Developing an mHealth Solution for Supporting Chemotherapy Administration in Pediatric Acute Lymphocytic Leukemia

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INTRODUCTION

In Brazil, cancer is the leading cause of disease-related death among children and adolescents aged 1 to 19 years, with leukemia being the most common diagnosis.

Chemotherapy is the primary treatment for leukemia, demanding skilled nursing care and access to updated technical information.

In Brazil, there remains a significant gap in providing training for nurses in this area. mHealth technology offers a promising solution by providing quick access to vital information, enhancing the quality of care nurses can provide.

OBJECTIVE

Develop a prototype application for a mobile device, for nurses, to support the administration of chemotherapy drugs in Pediatric Acute Lymphocytic Leukemia.

METHODS

Step 1. Content elicitation (Survey); **Step 2.** Content analysis (Identification); **Step 3.** Prospecting themes; **Step 4.** Content validation by experts; **Step 5.** Content adjustments; **Step 6.** Prototype building

RESULTS

Step 1 included identifying topics related to the administration of chemotherapy drugs in children and adolescents through an integrative literature review to develop a survey questionnaire for nurses. Topics: Physical assessment and hemodynamic monitoring; Safety and chemotherapy administration; Procedures for chemotherapy administration; Toxicity and symptoms.

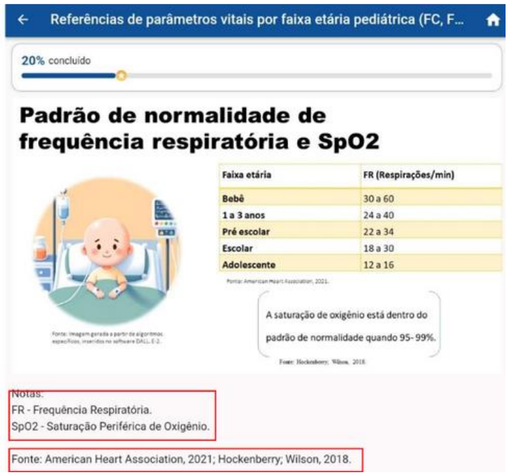

Fig.1. Example of application screen
(original language: Brazilian Portuguese)

In **Step 2**, 34 nurses answered the questionnaire. Most essential items - **Physical assessment and hemodynamic monitoring:** Vital parameters (97%) and Fluids calculation for the pediatric patient (97%); **Safety and checking:** checklist for chemo administration, a checklist that informs chemo contraindications, support checklist to identify patient, with the drugs' name and dose and administration route; **Procedures for chemotherapy administration:** chemotherapy extravasation (94,1%) and spillage (97%) was the primary concern. **Others:** laboratory tests, emotional support, elimination monitoring, and physical examination.

Steps 3 and 4: 15 main content topics were eligible to be part of the application. Examples: Calculate of the patient's body surface area; Provide references for vital parameters by pediatric age group; Provide a checklist with steps for medication administration specific to oncology. These steps also included the validation of this content by experts.

Step 5 and 6: the content was adjusted according to the expert's suggestion, and the prototype was built.

CONCLUSIONS

This study presents an mHealth prototype application for administering antineoplastic drugs in pediatric ALL nursing practice. Prioritized content includes physical assessment and hemodynamic monitoring, safety and administration processes, procedures for chemotherapy administration, and toxicity and symptom management. The prototype aims to provide safe, high-quality pediatric oncology practices that experts have validated. Future research will focus on refining it, improving its presentation and appearance, and usability testing to enhance the tool's accessibility and effectiveness.

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