Reliable Tool to Use in Asian Patients. *BioMed Res Int*.
535 2019;2019:9157895.
- 536 29. Weller K, Groffik A, Magerl M, Tohme N, Martus P, Krause K, et al. Development, validation, and
537 initial results of the Angioedema Activity Score. *Allergy*. 2013 Sep;68(9):1185–92.
- 538 30. Kulthanan K, Chularojanamontri L, Rujitharanawong C, Weerasubpong P, Maurer M, Weller K.
539 Angioedema quality of life questionnaire (AE-QoL) - interpretability and sensitivity to change. *Health*
540 *Qual Life Outcomes*. 2019 Oct 26;17(1):160.
- 541 31. Weller K, Groffik A, Magerl M, Tohme N, Martus P, Krause K, et al. Development and construct
542 validation of the angioedema quality of life questionnaire. *Allergy*. 2012 Oct;67(10):1289–98.
- 543 32. Weller K, Magerl M, Peveling-Oberhag A, Martus P, Staubach P, Maurer M. The Angioedema Quality
544 of Life Questionnaire (AE-QoL) - assessment of sensitivity to change and minimal clinically important
545 difference. *Allergy*. 2016 Aug;71(8):1203–9.
- 546 33. Zuberbier T, Abdul Latiff AH, Abuzakouk M, Aquilina S, Asero R, Baker D, et al. The international
547 EAACI/GA²LEN/EuroGuiDerm/APAAACI guideline for the definition, classification, diagnosis, and
548 management of urticaria. *Allergy*. 2022;77(3):734–66.
- 549 34. Młynek A, Zalewska-Janowska A, Martus P, Staubach P, Zuberbier T, Maurer M. How to assess
550 disease activity in patients with chronic urticaria? *Allergy*. 2008 Jun;63(6):777–80.
- 551 35. Maurer M, Eyerich K, Eyerich S, Ferrer M, Gutermuth J, Hartmann K, et al. Urticaria: Collegium
552 Internationale Allergologicum (CIA) Update 2020. *Int Arch Allergy Immunol*. 2020 May;181(5):321–
553 33.
- 554 36. Ahsan DM, Altrichter S, Gutsche A, Bernstein JA, Altunergil T, Brockstaedt M, et al. Development of
555 the Cold Urticaria Activity Score. *Allergy*. 2022 Aug;77(8):2509–19.
- 556 37. Koch K, Weller K, Werner A, Maurer M, Altrichter S. Antihistamine updosing reduces disease activity
557 in patients with difficult-to-treat cholinergic urticaria. *J Allergy Clin Immunol*. 2016 Nov;138(5):1483-
558 1485.e9.
- 559 38. Ruft J, Asady A, Staubach P, Casale T, Sussmann G, Zuberbier T, et al. Development and validation of
560 the Cholinergic Urticaria Quality-of-Life Questionnaire (CholU-QoL). *Clin Exp Allergy J Br Soc Allergy*
561 *Clin Immunol*. 2018 Apr;48(4):433–44.

