

MEDIA FACTSHEET A

Updates on research on health benefits of interaction with greenery

The National Parks Board (NParks) has been conducting several research projects to quantify the benefits of greenery on Singaporeans. The studies will also aid in enhancing the design of green spaces and therapeutic horticulture programmes.

1) Effects Of Therapeutic Horticulture On Elderly At Risk Of Cognitive Decline

This is a joint research with the National University Health System (NUHS) which will provide important data on the efficacy of therapeutic horticulture in the prevention of dementia.

The development of evidence-based non-invasive cognitive-enhancing therapies is important for improving the function and quality of life of individuals suffering from mild cognitive decline. This study's findings will be useful to guide future design of programmes in order to benefit individuals with cognitive decline and potentially scale up other community-based therapeutic horticulture programmes to healthcare institutions and eldercare facilities.

This is a randomised waitlist-controlled trial. Participants who are randomised to the intervention arm will participate in therapeutic horticulture for six months. Those in the waitlist arm will initially continue with their usual daily activities for the first six months, before commencing on therapeutic horticulture for another six months. Therapeutic horticulture will be conducted at the Therapeutic Garden @ HortPark. The programme is designed with inputs from AHTA registered horticultural therapist Ms Elizabeth Diehl who has personally supervised two sessions.

The study started in 2017 and is targeted to be completed by 2019.

2) Effects of Therapeutic Horticulture On Asian Elderly's Mental Health

This joint research with NUHS on the effects of therapeutic horticulture on seniors' mental health was completed in end 2016. The findings suggest that benefits of therapeutic horticulture on the elderly include:

- Improved social relations. *A significant improvement in the mean score for the sub-scale "positive relations with others" was observed between the baseline and 6-month readings for the participants of the treatment group.*
- Reduced inflammation. *A significant reduction in plasma IL-6 levels was observed between the baseline and 6-month readings for the participants of the treatment group. High IL-6 levels have been associated with a variety of inflammation-associated diseases including rheumatoid arthritis (Liu et al., 2012b), asthma (Lu et al., 2016) and obesity (Lu et al., 2015). Hence, the finding suggests that the therapy may attenuate inflammation in the elderly. On the other hand, there was no change in plasma IL-6 between the baseline and 6-month readings for the control group.*

- Increased neuronal protection. *An increase in plasma CXCL12 was observed between the baseline and 6-month readings for the participants of the treatment group. CXCL12 plays a key role in vascular repair mechanism by mobilizing brain marrow-derived stem cells to the site of lesions (Laske et al., 2008). Hence, the finding suggests that the therapy may protect neuronal functions in elderly. On the other hand, a significant reduction in plasma CXCL12 (SDF-1 α) was observed between the baseline and 6-month readings for the control group. A reduction in CXCL12 (SDF-1 α) levels was found in patients with Alzheimer's disease (Leyhe et al., 2009).*

The study was based on a sample size of 69 elderly living in Jurong. The participants were randomly assigned to receive therapeutic horticulture or to be on the waitlist, which served as a control group. Therapeutic horticulture comprised outdoor gardening, indoor horticultural activities and park visits. The therapeutic horticulture sessions were conducted weekly for 12 weeks, and then monthly for three months.

The participants' mental health was assessed through self-reports of depressive and anxiety symptomatology, social connectedness and psychological well-being and immunological markers. The participants were examined at three points of time: at the start (to establish a baseline), three months post-intervention (after therapy started), and six months post-intervention.

3) Surveying, Benchmarking, and Expanding the Wellbeing and Social Cohesion Impacts of Community Gardening Programmes in Singapore

This study by the Centre for Urban Greenery and Ecology (CUGE) aimed to document the baseline status of community gardening programmes in Singapore (after 10 years of Community in Bloom), with a focus on gardens within HDB estates and thematic focus on the programmes' associated impacts on well-being and perceived community cohesion. Community cohesion is interpreted here to include self-reported and observed interaction amongst different generational and cultural groups.

The study was completed in mid 2017. Key findings include:

- Positive relationships between respondents' community gardening involvement and subjective wellbeing and social indicators.
- The findings for this study are consistent with those of other studies in current international literature.
- Neighbours who garden elsewhere (i.e. their own homes) show higher motivation to join and more positive perception of their local community gardens than their non-gardening neighbours.
- In terms of proportionate, numeric provision of community gardens, Singapore is on par with its international peers.

4) Dementia Prevention Program

This project is also jointly conducted with NUHS and People's Association (PA). It aims to evaluate the efficacy of community programmes in improving the psychological well-being and cognitive function of the elderly. The community programmes comprise of Mindfulness Awareness Practices (MAPs), Music Reminiscence Therapy (MRT), Meridian Flapping (MF) and therapeutic horticulture. In addition, health talks will be conducted on diet, nutrition, physical health, dental health and medications. The study is currently being conducted at Queenstown and Eunos Community Centres (CC) and there are plans to extend the study to include other CCs. Currently, 40 seniors have been recruited for the programme, with more to be recruited once the study moves into Bukit Panjang CC.

The project started in 2015 and is targeted to be completed by end 2017.

5) Parks Prescription

The Parks Prescription study jointly conducted by NParks, National University of Singapore Saw Swee Hock School of Public Health and Khoo Teck Puat Hospital evaluates if there is improvement in the physical and mental well-being of Singaporeans aged 40 to 65 years through increasing physical activity and park use. It is targeted to be completed by end 2018.

There are two phases to the study:

1. Formative research to develop park prescription intervention from users' perspective and test logistics
2. Randomised Control Trial to test the effectiveness of the park prescription interventions through objective assessments of body-mass index, blood sugar, systolic and diastolic blood pressure, lipid profile and standardised questionnaires

The study started in 2015 and is targeted to be completed by end 2018.