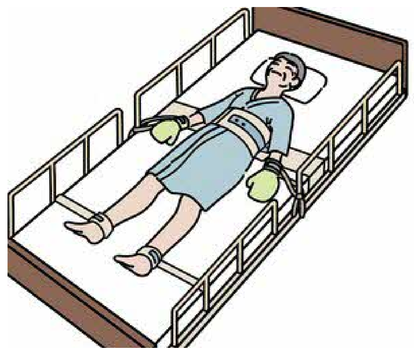
# Redesigning Body Vest to Improve Patient's Care

Singapore Healthcare Management 2025

Department: Ward 48

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## Background

Body vests are widely used for older adults with cognitive impairments in hospitals. In recent years, there has been a significant rise in older adults with cognitive impairments, along with the use of body vests. However, patients had feedback that the current body vests were uncomfortable, restrictive and humiliating. Nurses had also mentioned that it was time-consuming to apply, easily removed and torn by patients.

Hence, the aims of this project were to redesign a body vest for restrained patients, save 50% of the nurses' time in applying body vest and lastly, improve 30% of patients, families and nurses' experience on the application of body vest.

*Current Body Vest Design*

## Changes

A pre-survey involving 60 nurses, 30 patients, and 30 family members revealed widespread dissatisfaction. Key concerns included difficulty in application (95% of nurses), time consumption (90% of nurses), discomfort (80% of nurses, 95% of family members, and patients), poor durability (85% of nurses), reduced patient dignity (85% of nurses, 95% of family members, and 100% of patients), and a strong preference for redesigning the vest ( Table 1, 2 & 3).

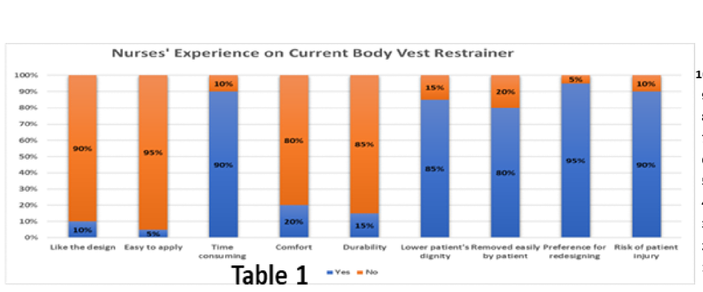


Table 1

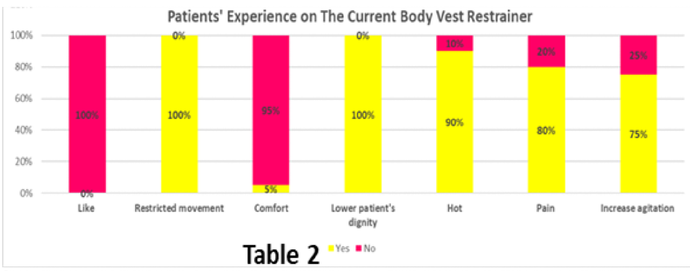


Table 2

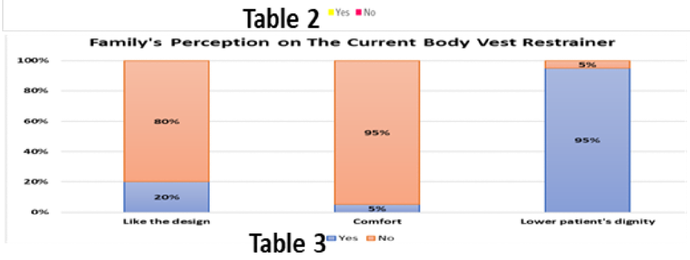


Table 3

We then conducted **four** PDSA cycles, as detailed in Table 4, before finalizing the design. Table 5 summarizes the pros and cons of each prototype.

| PDSA | Time Period | Interventions |
|---|---|---|
| 1 | Jan-Feb | -Global market research of current products<br>-Pre-survey<br>-Training all Ward 48 nurses on the application of body vest restrainer<br>-Time motion study with current body vest<br>-Drafting 1st prototype of redesigned body vest<br>-Education and try-out of 1st prototype<br>-Gather feedback from Ward 48 nurses, patient and family<br>-Improvements made on 1st prototype |
| 2 | Feb-Mar | -Drafting 2nd prototype design<br>-Education and try-out of 2nd prototype<br>-Gather feedback from Ward 48 nurses, patients and family<br>-Material Selection and appearance<br>-Improvements made on 2nd prototype |
| 3 | Mar-Apr | -Drafting 3rd prototype design<br>-Education and try-out of 3rd prototype<br>-Gather feedback from Ward 48 nurses, patients and family<br>-Improvements made on 3rd prototype |
| 4 | Apr-Jul | Drafting final prototype<br>-Education and try-out of final prototype<br>-Created an educational video (Use of the final prototype)<br>-Gather feedback from ward 48 nurses, family and patients<br>-Time motion study on final prototype<br>-Post survey |