- 562 39. Moestrup K, Ghazanfar MN, Thomsen SF. Patient-reported outcomes (PRO s) in chronic urticaria. *Int*
563 *J Dermatol.* 2017;56(12):1342–8.
- 564 40. Brunelli C, Zito E, Alfieri S, Borreani C, Roli A, Caraceni A, et al. Knowledge, use and attitudes of
565 healthcare professionals towards patient-reported outcome measures (PROMs) at a comprehensive
566 cancer center. *BMC Cancer.* 2022 Feb 10;22(1):161.
- 567 41. Kotronoulas G, Kearney N, Maguire R, Harrow A, Di Domenico D, Croy S, et al. What is the value of
568 the routine use of patient-reported outcome measures toward improvement of patient outcomes,
569 processes of care, and health service outcomes in cancer care? A systematic review of controlled
570 trials. *J Clin Oncol Off J Am Soc Clin Oncol.* 2014 May 10;32(14):1480–501.
- 571 42. Basch E. Patient-reported outcomes—harnessing patients’ voices to improve clinical care. *N Engl J*
572 *Med.* 2017;376(2):105–8.
- 573 43. Brunelli C, Borreani C, Caraceni A, Roli A, Bellazzi M, Lombi L, et al. PATIENT VOICES, a project for
574 the integration of the systematic assessment of patient reported outcomes and experiences within
575 a comprehensive cancer center: a protocol for a mixed method feasibility study. *Health Qual Life*
576 *Outcomes.* 2020 Jul 28;18:252.
- 577 44. Maurer M, Metz M, Bindslev-Jensen C, Bousquet J, Canonica GW, Church MK, et al. Definition, aims,
578 and implementation of GA(2) LEN Urticaria Centers of Reference and Excellence. *Allergy.* 2016
579 Aug;71(8):1210–8.
- 580 45. Maurer M, Aberer W, Agondi R, Al-Ahmad M, Al-Nesf MA, Ansotegui I, et al. Definition, aims, and
581 implementation of GA2 LEN/HAEI Angioedema Centers of Reference and Excellence. *Allergy.* 2020
582 Aug;75(8):2115–23.
- 583 46. Passmore C, Dobbie AE, Parchman M, Tysinger J. Guidelines for constructing a survey. *Fam Med.*
584 2002 Apr;34(4):281–6.
- 585 47. Cheung YT, Chan A, Charalambous A, Darling HS, Eng L, Grech L, et al. The use of patient-reported
586 outcomes in routine cancer care: preliminary insights from a multinational scoping survey of
587 oncology practitioners. *Support Care Cancer.* 2022 Feb 1;30(2):1427–39.
- 588 48. Basch E, Deal AM, Kris MG, Scher HI, Hudis CA, Sabbatini P, et al. Symptom Monitoring With Patient-
589 Reported Outcomes During Routine Cancer Treatment: A Randomized Controlled Trial. *J Clin Oncol.*
590 2016 Feb 20;34(6):557–65.
- 591 49. Alshehri F, Alarabi A, Alharthi M, Alanazi T, Alohal A, Alsaleem M. Use of patient-reported outcome
592 measures (PROMs) by orthopedic surgeons in Saudi Arabia. *J Orthop Surg.* 2020 Dec 10;15(1):598.
- 593 50. Abernethy AP, Herndon JE, Wheeler JL, Day JM, Hood L, Patwardhan M, et al. Feasibility and
594 acceptability to patients of a longitudinal system for evaluating cancer-related symptoms and
595 quality of life: pilot study of an e/Tablet data-collection system in academic oncology. *J Pain*
596 *Symptom Manage.* 2009 Jun;37(6):1027–38.
- 597 51. Schatz M. A survey of the burden of allergic rhinitis in the USA. *Allergy.* 2007;62(s85):9–16.

- 598 52. Ta NH, Gao J, Philpott C. A systematic review to examine the relationship between objective and
599 patient-reported outcome measures in sinonasal disorders: recommendations for use in research
600 and clinical practice. In Wiley Online Library; 2021. p. 910–23.
- 601 53. Valderas JM, Alonso J, Guyatt GH. Measuring patient-reported outcomes: moving from clinical trials
602 into clinical practice. *Med J Aust.* 2008;189(2):93–4.
- 603 54. Calvert M, Thwaites R, Kyte D, Devlin N. Putting patient-reported outcomes on the ‘Big Data Road
604 Map.’ *J R Soc Med.* 2015 Aug;108(8):299–303.
- 605 55. Gilbody SM, House AO, Sheldon TA. Outcomes research in mental health: Systematic review. *Br J*
606 *Psychiatry.* 2002 Jul;181(1):8–16.
- 607 56. Brower K, Schmitt-Boshnick M, Haener M, Wilks S, Soprovich A. The use of patient-reported
608 outcome measures in primary care: applications, benefits and challenges. *J Patient-Rep Outcomes.*
609 2021 Oct 12;5(Suppl 2):84.
- 610 57. Kolkhir P, Giménez-Arnau AM, Kulthanan K, Peter J, Metz M, Maurer M. Urticaria. *Nat Rev Dis*
611 *Primer.* 2022 Sep 15;8(1):1–22.
- 612 58. Sousa-Pinto B, Eklund P, Pfaar O, Klimek L, Zuberbier T, Czarlewski W, et al. Validity, reliability, and
613 responsiveness of daily monitoring visual analog scales in MASK-air®. *Clin Transl Allergy.* 2021
614 Aug;11(7):e12062.

