

Project Title

Humanoid Robot Instructor for Group Therapy Exercises (ROBO)

Project Lead and Members

Project Lead: Lai Ka Ying, Principal Physiotherapist

Project Members:

- Nur Amalina Binte Mohamed Noor, Principal Physiotherapist
- Rachel Tng, Senior Physiotherapist

Organisation(s) Involved

Ren Ci Hospital

Healthcare Family Group(s) Involved in this Project

Allied Health

Applicable Specialty or Discipline

Physiotherapy

Project Period

Start date: May 2019

Completed date: August 2020

Aim(s)

To adopt a humanoid robot for group therapy exercise for elderly patients/ clients

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

The lessons that we have learnt is that it is important to get staff buy-in to ensure that change implemented is sustainable. Adequate support should also be provided to address queries and troubleshoot issues faced so that staff will continue to use the equipment readily. Given the chance to start over again, we hope to understand more about the robot's limitations e.g. Speaker's performance. Currently, some adjustments to the work processes have to be made in order to accommodate to the robot's speakers which is unable to give audio instructions at high volume for prolonged periods of time.

Conclusion

Adopting new technology/implementing changes to work processes can be challenging work, but worthwhile as it ultimately helps us to serve our patients better. So don't give up no matter what! With the Robo as exercise instructor, we are able to free up one therapy aide during group therapy sessions to help out in other essential patient care duties so that other patient's needs can be met more promptly.

Additional Information

The innovative function and low cost of Robo increase its potential to spread and be adopted by other community partners. After our media feature & sharing in 2020, 2 other healthcare providers in the long-term care sector are currently in discussions with SJ Cosmo Future to purchase and adopt UBTECH Alpha 1E robot units as therapy buddies for their clients and residents, with 1 of them intending to place their order. Agency of Integrated Care (AIC) is also in the midst of analysing data on the UBTECH Alpha 1E robot and working to have it included into the AIC Healthcare Productivity Fund green-lane application, making it easier for healthcare institutions to apply and obtain funding in the future.

7 units of Robo have been deployed in RCH facilities since September 2020; which is sufficient for the time-being. Other potential aspects to explore with Robo include the conduct of exercises in other languages such as Malay/Hokkien/Cantonese and the addition of new exercises movements/routines.

Project Category

Technology, Medtech, Robotics

Care & Process Redesign, Productivity, Man-hour Saving

Keywords

Humanoid Robot For Exercise Therapy

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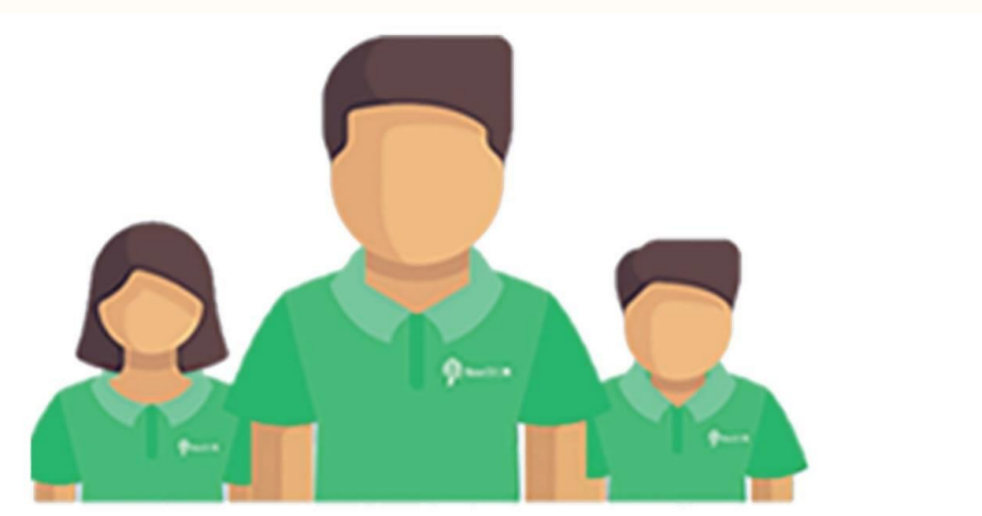
HUMANOID ROBOT INSTRUCTOR FOR GROUP THERAPY EXERCISES (ROBO)

INTRODUCTION

Background

Group therapy exercises are conducted across multiple Ren Ci Hospital facilities (Community Hospital, Chronic Sick Unit, 3 Senior Care Centres, 2 Nursing Homes).

