

# Urticaria Patients Are Highly Interested in Apps to Monitor Their Disease Activity and Control: A UCARE CURICT Analysis

Ivan Cherrez-Ojeda<sup>1</sup>, Emanuel Vanegas<sup>1</sup>, Annia Cherrez<sup>2</sup>, Miguel Felix<sup>1</sup>, Karsten Weller<sup>3</sup>, Markus Magerl<sup>3</sup>, Rasmus Maurer<sup>3</sup>, Valeria L MATA<sup>1</sup>, Alicja Kasperska-Zajac<sup>4</sup>, Agnieszka SIKORA<sup>4</sup>, Daria Fomina<sup>5</sup>, Elena KOVALKOVA<sup>5</sup>, Kiran Godse<sup>6</sup>, Nimmagadda Dheeraj RAO<sup>6</sup>, Maryam Khoshkhui<sup>7</sup>, Sahar RASTGOO<sup>8</sup>, Roberta Criado<sup>9</sup>, Mohamed Abuzakouk<sup>10</sup>, Deepa GRANDON<sup>10</sup>, Martijn van Doorn<sup>11</sup>, Solange Valle<sup>12</sup>, Eduardo M. de Souza Lima<sup>13</sup>, Simon Francis Thomsen<sup>14</sup>, German Ramón<sup>15</sup>, Edgar Matos E BENAVIDES<sup>16</sup>, Andrea Bauer<sup>17</sup>, Ana Giménez Arnau<sup>18</sup>, Emek Kocatürk<sup>19</sup>, Carole Guillet<sup>20</sup>, Jose Ignacio Larco<sup>21</sup>, Zuotao Zhao<sup>22</sup>, Michael Makris<sup>23</sup>, Carla RITCHIE<sup>24</sup>, PARASKEVI XEPAPADAKI<sup>25</sup>, Luis Ensina<sup>26</sup>, Sofia CHERREZ<sup>2</sup>, and Marcus Maurer<sup>3</sup>

<sup>1</sup>Universidad Espíritu Santo Samborondón Ecuador

<sup>2</sup>Respiralab Respiralab Research Group Guayaquil Ecuador

<sup>3</sup>Dermatological Allergology Allergie-Centrum-Charité Department of Dermatology and Allergy Charité - Universitätsmedizin Berlin Germany

<sup>4</sup>European Center for Diagnosis and Treatment of Urticaria Medical University of Silesia Katowice Poland

<sup>5</sup>City Center of Allergy and Immunology Clinical City Hospital 52 Moscow Russia

<sup>6</sup>Department of Dermatology D Y Patil University School of Medicine and Hospital Mumbai India

<sup>7</sup>Allergy Research Center Mashhad University of Medical Sciences Mashhad Iran

<sup>8</sup>Department of Allergy and Immunology Mashhad University of Medical Sciences Mashhad Iran

<sup>9</sup>Department of Dermatology Faculdade de Medicina do ABC São Paulo Brazil

<sup>10</sup>Allergy and Immunology Department Cleveland Clinic Abu Dhabi the UAE

<sup>11</sup>Department of Dermatology Erasmus MC Rotterdam The Netherlands

<sup>12</sup>Department of Internal Medicine Hospital Universitário Clementino Fraga Filho Rio de Janeiro Brazil

<sup>13</sup>Faculty of Science and Health of Juiz de Fora - SUPREMA - Minas Gerais

<sup>14</sup>Department of Dermatology Bispebjerg Hospital University of Copenhagen Biomedical Sciences Copenhagen Denmark

<sup>15</sup>Instituto de Alergia e Inmunología del Sur Bahía Blanca Prov De Buenos Aires Argentina

<sup>16</sup>Centro de Referencia de Alergia Asma e Inmunología - Instituto Nacional del Niño Lima-Perú

<sup>17</sup>Department of Dermatology University Allergy Center University Hospital Carl Gustav Carus Technical University Dresden Germany

<sup>18</sup>Department of Dermatology Hospital del Mar IMIM Universitat Autònoma Barcelona Spain

<sup>19</sup>Department of Dermatology Koç University School of Medicine Istanbul Turkey

<sup>20</sup>Department of Dermatology University Hospital Zurich Switzerland

<sup>21</sup>Allergy Department Clinica San Felipe Lima Peru

<sup>22</sup>Department of Dermatology and Venereology Peking University First Hospital Beijing China

<sup>23</sup>Allergy Unit 2nd Department of Dermatology and Venereology National and Kapodistrian University of Athens “Attikon” University Hospital Greece

<sup>24</sup>Allergy Division Hospital Italiano de Buenos Aires Buenos Aires Argentina

<sup>25</sup>Allergy Department 2nd Pediatric Clinic National and Kapodistrian University of Athens Greece