615

616

617

Table 1: Characteristics of physicians who are aware of PROMs divided by AD and CU use (N=1308)

	Atopic Dermatitis is PROM Use 26%	Chronic Urticaria PROM Use 28%	All
Sex, %			
Male	32%	36%	41%
Female	68%	64%	59%
Age Group, years			
20-29	12%	12%	11%
30-39	38%	36%	34%
40-49	23%	23%	24%
50-59	16%	19%	18%
60+	11%	11%	13%
Type of consultation, %			
Public practice	32%	41%	39%
Private practice	22%	18%	20%
Both public and private practice	46%	41%	41%
Do you use any PROMs?, %			
No	0%	0%	49%
Yes	100%	100%	51%
Specialty Status, %			
Specialist	82%	84%	80%
Non-Specialist(General Practitioners (GPs))	18%	16%	20%
Dermatologist	36%	36%	18%
Non-Dermatologist	64%	64%	82%
Allergist	36%	44%	28%
Non-Allergist	64%	56%	72%
Pediatrician	19%	16%	18%

Non-Pediatrician	81%	84%	89%
Family Medicine Specialist	6%	6%	9%
Non-Family Medicine Specialist	94%	94%	91%
Pulmonologist	6%	5%	14%
Non-Pulmonologist	94%	95%	86%
ENT (Otolaryngologist)	1%	1%	6%
Non-Otolaryngologist)	99%	99%	94%
Other	12%	11%	17%
Identified Specialists and General Practitioners (GPs)	88%	89%	83%
Years the provider has been a specialist, %			
1-9	43%	40%	37%
10-19	28%	30%	28 %
20-29	15%	16%	17%
30+	14%	14%	18%

Note: Sample was composed only of respondents who knew what PROMs were. In specialty status, percentages can add up to more than 100% because respondents could select multiple answers. This table shows descriptives for the total sample and broken down by their AD or CU PROM Use. The category "Specialist" encompasses a range of medical specialties represented in this study, including Dermatologists, Allergists, Pediatricians, Family Medicine practitioners, Pulmonologists, and ENT specialists. It is important to note that these categories are not mutually exclusive; respondents may identify with more than one specialty area.

In the provided table, each specialty and its corresponding "Non-" category collectively represent 100% of the surveyed population. For each specialty listed (e.g., Dermatologist, Allergist, Pediatrician, etc.), the percentage indicates the proportion of respondents who are specialists within that specific field. Conversely, the "Non-" category (e.g., Non-Dermatologist, Non-Allergist, Non-Pediatrician, etc.) encompasses all individuals who do not specialize in that particular field, including both specialists in other areas and General Practitioners (GPs). This categorization ensures a comprehensive overview, with each specialty and its "Non-" counterpart together accounting for the entire respondent group, highlighting the distribution between specialized and broader medical practice roles within the surveyed population.

PROM=patient-reported outcome measure; ENT=ear, nose, and throat

Table 2: AD and CU PROM users and their PROM use frequency, reasons for using PROMs, PROM training needs, and choice of PROMs.