Challenges:



Lean Manpower

- Labour Intensive
- Each session requiring about 3 Therapy Aides (TA)

Lead the exercise

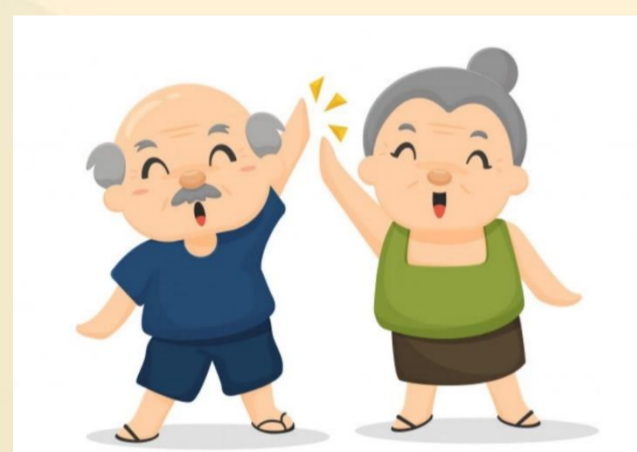
Assist care-recipients in doing the exercise movements in a safe and effective manner

Objectives:



1. Reduce Manpower

2. Novel creative way to engage seniors, especially those with short attention span, during their group therapy.



IMPLEMENTATION

Recognising that a key resource constraint that we face is our manpower coupled with the desire to introduce new means to engage and motivate care-recipients prompted the team of therapists and therapy aides to leverage on technology to improve our care and processes. A study trip to Hong Kong in 2019 involving the project lead then led to the discovery of humanoid robots. Ideas were then shared by the project lead with the team. Realising that utilising humanoid robots could potentially solve our long-lived issue of manpower crunch and improve engagement for our care-recipients, the team of therapists and therapy aides did a market research and found similar solutions that can meet our needs.

Period	Action
May 2019	Start of Project: - Identification of problems and possible ways to work around the issue of manpower crunch
Jul 2019	Invited potential vendors to quote
Jul 2019 – Sept 2019	Liaising with vendor, product trial and demo with the vendors
Nov 2019	Selected a vendor (SJ Cosmo Future)
Nov 2019 – Aug 2020	Groundwork with vendor: - Calibrating - Syncing of audio - Planning movement and sequences of the exercises
Aug 2020	7 units of Robo introduced to our facilities - Empowering staff to adopt Robo



Challenges faced:

- Deployment delayed by COVID-19 as physical meetings were not allowed
 - Proved to be a challenge as the vendor (SJ Cosmo Future) did not have healthcare background
 - Solution: team engaged vendor via virtual video conferencing
- Group therapy exercises were ceased during COVID waves

Empowering staff to adopt Robo:

- Operational guide by vendor for staff
- Training for staff by vendor
- Regular feedback check-ins

RESULTS

Value for Staff

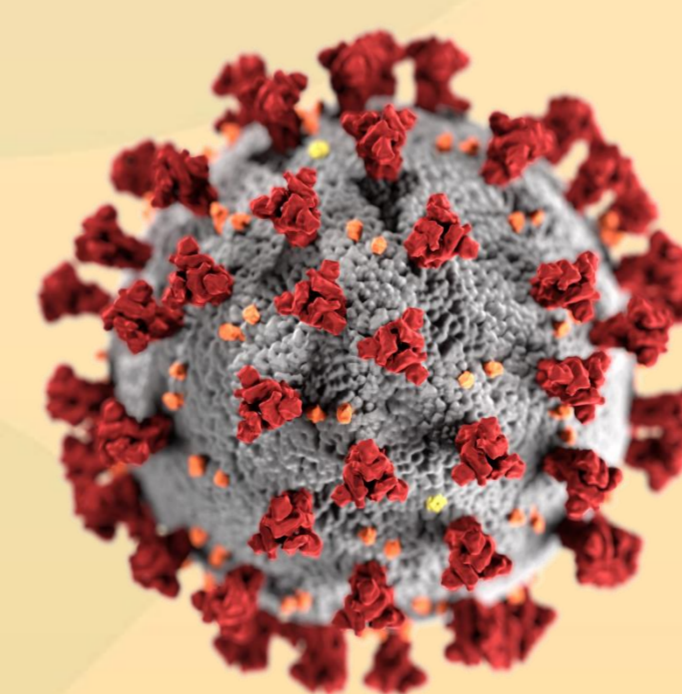
- Manpower savings of at least 1 TA per group exercise session with **man-hour savings of 256 hours per month.**
- Staff can be redeployed to other tasks
 - e.g. assisting physiotherapists/occupational therapists in the wards/centres for seniors with higher rehabilitation needs (i.e. require 2 staff or more intensive 1 to 1 therapy sessions)
 - helping seniors in the day care centre with their daily activities of living (e.g. toileting, feeding).
- Therapy Aides (TAs) partnering with Robo during group exercises can now pay more attention on seniors who may require a higher level of care and engagement, due to their cognitive constraints.

Value for Clients / Patients / Residents

- Significantly **improve the engagement and experience**
- Users who usually have difficulty following group exercises (e.g. moderate dementia patients with short attention span) are now more engaged during the sessions

POTENTIAL OPPORTUNITIES

Opportunistic Amidst the Pandemic



- COVID-19 has reduced the manpower in the wards (as staff are to minimise their movement across various wards as part of infection prevention control measures).
- Robo will be a great replacement for staff to help conduct and lead patients in exercises/therapy in multiple wards.

POTENTIAL IMPROVEMENTS



- Conduct of exercises in other languages such as Malay/Hokkien/Cantonese
- Addition of new exercises movements/routines