

Supporting the Future Interoperability of a Game-Based Symptom Reporting App for Children

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What might the attendee be able to do after being in your session?

Attendees will describe efforts to support the future interoperability of a game-based symptom reporting app for children. Attendees will learn how clinical terms in the app were identified and mapped to standards-based terminology using SNOMED CT and LOINC databases to support future integration of children's self-reported data into electronic health record systems.

Description of the Problem or Gap

Self-report is the gold standard for symptom assessment, yet few resources are available for children.¹ Mobile health (mHealth) resources provide a developmentally relevant option to deliver child-centric measures.² For mHealth resources to reach their clinical potential, semantic interoperability with EHR systems needs to be achieved.³ This project mapped clinical terms in a game-based symptom reporting app for children to standards-based terminology.

Methods: What did you do to address the problem or gap?

Color Me Healthy is a game-based symptom reporting app for children 6-12 years of age that was co-designed with children and clinicians (Figs. 1&2).⁴ Its initial feasibility, acceptability, and clinical relevance were demonstrated in 19 children with cancer.⁵ Terminology mapping began by aligning the app's clinical content with Fast Healthcare Interoperability Resources (FHIR). Symptoms aligned with the Condition Resource and ordinal questions aligned with the Observation resource. SNOMED Clinical Terms (CT) from the Clinical Findings hierarchy were required for Condition.code,⁶ LOINC for Observation.code, and SNOMED CT for Observation.value. SNOMED CT and LOINC databases were searched using an online SNOMED CT browser⁷ and the Regenstrief LOINC Mapping Assistant.⁸ Terms without codes were identified and requested.

Results: What was the outcome(s) of what you did to address the problem or gap?

Thirty clinical terms were mapped to SNOMED CT and LOINC codes. Value sets were developed for relevant terms such as yes/no. A request was submitted to LOINC to have codes and a panel created for the 8 terms without codes. In response, LOINC created the "*Color Me Healthy – children's symptom assessment app*" panel (94067-6).

Discussion of Results

Completion of this project positions the app for FHIR development and future interoperability with EHR systems. Next steps include the development FHIR profiles for each of the symptoms included in the app. FHIR-enabling the app will support transmission of data as discrete elements and the capacity to analyze data across healthcare settings.

Conclusion

Attention to semantic interoperability during the development of mHealth resources is feasible and may support their future clinical utility and implementation.

Attendee's Take-away Tool

Attention to data structure during the development of mHealth apps guides correct mapping of clinical terms to support future interoperability.

References

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7. SNOMED-CT: The global language of healthcare. <https://www.snomed.org/snomed-ct>
8. LOINC: The universal standard for identifying health measurements, observations, and documents. <https://loinc.org>

Figures 1 & 2: Example screenshots of the symptom reporting features of the *Color Me Healthy* app