%	AD (N=344)	CU (N=376)
Frequency of PROM use		
Always	13%	15%
Often	35%	37%
Sometimes	42%	40%
Rarely	10%	8%
Never	0%	0%
What do you use PROMs for?		
To monitor disease control	94%	96%
To monitor disease severity	92%	94%
To monitor performance and therapeutic approach	89%	89%
To facilitate decision making	87%	90%
To improve efficiency of consultation	78%	80%
To facilitate communication with patients	71%	75%
For research	66%	67%
To facilitate communication across different health care sectors	57%	61%
Other	7%	11%
Which of the following would you like to receive further training/information on?		
How to choose which PROMs to use	83%	80%
How to interpret PROM scores	75%	71%
The challenges of using PROMs	65%	63%
How to administer PROMs	62%	58%
How to calculate PROM scores	62%	58%
The benefits of using PROMS	58%	53%
What PROMS are	40%	36%
Other/further training areas	5%	6%
What are the main barriers to the use of PROMs?		
Time constraints	83%	80%
Lack of integration into clinical systems	58%	60%
Patients dislike questionnaires	57%	60%
Not available for certain groups	56%	52%

Mandated to complete	52%	55%
Sufficient understanding of the disease without PROMS	47%	46%
Not available in the native language of my patients	45%	41%
Uncertainty about reliability	39%	38%
Lack of confidence in interpreting	36%	34%
Too complicated to fill in	34%	34%
Too complicated to evaluate/score	33%	33%
Not suitable for obtaining the information I need	32%	28%
Feel uncomfortable	31%	31%
Perceived as additional cost	26%	24%
Constrain doctor-patient relationship	22%	19%
How patients access PROMs		
Paper	75%	79%
Online	70%	66%
Clinical Systems	31%	31%
Other	5%	4%
How patients complete the PROMs		
Paper	86%	88%
Electronically	47%	46%
AD		
POSCORAD	61%	
DLQI	48%	
NRS	29%	
POEM	18%	
ADCT	7%	
Other Atopic Dermatitis PROM	7%	
RECAP	4%	
CU PROMs used		
UAS7		73%
UCT		47%
VAS_CU		30%
CUQ2oL		29%
NRS11		16%
Other Chronic Urticaria PROM		5%

AD=atopic dermatitis; ADCT=Atopic Dermatitis Control Tool; CDLQI=Children's Dermatology Life Quality Index; CU=chronic urticaria; CU=Q2oL=Chronic Urticaria Quality of Life Questionnaire; DLQI=Dermatology Life Quality Index; IDQOL=Infants' Dermatitis Quality of Life Index; NA=not applicable; NRS=numeric rating scale; NRS11=11-Point Numeric Rating Scale; POEM=Patient-Oriented Eczema Measure; PO-SCORAD=Patient-Oriented Scoring Atopic Dermatitis Index; PROMs=Patient-Reported Outcomes Measure; RECAP=Recap of Atopic Eczema; UAS7=Urticaria Activity Score; UCT=Urticaria Control Test; VAS-CU=Visual Analog Scale in Chronic Urticaria

Note: These are the results of an analysis of specific variables related to PROM use by physicians who use AD CU PROMs. The table includes data from a survey of 720 providers, with 344 reporting the use of AD PROMs and 376 reporting the use of CU PROMs. The variables analyzed in the table include the frequency of PROM use, reasons for use, areas of training, barriers to PROM use, access methods, and specific PROMs used (questionnaires). The results are presented separately for providers who use AD PROMs and those who use CU PROMs. Percentages can add up to >100% because respondents could select multiple answers.

