

# Enhancing The Hospital At Home Experience

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## INTRODUCTION

Hospital at Home programmes have demonstrated to be safe, feasible and cost effective. However, challenges such as infection control, cleanliness, space constraints and insufficient resources may hamper the adoption and effectiveness of such programs (Picture 1).

**Aims:** The aim of this study is to understand the challenges of providing and receiving healthcare in the community, design a solution to meet the challenge, and to pilot and evaluate the solution

Picture 1: Nurse delivering hospital care at home



## METHODS

This is a three-phase mixed method study implemented from July 2022 to November 2022.

**Phase 1** is a survey with stakeholders providing or receiving healthcare at home to understand their challenges and needs.

**Phase 2** is to design a solution to meet the needs identified in Phase 1.

**Phase 3** is to pilot and evaluate the solution.

### Participants

Convenient sampling was used. Patients enrolled under the Hospital at Home Programme or their caregivers or family members, aged 21 years and above, with no history of cognitive impairment and able to converse in English were invited to participate in the study. All community nurses were included in Phase 1 of the study.

### Phase 1

20 community nurses & 50 patient-caregiver dyads participated in the survey to understand their challenges and needs in delivering and receiving hospital care at home.

### Phase 2 & 3

**Phase 2:** Taking into account the survey findings and suggestions, a prototype of an integrated structure (a movable, cabinet like structure designed to meet the needs by those providing or receiving care in the community) was considered. Grant approval and funding to co-design and fabricate this integrated structure prototype was obtained (Figure 1 to 3).

**Phase 3:** The final prototype was piloted in 10 patients' home to gather their feedback and user experience.

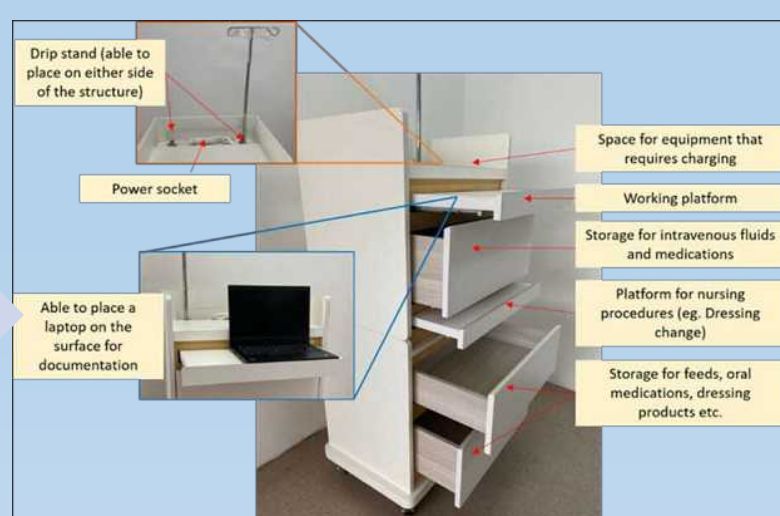
### Ethical consideration

Ethical approval was obtained from the SingHealth Centralised Institutional Review Board (CIRB).

### Data analysis

For Phase 1, descriptive statistics were used to analyze the survey results. In phase 3, the audio recordings were transcribed verbatim before content analysis was performed on the qualitative data.

Figure 3: Final prototype design specifications & functions

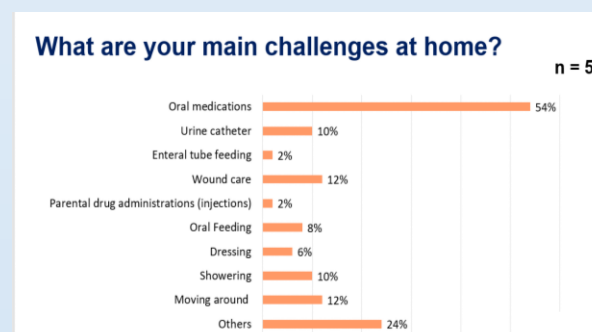


## RESULTS

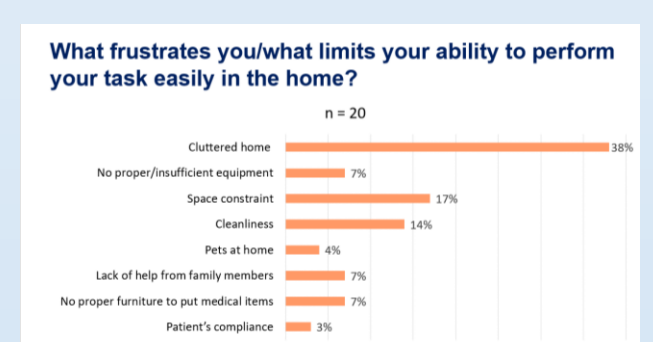
**Phase 1:** A total of 70 participants responded to the survey; 50 patient-caregiver dyads and 20 community nurses.

- Medication management such as polypharmacy, storage, clean space for medication preparation and pill minding (54%) was the greatest challenge faced by the dyads (Graph 1).
- Physical home environment; cluttered home (38%), space constraint (17%) and cleanliness (14%) were most cited by the nurses as the main challenge when providing healthcare at home, particularly the lack of a dedicated and clean space to conduct nursing procedures (Graph 2).

Graph 1: Dyads main challenge



Graph 2: Nurses main challenge



### Phase 2: Design solution

The initial artist impression of the structure (Figure 1) was co-designed with stakeholders. However, it differed significantly from the first prototype (Figure 2) because design change took place to ensure stability of the prototype. The prototype design was reviewed and revised to incorporate all the modifications and specifications required (Figure 3).

Figure 1: Artist impression

Figure 2: Prototype 1

Figure 3: Final prototype



**Phase 3:** Ten patient-caregiver dyads and nine community nurses completed the post evaluation interview. Most participants found the structure useful, but had some feedback and suggestions for future enhancement/improvement.

The participants appreciated that the structure provided ample storage space for their one-stop healthcare consumables and equipment. The small table-top provided a clean workspace for the nurses to place their laptop or medical requisites.

Common recommendations cited was to improve the design, size and outlook of the structure. The size was too bulky especially for small houses/apartments. Participants recommended to have the height and size reduced, and drawers to open more easily. As for cost, most were willing to pay anything below \$100; those with lower income suggested to include government subsidies to keep the price affordable.

## DISCUSISON & SUMMARY

Providing healthcare services in the home setting will become a necessity due to the changing healthcare needs. Through this study, we have identified several challenges that the hospital at home nurses face while carrying out safe hospital care at home, and opportunities for improvement and innovation. The integrated structure was useful and practical to use in our local home setting and layout. Although the structure provides a solution that is less costly and permanent as compared to a home modification, more work is required to further enhance the aesthetics, layout and size of this current version. The team hopes for the structure to be designed to allow it to be repurposed as a common household furniture if the patient does not need it anymore. The team is also conscious to keep it affordable as most patients are only willing to pay below \$100 for such a structure.

### Summary:

Despite the limitations, our findings guide the design of optimal user experience in delivering and receiving hospital care at home. With knowledge of stakeholders' preferences, we will be able to inform the design of an ideal integrated structure to facilitate delivery of hospital care at home. This has the potential to enhance patient, family and staff experience, efficiency, and comfort.