Development and pilot study of “Smart Cancer Care”: a platform for managing side effects of chemotherapy

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Backgrounds

As outpatient chemotherapy treatment increases, cancer patients receiving chemotherapy spend more time at home. In addition, since the types of chemotherapy are gradually expanding, it will be essential to prepare patient self-management strategies for various chemotherapy-related side effects. This study aimed to develop a platform (called Smart Cancer Care) to implement a chemotherapy side effect management program and to evaluate its feasibility.

Methods

Smart Cancer Care comprises an application for patients and a dashboard for medical staff. Thirty-two symptoms to be managed using Smart Cancer Care were summarized through a literature review and Delphi. Management guidelines were developed based on the severity of each symptom (3 stages), and installed in Smart Cancer Care according to the Common Terminology Criteria for Adverse Events (CTCAE) v5.0 guidelines. To evaluate the feasibility of the developed application and medical dashboard, cancer patients and cancer treatment medical staff used Smart Cancer Care for 2 to 3 weeks and subsequently reported the experience of using them.

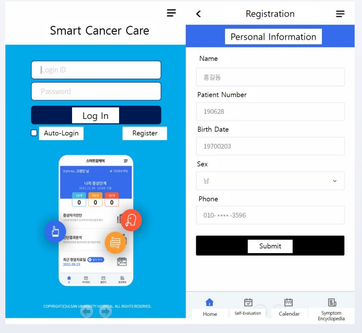

Figure 1

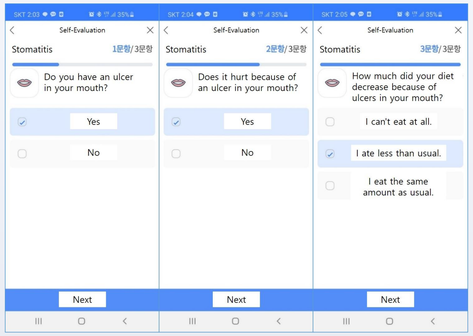

Figure 2

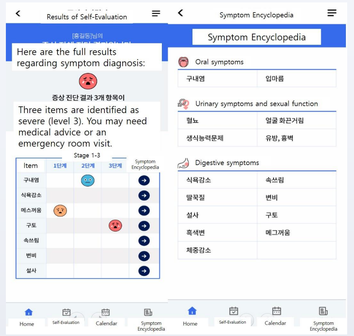

Figure 3

Results

The patient application provided a list of symptoms according to the cancer type and anticancer drug enabling presence and severity of each symptom to be evaluated. Patients received management guidelines for symptoms based on the symptom evaluation results. On the medical staff dashboard, administrators and authorized medical personnel could access and assess information regarding side effects and symptom severity submitted by the patient. The feasibility and usefulness of Smart Cancer Care were confirmed through a pilot test targeting 30 patients and 24 chemotherapy-related medical staff. For patients, the evaluation score for the “The program will be helpful when seeing medical staff” item was the highest. For medical staff, the score for the “By checking the patient's symptoms using the program, it helps to take appropriate measures for the patient” item was the highest. Although minor corrections were raised, most patients and medical staff expected that Smart Cancer Care would help their treatment.

Discussion

The configuration of the application and dashboard of Smart Cancer Care detailed in this study could be used for the development of a widely accepted platform to implement a chemotherapy side effect management program.

Keywords

Drug Therapy; Mobile Applications, Neoplasms, Drug-Related Side Effects and Adverse Reactions