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## Psychoeducation and mHealth apps: Bipolar disorder management in the post-pandemic world – The BeepMood app

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Dear Editor,

Bipolar disorder (BD) is a chronic and debilitating mental health condition that affects millions globally, posing challenges in both diagnosis and management. Traditional treatments, while effective, often leave gaps that can be addressed through complementary therapeutic strategies in a combined approach. Psychoeducation is one of the complementary strategies recommended (Britvić et al., 2009).

Bessana, 2023 provides a thorough review of the importance of bipolar-specific psychoeducation, while reviewing the manual by Colom and Vieta, 2006. Their effectiveness is well established, and the results have shown reduced hospitalization rates and an overall improvement in quality of life (Dietch, 2015; Bessana et al., 2023). These measures should be implemented early on (Filaković, 2011).

However, like all therapeutic interventions, psychoeducation is not without its challenges. It requires trained facilitators, consistent attendance from participants, and a tailored

curriculum that caters to the diverse needs of those with BD. More recently, psychoeducational interventions involving technological tools have been developed, such as the use of dedicated apps (García-Estela et al., 2022; Depp et al., 2015).

Mental health apps are a rapidly growing category and with high demand. These apps are readily available, inexpensive and used by many patients. However, the great majority are not clinically validated nor use evidence-based information. The development of mHealth smartphone apps should assess consumer needs in its development (Nicholas et al., 2015) and their efficacy has been addressed by recent systematic review (Anmella et al., 2022).

Their value proved remarkable during recent pandemic times, where social interaction and group settings were discouraged by local health authorities. After more than 10 years of providing psychoeducational groups and in order to improve accessibility we developed the BeepMood app, the first European Portuguese mHealth app developed with

evidence-based information for BD and with active involvement of patients.

BeepMood is a smartphone app for self-monitorization and a psychoeducation platform for BD. In the development of this app patients were involved, assessing a cohort of 25 patients followed-up in an outpatient community setting. Their interest in such tool and their possible needs were assessed. Mood assessment, medication adherence and brief assessment of possible warning signs (such as changes in sleep patterns, mood symptoms, suicidal ideation and delusional thoughts) were included. Patients showed concern with privacy issues. With this in consideration, none of the inserted data are saved in the cloud or accessible by anyone other than the user. Regarding content, the quality assessment statements stated by Nicholas et al, 2015 on app development in BD and psychoeducation, were followed and the Portuguese BD patient's association gave the final approval of the content, to ensure readability.

The app is free to download in both Google Play and Apple Store. The user is invited to create an account in order to access the app's different sections and a privacy policy is clearly stated. Every day the user opens the app, they can assess their mood using an intuitive slider and answer simple questions to further analyze mood, thought content and sleep. Some possible daily activities can also be added, using simple buttons. Information regarding medication can be inserted and prompts activated to remind daily intake and for stock management.

A mood graph is obtained and the information regarding the data inserted is easily accessible. A section regarding psychoeducation is also available, with all the used bibliography clearly stated, with information on different topics. Information regarding sleep and diet is also provided. The user can also insert their relapse prevention plan (previously created with their mental health provider).

After fulfilling the mood assessment and the questionnaires, in case a warning sign is detected, this is signaled to the user and, according to the degree of severity detected, the appropriate steps are provided: the contacts of their mental health team are shown to anticipate the follow-up appointment; and in case of an emergency the patient is provided with the emergency health Portuguese number and the cell phone number of their sentinel-figure (previously defined); Sleep and activity monitoring can be integrated in the app. The patient can also share their mood chart with their psychiatrist if they wish to.

Users experience has been overall positive, valuing the existent flexibility in the use of the app, without feeling pressured

to use it and don't feel the app is intrusive. This option has most likely led to the low maintenance in the use of the app that is also reported.

In conclusion, while pharmacological treatments remain the mainstay of bipolar disorder management, psychoeducation interventions offer immense potential in the maintenance treatment of BD. mHealth apps, such as the one presented, can provide this intervention to more patients, in real-time and naturalistic conditions.

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