Table 3: AD or CU PROM Use (% in Variables of Interest (n=1308))

	ADPROM Users	p value	CU PROM Users	p value
Sex		0.000		0.017
Male	20%		25%	
Female	30%		31%	
Age Group		0.23		0.478
20-29	28%		30%	
30-39	29%		29%	
40-49	25%		27%	
50-59	23%		30%	
60+	22%		24%	
Type of consultation		0.014		0.522
Public practice	21%		30%	
Private practice	29%		26%	
Both public and private practice	29%		28%	
Years the provider has been a specialist		0.072		0.422
1-9	29%		30%	
10-19	26%		29%	
20-29	22%		27%	
30+	22%		24%	
Specialty status				
Dermatologist	51%	0.000	55%	0.000
Allergist	33%	0.001	44%	0.000
Pediatrics	27%	0.693	24%	0.135
Specialist	27%	0.250	30%	0.035
Other	26%	0.003	18%	0.000
Family Medicine	18%	0.048	18%	0.006
Pulmonologist	11%	0.000	11%	0.000
ENT	3%	0.000	7%	0.000

Total	14%		15%	
--------------	-----	--	-----	--

AD=atopic dermatitis; CU=chronic urticaria; PROM=patient-reported outcome measure

Note: Sample was composed only of respondents who knew what PROMs were. For each variable of interest, the table presents the proportion of physicians who reported using AD or CU PROMs out of the total number of physicians in each category. For example, the table shows that 20.2% of male physicians who were aware of PROMs reported using AD PROMs in their practice, out of the total number of male physicians who responded to the survey. P values are based on chi-square tests. For specialties, the p value comes from comparing a specific specialist against not having it.

Journal Pre-proof

Figure E1: Questionnaire

Table E1. Centers and Locations.

Organization	Surveys	Country
ARIA	127	France
AMERICA	841	Ecuador
	120	Mexico
	53	SLAAI
	33	Brazil
	20	Argentina
	3	Peru
UCARE	257	Poland
	217	Russia
	143	Republic of Macedonia
	78	Romania
	68	Kuwait
	63	Qatar
	55	Spain
	53	Germany
	52	Georgia
	51	Iran
	41	India
	34	Slovenia
	31	Turkey
	21	China
	8	Lithuania
	7	Canada
	5	Germany
	3	London
	41	India
	34	Slovenia
31	Turkey	
21	China	

8	Lithuania
7	Canada
5	Germany
3	London

Journal Pre-proof

PROMUSE SURVEY ENG_2021_11_25

Start of Block: Default Question Block

Dear doctor: We are conducting a study to determine the knowledge, perceptions, and limitations of the use of patient-reported outcomes measures (PROM).

Patient-reported outcome measures (PROM) are validated questionnaires that take into account the opinions, feelings and experiences of patients to assess their health status and medical care received, as well as the course of the disease and the response to the patient. treatment.

PROMs help clinicians make inferences about changes in disease activity, response to treatment, and changes in health-related quality of life. All information provided in this survey will be confidential and anonymous. Your participation is completely voluntary. Please answer all of the following questions.



Q61 Are you a specialist doctor?

Yes (1)

No (2)

Skip To: Q40 If Are you a specialist doctor? = No



Q6 What is your medical specialty?

	Yes (1)	No (2)
Family Medicine (8)	<input type="radio"/>	<input type="radio"/>
Pediatrician (2)	<input type="radio"/>	<input type="radio"/>
ENT specialist (3)	<input type="radio"/>	<input type="radio"/>
Allergologist (4)	<input type="radio"/>	<input type="radio"/>
Dermatologist (5)	<input type="radio"/>	<input type="radio"/>
Pulmonologist (6)	<input type="radio"/>	<input type="radio"/>
Other (7)	<input type="radio"/>	<input type="radio"/>

Display This Question:

If What is your medical specialty? = Other [Yes]

*

Q62 If you answered "other", please write what other medical specialty do you have?

Q40 How long (years) have you been practicing your medical profession?

Years (4)

▼ 1 (1) ... 100 (100)

*

Q41 Have you heard about the use of PROMs in clinical practice?

- Yes (1)
- No (2)
-

*

Q9 Do you currently use PROMS in your daily medical practice?

