

Integrating Innovative Technologies to Support Exercise in Children and Young Adults with Cancer: User Experiences from the FORTEe Clinical Trial



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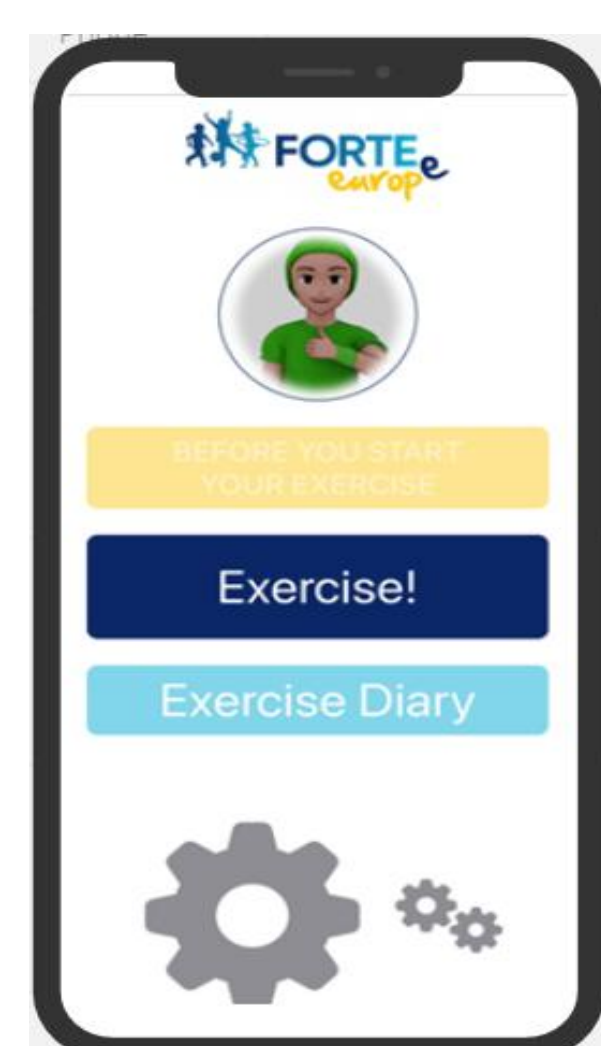
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INTRODUCTION

- Technological innovations are increasingly used to enhance supportive care in paediatric oncology, offering new ways to promote engagement and motivation in exercise-based interventions [1-2].
- The FORTEe European randomised controlled trial [3] explored two complementary technologies as part of a wider individualised exercise intervention: A motion-tracking device (Pixformance) for in-hospital training, and an augmented reality (AR) app for home-based exercise

METHODS

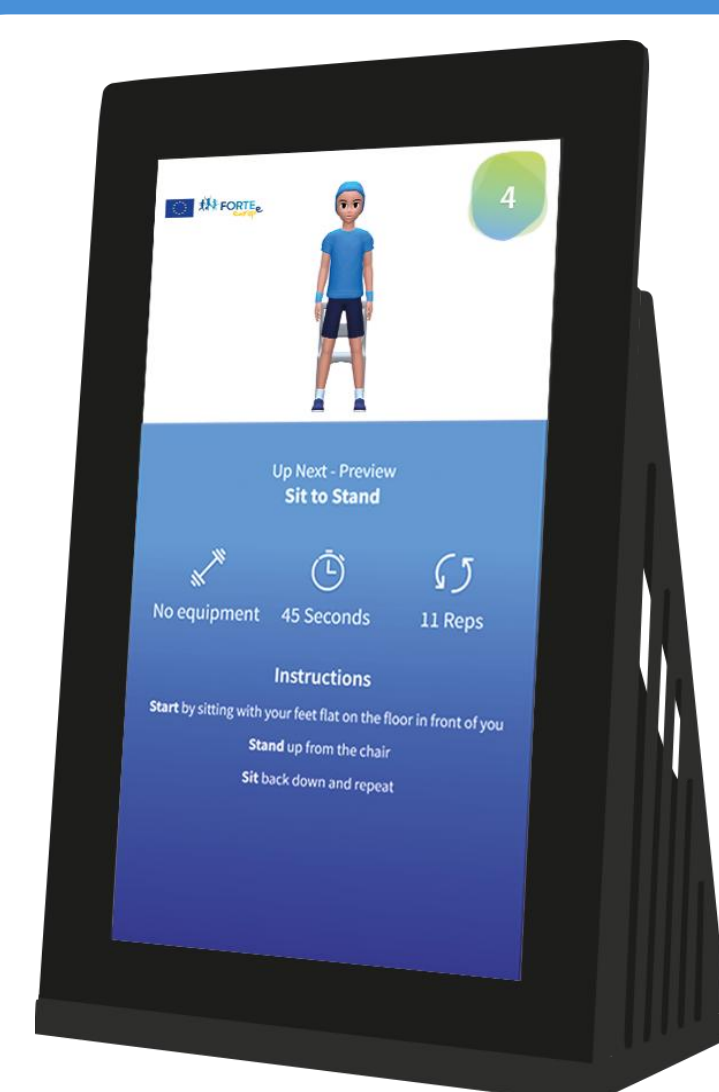
- Children, adolescents, and young adults with cancer (CAYA) aged 4-21 years, and exercise and healthcare professionals (EHCPs) from multiple European centres participated in the FORTEe technology sub-studies.
- User experiences were explored through half-structured interviews with CAYA and anonymous online surveys completed by EHCPs.



AR Smartphone App [4]

Key features:

- Personalised exercise programmes
- 54 exercises (upper body, lower body, core, inc. seated exercises)
- Child-friendly AR avatar demonstrations
- Integrated exercise diary



Motion tracking device 'Pixformance'

Key features:

- Motion tracking
- Real time feedback
- Individualised exercise programmes
- Child-friendly avatar demonstrations

RESULTS

AR App

Feedback from 46 CAYA (mean age 13.6 ± 2.7 years, 39% female) and 31 EHCPs

CAYA enjoyed being able to use the app at home and use it with family members.

The technology felt tailored to young cancer patients, increasing confidence in using the app.

Technical difficulties sometimes impacted reliability of AR features, e.g. time for avatar to appear or appearing in strange locations.

Additional gamification elements, challenges and avatar customisation were suggested for future development.

The AR app could be a useful addition to exercise programmes but should not replace face-to-face support.

Pixformance

Feedback from 90 CAYA (mean age 11.1 ± 3.7 years; 44.4% female) and 33 EHCPs

The avatar demonstrations helped users understand the exercises.

The system sometimes failed to detect movements accurately.

Additional gamification elements, challenges and avatar customisation were suggested for future development.

The size of the station made it difficult to move or position in suitable locations in centres with limited space.

The technology may provide a motivating alternative to conventional exercise sessions for some children but should not replace face-to-face exercise programmes.

CONCLUSION

Findings from these user experience studies indicate that both the motion-tracking device and the AR app were well received by CAYA and EHCPs within the FORTEe trial. Each technology offered distinct benefits for supervised and home-based exercise, highlighting their complementary roles in exercise programmes. Future development should prioritise user-centred design, gamification, and seamless integration into care pathways to optimise engagement and clinical utility in paediatric oncology exercise programmes.

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