Table 4: PDSA Cycles

| Prototypes | Summary of feedback received (Pros and cons of each prototype) |
|---|---|
| Prototype 1<br>Front View / Back View | **Pros:**<br>-Presentable<br>-Does not look like restrainers<br>-Time-saving<br>-Preserves Patients' dignity<br><br>**Cons:**<br>-Easy removal of buttons<br>-Easily torn off |
| Prototype 2<br>Front View / Back View | **Pros:**<br>-Comfortable<br>-Presentable<br><br>**Cons:**<br>-Might strangle patient<br>-Straps easily torn off<br>-Difficult to wear<br>-Very hot<br>-Easily removed without hand restrainers |
| Prototype 3<br>Front View / Back View | **Pros:**<br>-Presentable<br>-Less restrictive for patients<br><br>**Cons:**<br>-Difficult to wear<br>-Easily torn off with aggressive patients<br>-Uncomfortable for big size patients<br>-Time-consuming |
| Prototype 4<br>Front view / Back view | **Pros:**<br>-Easy to wear<br>-User-friendly<br>-Secure and durable<br>-Less restrictive for patients<br>-Comfortable<br>-Time-saving<br>-Protect patient's dignity<br>-Not hot<br>-Presentable<br>-Accept by patients and family<br>**Cons:**<br>-Nil negative feedback received |

Table 5: Pros and cons of each prototype


The final prototype with front, back, side and supine view is as shown above

## Measures

We had successfully **redesigned** the body vest restrainer within the scheduled timeline.

The following aspects were measured to evaluate the final prototype:

### *Users Experience*

We conducted a post survey among 68 Ward 48 nurses, 30 patients and 30 family members with positive feedback received as shown below in Table 6, 7 & 8. We had achieved our goal: **100% of patients, 79% of family and 90% of nurses were satisfied and liked the design.**

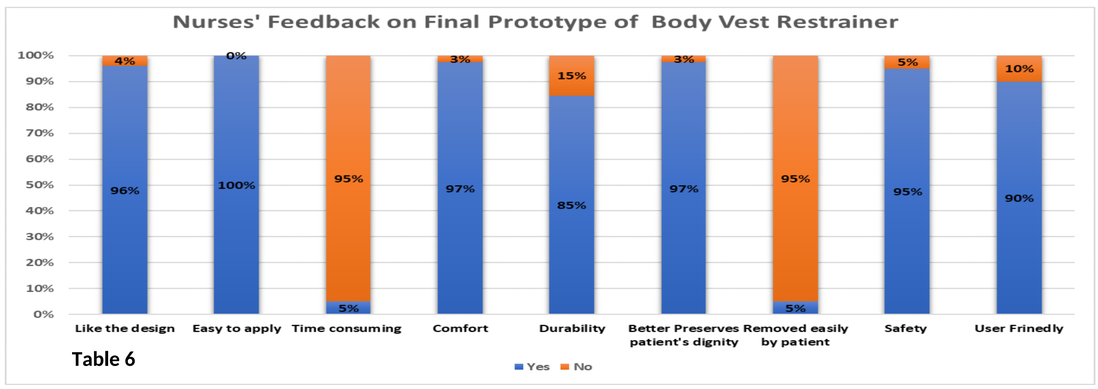


Table 6

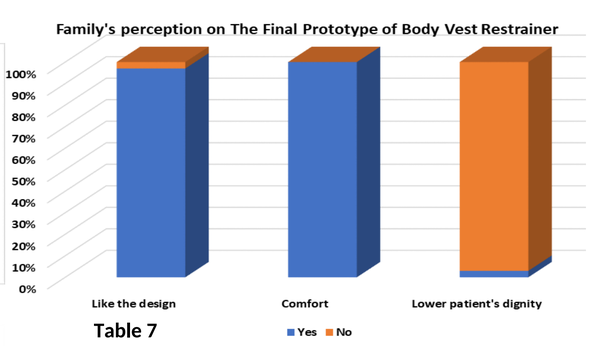


Table 7

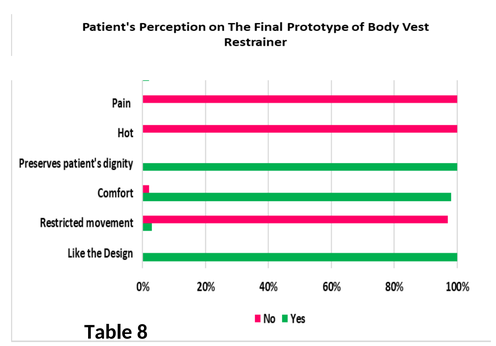


Table 8

### *Time Motion Study*

Time motion study was done with 10 nurses, and we were able to save an average of **1** hour (91%) of nursing time (Table 9) and at least **3** manpower in comparison with the application of the current body vest restrainer.

| | 1. Time to retrieve body vest & Manpower required | 2. Time taken to prepare body vest prior wearing for patient & Manpower required | 3. Time taken to wear body vest for patient & Manpower required | 4. Time taken to secure body vest to bed& Manpower required | 5. Time taken to release body vest to check diaper or offer urinal/bedpan & Manpower required | Total time taken |
|---|---|---|---|---|---|---|
| Current Body Vest (Average) | 60 sec x 1 person per patient | 60 sec x 1 person per patient | 480 sec x 6 persons per patient | 120 sec x 6 persons per patient | 60 sec x 6 persons per patient | 4080 sec |
| New Body Vest (Average) | 60 sec x 1 person per patient | 20 sec x 1 person per patient | 60sec x 3 persons per patient | 20 sec x 3 persons per patient | 20 sec x3 persons per patient | 380 sec |

Time Motion Study

Saved 1Hours /Case

### *Cost Saving*

We managed to save **76%** of cost with the redesigned body vest

| | Current Body Vest Restrainer | Resigned Body Vest Restrainer | Cost Saved |
|---|---|---|---|
| Cost | $57.8/pc | $14/pc | $43.8/pc |
| Torn | Average 7/month | Nil during the trial | $404.6/mth/WD |

## Conclusion

The redesigned body vest is more durable, comfortable, time-saving and better preserve patient's dignity. With the emerging ageing population, quality improvement of restrainers would bring about a significant impact in patient care.