- Yes (1)
- No (2)

Skip To: Q38 If Do you currently use PROMS in your daily medical practice? = No

Display This Question:

If Do you currently use PROMS in your daily medical practice? = Yes

*

Q42 If you answered yes, how frequent do you use PROMS?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- Always (5)
-

*

Q10 In which allergic diseases do you use PROMs? You can choose more than one answer.

- Allergic conjunctivitis (1)
- Asthma (2)
- Atopic dermatitis (3)
- Rhinitis (4)
- Rhinosinusitis (5)
- Urticaria/Angiodema (6)

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Allergic conjunctivitis

Or In which allergic diseases do you use PROMs? You can choose more than one answer. = Rhinitis

Or In which allergic diseases do you use PROMs? You can choose more than one answer. = Rhinosinusitis



Q12 What PROMs do you prefer for Allergic Rhinitis/Conjunctivitis? if it is needed select more than one option:

- RQLQ (1)
 - VAS (2)
 - EQ-5D (3)
 - Rhinitis Control Assessment Test (4)
 - Other (5)
-

Display This Question:

If What PROMs do you prefer for Allergic Rhinitis/Conjunctivitis? if it is needed select more than o... = Other



Q16 If you answered "other", please write what other PROMs do you prefer for Allergic Rhinitis/Conjunctivitis?

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Atopic dermatitis



Q14 What PROMs do you prefer for Atopic Dermatitis? if it is needed select more than one option:

- PO-SCORAD (1)
- EASI (2)
- RECAP (3)
- ADCT (4)
- POEM (5)
- IGA (6)
- DLQI (7)
- Numerical Rating Scale (NRS) (8)
- Other (9)

Display This Question:

If What PROMs do you prefer for Atopic Dermatitis? if it is needed select more than one option: = Other



Q20 If you answered "other", please write what other PROMs do you prefer for Atopic Dermatitis?

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Urticaria/Angiodema



Q17 What PROMs do you prefer for Urticaria? if it is needed select more than one option:

- HACK (1)
- Numerical Rating Scale of pruritus NRS-11 (2)
- Pruritus Visual Analogue Scale (VAS) (3)
- UAS-7 (4)
- CU-Q2oL (5)
- UCT (6)
- Other (10)

Display This Question:

If What PROMs do you prefer for Urticaria? if it is needed select more than one option: = Other



Q21 If you answered "other", please write what other PROMs do you prefer for Urticaria?

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Urticaria/Angioedema



Q38 What PROMs do you prefer for Angioedema? if it is needed select more than one option:

- AAS (1)
- AE-QoL (2)
- AECT (3)
- Other (4)

Display This Question:

If What PROMs do you prefer for Angioedema? if it is needed select more than one option: = Other



Q39 If you answered "other", please write what other PROMs do you prefer for Angioedema?

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Asthma



Q18 What PROMs do you prefer for Asthma? if it is needed select more than one option:

- Asthma Quality of Life Questionnaire (AQLQ) (1)
- VAS (2)
- Asthma Control Test (ACT) (3)
- Mini-Asthma Quality of Life Questionnaire (mini-AQLQ) (4)
- ACQ (5)
- Asthma Symptoms Utility Index (ASUI) (6)
- AM/PM Asthma Symptom Score (7)
- Asthma Bother Profile (ABP) (8)
- Other (9)

Display This Question:

If What PROMs do you prefer for Asthma? if it is needed select more than one option: = Other



Q22 If you answered "other", please write what other PROMs do you prefer for Asthma?

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Rhinosinusitis



Q19 What PROMs do you prefer for Rhinosinusitis? if it is needed select more than one option:

- SNOT 22 (1)
- SNOT 16 ARS (2)
- VAS (3)
- Other (4)

Display This Question:

If What PROMs do you prefer for Rhinosinusitis? if it is needed select more than one option: = Other

*

Q23 If you answered "other", please write what other PROMs do you prefer for Rhinosinusitis?

*

Q43 What do you use PROMS for?

