The app 'Robin' including virtual assistance and a reminder function improves medication adherence in chronic myeloid leukemia patients.

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Background Chronic myeloid leukemia (CML) is a malignant hematological disorder, which can be effectively treated with tyrosine kinase inhibitors. Studies showed that 25%-35% of the patients were non-adherent. Reasons for poor adherence may be internal to the patient, such as hindering beliefs and personality traits, and external , such as demands during work pressure, the relationship with the health care professional as well as the regimen prescribed. Non-adherence has been associated with disease progression. As a solution for this problem, we developed the innovative eHealth intervention 'Robin'. 'Robin' is a program built as smartphone application which can be applied by patients in a personalized way. By using the app patients are supported in dealing with daily life issues. 'Robin' includes: 1. A chatbot with over 150 chats with tips and tricks, personalized to patients? preferences 2. Logs to keep track of medicine adherence, side effects, blood values 3. A list of frequently asked questions 4. A reminder function and support for difficult moments

Purpose The aim of the study was to get insight into the effects of the app 'Robin' on medication adherence and quality of life (QoL) of CML patients.

Method We performed a pretest-posttest intervention study including CML patients older than 18 years. CML patients in The Netherlands were invited to participate via letters from the Amsterdam UMC, location VUMC, the patient advocacy group Hematon website, and at visits to the hospital. Patients interested to participate could register online. During the three-month pretest period patients received usual care and used MEMS. During the three months posttest period the app 'Robin'was used. Adherence was measured with MEMS device and MARS questionnaire. QoL was assessed with EORTC-QLQ-C30. Paired sample t-test, McNemar test and Wilcoxon signed rank test were used to analyse the data.

Findings Of 67 registered patients 14 (21%) completed the study. Medication adherence increased from 83.4% ± 1 8.8% before to 96.9% ± 4.2% ($P < 0.009$) measured with MEMS after the app Robin was introduced and increased f rom 38.5% to 84.6% ($P < 0.031$) measured with MARS. QoL was not influenced.

Conclusion The app 'Robin' in combination with MEMS considerably increased medication adherence of CML patients. It is not known to which extent the reminder function contributes to the effect. The large drop-out limits the study. The app 'Robin' is a promising medication adherence support tool. The effects of the app 'Robin' on the long-term need to be investigated.