

Editorial

The Use of Mobile Health Apps in Clinical Practice Remains Challenging

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According to several international recommendations, disease activity should be regularly monitored with validated outcome measures in patients with axial spondyloarthritis (axSpA), and therapy should be adapted accordingly.^{1–3} Increasingly, healthcare providers are encouraged to also use patient-reported outcomes (PROs) for this purpose, to capture valuable data from the patient's perspective. However, because of workforce capacity issues and limited resources, close monitoring with frequent visits is often not feasible in many rheumatology outpatient clinics.^{4,5} Due to the widespread adoption of smart technology, mobile health apps are being increasingly used to monitor the disease course with electronic PRO measures (ePROMs).⁶ These apps collect personal data from patients and enable self-monitoring of disease activity and functioning over time. Health apps can also aid in providing education and support, increase adherence to therapy, and facilitate delivery of care.^{6,7} The large advantage of mobile apps is that they are accessible anytime and anywhere, offering the possibility for flexible, patient-tailored, off-site monitoring.⁷ Further, frequent PRO assessments have a huge potential to gain insight into what actually happens to patients in between visits and enriches the understanding of the disease course in an individual patient. This way, patterns in disease activity and physical functioning that may have gone unnoticed otherwise, and in particular, the occurrence of disease flares, may be revealed.^{8,9} For patients, tracking symptoms may increase the sense of being in control of the disease.¹⁰ Subsequently, discussing these results with healthcare providers enables patients to actively participate in their own disease management and may result in a more

personal approach to treatment and enhance shared decision making.^{9–11} Additionally, the use of these health apps have the potential to improve the efficiency of care, such as in determining whether to postpone a visit or to perform the visit remotely in patients in remission or with low disease activity (LDA).⁸

In this issue of *The Journal of Rheumatology*, Kempin et al report a proof-of-concept study that investigated the performance of a health app, the AxSpA Live App, with respect to usability, adherence, and equivalence of data in the daily care of patients with axSpA.¹² Every 2 weeks during a 6-month period, patients were asked to complete ePROMs on disease activity and pain, and they subsequently had to export these data via a secure link to the treating rheumatologist. The entries were graphically displayed, so patients could view personal results over time. Sixty-nine patients participated, with an average age of 41.5 years; 58.0% were male, and 76.8% were treated with biologic disease-modifying antirheumatic drugs (bDMARDs). Although 92.8% of the patients still participated in the study at 6 months, the attrition rate of the app was high. At 3 and 6 months, respectively, only 29.0% and 28.4% of the patients were considered app-adherent, meaning that they exported their data at least 4 out of 5 times. The researchers found that high disease activity (HDA) and older age predicted good adherence to the app. The usability of the app was rated as acceptable to good, and no systematic differences were found between digital and paper-based assessments.

Poor patient compliance and high attrition rates are well-known limitations to the use of health apps.^{11,13} Patients may be motivated and enthusiastically start using an app but may become tired of repeatedly recording their symptoms and lose interest over time. The poor adherence rate in the study by Kempin et al might be explained by the relatively short interval between assessments, as well as the high number of required data transfers.¹² The interval was based on an Assessment of SpondyloArthritis International Society–European Alliance of Associations for Rheumatology recommendation specifically targeted at patients with axSpA with HDA, starting nonsteroidal antiinflammatory drug (NSAID) therapy, for whom biweekly

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disease activity assessments are advised during a 4-week period (ie, 2 courses of NSAID), after which bDMARD therapy is indicated in case of insufficient response.² However, the study design of Kempin et al¹² does not allow for determining whether the AxSpA Live App is fit for use in this specific context. Moreover, the majority (76.8%) of study participants already received bDMARD therapy at baseline. The fact that these patients were overrepresented among nonadherers might indicate that the assessment frequency exceeded the clinical need in this group. The authors acknowledge that this 2-week assessment interval might have been very ambitious.¹² However, other studies have suggested that more frequent use of a health app could actually lead to better adherence, because patients are more likely to integrate this in their daily routine.^{9,10}

In the study by Kempin et al, patients had to actively export their data and only these exported data were included in the evaluation.¹² This action could also have been a barrier for patients to use the app. Perhaps patients had actually entered data, but did not export them; however, this was not studied. The integration of data collected outside the hospital into local electronic health records (EHRs) seems crucial for adherence to health apps.^{8,9} The app should be easy in use. Data exchange between the mobile health app and the local hospital should therefore go without any burden for the patient. Also, the workload for the physician should be kept to a minimum. Despite being demonstrated that incorporating patient-recorded data into the EHR, graphically displaying them, and discussing the results with the patient improves patient participation and communication, there are, unfortunately, still many barriers (eg, regulatory challenges, privacy, security, and technical issues) before this can be established in clinical practice.^{9,14,15}

In their study, Kempin et al found that older age and higher disease activity were predictors of better app adherence and concluded that health apps such as the AxSpA Live App should concentrate on more severely affected patients.¹² These results contrast in part with findings from a study of rheumatoid arthritis, in which ePROMs were assessed daily with an app.¹⁰ In this study, patients aged 65 years and older were also found to have adhered better to the app; however, the same study found that low instead of high baseline clinical disease activity predicted better adherence.¹⁰ A health app for self-monitoring of a disease could be valuable for patients with HDA as well as LDA. In patients with HDA, this could provide more insight into the course of the disease over time, with the possibility of identifying patterns of symptoms that precede flares or visualizing response to medication.¹⁶ In patients in remission or with LDA, symptom tracking could provide reassurance that the disease is still well controlled and potentially replace hospital visits. However, for some patients with well-controlled disease, frequent app entries could become a nuisance if there are no symptoms. Moreover, there is a risk that patients will enter data only on “bad” days, which could distort the results.⁹

When developing a health app, the key to success is a user-centered design. This entails composing an inventory of needs and priorities of patients and members of the healthcare team through focus groups; designing a proof-of-concept

prototype; and using an iterative and cyclical process of further development, testing, and evaluation of this prototype with end users.^{8,14} Examples of features that should be taken into account are the content of the app (ie, what to assess and how), visual display (eg, personal results and plotting these against past results or those of patient peers), and functionality (ie, factors determining the ease of use, such as options for voice enablement, push notifications to increase adherence, and customizable assessment intervals).^{8,13,14,16} Ideally, an app should be able to address different clinical scenarios and serve different types of end users. To avoid app fatigue, computerized adaptive testing methods could be applied, such as those offered by the Patient-Reported Outcomes Measurement Information System.¹⁷ Adding passive sensors that measure movement could be a solution for those who do not wish to actively enter data.⁷ Relatively unknown is the application of gamification in health apps, which is a set of motivational techniques that uses a game or competitive element in a non-gaming context. Participation in a competition-like environment with rewards for actions has the potential to enhance participation, engagement, and loyalty to an app.⁷

In conclusion, the development and use of mobile health apps are growing rapidly in popularity. These apps enable patients to monitor their disease course and to become active participants in their own disease management. Adherence to these health apps, however, remains challenging. Engaging end users and all other stakeholders when developing the app and integrating the collected data into the EHR are essential for success. Keeping the app attractive through personalized visual feedback, adaptive testing, gamification, and other elements could potentially increase adherence further and sustainably exploit the benefits of this technology for patients and healthcare providers.

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