<sup>26</sup>Federal University of São Paulo São Paulo Brazil

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## Abstract

**Background:** Information/communication technologies such as mobile phone applications (apps) would enable chronic urticaria (CU) patients to self-evaluate their disease activity and control. Yet, recently Antó et al (2021) reported a global paucity of such apps for patients with CU. In this analysis, we assessed patient interest in using apps to monitor CU disease activity and control using questions from the CURICT study, **Methods:** The methodology for CURICT has been reported. Briefly, a 23-item questionnaire was completed by 1,841 CU patients from 17 UCAREs across 17 countries. Here, we analyzed patient responses to the CURICT questions on the use of apps for urticaria-related purposes. **Results:** As previously published, the majority of respondents had chronic spontaneous urticaria (CSU; 63%; 18% chronic inducible urticaria [CIndU]; 19% with both), were female (70%) and in urban areas (75%). Over half of patients were very/extremely interested in an app to monitor disease activity (51%) and control (53%), while only ~1/10 were not. Patients with both urticaria types vs those with CSU only (OR, 1.36 [1.03-1.79]) and females vs males (OR[95%CI], 1.47 [1.17-1.85]) were more likely to be very to extremely interested in an app to assess disease control. **Conclusions:** Overall, patients with CU were highly interested in using an app to assess their disease activity and control. Development of well-designed apps, specific to disease types (CSU, CIndU, CSU+CIndU, etc), validated by experts across platforms would help improve the management and possibly outcomes of CU treatment while providing important patient information to be used in future research.

## Introduction

In the recent Urticaria Centers of Reference and Excellence (UCARE) study, CURICT, we assessed use and interest in information and communications technologies (ICTs) for patients with chronic urticaria (CU).<sup>1,2</sup> We found that almost all CU patients had access to ICTs and most were using these regularly to obtain health and disease-related information.<sup>1</sup> Specifically, most patients with CU were interested in ICTs to receive disease information and to communicate with their physicians and other patients about their urticaria.<sup>2</sup>

ICTs such as mobile phone applications (apps) would enable patients to (i) self-evaluate their disease activity, impact, and control, (ii) improve self-management and (iii) optimize their therapy including allergic comorbidities. Yet, very recently Antó et al (2021) reported a global paucity of such apps for patients with CU.<sup>3</sup> To date, the unmet need for suitable apps from the patient’s point of view remains unknown.

**Objective:** Using questions from the CURICT study, we assessed patient interest in using apps to monitor CU disease activity and control.

## Methods

The scope, methodology, conduct, and other results of the CURICT study have been previously reported.<sup>1,2</sup> Briefly, a 23-item questionnaire<sup>2</sup> was completed by 1,841 CU patients from 17 UCAREs across 17 countries. Here, we analyzed patient responses to the CURICT questions on the use of apps for urticaria-related

purposes. As previously published, the majority of respondents had chronic spontaneous urticaria (CSU; 63%; 18% chronic inducible urticaria [CIndu]; 19% with both), were female (70%) and lived in urban areas (75%) with a mean age of 41 years, and ~4 years of disease duration.<sup>1,2</sup>

### *Statistical analysis*

The agreement scale was dichotomized as “agree-to-strongly agree” (agree and strongly agree) and “not agree-to-strongly agree” (strongly disagree, disagree and undecided). Similarly, the interest scale was dichotomized as “very-to-extremely interested” (very interested and extremely interested) and “not very-to-extremely interested” (not interested, slightly interested and moderately interested).

A binomial logistic regression analysis was performed to predict the likelihood of being very to extremely interested or not in app development described above stratified by age, gender, educational level, region, living area, economy according to the World Bank data, urticaria type and years with diagnosis. All data were analyzed using SPSS version 24.0 software (SPSS Inc., Chicago, IL, USA).

### *Ethical Considerations*

This study was approved by the ethics committee “Comité de ética e Investigación en Seres Humanos” (CEISH), Guayaquil, Ecuador (IRB number HCK-CEISH-19-0059) and by a committee for each participating UCARE center. Each participant provided consent to completion of the anonymous survey, and confidentiality was maintained throughout the study.

## **Results**

### **More Than Half of Patients with CU Are Very to Extremely Interested in an App to Monitor Disease Activity and Control**

Over half of patients were very or extremely interested in the development of an app to monitor disease activity (51%; n=946) and control (53%; n=967), while only ~1/10 were not interested at all in apps to assess such parameters (urticaria activity, 12.8%, n=236; urticaria control, 12.0%, n=221).

### **Comorbid CIndU in Patients with CSU is Linked to Higher Levels of Interest in the Use of an App to Assess Disease Control**

Patients with both urticaria types reported a greater likelihood of being very to extremely interested in app development to assess disease control (OR, 1.36 [1.03-1.79]) versus those with CSU only.

