

Chronic urticaria patients are interested in apps to monitor their disease activity and control: A UCARE CURICT analysis

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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 chronic urticaria information and communication technologies (CURICT) study.

Methods: The methodology for CURICT has been reported. Briefly, a 23-item questionnaire was completed by 1841 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) [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 versus those with CSU only (odds ratio [OR], 1.36 [1.03–1.79]) and females versus 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, half of the patients with CU were very to extremely 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.

KEYWORDS

apps, chronic inducible urticaria, chronic spontaneous urticaria, chronic urticaria, UCARE

SCHLÜSSELWÖRTER

apps, chronische induzierbare urtikaria, chronische spontane urtikaria, chronische urtikaria, UCARE

1 | INTRODUCTION

In the recent Urticaria Centers of Reference and Excellence (UCARE) study, chronic urticaria information and communication technologies (CURICT), we assessed use and interest in information and communications technologies (ICTs) for patients with chronic urticaria (CU).^{1,2} We found that almost all CU patients had access to ICTs and most were using these regularly to obtain health and disease-related information.¹ 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.²

Information and communications technologies 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.³ To date, the unmet need for suitable apps from the patient's point of view remains unknown.

1.1 | Objective

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

2 | METHODS

2.1 | Study design and population

The scope, methodology, conduct, and other results of the CURICT study have been previously reported.^{1,2} Patients were ≥ 12 years old and previously diagnosed with chronic spontaneous urticaria (CSU) or chronic inducible urticaria (CIndU) by a physician; those with other dermatological diseases or intellectual disabilities were excluded. A 23-item questionnaire, designed, evaluated, and reviewed by an expert panel of physicians that collected demographic (age, gender, education level, living area, etc) and clinical information (urticaria type, years with diagnosis, etc.) from each patient. Furthermore, participants were asked to quantify their interest using a scale (not interested, slightly interested, moderately interested, very interested, and extremely interested).^{1,2}

Here, we analyzed patient responses to the CURICT questions on the use of apps for urticaria-related purposes. As previously published, the 23-item questionnaire² was completed by 1841 CU patients from 17 UCAREs across 17 countries. The majority of respondents had chronic spontaneous urticaria (CSU; 63%; 18% 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.^{1,2}

2.2 | 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 given the effects of 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.).

2.3 | 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.

3 | RESULTS

3.1 | 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 $\sim 1/10$ were not interested at all in apps to assess such parameters (urticaria activity, 12.8%, $n = 236$; urticaria control, 12.0%, $n = 221$).

3.2 | 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 (odds ratio [OR], 1.36 [1.03–1.79]) versus those with CSU only.

3.3 | 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 very/extremely 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 (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).

4 | 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 ORs 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 versus those in high income countries.

5 | DISCUSSION

In this study, across all strata, patients with CU demonstrated very/extreme 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.

Other recent studies assessing app use in chronic allergic conditions have demonstrated high patient interest/satisfaction as well compliance and subjective improvements in their disease across age groups.⁴⁻⁶ Glattacker et al found that adults patients with allergic rhinitis were adherent with over half using the app for >6 months. Patients also reported subjective improvements due to app use including greater knowledge of their allergies, improved QoL, and greater allergy self-management.⁴ In a study assessing the impact of ASTHMAXcell Adventures, a gamified, guideline-based, pediatric app, Hsia et al, found that children were highly satisfied with an app and that its use improved asthma control, knowledge, and QoL while reducing emergency department visit and prednisone use.⁵ In young adults with asthma, Murphy et al discovered that use of an app may

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

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

Note: 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 0.05 significance level.

Abbreviations: CI, confidence interval; CIndU, chronic inducible urticaria; CSU, chronic spontaneous urticaria; OR, odds ratio

^aReference gender category is “female”.

^bReference education level category is “No education/Primary school”.

^cReference economy category is “high income”. Categories are defined according to the World Bank data. This classification changes the thresholds to define each category based on the gross national income per capita of each country, which is the dollar value of a country’s final income year divided by its population. Currently the thresholds are: Low income (<1046), Lower-middle income (1046–4095), Upper-middle income (4096–12,625), High income (>12,535).

^dReference urticaria type is CSU.

support adherence in inhaled corticosteroid use.⁶ Moreover, Bousquet et al, were able to identify phenotype differences between *a priori*-defined rhinitis groups using the MASK-rhinitis app.⁷ This suggests that research questions for chronic diseases may be better and more easily identified using app technology.

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 very 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.³

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. Also, we did not record the disease severity and control, and as such, we cannot identify if these variables could affect the outcomes of interest.

6 | CONCLUSIONS

Overall, over half of patients with CU were very to extremely 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.

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CONFLICT OF INTEREST

Ivan Cherez-Ojeda has no conflicts of interest. **Emanuel Vanegas** has no conflicts of interest. **Annia Cherez** has no conflicts of interest. **Miguel Felix** has no conflicts of interest. **Karsten Weller** is or recently was a speaker and/or advisor for, and/or has received research funding from: Biocryst, CSL Behring, Dr. Pflieger, FAES, Moxie, Novartis, Shire/Takeda, and Uriach. **Markus Magerl** is or recently was a speaker and/or advisor for, and/or has received research funding from Biocryst, CSL Behring, Kalvista

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