Developing a Mobile App to Self-Manage Postural Orthostatic Tachycardia Syndrome

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Abstract

Postural Orthostatic Tachycardia Syndrome (POTS) is a chronic illness affecting the autonomic nervous system, often impacting young women. Many patients use mobile apps to manage symptoms, but existing tools are not tailored to their needs. We surveyed 89 patients to identify key requirements for effective self-management software. Findings informed the development of a prototype app designed to reduce cognitive load and energy demands. The app features a simplified interface that enables faster symptom logging compared to existing solutions.

Reference Format:
Rosalind Thwaites and Adriana Wilde. 2025. Developing a Mobile App to Self-Manage Postural Orthostatic Tachycardia Syndrome. In *Proceedings of 7h UK Mobile, Wearable and Ubiquitous Systems Research Symposium (MobiUK 2025).* Edinburgh, UK, 1 page. https://mobiuk.org/2025/

1 Introduction and motivation

Postural Orthostatic Tachycardia Syndrome (POTS) was first identified in 1997 as a form of dysautonomia affecting mainly young women [4], characterised by tachycardia without hypotension upon standing. It has three main subtypes (hyperadrenergic, neuropathic, and hypovolemic) and significantly affects quality of life. With no cure, treatment focuses on symptom management through medication, lifestyle changes, and supportive garments, although effectiveness varies. Mobile health apps have shown promise in managing chronic conditions and may support POTS patients in maintaining personalised care plans.

2 Background and Study Design

We conducted an online survey to explore how POTS patients use health tracking technologies and to identify unmet needs. A review of 82 relevant studies (filtered from 960 hits) that did not include the POTS population [3]. revealed no research focused on this population. Existing apps are often unsuitable due to the cognitive and energy demands associated with POTS [1, 2]. Our survey, conducted in two phases, received 89 responses, with 36 completing a long-form version. Participants prioritised features that reduced energy cost, supported biometric integration, and minimised emotional distress.

3 Implementation and Evaluation

The app was designed for minimal interaction, enabling symptom tracking with a single tap. It avoids traditional navigation structures that increase cognitive and physical effort. Features include colour-coded symptom buttons to aid users experiencing brain fog and flexible tracking modes to match the user's current energy level. This makes it adaptable to suit the user's energy level, e.g., fatigued users can log a symptom simply by clicking one button (*'fast track'*), but if willing to add additional details, they can complete a *'detailed track'*. These design choices aim to streamline the user experience and lower barriers to consistent symptom monitoring. The prototype application effectively demonstrated the functional requirements of the system designed to assist POTS patients managing their condition. When compared to the current most popular solutions, the prototype offers a fast user interface that is not energetically burdensome (e.g., Visible) the prototype offers a faster user interface that is not energetically burdensome as it requieres 50% fewer screens to log symptoms on the fast track mode.

4 Conclusion

This work identified critical gaps in existing mobile health applications for POTS patients and demonstrated the potential of a user-centered, low-energy interface to improve symptom tracking. Survey responses from 89 patients highlighted the need for simplified navigation, biometric data integration, and emotional sensitivity in app design. The resulting prototype offers a streamlined, single-click tracking system that reduces cognitive load and energy expenditure compared to current solutions. By prioritising ease of use and adaptability to fluctuating patient capacities, this proof-of-concept app illustrates a promising direction for future POTS-specific health technology. Further development and clinical evaluation are recommended to validate its effectiveness and refine features based on ongoing patient feedback.

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MobiUK 2025, Edinburgh

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