### **Female Patients and Those with Higher Education are Significantly More Likely to Use Apps for Disease Control**

Female patients were more likely than males to be interested in the development of an app to monitor disease control (**Table 1**). The two highest levels of education (undergraduate and postgraduate studies) presented the highest odds of being very to extremely interested in the use of an app to assess disease activity (odds ratio [OR; 95%CI], 3.60 [2.37-5.48] and 2.56 [1.64-3.99], respectively) and control (OR, 2.82 [1.88-4.23] and 2.36 [1.53-3.64], respectively).

### **Older Age was Identified as a Significant Predictor for Less Interest in App Development for Disease Activity and Control.**

Even though older age was identified as a significant predictor for less interest in app development for disease activity and control, the odds ratios approached but did not exceed the unit value of 1.0 (OR, 0.97 [0.96-0.98]; 0.97 [0.96-0.98], respectively). Furthermore, patients residing in upper middle-income countries were less likely to be interested in app development to measure disease outcomes vs those in high income countries.

## **Discussion**

In this study, across all strata, patients with CU demonstrated significant interest in using an app for monitoring their disease activity and control. Being female, higher education, and having both CSU and

CIndU were important drivers of this interest.

Given our findings, there is a clear unmet need for well-developed apps, particular for CU disease type, that could comprehensively document patients’ daily disease activity (triggers, QoL, comorbidities, consequences) and accurately account for disease control or lack thereof. Apps could also provide detailed and unique data about each patient, which would enable practitioners to develop and implement individualized treatment plans and adapt quickly according to disease course. Yet, while most CU patients are highly interested in using apps to document their condition, suitable ones which would thoroughly assess their condition are limited in number, function, geographical reach, and none covered comorbidities; importantly only one app noted by Anto et al assessed disease control.<sup>3</sup>

Our study included a large sample of patients and utilized a network of researchers across the world. However, the study design was cross-sectional and therefore cause-and-effect relationships could not be detected; in addition, while the questionnaire was developed by experts worldwide, it has not been confirmed in validation studies to date.

**Conclusions:**

Overall, patients with CU were highly interested in using an app to assess their disease activity and control. Development of well-designed apps, specific to disease types (CSU, CIndU, CSU+CIndU, etc), validated by experts across platforms would help improve the management and possibly outcomes of CU treatment while providing important patient information to be used in future research.

**References:**

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**Table 1. Adjusted logistic regression reporting patient interest in app development to assess urticaria activity and control.**

Variable	Disease Activity Very to extremely interested in app development OR (95% CI)	Disease Activity Very to extremely interested in app development OR (95% CI)	Disease Control Very to extremely interested in app development OR (95% CI)
<b>Age</b>	<b>0.97 (0.96-0.98)</b>	<b>0.97 (0.96-0.98)</b>	<b>0.97 (0.96-0.98)</b>
<b>Gender<sup>+</sup></b>			
Female	1.24 (0.98-1.56)	1.24 (0.98-1.56)	<b>1.47 (1.17-1.85)</b>
<b>Education level<sup>++</sup></b>			
Secondary/Highschool	<b>2.33 (1.53-3.53)</b>	<b>2.33 (1.53-3.53)</b>	<b>1.75 (1.17-2.62)</b>
Undergraduate/college	<b>3.60 (2.37-5.48)</b>	<b>3.60 (2.37-5.48)</b>	<b>2.82 (1.88-4.23)</b>
Postgraduate studies	<b>2.56 (1.64-3.99)</b>	<b>2.56 (1.64-3.99)</b>	<b>2.36 (1.53-3.64)</b>
<b>Economy<sup>§</sup></b>			
Upper middle income	<b>0.52 (0.38-0.73)</b>	<b>0.52 (0.38-0.73)</b>	<b>0.47 (0.34-0.66)</b>
<b>Urticaria type<sup>¶</sup></b>			
Both (CSU & CIndU)	1.26 (0.95-1.67)	1.26 (0.95-1.67)	<b>1.36 (1.03-1.79)</b>

Notes: Regression analyses were adjusted for variables such as age, gender, education level, region, living area, economy, urticaria type and years with urticaria. **Bolded values are significant at .05 significance level.** CSU, chronic spontaneous urticaria; CIndU, chronic inducible urticaria; CI, confidence interval; OR, odds ratio; <sup>+</sup>Reference gender category is “female” <sup>++</sup>Reference education level category is “No education/Primary school”. <sup>§</sup>Reference economy category is “high income”. Categories are defined according to the World Bank data <sup>¶</sup>Reference urticaria type is CSU

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