HUMANOID IN NURSING HOMES TO IMPROVE CARE QUALITY AND PRODUCTIVITY

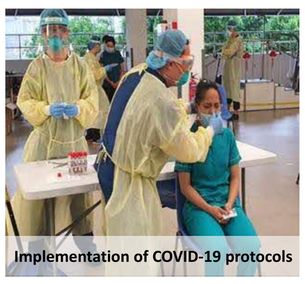
Bright Hill Evergreen Home

Bright Hill 光明山修身院 Evergreen Home

Background

Nursing homes face complex and rapidly growing demands for holistic care and workforce constraints. Residents' psychosocial and emotional needs often take a backseat due to the focus on clinical and care needs.

BHEH, a 436-bedded non-profit nursing home, faces the same challenge of lacking trained staff to engage effectively and in meaningful interactions with residents exacerbated by COVID-19 restrictions.


Implementation of COVID-19 protocols

At the peak of these challenges, the activity programme and engagement level was nearly nil due to other clinical care priorities, staff shortage and isolation restrictions.

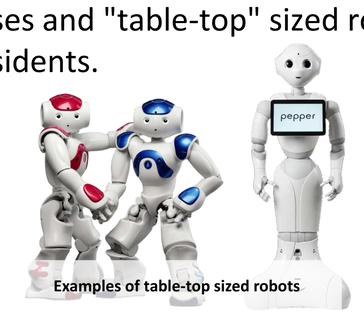
BHEH strategically partnered with multidisciplined experts from IMI NTU and Goshen Consultancy Services to adopt the use of an Eldercare Humanoid to improve resident engagement and increase workforce savings with its Humanoid Therapeutic Programme.


Nadine, the Humanoid Employed During Pilot Phase


Dexie, the Humanoid Employed During Implementation Phase

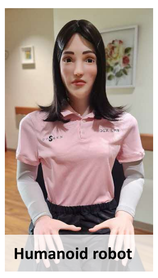
Innovation

BHEH considered multiple solutions, including the use of virtual platforms to conduct activities and exercises and "table-top" sized robots to entertain the residents.



Examples of table-top sized robots

VS


Humanoid robot

BHEH eventually decided to adopt a humanoid robot due to the following reasons:

- It is a consistent "manpower" as it is immune to contracting Covid-19.
- It addresses the consistency of delivering activity programmes and interacting with the residents without the constant presence of a human worker.
- Research findings indicate that social robots have the potential to improve the well-being of seniors, and a humanoid that has a human-like presence may provide a longer-lasting impact on residents.
- Using a humanoid paves the way to future-proof the care industry. It can be further programmed to enhance its capabilities to perform other engagement functionalities. It can be scaled to be implemented at other wards, nursing homes, day centres, and community care settings.


Humanoid robot interacting with residents

Strategy

- Engage stakeholders and partners
- Communicate the project intent, objectives and plan within the BHEH team
- Review how activities can be conducted using fewer staff
- Incorporate humanoid to address the activity and social engagement needs of the residents
- Induct the humanoid robot to the ward, therapy and nursing care staff and residents for pilot and implementation
- Gain buy-in from staff through a comparison of pre-and post-pilot results

The critical change management strategies include the following:

- Regular communications and project updates with the key stakeholder and end-users to support the seamless adoption of the humanoid.
- Accessible onsite and remote technical and programme support by experts and professionals to ensure a positive user experience.
- Regular feedback and observation sessions to validate and evaluate project outcomes.

Objectives

1. To provide an alternate activity engagement tool without increasing workforce demands
2. To provide a structured and consistent activity programme that can be facilitated easily, minimising the language and communication barriers between staff and residents.
3. To increase the duration and type of engagement for residents to improve their quality of life.