	Yes (1)	No (2)
To facilitate decision making (1)	<input type="radio"/>	<input type="radio"/>
To improve efficiency of consultation (2)	<input type="radio"/>	<input type="radio"/>
Facilitate communication across different health care sectors (3)	<input type="radio"/>	<input type="radio"/>
To facilitate communication with patients (4)	<input type="radio"/>	<input type="radio"/>
To monitor disease control (6)	<input type="radio"/>	<input type="radio"/>
To monitor disease severity (7)	<input type="radio"/>	<input type="radio"/>
Monitor for performance and therapeutic approach (8)	<input type="radio"/>	<input type="radio"/>
For research (9)	<input type="radio"/>	<input type="radio"/>
Other (10)	<input type="radio"/>	<input type="radio"/>

Display This Question:

If What do you use PROMS for? = Other [Yes]

*

Q27 If you answered "other", please write the other reasons why you currently use PROMs?

*

Q44 How do you access PROMs?

	Yes (1)	No (2)
Through clinical systems (1)	<input type="radio"/>	<input type="radio"/>
Online (internet) (2)	<input type="radio"/>	<input type="radio"/>
Paper (3)	<input type="radio"/>	<input type="radio"/>
Other (4)	<input type="radio"/>	<input type="radio"/>

Display This Question:

If How do you access PROMs? = Other [Yes]

*

Q28 If you answered "other", please write the other ways to access PROMs?

*

Q29 Where do your patients complete PROMs?

- Prior to consultation: At home (2)
- Prior to consultation: In the waiting room (1)
- During the consultation (3)
- Other (4)

*

Q30 How do your patients currently fill out PROMs?

	Yes (1)	No (2)
By paper (1)	<input type="radio"/>	<input type="radio"/>
By an electronic device (2)	<input type="radio"/>	<input type="radio"/>

*

Q31 How satisfied and/or motivated do you think your patient feels about completing PROMs?

- Not all satisfied (1)
- Slightly satisfied (2)
- Moderately satisfied (3)
- Very satisfied (4)
- Completely satisfied (5)

*

Q33 Which of the following areas would you like to receive further training/information?

	Yes (1)	No (2)
What PROMs are (1)	<input type="radio"/>	<input type="radio"/>
The benefits of using PROMs (2)	<input type="radio"/>	<input type="radio"/>
The challenges of using PROMs (3)	<input type="radio"/>	<input type="radio"/>
How to choose which PROM to use (4)	<input type="radio"/>	<input type="radio"/>
How to administer PROMs (5)	<input type="radio"/>	<input type="radio"/>
How to calculate PROM scores (6)	<input type="radio"/>	<input type="radio"/>
How to interpret PROM scores (7)	<input type="radio"/>	<input type="radio"/>
Other (8)	<input type="radio"/>	<input type="radio"/>

Display This Question:

If Which of the following areas would you like to receive further training/information? = Other [Yes]



Q41 If you answered "other", please write the other areas you would like to receive further training/information:

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Allergic conjunctivitis

Or In which allergic diseases do you use PROMs? You can choose more than one answer. = Rhinitis

Or In which allergic diseases do you use PROMs? You can choose more than one answer. = Rhinosinusitis

Q34 How strongly do you agree or disagree with the following statements about the benefits of using PROM in patients with Allergic Rhinitis/Conjunctivitis?

	Strongly Disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
Useful to measure the treatment outcomes (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Useful to monitor the impact of the disease (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Benefits patient care (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facilitates communication with the patient (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Asthma

Q35 How strongly do you agree or disagree with the following statements about the benefits of using PROM in patients with Asthma?

	Strongly Disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
Useful to measure the treatment outcomes (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Useful to monitor the impact of the disease (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Benefits patient care (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facilitates communication with the patient (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Urticaria/Angiodema

Q36 How strongly do you agree or disagree with the following statements about the benefits of using PROMs in patients with Urticaria/Angioedema?

	Strongly Disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
Useful to measure the treatment outcomes (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Useful to monitor the impact of the disease (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Benefits patient care (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facilitates communication with the patient (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If In which allergic diseases do you use PROMs? You can choose more than one answer. = Atopic dermatitis

Q37 How strongly do you agree or disagree with the following statements about the benefits of using PROMs in patients with atopic dermatitis?

	Strongly Disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly Agree (5)
Useful to measure the treatment outcomes (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Useful to monitor the impact of the disease (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Benefits patient care (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facilitates communication with the patient (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Q38 What are the main barriers to the use of PROMs?

	Yes (1)	No (2)
Time constraints (1)	<input type="radio"/>	<input type="radio"/>
Mandated to complete (2)	<input type="radio"/>	<input type="radio"/>
Sufficient understanding of the disease without PROMS (3)	<input type="radio"/>	<input type="radio"/>
Patients dislike questionnaires (4)	<input type="radio"/>	<input type="radio"/>
Uncertainty about reliability (5)	<input type="radio"/>	<input type="radio"/>
Perceived as additional cost (6)	<input type="radio"/>	<input type="radio"/>
Constrain doctor-patient relationship (7)	<input type="radio"/>	<input type="radio"/>
Lack of integration into clinical systems (8)	<input type="radio"/>	<input type="radio"/>
Lack of confidence in interpreting (9)	<input type="radio"/>	<input type="radio"/>
Feels uncomfortable (10)	<input type="radio"/>	<input type="radio"/>
Not available in the native language of my patients (11)	<input type="radio"/>	<input type="radio"/>
Not available for certain age groups (12)	<input type="radio"/>	<input type="radio"/>
Not suitable for obtaining the information I need (13)	<input type="radio"/>	<input type="radio"/>
Too complicated to fill in (14)	<input type="radio"/>	<input type="radio"/>
Too complicated to evaluate / score (15)	<input type="radio"/>	<input type="radio"/>

Display This Question:

If What are the main barriers to the use of PROMs? = Time constraints [Yes]

*

Q46 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "time limitation" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Mandated to complete [Yes]

Q20 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Mandated to complete" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Sufficient understanding of the disease without PROMS [Yes]

Q21 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Sufficient understanding of the disease without PROMs" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Patients dislike questionnaires [Yes]

Q22 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Patients dislike questionnaires" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Uncertainty about reliability [Yes]

Q23 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Uncertainty about reliability" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Perceived as additional cost [Yes]

Q24 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Perceived as additional cost" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Constrain doctor-patient relationship [Yes]

Q25 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Constrain doctor-patient relationship" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Lack of integration into clinical systems [Yes]

Q53 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Lack of integration into clinical systems" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Lack of confidence in interpreting [Yes]

Q27 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Lack of confidence in interpreting" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Feels uncomfortable [Yes]

Q28 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Feels uncomfortable" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Not available in the native language of my patients [Yes]

Q29 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Not available in the native language of my patients" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Not available for certain age groups [Yes]

Q30 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Not available for certain age groups" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Not suitable for obtaining the information I need [Yes]

Q31 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Not suitable for obtaining the information I need" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Too complicated to fill in [Yes]

Q32 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Too complicated to fill in" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)

Display This Question:

If What are the main barriers to the use of PROMs? = Too complicated to evaluate / score [Yes]

Q33 From 0 to 10 (0 being in total disagreement and 10 in total agreement), how strongly do you agree with the statement "Too complicated to evaluate / score" as a barrier to the use of PROMs in your daily clinical consultation?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)



Q39 How old are you (years)?



Q4 What is your sex?

- Male (1)
 - Female (2)
-

Q24 In which country do you currently practice your medical profession?

Country (5)

▼ Afghanistan (1) ... Zimbabwe (194)



Q8 Which is your current practice?

- Public practice (1)
- Private practice (2)
- Both (3)

End of Block: Default Question Block