Phase	Target Residents	Type of Activity	Number of sessions	Period
1. Pilot	Between 14-29 female residents for the respective activity	▪ Bingo game ▪ Reminiscence ▪ Social conversations	24 to 29 sessions	Oct '20 – Jun '21
2. Implementation	35 male and female residents from 2 wards	▪ Psychomotor exercises ▪ Games ▪ Sing-a-longs, ▪ Social chit-chat	24 to 29 sessions	Jul '21 – Jul '22
3. Scale up	• Preparation to scale up to 8 wards			Aug '22 – to present


Humanoid conducting psychomotor exercises

Impact

The key findings from the pilot results show:

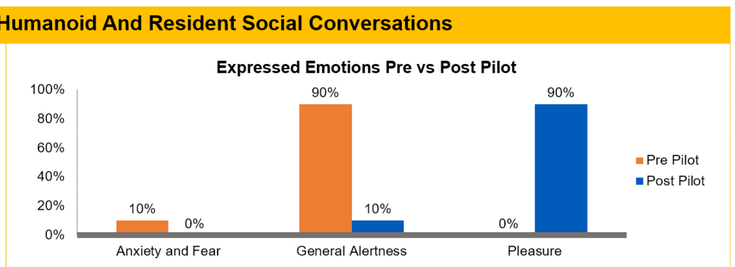
1. Improved well-being of residents with increased positive expressed emotion and improved quality, level, and duration of engagement during the programme
2. Improved staff productivity by augmenting or reducing staff required to provide activity and interaction engagement

The following methods of data collection were used:

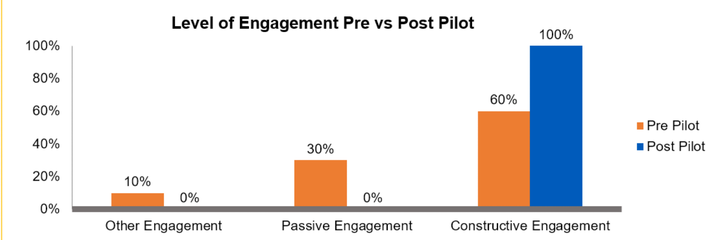
- Time-motion study to measure time and effort taken to conduct the activities
- Computer Vision Method
- Observational Tools – Observed Emotion Rating Scale[1] (OERS), Menorah Park Engagement Scale[2] (MPES) and Person-centred Interaction Observation Tool[3] (PCIO)

Client Impact From Humanoid And Resident Social Conversations

Observed Emotion Rating Scale (OERS) to determine expressed emotions during personalized conversations

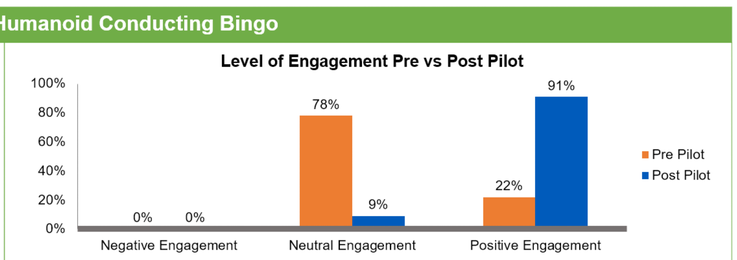


Menorah Park Engagement Scale (MPES) to determine the level of engagement during personalized conversations



Client Impact from Humanoid Conducting Bingo

Person-centred Interaction Observation Tool (PCIO) to determine the level of engagement during Bingo



Productivity Impact from Humanoid Conducting Bingo

Staff needed to conduct the Bingo game

Pre Pilot: 3 staff

VS

Post Pilot: 1 staff and 1 Humanoid

1: The Observed Emotion Rating Scale (OERS) is an observational instrument that measures the presence or absence of three positive (pleasure, interest, and tranquility) and three negative emotions (anger, anxiety, and sadness).

2: The Menorah Park Engagement Scale (MPES) is an observational scale that was developed together with the Montessori-Based Dementia Programme designed to assess the type and amount of engagement (i.e., constructive engagement, passive engagement, non-engagement and other engagement).

3: Person-Centred Interaction Observation Tool (PCIO) is an observation tool to quantify the interactions between staff and resident. As the staff (Dexie) delivery is consistent, we used it to measure the residents' reactions and engagement.

Next Steps

BHEH has deployed the humanoid programme since August 2022 in 2 wards after the implementation phase. The scale-up effort is targeted to implement across the remaining seven wards by March 2024.